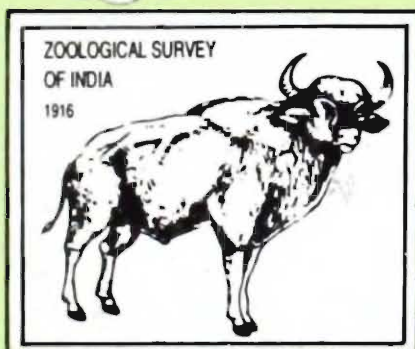


State Fauna Series 4

FAUNA OF MEGHALAYA

PART-7



**Zoological Survey of India
Calcutta
2000**

State Fauna Series 4

FAUNA OF MEGHALAYA

PART-7

INSECTA

Edited by
The Director
Zoological Survey of India, Calcutta



Zoological Survey of India
2000

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FAUNA OF MEGHALAYA

PART-7

INSECTA

Part-7	2000	Pages 1-628

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INSECTA : ANOPLEURA

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Zoological Survey of India, Calcutta

INTRODUCTION

Sucking lice or Anopleura infest domesticated or wild mammals. From Meghalaya only 4 sps have been recorded so far though from India 56 sp. have been recorded. Quite a few workers viz., Ansari (1951), Misra et al (1981) worked on this group.

SYSTEMATIC ACCOUNT

The head is conical and divided into two parts forehead and hind head. The base setal arrangement of the hind is rather consistent. Antenna five segmented and with sensoria.

The thoracic segments are dorsally fused. The sternal plate is an important character as like thoracic chaetotaxy.

Abdomen nine distinct segmented. The number, size & shape of paratergite is of taxonomic importance. Male genitalia consists of basal apodema, parameres, aedeagus & pseudopenis. Female genitalia consists of subgenital plate, gonopods and spermatheca.

LIST OF THE TAXA

Family : HAPLOPLEURIDAE

1. *Haplopleura pacifica* Ewing
2. *Haplopleura sicata* Johnson

Family : LINOGNATHIDAE

3. *Linognathus africanus* Kellogg & Paine

Family : POLYPLACIDAE

4. *Polyplax reclinata* (Nitzsch)

Key to the families

Abdominal paratergites absent or almost represented by small tubercles anterior to each spiracle. Tergal and sternal plate in abdomen entirely absent..... Linognathidae

Abdominal paratergites usually highly developed and its apex free from the body wall. Tergal and sternal plates usually highly developed on abdomen..... 1

* Now in F.R.I.

1. Sternal plate on abdominal segment II extended laterally on each side to articulate with the corresponding paratergal plate.....Hoplopleuridae
Sternal plate on abdominal segment II never extended laterally on each side to articulate with the corresponding paratergal plate.....Polyplacidae

Hoplopleura pacifica Ewing

1924. *Hoplopleura pacifica* Ewing, Bull. Bishop Museum, Honolulu, 14 : 9

1981. *Hoplopleura pacifica* Ewing, Mishra, 1981, Rec. Zool. Surv. India, Occ. paper, 21:52-54

Diagnosis : Female (Fig.1A). Body length 1mm. range 0.9-1.3 mm. Head : longer than wide, all typical head setae present, post antennal and postero lateral angles round. Thorax, posterior process rounded at tip, MDTs one pair, long. Abdomen, Dorsal, segment II with single tergite, having 2 rows of setae, anterior with 2 and posterior with 4 setae, segment III-VII each with 3 tergites, having 6-10 setae each except first tergite at III which bears 4 thin setae, VIII and terminal segment each with single tergite, having 4 and 2 setae respectively, DAAs 5-7 pairs, ventral, segment II with single sternite, having 8 setae, III with 4 sternites, first with 7 and remaining with 6-9 setae each, IV to VII each with 3 sternites having 6-10 setae each, VII with 2 sternites having 7-8 setae anteriorly and 8 setae posteriorly; VAAS 8 to 9 pairs. Lateral; paratergites, II typical, dorsal seta longer than ventral; III to V each with posterior process truncated and emerginate, each with dorsal setae minute, ventral equal to process except III which has both setae long. VI with dorsal process emerginate and truncated, ventral process acute, dorsal seta minute, ventral longer than process, VII and VIII devoid of process, both setae long. Genitalia : Gonopods paired: each genital lobe with 3 setae; genital setae short and slightly enlarged.

Male : (Fig. 1B) Body length 0.67mm, range 0.58-0.72 mm. Head and thorax as in female. Abdomen: Dorsal segment II as in female: III with 2 tergites, anterior with 4 and posterior with 8-10 setae, VIII with single tergite without setae, DAAS 1-2 pairs. Ventral segment II as in female, III with 3 sternites, first as in female, remaining with 7-9 setae each, IV to VI each with 2 sternites, with 7-9 setae each; VII and VIII each with single sternite having 4- and 2 setae respectively; VAAS 3-4 pairs. Genitalia : Parameres uniform in thickness, pseudopenis serrated:

Material examined : 5♀, 3♂ from *Rettus rettus*, Shilling, Meghalaya, 4.7.85 coll. C.C. Adhikari.

Distribution : India, Arunachal Pradesh, Meghalaya, Orissa, Maharashtra, Rajasthan, M.P., H.P. W.B., Andaman Islands, other Oriental & Australian region.

2. *Hoplopleura sicata* Johnson

1964. *Hoplopleura sicata* Johnson, Misc. Publ. Ent. Soc. Am., 4:73

1981. *Hoplopleura sicata* Johnson, Mishra, Rec. Zool. Surv. India, Occ. paper, 21 : 59-61.

Diagnosis : Female : (Fig. 2A) : Body length 1mm, range 0.88-1.51 mm. Head longer than wide all typical head setae present, antennal sensoria large and contiguous, marginal head setae not in straight line. Thorax, sternal plate 0.09 mm. long and 0.04 mm. wide, with posterior process long rounded at tip, MDTs medium sized. Abdomen, setae sword shaped. Dorsal. Segment II with single tergite, having 2 rows of setae, with 2 and 4 setae respectively, III to VII each with 3 tergites having 7-10 setae each except first tergite of III which bear 4 thin setae, VIII and terminal segment each with

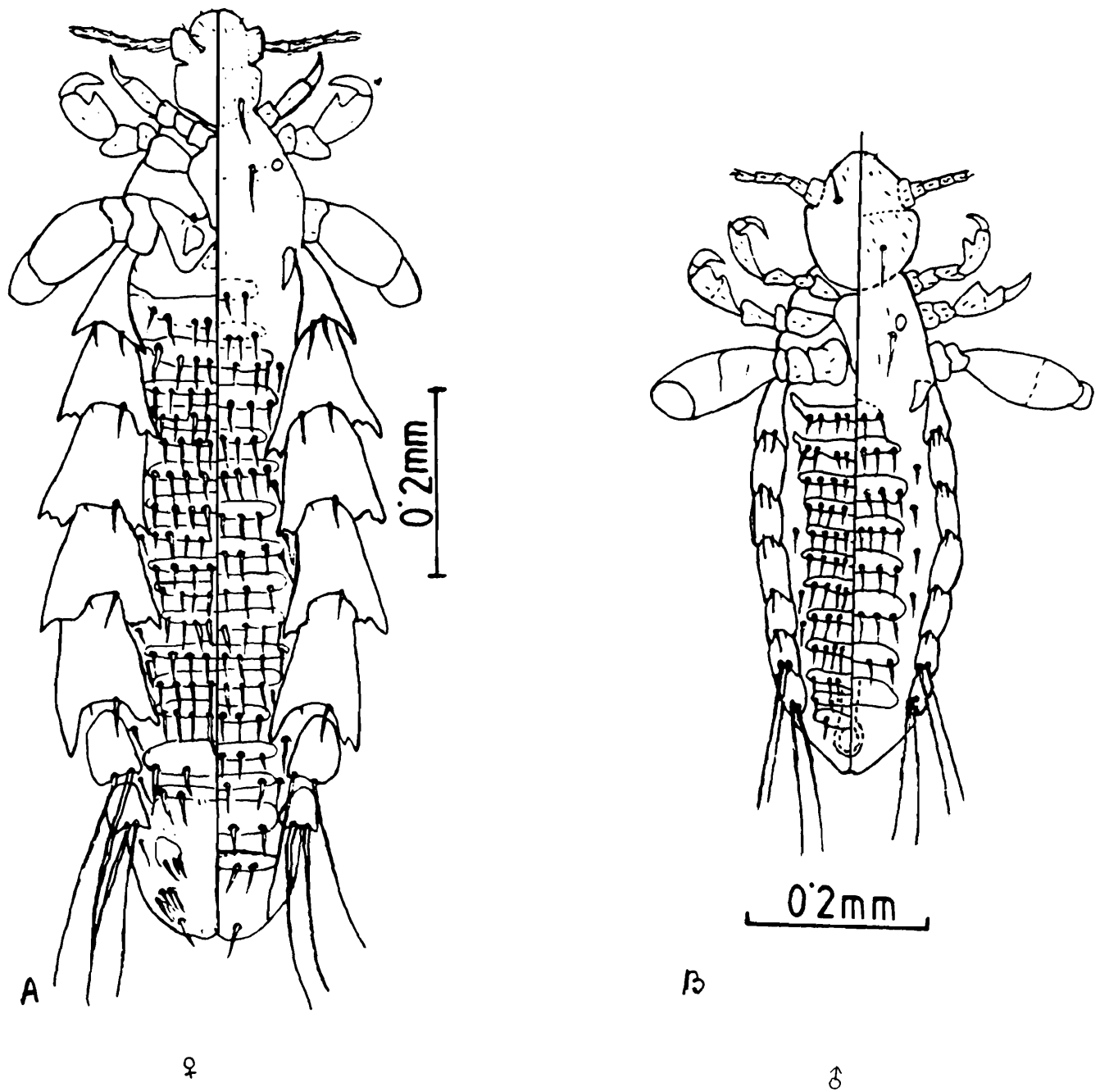


Fig 1. *Hoplopleura pacifica* Ewing Whole body (Ventral and dorsal views)

single tergite having 4 setae each. Ventral segment II with single sternite with 4 pairs of setae, III with 4 sternite, first with seven and remaining with 6 or 7 setae each, IV to VI each with 3 sternites having 5-8 setae each, VII with 2 sternites having usually 6 or 7 setae each; remaining sternites modified to form genitalia. Lateral : Paratergites II typical, dorsal setae longer, ventral equal to or shorter processes of their sides; III to VI each with posterior process truncated and emerginate, each with dorsal setae minute, ventral medium sized but shorter than process at their sides except III which has dorsal setae longer, ventral equal to or shorter than process at their sides; VII with dorsal process narrow, ventral process lacking, both setae long, VIII devoid of process with usual 2 long setae; Genitalia, gonopods paired, genital setae short and thick.

Male (Fig. 2B) : Body length 0.65 mm, range 0.61 mm to 0.72 mm. Head and thorax as in female. Abdomen dorsal: Segment II with a single tergite, with 4 setae; segment III with 2 tergites having 4 setae anteriorly and 6 setae posteriorly; IV to VII each with single tergite having 5-8 setae, segment II without setae. Ventral segment II with a single sternite having 8 setae, III with 3 sternites, first with 7 and remaining with 6-7 setae each, IV to VI each with 2 sternites having 6-8 setae, VII and VIII, each with a single sternite with 4 and 2 setae respectively. Lateral paratergites as in females; genitalia, parameres thickened near the base, Pseudopenis curved dorsally and pointed towards tip.

Material examined : 12♀, 10♂ from *Rattus niviventer*, Shillong, Meghalaya; 4.7.85, coll. C.C. Adikari.

Distribution : India, jammu & Kashmir, Meghalaya, Sikkim, W.B.; Laos & Indonesia.

3. *Linognathus africanus* Kellogg & Paine

1911. *Linognathus africanus* Kellogg & Paine, *Bull. Ent. Res.* 2 : 146.

1974. *Linognathus africanus* Kellogg & Paine, Misra et al, *India J. Med. Res.*, 62:1280.

Female (Fig. 3A) : Body length 1 mm. range 0.7mm. 2.1 mm. Head Elongate & slender, forehead sharply parabolic, the antenna set quite well forward; lateral margins of the hind head strongly and angularly convex, dorsal setae in no case very long and slender, pharynx with brushes, mouth parts only slightly exceeding the posterior margin of the head. Thorax about as long as head, narrow and parallel sided, meso thoracic phragmata well developed. Abdomen: Relatively large, elongate, oval, moderately hairy, the setae very slender, stouter and arranged in the normal pattern, spiracles normal, globular form, not large. Genitalia : Gonopophyses slender, convergent, narrowly rounded at the apex which bears a cluster of slender setae; median genital plate present, large and elongate, apical lobes shorter.

Male : Similar to female but slightly less hairy. Genitalia. parameres without a mesal expansion and is having the endomeral piece in the form of a very narrow, almost tube like structure enclosed between the apical half of the parameres.

Material examined : 15♀, 10♂ from Goat, Shillong, Meghalaya, 4.7.85 coll. C.C. Adikari.

Distribution : India : Arunachal Pradesh, Andaman Islands, Karnataka, Punjab, Meghalaya, W.B. and widely distributed.

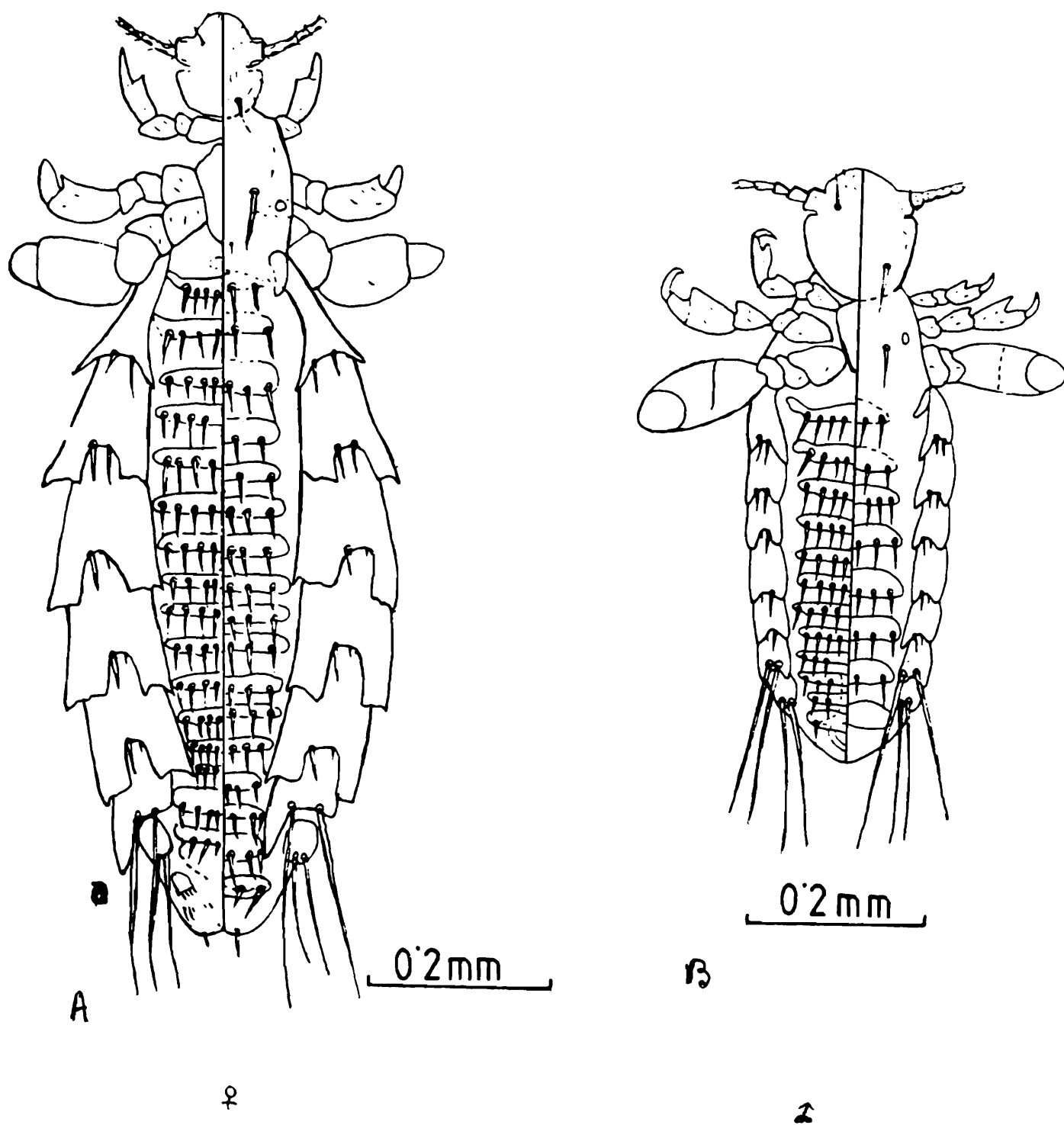


Fig.2 *Hoplopleura sicata* Johnson whole body (Ventral and dorsal views)

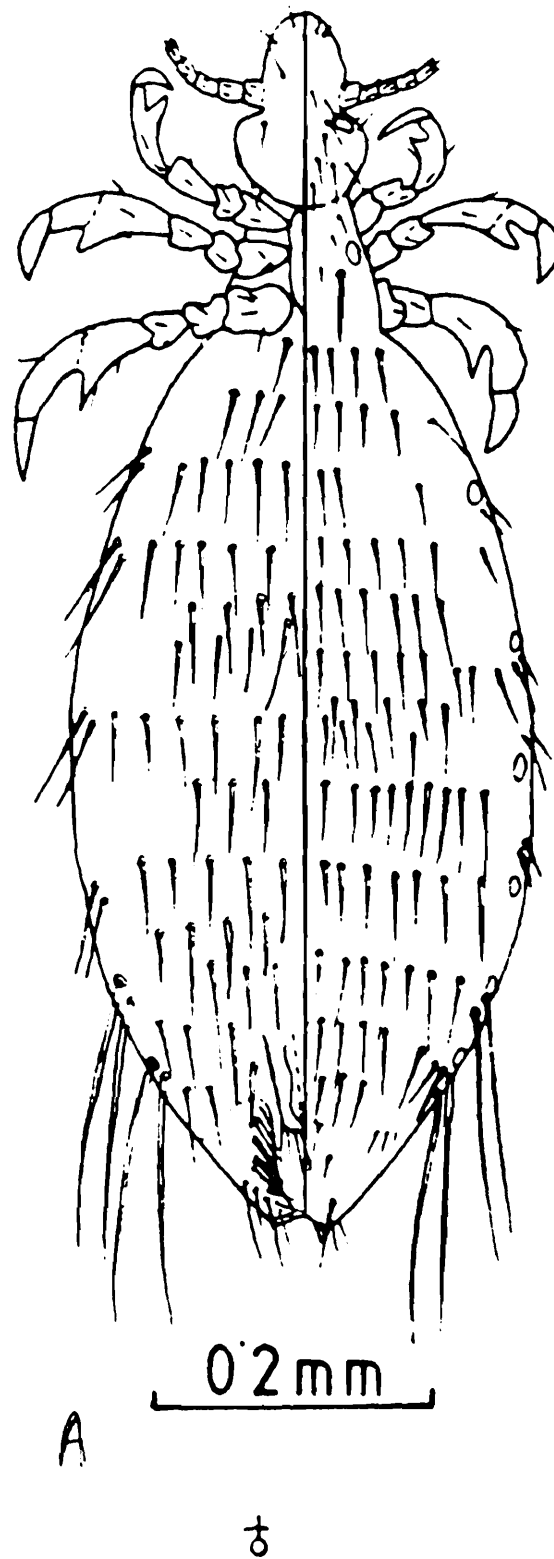


Fig. 3. *Linognathus africanus* Kellogg and Paine whole body (Ventral and dorsal views)

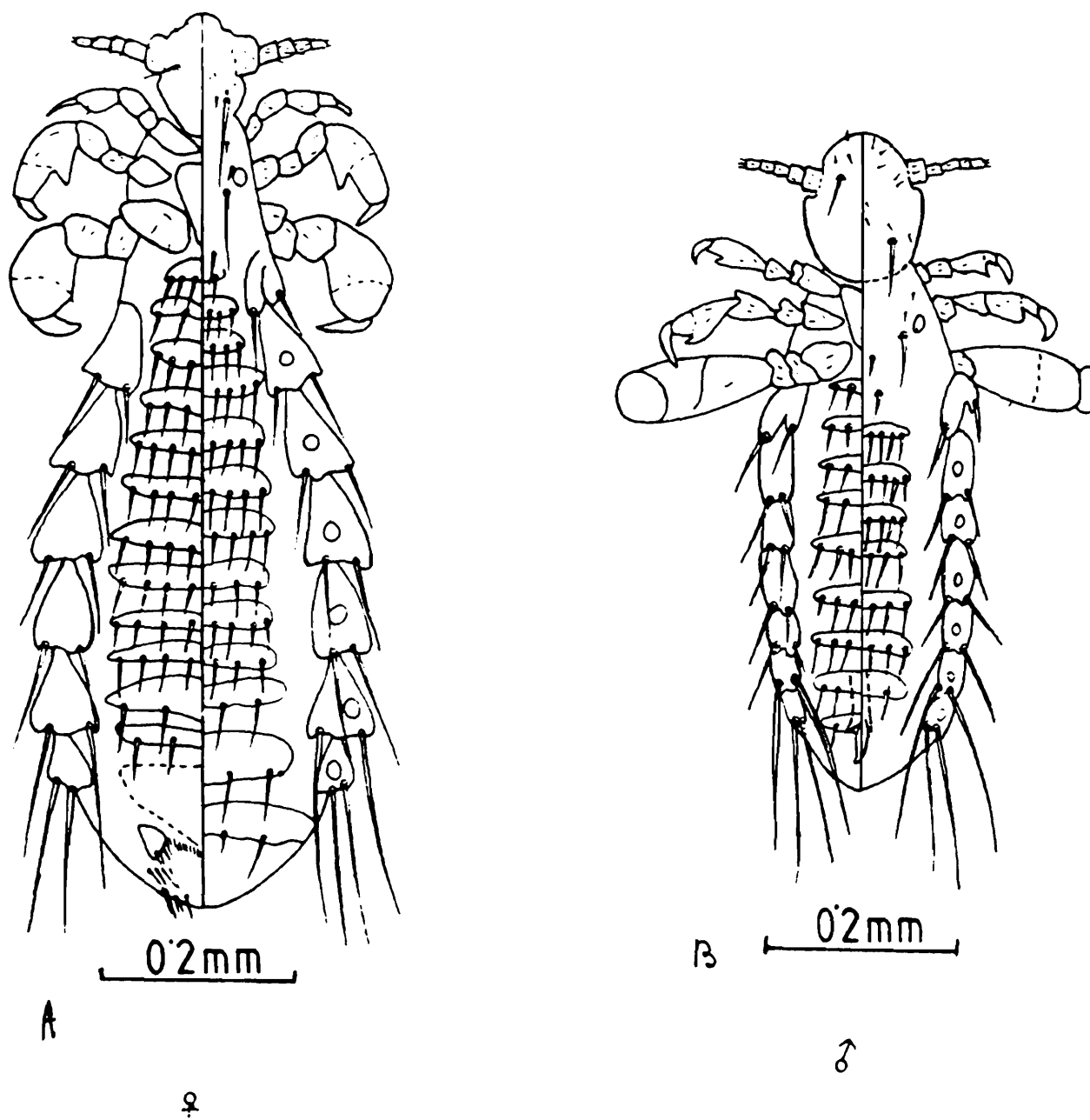


Fig. 4. *Polyplax reclinata* (Nitzsch) whole body (Ventral and dorsal view)

4. *Polyplax reclinata* (Nitzsch)

1864. *Polyplax reclinatus* Nitzsch, *Gesam. Naturw.* 23 : 23.

1904. *Polyplax reclinata* (Nitzsch), Enderlein, *Zool. Anz.* 28:142.

1981. *Polyplax reclinata* (Nitzsch), Misra, *Rec. Zool. Surv. India, Occ. Paper 21* : 98-101.

Female (Fig. 4A) : Body length 0.9 mm., range 0.78-1.51 mm. Head longer than wide, post antennal and occipetal angles weakly developed, gular fold present, all typical head setae present, DDHS long, Thorax : Sternal plate 0.053 mm. long and 0.042 mm. wide, roughly triangular, anterior margin straight, posterior process rounded at tip, MDTs one pair, long. Abdomen : dorsal segment 2 with 2 rows of setae each, with indistinct tergites; III to VII with 2 tergites having 5-7 setae each, VIII and terminal segment with a single tergite each, having 4 setae each; DAAS absent. Ventral segments II to VII each with 2 sternites, 4 to 8 setae each, remaining tergites modified to form genitalia, VAAS absent. Lateral, Paratergites II typical setae usually shorter than plates III to VIII each roughly triangular, posterior angles usually rounded, both setae on paratergites III to V variable in length, VI to VIII always with both setae long, spiracles usually large. Genitalia. Genital plate roughly triangular, gonopods paired, genital setae short and spiniform.

Male (Fig. 4B) : Body length 0.67mm., range 0.58-0.77 mm. Head and thorax as in female. Abdomen. Dorsal Segment II with single indistinct tergites with 2 rows of 2 setae each : III with 2 tergites usually 8 setae on each, IV to VIII each with single tergite having 2 setae, DAAS absent. Ventral segment II and III each with 2 sternites, 4-6 setae each, IV to VII each with a single sternite having 2 setae; VAAS absent. Lateral, Paratergites and spiracles as in female. Genitalia, Pseudopenis long and tapering, articulating at the apices of parameres.

Material examined : 2♀, 2♂ from *Sukcus murinus*, Shillong, Meghalaya, 30.6.85, Coll. C.C. Adikari.

Distribution : India. Arunachal Pradesh, Jammu & Kashmir, H.P., Maharashtra, Meghalaya, Orissa, Rajasthan, U.P., W.B. and widely distributed.

SUMMARY

Only 4 spp of sucking lice have been recorded from Meghalaya. These were recorded from wild and domesticated hosts. Further exploration may extend the host and species range.

ACKNOWLEDGEMENT

The authors are thankful to the Director, Z.S.I. for providing working facilities and encouragement and to Dr. R.K. Vershney, Add. Director, for helpful suggestions.

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- Mishra, A.C. 1981. The Hoploteroid lice of the Indian subcontinent (Anopleura: Hoplopleuridae), *Rec. Zool. Surv. India; Occ. paper 21*:1-128.

INSECTA : TRICHOPTERA

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INTRODUCTION

Trichoptera or caddisflies form a well-defined order. It is closely related to Lepidoptera and some what resembling small moths. They are generally aquatic in immature stages and occur in most types of aquatic habitats, but are abundant in freshwaters. Though this group is generally not recognised as insects of economic importance but because of the broad trophic habits of the larvae they play the important role in freshwater ecology.

Amongst a total of about 7000 species in 30 families reported from the whole world and 812 species in 18 families hitherto recorded from India, altogether 61 species in 9 families from Meghalaya are presently dealt with in the paper. Out of total of 61 species from the state one species is for the first time recorded from India and fourteen species constitute new locality records (Marked *). The literature review of 30 species (marked **) has been incorporated as the material are not available for study.

In early part of this century. Morton (1900-1902) Ulmer (1905-1907), Banks (1911-1939), and Betten (1909) contributed much to the study of Indian Trichoptera.

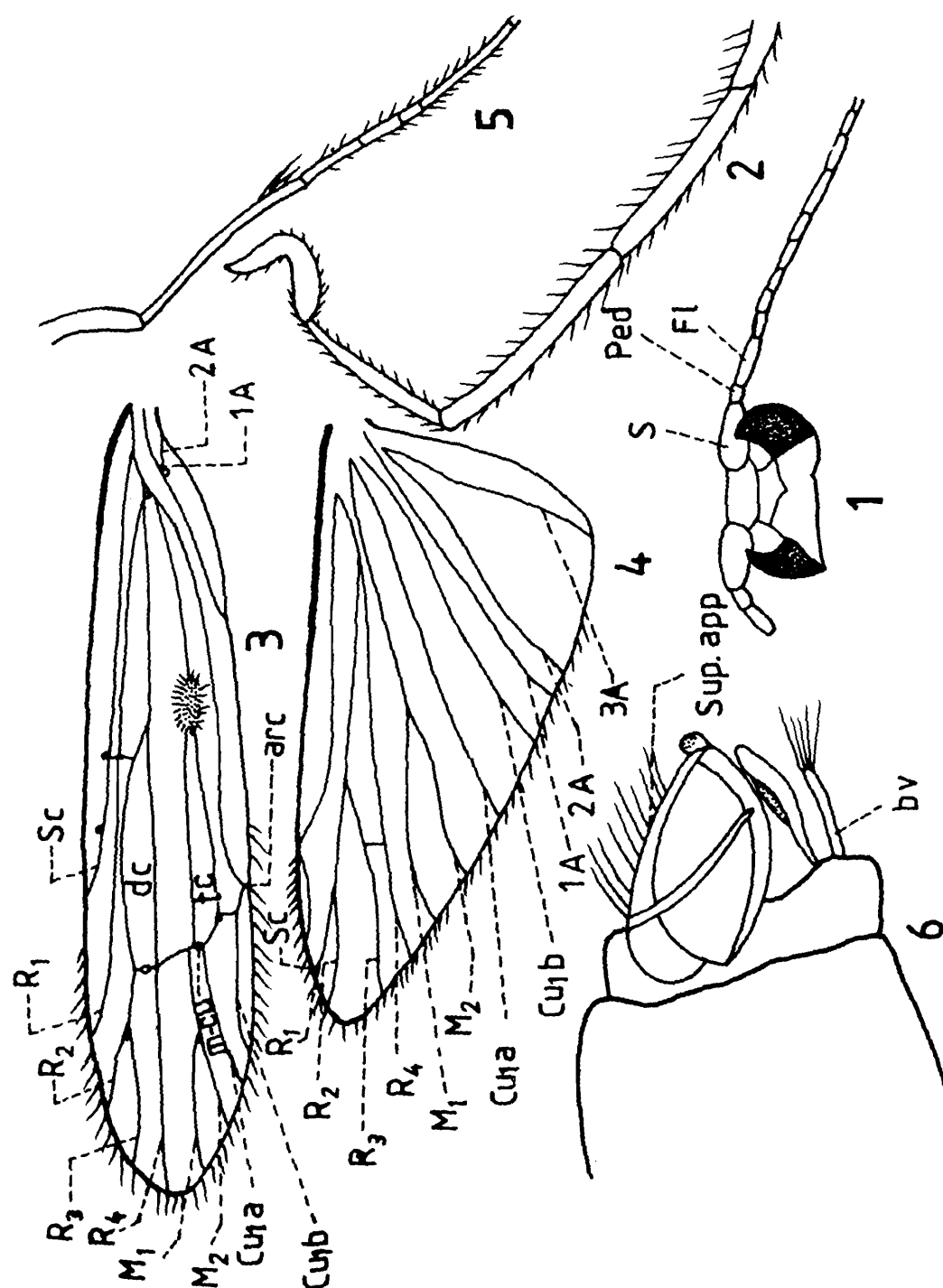
Martynov (1930, 1935-1936) worked out the collections present in the Indian Museum. Mosely (1935-1949) worked out some Indian forms. In the later part of this century Kimmins (1950-1956), Schmid (1949-1972), Wiggins, Weaver and Unzicker (1985) reported several species from the state of Meghalaya.

The collections of Trichoptera have so far mainly been made from Himalayan ecosystem, specially from the Garhwal Himalayas, Sikkim, Darjeeling (West Bengal), Arunachal Pradesh and from Meghalaya, peninsular part of West Bengal and Uttar Pradesh through field exploration by the Zoological Survey of India.

In the paper, a breif account of general morphology, collections and preservation, list of taxa, keys to taxa, generic and species references have been incorporated. Distribution of each species including those reviewed from literature in India and other zoogeographical regions of the world along with new records have been included. Summary and literature references have been provided.

Collections and preservations :

The caddis-flies are found in the neighbourhood of rivers, streams, ponds, lakes etc. They are either crepuscular or nocturnal and generally concealed during the day. They may be collected from herbage and bushes bordering water bodies, the bushes and branches of trees over hanging water,



Figs. 1-6. *Parasetodes respersella* (Rambur). 1. Head. 2. Maxillary palpus. Forewing. 4. Hindwing. 5. Hindleg. 6. Male genitalia.

Abbreviations : S = Scaphium; Ped. = Pedicel; Fl. = Flagellum; Sc = Subcosta; R = Radius; M = Media; A=Anal; Arc = Arculus; Tc = Thyridical cell; m-Cu = Mediocubital; dc = discocellular; Sup.app. = Superior appendage; bv = basoventral lobe of inferior appendage.

isolated trees at a little distance away from water, crevices of the bark, underside of the bridges, under stones or on the artificial light at night.

During daytime the collection may be made by disturbing the water-side branches of trees with a stick and when they are on flight they may be collected by aerial netting, sweeping the vegetation in the vicinity of water source with a net also yeilds good collection. They may also be collected individually by overturning stones and pebbles alongside streams specially in hilly areas or from nooks and crevices by the aspirator. The application of light traps at night is a good source for collection.

The adults may be killed in cynide, ethyl acetate or benzene vapour. It may be preserved dry in set or pinned condition or in 80% ethyl alcohol.

General morphology :

Moth-like, hairy; ocelli : 3, when present; antenna: long, filiform and multisegmented; mouth parts : poorly developed; maxillary palpi (fig. 2) : 5 segmented in females but reduced in males; labial palpi: 3 segmented; wings (fig.3-4) : 2 pairs, clothed generally with hairs and scales; folded roof-like over body at rest; with many longitudinal and few crossveins; hind pair widest alongwith anal fold; legs (fig. 5) : long, tibiae with spurs. Abdomen : 10-segmented; males are readily distinguished from females by paired forcep-like clasper or inferior appendages; generally with complex genitalic structures terminating the abdomen (fig. 6).

Super family	(A)	HYDROPSYCHOIDEA
Family	(a)	HYDROPSYCHIDAE
Genus	1.	<i>Amphipsyche</i> McLachlan
Species	*1.	<i>A. tricalcarata</i> Martynov
Genus	2.	<i>Aethaloptera</i> Brauer
	*2.	<i>A. sexpunctata</i> Kolenati
Genus	3.	<i>Paraethaloptera</i> Martynov
	*3.	<i>P. gracilis</i> Martynov
Genus	4.	<i>Cheumatopsyche</i> Wallengren
	4.	<i>C. truncata</i> Martynov
	*5.	<i>C. columnata</i> Martynov
Genus	5.	<i>Amphipsychella</i> Martynov
	*6.	<i>A. extrema</i> Martynov
Genus	6.	<i>Hydatopsyche</i> Ulmer

	*7.	<i>H. spatulata</i> Martynov
Genus	7.	<i>Arctopsyche</i> McLachlan
	**8.	<i>A. tricornis</i> Schmid
Family	(b)	STENOPSYCHIDAE
Genus	8.	<i>Stenopsyche</i> McLachlan
	*9.	<i>S. splendida</i> Martynov
	**10.	<i>S. haimavatika</i> Schmid
	**11.	<i>S. griseipennis</i> McLachlan
	**12.	<i>S. himalayana</i> Martynov
	**13.	<i>S. khasia</i> Kimmins
	**14.	<i>S. dvyankapayukta</i> Schmid
	**15.	<i>S. benaventii</i> Navas
Family	(c)	POLYCENTROPIDAE
Genus	9.	<i>Dipseudopsis</i> Walker
	*16.	<i>D. dohleri</i> Ulmer
	*17.	<i>D. indica</i> McLachlan
	18.	<i>D. triclavata</i> Martynov
Genus	10.	<i>Hyalopsyche</i> Ulmer
	*19.	<i>H. parsula</i> Martynov
Super family	(B)	RHYACOPHILOIDEA
Family	(d)	RHYACOPHILIDAE
Genus	11.	<i>Rhyacophila</i> Pictet
	20.	<i>R. parva</i> Kimmins
	21.	<i>R. pemba</i> Schmid
	22.	<i>R. inconspicua</i> Morton
	23.	<i>R. mortoni</i> Kimmins

	24.	<i>R. curvata</i> Morton
	25.	<i>R. namgyal</i> Schmid
	26.	<i>R. anatina</i> Morton
	27.	<i>R. nagongpa</i> Schmid
	28.	<i>R. drosampa</i> Schmid
	29.	<i>R. ancestralis</i> Martynov
	30.	<i>R. scissa</i> Morton
	31.	<i>R. muktepa</i> Schmid
	32.	<i>R. dolingpa</i> Schmid
	**33.	<i>R. tecta</i> Morton
	**34.	<i>R. gyaldzen</i> Schmid
	**35.	<i>R. kusang</i> Schmid
	**36.	<i>R. ngawang</i> Schmid
	**37.	<i>R. norbu</i> Schmid
	**38.	<i>R. putata</i> Kimmins
	**39.	<i>R. senggepa</i> Schmid
	**40.	<i>R. scotina</i> Kimmins
	**41.	<i>R. kyimdongpa</i> Schmid
	**42.	<i>R. nyelungpa</i> Schmid
	**43.	<i>R. khasiorum</i> Schmid
	**44.	<i>R. karpa</i> Schmid
	**45.	<i>R. ugyenpa</i> Schmid
	**46.	<i>R. scissoides</i> Kimmins
Genus	12.	<i>Himalopsyche</i> Banks
	**47.	<i>H. lanceolata</i> (Morton)
Family	(c)	GLOSSOSOMATIDAE

Genus	13.	<i>Glossosoma</i> Curtis
	*48.	<i>G. fissum</i> Martynov
	**49.	<i>G. (Muroglossa) hemantajam</i> Schmid
	**50.	<i>G. (M) varjakantakam</i> Schmid
Super family	(c)	LIMNEPHILOIDEA
Family	(f)	LEPTOCERIDAE
Genus	14.	<i>Triplectides</i> Kolenati
	*51.	<i>T. magnus</i> (Walker)
Genus	15.	<i>Setodellina</i> Lestage
	*52.	<i>S. mahadeva</i> (Banks)
	*53.	<i>S. indivisa</i> Martynov
Genus	16.	<i>Adicella</i> McLachlan
	54.	<i>A. biramosa</i> Martynov
Genus	17.	<i>Parasetodes</i> McLachlan
	55.	<i>P. respersella</i> (Rambur)
Family	(g)	PSYCHOMYIIDAE
Genus	18.	<i>Tinodes</i> Curtis
	**56.	<i>T. arala</i> Schmid
	**57.	<i>T. akanda</i> Schmid
	**58.	<i>T. utchringita</i> Schmid
Family	(h)	MOLANNIDAE
Genus	19.	<i>Indomolannodes</i> Wiggins
	**59.	<i>I. falcifer</i> Wiggins
	**60.	<i>I. comans</i> Wiggins
Family	(i)	UENOIDAE
Genus	20.	<i>Uenoa</i> Iwata
	**61.	<i>U. hiberna</i> Kimmins

Key to superfamilies of order Trichoptera

1. Terminal segment of maxillary palpi neither annulate nor flexible 2
 Terminal segment of maxillary palpi annulate and flexible.....HYDROPSYCHOIDEA
2. Legs equal in length RHYACOPHILOIDEA
- Legs unequal, forelegs shorter than mid and hind legs LIMNEPHILOIDEA

Key to families of the superfamily Hydropsychoidea

1. Mesoscutum with setal warts 2
 - Mesoscutum without setal warts.....Hydropsychidae
2. Adults with ocelli; apical segment of maxillary palpi longer than others combined; labial palpi present.....Stenopsychidae
 - Adults without ocelli; apical segment of maxillary palpi shorter than the others combined; labial palpi lacking Polycentropidae

Family HYDROPSYCHIDAE

Key to genera

1. Spurs 1,4,4; hindwing without discoidal cell*Amphipsyche* McLachlan
 - Spurs 2,4,4; hindwing with discoidal cell.....2
2. Adults without maxillary palpi 3
 - Adults with maxillary palpi 4
3. Forewing with false costal vein; Sc + R not uniting to form a common vein.....*Aethaloptera* Brauer
 - Forewing without false costal vein, Sc uniting at its end with R into a common vein.....*Paraethaloptera* Martynov
4. First apical fork little longer than pedicel.....5
 - First apical fork not longer than pedicel*Cheumatopsyche* Wallengren
5. Median cell in forewing shorter than discoidal cell*Amphipsychella* Martynov
 - Median cell in forewing longer than discoidal cell*Hydatopsyche* Ulmer

Genus *Amphipsyche* McLachlan

1872. *Amphipsyche* McLachlan, *Annls, Soc, ent, Belg.*, **25** : 68

1935. *Amphipsyche*, Martynov, *Rec. Indian Mus.*, **37** : 196.

*1. *Amphipsyche tricalcarata* Martynov

1935. *Amphipsyche tricalcarata* Martynov, *Rec. Indian Mus.*, **37** : 197-198

Diagnostic characters : Forewing pale yellowish, opaque anteriorly and along Cu_{1a}, Rs strongly curved, 1st apical fork almost equal to its pedicel, R₃ not approximated to R₁₊₂, MC subtriangular.

Material examined : India, Meghalaya, East Garo Hills, Tasek F.R.H., 1.B., Songsook, 9♀ ♀2, 3,4, 7. vii. 1998 (coll R.K. Ghosh & party) : West Garo Hills, Tura, 290 m., 5♀ ♀, 4.x.1991 (Coll. R.K. Varshney, I.J. Gupta and S.K. Ghosh).

Distribution : India : Meghalaya (East Khasi and West Garo Hills), West Bengal and Orrisa.

Genus *Aethaloptera* Brauer

1875. *Aethaloptera* Brauer, *Verh. zool. bot. Ges. Wien.*, : 25, Abh. 71.

1983. *Aethaloptera*, Neboiss, *Australian Society for Limnology*, Spl, Publication no. 5 : 48

*2. *Aethaloptera sexpunctata* Kolenati

1859. *Setodes sexpunctata* Kolenati, *Genera species Trichop.*, **3** : 266.

1909. *Aethaloptera sexpunctata*, Betten, *Rec. Indian Mus.*, **3** : 234, p, 14, figs. 10-12.

1980. *Aethaloptera sexpunctata*, Bernard, *Bull. Br. Mus. nat. Hist. (ent)*, **41** : 75, figs. 41-46.

Diagnostic characters : White with brown annulation, legs : slender; wings: white diaphanous, 1st and 2nd apical forks arising from a common stalk, four brown spots present in forewing; hindwing : diaphanous, 1st apical fork short.

Material examined : India, Meghalaya, West Garo Hills, Sibbari P, W, D.I.B., 7♂♂, 17.vii. 1998 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (Garo Hills), West Bengal and Bihar. Elsewhere : Upper Myanmar.

Genus *Paraethaloptera* Martynov

1935. *Paraethaloptera* Martynov, *Rec. Indian Mus.*, **37** : 193

*3. *Paraethaloptera gracilis* Martynov

1935. *Paraethaloptera gracilis* Martynov. *Rec. Indian Mus.*, **37** : 193-194, figs. 97-98

Diagnostic characters : Head : pale yellow; antennae : long, slender with brown annulation; mouth parts lacking; legs : mid tibiae and 1st tarsal joint strongly dilated with fringes of hair behind it, two flattened spurs present of which one is very small and triangular; wings : forewings semihyaline, 2nd apical fork more than twice longer than its pedicel, a small triangular cell present at base of 2nd apical fork; hindwing: Sc and R strong, which are uniting into a common vein at their ends; abdomen : pale.

Material examined : India : Meghalaya, Garo Hills, Tasek F.R.H. 1.B., Songsok, 1 F. , 4. vii. 1988 (coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (Garo Hills), West Bengal and Bihar.

Genus *Cheumatopsyche* Wallengren

1891. *Cheumatopsyche* Wallengren, *Skand. Neuroptera II Kongl. Sv. Vet. Akad. Handlinger*, **24** : No. 10 : 142.

1983. *Cheumatopsyche*, Neboiss, *Australian Society for Limnology*, spl. Publication **5** : 46.

Key to species of the genus *Cheumatopsyche* Wallengren

1. First fork of forewing equal to pedicel, median cell almost twice longer than discoidal cell.....*truncata* Martynov
- First fork of forewing shorter than its pedicel, median cell one third or more longer than discoidal cell*columnata* Martynov

4. *Cheumatopsyche truncata* Martynov

,1935. *Cheumatopsyche truncata* Martynov, *Rec. Indian Mus.*, **37** : 175-177, figs. 78, 79.

Material examined : India : Meghalaya, West Garo Hills, Tura, 1200-1500 ft., 1 ♂ and 1 ♀ , June-July 1917 (Coll. S.W. Kemp); East Garo Hills, Tasek F.R.H. 1.B., 1 ♂ , 4. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (Garo Hills), Uttar Pradesh (Dehradun) and Bihar.

*5. *Cheumatopsyche columnata* Martynov

1935. *Cheumatopsyche columnata* Martynov, *Rec. Indian Mus.*, **37** : 177-178, figs. 80.

Material examined : India : Meghalaya, East Garo Hills, Tasek F.R.H. 1.B., Songsok, 1 ♂ , 4. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (East Garo Hills) and Bihar.

Genus *Amphipsychella* Martynov

1935. *Amphipsychella* Martynov, *Rec. Indian Mus.*, **37** : 201.

***6. *Amphipsychella extrema* Martynov**

1935. *Amphipsychella extrema* Martynov, *Rec. Indian Mus.*, 37 : 202-203, figs 107-109.

Diagnostic characters : Pale yellow : maxillary palpi : very short not reaching to eyes; tibiae of mid legs shorter than femur but in hind legs it is longer; outer spur of mid legs reduced and indistinct, in female, second tarsal joint of mid legs as broad as basal, quadrilateral; forewing : with three false veinlets in between costa and subcosta, median cell very broad.

Material examined : India : Meghalaya, East Garo Hills, Tasek F.R.H. 1.B., Songsok, 3 ♀♀, 5. vii. 1988 (Coll. R.K. Ghosh & Party).

Distribution : India : Meghalaya (East Garo Hills) and West Bengal.

Genus *Hydatopsyche* Ulmer

1935. *Hydatopsyche* Ulmer, *Arch. Naturgesch.*, : 91.

1935. *Hydatopsyche*, Martynov, *Rec. Indian Mus.*, 37 : 179.

***7. *Hydatopsyche spatulata* Martynov**

1935. *Hydatopsyche spatulata* Martynov, *Rec. Indian Mus.*, 37 : 179-180, fig. 82.

Diagnostic characters : Head : yellow; antennae : yellow, in apical portion of each joint with a brown spot; thorax: brown above but median portion paler; legs: brownish yellow with long spurs; forewing: brownish with numerous small pale irroration and clothed with short yellow hairs; abdomen: tenth segment above and its end portion subdivided into two lobes; penis: long, cylindrical, apex truncated, from its lower edge a slender process arises, which is curved upwards.

Material examined : India , Meghalaya, West Garo Hills, Sibbari P.W.D. 1.B. 2♂♂ , 13. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (East Garo Hills), Karnataka (North Kanara) and Maharashtra (Bombay).

Genus *Arctopsyche* McLachlan

1868. *Arctopsyche* McLachlan, *Trans. ent. Soc. Lond.*, : 300.

1968. *Arctopsyche*, Schmid, *Mem. Soc. Entomol.*, no. 1, : 21.

****8. *Arctopsyche tricornis* Schmid**

1968. *Arctopsyche tricornis* Schmid, *Mem. Soc. Entomol.*, no. 1, : 34, figs. 21-24.

Distribution : India : Meghalaya (Khasi Hills).

Family STENOPSYCHIDAE

Genus *Stenopsyche* McLachlan

1866. *Stenopsyche* McLachlan, *Trans. R. ent. Soc. Lond.*, : 264.

1969. *Stenopsyche*, Schmid, *Can. Ent.*, **101** :- 206.

Diagnostic characters : Head : very short; antennae: longer than forewing: hind wing : much broader than forewing: tibial spurs : 3.4.4.; maxillary palpi: 5 segmented, the apical segment is larger than the others combined.

***9. *Stenopsyche splendida* Martynov**

1935. *Stenopsyche splendida* Martynov, *Rec. Indian Mus.*, **37** : 133-134, fig. 37.

Diagnostic characters : Head : brownish, clothed with yellow hairs; eyes : large; antennae : reddish yellow with brown spiral line; forewing : pale yellow clothed with golden yellow pubescence but uniformly reticulate with short anastomosing transverse brown bands; hindwing: pale and rounded at their ends; aedeagus: long and thick in its end portion bearing on each side numerous acute spinules.

Material examined : India : Meghalaya, East Khasi Hills, Cherrapunji Circuit House Compound, 1♀ , 14. ix. 1988 (Coll. A.R. Lahiri and party).

Distribution : India : Meghalaya (East Khasi Hills) and Karnataka (North Kanara).

****10. *Stenopsyche haimavatika* Schmid**

1969. *Stenopsyche haimavatika* Schmid, *Can. Ent.*, **101** : 215, pl, 5, figs. 12 & 29, pl. 6.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Arunachal Pradesh, Uttar Pradesh (Garhwal), Nepal.

****11. *Stenopsyche griseipennis* McLachlan**

1886. *Stenopsyche griseipennis* McLachlan, *Trans. ent. Soc. Lond.*, (3) **5** : 265, pl. 18, fig. 5.

1969. *Stenopsyche griseipennis* Schmid, *Can. Ent.*, **101** : 217.

Distribution : India : Meghalaya (Khasi Hills), Manipur, Arunachal Pradesh (Kameng & Lohit), Sikkim, Uttar Pradesh (Garhwal) and Punjab. Elsewhere : Birmanie Septentrionale.

****12. *Stenopsyche himalayana* Martynov**

1926. *Stenopsyche himalayana* Martynov, *Eos. Madr.*, **2** : 298.

1969. *Stenopsyche himalayana*, Schmid, *Can. Ent.*, **101** : 218.

Distribution : India : Meghalaya (Khasi Hills), Arunachal Pradesh (Lohit), Sikkim, Uttar Pradesh (Garhwal) and Jammu & Kashmir. Elsewhere : Afghanistan.

****13. *Stenopsyche khasia* Kimmins**

1958. *Stenopsyche khasia* kimmins, *Bull. Br. Mus. nat. Hist.*, **6** : 258.

1969. *Stenopsyche khasia*, Schmid, *Can. Ent.*, **101** : 221.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Birmanie Septentrionale.

****14. *Stenopsyche dvyankapayukta* Schmid**

1969. *Stenopsyche dvyankapayukta* Schmid, *Can. Ent.*, **101** : 221, pl 5. figs. 15 & 27, pl. 7, fig. 5

Distribution : India : Meghalaya (Jaintia Hills).

****15. *Stenopsyche benaventi* Navas**

1934. *Stenopsyche benaventi* Navas, *Mem. Pont. Acad. Sci.*, (3) **1** : 225.

1969. *Stenopsyche benaventi*, Schmid, *Can. Ent.*, **101** : 222.

Distribution : India : Meghalaya (Khasi Hills), West Bengal, Bihar and Maharashtra (Bombay).
Elsewhere : Birmanie Septentrionale.

Family POLYCENTROPIDAE**Key to genera**

1. Hindwing with discoidal cell short; legs with spurs ornamented *Dipseudopsis* Walker
- Hindwing with discoidal cell long; legs with spurs simple *Hyalopsyche* Ulmer

Genus *Dipseudopsis* Walker

1852. *Dipseudopsis* Walker, *List specimen Neurop, Ins. Brit. Mus.*, **1** : 91.

1988. *Dipseudopsis*, Malicky & Weaver, *Opusc. zool. flumin*, **24** : 1.

Key to species of the genus *Dipseudopsis* Walker

1. An irregular spot behind discoidal cell extending from Rs to inner margin of forewing ...
..... *dohleri* Ulmer
- No such spot 2
2. Inner spur of hind leg nearly as long as outer; preanal appendages triangular in side view
..... *indica* McLachlan
- Inner spur of hind leg little shorter than outer; preanal appendages rounded in side view.....
..... *triclavata* Martynov

***16. *Dipseudopsis dohleri* Ulmar**

1929. *Dipseudopsis dohleri*; Ulmer, *Dt. Ent. Z. Berlin*, p. 189.

Material examined : India : Meghalaya, West Garo Hills, Kherapara P.W.D. 1.B. 2 ♀♀, 21. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (West Garo Hills) and Assam. *Elsewhere* : Thailand.

***17. *Dipseudopsis indica* McLachlan**

1875. *Dipseudopsis indica* McLachlan, *Tijdschr. Ent.*, 18 : 12, pl. 18.

1935. *Dipseudopsis indica*, Martynov, *Rec. Indian Mus.*, 37 : 158-159.

Material examined : India : Meghalaya, East Garo Hills, Tasek, F.R.H. 1.B., Songsok, 1 ♂, 2 ♀♀, 3, 5. vii. 1988, West Garo Hills, Kherapara P.W.D. 1.B, 2 ♂♂, 1 ♀, 21. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (East and West Garo Hills), Bihar and Orissa. *Elsewhere* : Pakistan (Sind).

18. *Dipseudopsis triclavata* Martynov

1935. *Dipseudopsis triclavata* Martynov, *Rec. Indian Mus.*, 37 : 161-163, figs. 62-64.

Diagnostic character : Vide Key.

Material examined : India : Meghalaya, West Garo Hills, Shibbari P.W.D. 1.B., 1 ♂, 1 ♀, 13. vii. 1988 (Coll. R.K. Ghosh and party).

Distribution : India : Meghalaya (East Khasi Hills : Shillong and West Garo Hills).

Genus *Hyalopsyche* Ulmer

1904. *Hyalopsyche* Ulmer, *Zool. Arg.*, 28 : 57.

1983. *Hyalopsyche*, Neboiss, *Australian Society for Limnology*, spl. Publication 5 : 100.

***19. *Hyalopsyche parsula* Martynov**

1935. *Hyalopsyche parsula* Martynov, *Rec. Indian Mus.*, 37 : 169-170, fig. 73

Diagnostic characters : Head and thorax : reddish yellow; wings : forewing : 3rd apical fork very short, cross vein Rs and M arises from the same level of discoidal cross vein; hind wing: 1st apical fork present, pedicel of 3rd apical fork very short; genitalia: penis bearing two small side lobes, each with one spinules before its end, each side of apical portion of penis with 2-3 small spinules.

Material examined : India : Meghalaya, East Garo Hills, Tasek F.R.H. 1.B., Songsok, 1 ♂, 3. vii 1988; West Garo Hills, Shibbari P.W.D. 1.B., 1 ♂, 13. vii. 1988. (Coll R.K. Ghosh and party).

Distribution : India : Meghalaya (Garo Hills) and Assam.

Superfamily RHYACOPHILOIDEA

Key to families

1. Fore tibia with a preapical spur Rhyacophilidae
- Fore tibia without preapical spur Glossosomatidae

Family RHYACOPHILIDAE

Genus *Rhyacophila* Pictet

1834. *Rhyacophila* Pictet, *Rech. Phrygan.*, p. 181.

1970. *Rhyacophila*, Schmid, *Mem. ent. Soc. Can.* no. 66 : 29.

Diagnostic characters : Maxillary palpi : 1st and 2nd segment shorter and stouter than other segments; tibiae : spurs, 3,4,4.; wings: broad and rounded with discoidal cell open in both wings.

Key to species of the genus *Rhyacophila* Pictet

1. Penis unbranched*parva* Kimmins
- Penis branched 2
2. Inferior appendages triangular 3
- Inferior appendages not triangular 4
3. Two branches of penis equal*pemba* Schmid
- Two branches of penis subequal 9
4. Terminal segment of inferior appendages quadrilateral*inconspicua* Morton
- Terminal segment of inferior appendages not quadrilateral 5
5. Inferior appendages produced*mortoni* Kimmins
- Inferior appendages not produced 6
6. Upper angle of inferior appendages rounded*curvata* Morton
- Upper angle of inferior appendages not rounded 7
7. Inferior appendages bilobed*namgyal* Schmid
- Inferior appendages not bilobed 8
8. Ninth segment with bifid apex*anatina* Morton
- Ninth segment emarginate but without bifid apex*nagongpa* Schmid

9. Wings uniformly black *drosampa* Schmid
 - Wings brown 10
 10. Terminal segment of inferior appendages oval *ancestralis* Martynov
 - Terminal segment of inferior appendages triangular 11
 11. Penis composed of two subequal branches 12
 - Penis composed of four spines or processes *scissa* Morton
 12. Preanal appendages sub quadrangular *muktepa* Schmid
 - Preanal appendages elongate *dolingps* Schmid

20. *Rhyacophila parva* Kimmins

1953. *Rhyacophila parva* Kimmins, *Ark. zool. Stockholm*, (N.S.), 4 : 536.

1970. *Rhyacophila parva*, Schmid, *Mem. ent. Soc. Can.* no. 66 : 128.

Material examined : India (U.J.K.H), Serrarim, 1 ♂ , 3.x. 1968 (Coll. *F. Schmid*).

Distribution : India : Meghalaya (Jaintia and Khasi Hills).

21. *Rhyacophila pemba* Schmid

1970. *Rhyacophila pemba* Schmid, *Mem. Soc. Can.* no. 66: 147-148, pl. 21. fig. 21-24.

Diagnostic character : Vide key.

Material examined : India : (U.J.K.H.), Borghat, 1 ♂ , 21, 22, xii. 1959, Taranhblang, 3 ♀ ♀
 27. xii. 1959, 1.1.1996 (Coll. *F. Schmid*).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

22. *Rhyaophila inconspicua* Morton

1900. *Rhyacophila inconspicua* Morton, *Trans. ent. Soc. Lond.*, : 7, pl. 1, fig. 21.

1970. *Rhyacophila inconspicua*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 129.

Material examined : India (U.J.K.H), Nongrim, 1 ♂ , 11.x. 1966 (Coll. *F. Schmid*).

Distribution : India : Meghalaya (Khasi and Jaintia Hills) and Manipur.

23. *Rhyacophila mortoni* Kimmins

1953. *Rhyacophila mortoni* Kimmins, *Ark. zool., Stockholm*, (N.S.), 4 : 526.

1970. *Rhyacophila mortoni*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 131.

Diagnostic character : Vide key.

Material examined : India (U.J.K.H.), Serrarim, 1 ♂ , 3.x. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

24. *Rhyacophila curvata* Morton

1900. *Rhyacophila curvata* Morton, *Trans. ent. Soc. Lond.*, : 5, pl. 1, figs. 12-14.

1970. *Rhyacophila curvata*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 130.

Material examined : India (U.J.K.H.), Muktapur, 1 ♀ , 11-12. xii. 1949; Borghat, 1 ♂ , 23.1.1960; Pynter, 1 ♂ , 19.1.1960; Mowshun, 1 ♂ , 24.1.1960 (Coll F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills) and Manipur.

25. *Rhyacophila namgyal* Schmid

1970. *Rhyacophila namgyal* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 146, pl. 21, figs.

Material examined : India (U.J.K.H.), Shillong, Myntang, 1 ♂ , 21.v. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

26. *Rhyacophila anatina* Morton

1900. *Rhyacophila anatina* Morton, *Trans. ent. Soc. Lond.*, : 6., pl. 1, figs. 17-18.

1970. *Rhyacophila anatina*, Schmid, *Mem. ent. soc. Can.*, no. 66 : 121.

Material examined : India (U.J.K.H.), Serrarim 1 ♂ , 3.x. 1960; Mowrap, 1 ♂ , 8.x. 1960; Cherrapunji, 1 ♀ , and 1 ex. (abdomen missing), 14.x. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills) and Sikkim.

27. *Rhyacophila nagongpa* Schmid

1970. *Rhyacophila nagongpa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 140-141, pl 60, figs. 17-20.

Material examined : India (U.J.K.H.), Syndai, 1 ♂ , 1 ♀ , 16, 25. xii. 1959; Larensiap, 1 ♀ , 17. xii. 1959; Umpuh, 1 ♂ , 6.1.1960 (Coll F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

28. *Rhyacophila drosampa* Schmid

1970. *Rhyacophila drosampa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 162-163, pl. 28, figs. 3-4.

Material examined : India (U.J.K.H.), Shnongpdeng, 1 ♂, 5. xii. 1959, Mawpran, 1 ♀, 8. iv. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

29. *Rhyacophila ancestralis* Martynov

1935. *Rhyacophila ancestralis* Martynov, *Rec. Indian Mus.*, 37 : 93-95, figs. 1a-d.

1970. *Rhyacophila ancestralis*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 129.

Material examined : India : Meghalaya, Khasi Hills, Dumpep, 3 ♀♀, Oct. 1929 (Coll. S.L. Hora); Laitlyngkot, 3 ♀♀, 1 ex. (abdomen missing), 14. iii. 1960; Rumkheng, 1 ♂, 1 ♀, ex. (abdomen missing), 20-23. iii. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

30. *Rhyacophila scissa* Morton

1900. *Rhyacophila scissa* Morton, *Trans. ent. Soc. Lond.*, : 5, pl. 1, figs. 15-16.

1970. *Rhyacophila scissa*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 123.

Material examined : India (U.J.K.H.) Umpuh, 1 ♀, 6. i. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills), Arunachal Pradesh, Manipur and Sikkim. *Elsewhere* : North-east Myanmar and Kwangtong.

31. *Rhyacophila muktepa* Schmid

1970. *Rhyacophila muktepa* Schmid, *Mem. ent. Soc. Can.*, no. 66, 188-189, pl. 35, figs. 1-2.

Material examined : India (U.J.K.H.), Larensiap, 1 ex. (abdomen missing), 17.xii.1959; Laitlyngkot, 1 ♂, 15.iii.1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

32. *Rhyacophila dolingpa* Schmid

1970. *Rhyacophila dolingpa* Schmid, *Mem. ent. Soc. Can.* no. 66 : 181, pl. 32, figs 22-23.

Material examined : India (U.J.K.H.), Mowpran, 1 ♂, 1.xii. 1959; Syndai, 1 ♂, 14.xii. 1959; Tarangblang, 2 ♂♂, 1 ♀, 6.i.1960; Umph, 2 ♂♂, 6.i.1960; Tharauyang, 1 Shnongpdang, 1 ♂, 10. 1. 1960; Shnongpdang, 1 ♀, 7.iv. 1960 (Coll. F. Schmid).

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****33. *Rhyacophila tecta* Morton**

1900. *Rhyacophila tecta* Morton, *Trans. ent. Soc. Lond.*, : 4, pl. 1, figs. 8-9.

1970. *Rhyacophila tecta*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 128.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****34. *Rhyacophila gyalzen* Schmid**

1970. *Rhyacophila gyalzen* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 144-145, pl. 21, figs. 9-12.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****35. *Rhyacophila kusang* Schmid**

1970. *Rhyacophila kusang* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 145, pl. 21, figs. 5-8.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****36. *Rhyacophila ngawang* Schmid**

1970. *Rhyacophila ngawang* Schmid, *Mem. ent. Soc. Can.*, no. 66, 147, pl. 21, figs. 17-20.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****37. *Rhyacophila norbu* Schmid**

1970. *Rhyacophila norbu* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 147, pl. 21, figs. 25-28.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****38. *Rhyacophila putata* Kimmins**

1953. *Rhyacophila putata* Kimmins, *Ark. zool., Stockholm*, (N.S.) 4 : 512.

1970. *Rhyacophila putata*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 128.

Distribution : India : Meghalaya (East Khasi Hills, Shillong).

****39. *Rhyacophila senggepa* Schmid**

1970. *Rhyacophila senggepa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 167, pl. 28, figs. 11-12.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****40. *Rhyacophila scotina* Kimmins**

1953. *Rhyacophila scotina* Kimmins, *Ark. zool., Stockholm*, (N.S.), 4 : 513

1970. *Rhyacophila scotina*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 128.

Distribution : India Meghalaya (East Khasi Hills, Shillong).

****41. *Rhyacophila kyimdongpa* Schmid**

1970. *Rhyacophila kyimdongpa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 176-177.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****42. *Rhyacophila nyelungpa* Schmid**

1970. *Rhyacophila nyelungpa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 183, pl. 33, figs. 9-11.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****43. *Rhyacophila khasiorum* Schmid**

1970. *Rhyacophila khasiorum* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 187, pl. 34, figs. 5,6.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****44. *Rhyacophila karpa* Schmid**

1970. *Rhyacophila karpa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 206, pl. 29, figs. 10-11.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****45. *Rhyacophila ugyenpa* Schmid**

1970. *Rhyacophila ugyenpa* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 206-205, pl. 29, figs. 8-9.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****46. *Rhyacophila scissoides* Kimmins**

1953. *Rhyacophila scissoides* Kimmins, *Ark. zool., Stockholm*, (N.S.), 4 : 520.

1970. *Rhyacophila scisoides*, Schmid, *Mem. ent. Soc. Can.*, no. 66 : 123.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

Genus *Himalopsyche* Banks

1940. *Himalopsyche* Banks, *Proc. U.S. natl. Mus.*, 88 : 3079 : 197.

1970. *Himalopsyche* Schmid, *Mem. ent. Soc. Can.*, no. 66 : 29.

****47. *Himalopsyche lanceolata* (Morton)**

1900. *Rhyacophila lanceolata* Morton, *Trans. ent. Soc. Lond.*, : 2, pl. 1, figs. 1-4.

1952. *Himalopsyche lanceolata*, Kimmins, *Ann. Mag. nat. Hist., Londoan*, (12) 5 : 354.

Distribution : India : Meghalaya.

Family GLOSSOSOMATIDAE

Genus *Glossosoma* Curtis

1834. *Glossosoma* Curtis, *Philips Mag.*, : 216

1971. *Glossosoma*, Schmid, *Naturaliste Can.*, **98** : 607

Diagnostic characters : Maxillary palpi : 1st and 2nd segment shorter and stouter than others; tibia : spurs, 0-2.4.3-4; wings : slender.

***48. *Glossosoma fissum* Martynov**

1935. *Glossosoma fissum* Martynov, *Rec. Indian Mus.*, **37** : 106-107, figs. 11.

Diagnostic characters : Head : black; antennae : brown; forewing: black, discoidal cell broad, basal callosity present; hindwing: pale, 3rd fork little longer than its pedicel; abdomen: dark brown.

Material examined : India, Meghalaya, East Khasi Hills, Shillong, Risa colony, 1 ♀, 7.ix.1995 (Coll. N. Muraleedharan & party).

Distribution : India : Meghalaya (Shillong) Uttar Pradesh (Dehradun) and West Bengal.

****49. *Glossosoma (Muroglossa) hemantajam* Schmid**

1971. *Glossosoma (Muroglossa) hemantajam* Schmid, *Naturalist Can.*, **98** : 623-625, figs. 28, 34-37.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

****50. *Glossosoma (Muroglossa) varjakantakam* Schmid**

1971. *Glossosoma (Muroglossa) varjakantakam* Schmid, *Naturalist Can.*, **98** : 625-626, figs. 29, 40-43.

Distribution : India : Meghalaya (Khasi and Jaintia Hills).

Superfamily LIMNAPHILOIDEA

Family LEPTOCERIDAE

Key to genera

1. Inferior appendages with two segments *Triplectides* Kolenati
- Inferior appendages with single segment 2
2. First apical fork of forewing arising from angle of discoidal cell; Sc+R in their greater part united into one thick vein..... *Setodellina* Lestage
- First apical fork of forewing with long stalk; Sc+R not united 3

3. Hindwing without fifth apical fork; wing short and broad.....*Adicella* McLachlan
 - Hindwing with fifth apical fork; wings very narrow*Parasetodes* McLachlan

Genus *Triplectides* Kolenati

1859. *Triplectides* Kolenati, *Genera et species Trichopterorum pars aitera Aequiipalpia*, : 247.

1982. *Triplectides*, Morse & Neboiss, *Mem. Mus, Vict.*, no. 43 : 62.

*51. *Triplectides magnus* (Walker)

1852. *Leptocerus magnus* Walker, *Cat. Brit. Mus. Neur.*, 1 : 73.

1982. *Triplectides magnus*, Neboiss, *Mem. natn. Mus. Vict.*, no. 43 : 65, figs. 5,6,56,85.

Diagnostic characters : Palpi : black; antennae: black, more than five times the length of the body, ferruginous at base and tips of joints white; forewing: fawn colour; hind wing : light grey.

Material examined : India : Meghalaya, East Garo Hills, Tasek F.R.H. 1.B., Songsok, 2♂♂, 3, 5, vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India: Meghalaya (Garo Hills), Bihar, West Bengal and Orissa.

Key to species of the genus *Setodellina* Lestage

1. Forewing with bark brown streaks*mahadeva* (Banks)
 - Forewing without dark brown streak.....*indivisa* Martynov

*52. *Setodellina mahadeva* (Banks)

1913. *Oecetina mahadeva* Banks, *Trans. Am. ent. Soc.*, 39 : 236.

1936. *Setodellina mahadeva*, Martynov, *Rec. Indian Mus.*, 38 : 276-277, fig. 45.

Diagnostic character : Vide Key.

Material examined : India: Meghalaya, East Garo Hills, 1 Km. West of 1.B., Rongroom, 1♀, 27.ix.1975 (Coll. N. Muraleedharan).

Distribution : India : Meghalaya (East Garo Hills) and Bihar. Elsewhere : Myanmar.

*53. *Setodellina indivisa* Martynov

1939. *Setodellina indivisa* Martynov, *Rec. Indian Mus.*, 38 : 272-273.

Diagnostic character : Vide Key.

Material examined : India, Meghalaya, East Garo Hills, 1 Km. West of 1.B., 2♂♂, 27.ix.1975 (Coll. N. Muraleedharan).

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Myanmar.

Genus *Adicella* McLachlan

1877. *Adicella* McLachlan, *Rev. & Syn. Trichop.*, : 326-327.

1936. *Adicella*, Martynov, *Rec. Indian Mus.*, 38 : 279.

54. *Adicella biramosa* Martynov

1936. *Adicella biramosa* Martynov, *Rec. Indian Mus.*, 38 : 279-280, figs. 49,49.

Diagnostic characters : Head and thorax : pale brownish yellow; antennae: yellow with black annulation; on vertex near the eyes two brushes of long pale hairs; spurs: 1.2.2.; forewing: vein R thickened in the apical portion; abdomen : pale yellowish.

Material examined : India, Meghalaya, East Khasi Hills, Shillong Peak, 8400 ft., 1♂, 12.x.1914 (Coll. S.W. Kemp), West Garo Hills, Kherapara, 1♂, 19. vii. 1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (West Garo Hills and East Khasi Hills; Shillong).

Genus *Parasetodes* McLachlan

1880. *Parasetodes* McLachlan, *Rev. & Syn. Trichop.*, : 66-67.

*55. *Parasetodes respersella* (Rambur)

1842. *Setodes respersella* Rambur, *Nevrop.*, p. 515.

1880. *Parasetodes respersella*, McLachlan, *Rev. & Syn. Trichop.*, : 67-68, pl. 57, figs. 1-4.

Diagnostic characters : Palpi : pale testaceous with hairs; forewing : ochreous, with a very irregular pale band extending from near base to near apex; about twelve black spots situated in the axillae of all the furcation, on the transverse nervules and at the termination of sub-costa, lower cubitus and post costa; discoidal cell long, upper edge of cellula thyridii with a larger whitish spot surrounded by black hairs; hindwing: whitish subhyaline, beset with very sparse and short whitish, pubescence, 1st apical fork rather long but shorter than 5th; abdomen: whitish.

Material examined : India, Meghalaya, West Garo Hills, Shibbari P.W.D. 1.B., 8♂♂, 13.vii. 1988, Rongringiri F.R.H.; East Garo Hills, 10♂♂, 17.vii.1988 (Coll. R.K. Ghosh & party).

Distribution : India : Meghalaya (Garo Hills). Elsewhere : France.

Remarks : The species is for the first time recorded from India. It is agreeing with the characters described by McLachlan (1880) excepting for the expanse of wings. The expanse of the wings in male is 28 mm. The expanse as recorded by McLachlan is 23 mm.

Family PSYCHOMYIIDAE

Genus *Tinodes* Curtis

1934. *Tinodes* Curtis, *Lond. Edinb. Mag.*, (3) 4 (21) : 216.

****56. *Tinodes arala* Schmid**

1972. *Tinodes arala* Schmid, *Naturalist Can.*, 99, no. 3 : 154-155, figs. 24-27.

Distribution : India : Meghalaya.

****57. *Tinodes akanda* Schmid**

1972. *Tinodes akanda* Schmid, *Naturaliste Can.*, 99 no. 3 : 155-156, figs. 30-32.

Distribution : India : Meghalaya.

****58. *Tinodes utchringita* Schmid**

1972. *Tnodes utchringita* Schmid, *Naturaliste Can.*, 99, no. 3 : 162, figs. 43-44 & 46.

Distribution : India : Meghalaya.

Family MOLANNIDAE**Genus *Indomolannodes* Wiggins**

1968. *Indomolannodes* Wiggins, *Life Sci. Centr. R. ent. Mus.*, no. 72 : 19-21, figs 18.

****59. *Indomolannodes falcifer* Wiggins**

1968. *Indomolannodes falcifer* Wiggins, *Life Sci. Contr. R. Ont. Mus.*, no. 72 : 19-21, fig. 18.

Distribution : India : Meghalaya and Manipur.

****60. *Indomolannodes comans* Wiggins**

1968. *Indomolannodes comans* Wiggins, *Life Sci. Contr. R. Ont. Mus.*, no. 72 : 21-23, pl. 19.

Distribution : India : Meghalaya.

Family UENOIDAE**Genus *Uenoa* Iwata**

1927. *Uenoa Iwata*, *Annotnes, zool, jap*, 11 : 214.

1985. *Uenoa*, Wiggins, Weaver & Unzicker, *Can. Ent.*, 117 : 171-773.

****61. *Uenoa hiberna* Kimmins.**

1964. *Uenoa hiberna* Kimmins, *Bull. Br. Mus. Nat. Hist.*, 15 : 52.

1985. *Uenoa hiberna*, Wiggins, Weaver & Unzicker, *Can. Ent.* 117 : 775-777.

Distribution : India : Meghalaya, Arunachal Pradesh, Sikkim, West Bengal and Uttar Pradesh (Garhwal).

	East Gar Hills	West Gar Hills	West Khasi Hills	East Khasi Hills	Jaintia Hills	Khasi Hills	Meghalaya
Name of the species	1	2	3	4	5	6	7
1. <i>Amphipsyche tricalcarata</i> Martynov	+	+					
2. <i>Aethaloptera sexpunctata</i> Kolenati		+					
3. <i>Paraethaloptera gracilis</i> Martynov	+						
4. <i>Cheumatopsyche truncata</i> Martynov	+	+					
5. <i>Cheumatopsyche columnata</i> Martynov	+						
6. <i>Amphipsychella extrema</i> Martynov	+						
7. <i>Hydatopsyche spatulata</i> Martynov		+					
8. <i>Arctopsyche tricornis</i> Schmid						+	
9. <i>Stenopsyche splendida</i> Martynov				+			
10. <i>Stenopsyche haimavatika</i> Schmid						+	
11. <i>Stenopsyche griseipennis</i> McLachlan						+	
12. <i>Stenopsyche himalayana</i> Martynov						+	
13. <i>Stenopsyche khasia</i> Kimmins						+	
14. <i>Stenopsyche dvyankapayukta</i> Schmid					+	+	
15. <i>Stenopsyche benaveni</i> Navas						+	
16. <i>Dipseudopsis dohleri</i> Ulmer		+					
17. <i>Dipseudopsis indica</i> McLachlan	+	+					
18. <i>Dipseudopsis triclavata</i> Martynov		+		+			
19. <i>Hyalopsyche parsula</i> Martynov	+	+					
20. <i>Rhyacophila parva</i> Kimmins					+	+	
21. <i>Rhyacophila pemba</i> Schmid					+	+	
22. <i>Rhyacophila inconspicua</i> Morton					+	+	
23. <i>Rhyacophila mortoni</i> Kimmins					+	+	

Name of the species	1	2	3	4	5	6	7
24. <i>Rhyacophila curvata</i> Morton					+	+	
25. <i>Rhyacophila namgyal</i> Schmid					+	+	
26. <i>Rhyacophila anatina</i> Morton					+	+	
27. <i>Rhyacophila nagongpa</i> Schmid					+	+	
28. <i>Rhyacophila drosampa</i> Schmid					+	+	
29. <i>Rhyacophila ancestralis</i> Martynov					+	+	
30. <i>Rhyacophila scissa</i> Morton					+	+	
31. <i>Rhyacophila muktepa</i> Schmid					+	+	
32. <i>Rhyacophila dolingpa</i> Schmid					+	+	
33. <i>Rhyacophila tecta</i> Morton					+	+	
34. <i>Rhyacophila gyaldzen</i> Schmid					+	+	
35. <i>Rhyacophila kusang</i> Schmid					+	+	
36. <i>Rhyacophila ngawang</i> Schmid					+	+	
37. <i>Rhyacophila norbu</i> Schmid					+	+	
38. <i>Rhyacophila putata</i> Kimmins				+	+	+	
39. <i>Rhyacophila senggepa</i> Schmid							
40. <i>Rhyacophila scotina</i> Kimmins				+			
41. <i>Rhyacophila kyimdongpa</i> Schmid					+	+	
42. <i>Rhyacophila nyelungpa</i> Schmid					+	+	
43. <i>Rhyacophila khasiorum</i> Schmid					+	+	
44. <i>Rhyacophila karpa</i> Schmid					+	+	
45. <i>Rhyacophila ugyenpa</i> Schmid					+	+	
46. <i>Rhyacophila scissoides</i> Kimmins					+	+	
47. <i>Himalopsyche lanceolata</i> Kimmins							+
48. <i>Glossosoma fissum</i> Martynov			+				

Name of species	1	2	3	4	5	6	7
49. <i>Glossosoma (Muroglossa) hemantajam</i> Schmid						+	+
50. <i>Glossosoma (Muroglossa) varjakantakam</i> Schmid						+	+
51. <i>Triplectides magnus</i> (Walker)	+						
52. <i>Setodellina mahadeva</i> (Banks)	+						
53. <i>Setodellina indivisa</i> Martynov	+						
54. <i>Adicella biramosa</i> Martynov		+		+			
55. <i>Parasetodes respersella</i> (Rambur)	+	+					
56. <i>Tinodes arala</i> Schmid							+
57. <i>Tinodes akanda</i> Schmid							+
58. <i>Tinodes utchringita</i> Schmid							+
59. <i>Indomolannodes falcifer</i> Wiggins							+
60. <i>Indomolannodes comans</i> Wiggins							+
61. <i>Uenoa hiberna</i> Kimmins							+

SUMMARY

The paper deals with a brief account of general morphology, collection and preservation and taxonomic account alongwith the geographical distribution of 61 species of Trichoptera from Meghalaya. Amongst a total of 61 species, *Parasetodes respersella* (Rambur) is for the first time recorded from India and fourteen other species marked asterisk (*) constitute new locality records for Meghalaya. Besides, 30 species have been reviewed from literature (marked**). Runn keys to all the taxa examined and also a table showing the distribution of species in different districts of Meghalaya have been provided. Relevant references have also been included at the end.

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INSECTA : THYSANOPTERA

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INTRODUCTION

There was absolutely no report of Thysanoptera fauna of Meghalaya. Keeping this in view Dr. R.K. Varshney made an effort to collect thrips material from flowers of cultivated plants in and around Shillong and he (1970) reported 9 species *Thrips coloratus* Schmutz; *Thrips flavus* Schrank; *Thrips hawaiiensis* (Morgan) [= *Thrips florum* Schmutz]; *Thrips hispidus* Ananthakrishnan & Jagadish; *Thrips tabaci* Lindeman; *Megalurothrips distalis* (Karny) [= *Taeniothrips distalis* Karny]; *Megalurothrips peculiaris* (Bagnall) [= *Taeniothrips peculiaris* (Bagnall)]; *Thrips flavus* Schrank (= *Taeniothrips sulfuratus* Priesner) and *Haplothrips ganglbaueri* Schutz. First major collection of thrips (mostly gall inhabiting & Mycophagous) was made by Dr. Muraleedharan in 1975. Sen & Muraleedharan (1977) described 2 new species (*Pegothrips* Meghalaya and *Tylothrips indicus*) of which the genus *Pegothrips* is new to science and the other genus *Tylothrips* is recorded for the first time from India. Muraleedharan & Sen (1981) described *Stigmothrips skajimai* along with material from Tripura, Sen, Pramanik & Sen Gupta (1988) in the *Thysanoptera Fauna of North Eastern India* have recorded 17 species from Meghalaya out of which 6 species are new from the State. Subsequently two substantial collections were made, one by C.K. Sen Gupta accompanying West Garo Hills Survey, 1988 (K.K. Ray) and the other by S. Sen in 1991.

The present monograph is the outcome of studies based on the following collections.

- (1) Meghalaya Survey, 1967 (Dr. R. K. Varshney)
- (2) Meghalaya Survey, 1975 (Dr. N. Muraleedharan)
- (3) Meghalaya Survey, 1979 (Dr. J. K. Jonathan)
- (4) West Garo Hills Survey, 1988 (K. K. Ray).
- (5) Meghalaya Survey, 1991 (S. Sen)
- (6) Meghalaya Survey, 1991 (H. C. Ghosh)

Approximately 6000 species of Thysanoptera under 8 families are known from the world. Altogether 691 species pertaining to 5 families are recorded from India out of which 47 species pertaining to 30 genera under 2 families are represented from Meghalaya. As a result of the present studies 30 species have been recorded for the first time from the area.

The terminology used in the keys and description of species conforms to the established and well accepted works (Mound et al, 1976; Ananthakrishnan & Sen, 1980; Palmer et al, 1989).

Key to the suborders, families; genera and species, synonymy localities of relatively known species; description of the species described from the area and short diagnostic characters in cases where single species represent a genus have been provide.

All measurements are in microns, unless otherwise mentioned.

Key to the Families and Subfamilies of Thysanoptera from Meghalaya

1. Abdominal segment X tubular. Female without ovipositor, Forewings without longitudinal veins and setae (Suborder TUBULIFERA). Family Phlaeothripidae

Maxillary stylets uniformly thin, never broadened; narrower than labial palp.

Subfamily Phlaeothripinae

Maxillary stylets thickened, band like broad at apex, broader than labial palps.

Subfamily Idolothripinae

Abdominal segment X very rarely tubular. Female always with saw-like ovipositor, curved downwards. Forewings with veins & cross veins and setae on veins, also wings more or less pointed at apex; foremargin with fringe of hairs. Antennae 6-9 segmented; segments 3 & 4 with simple or forked sensecones (Suborder TEREBRANTIA). .Family Thripidae

Dorsum of body not polygonally reticulate, atmost with transverse striae. Terminal antennal segments not long and thin Subfamily Thripinae

Dorsum of body deeply reticulate with polygonal areas. Terminal antennal segments long and thin, needle like.....Subfamily Panchaetothripinae

SYSTEMATIC ACCOUNT

Order / THYSANOPTERA

Suborder / TEREBRANTIA

Family / THIRIPIDAE

Key to the Genera of the Family Thripidae from Meghalaya

1. Dorsum of body not polygonally reticulate, atmost with transverse striae. Antennae 7 or 8 segmented, rarely 9-segmented; terminal segments not long and thin. (Subfamily Thripinae)....2

Dorsum of body deeply reticulate with polygonal areas. Terminal antennal segments long and thin (Subfamily Panchaetothripinae). 10

2. Abdomen with dense rows of microtrichia; posterior margin of each segment with a fine pubescence of microsetulae; segment IX with 3 pairs of setae. Prothoracic setae short. Spuluta present only on mesosternum. Antennae 8-segmented. style 2-segmented. Lower veins of forewings with only 2-4 scattered setae. .Scirtothrips Shull

Abdomen without dense rows of microtrichia (Tribe Thripinae).....3

3. Prothorax without any major setae, only with 2 moderately conspicuous setae at hind angle. Head, mouth cone and prothorax normal. Antennae 8-segmented. Wings somewhat narrow, setae on veins weak *Anaphothrips* Uzel
- Prothorax with major setae and with one or two conspicuous setae at hind angle, and usually with 2-6 pairs of posteromarginal 4
4. Antennae 7-segmented, very rarely 8-segmented due to a secondary split of style 5
- Antennae 8-segmented, style 2 segmented 7
5. Spinula on meso-and metasternum absent or weakly developed on mesosternum only. Head with 1 pair of anteocellar setae, longer than interocellars. Maxillary palpi 3-segmented, rarely 2- segmented. Antennal segment 2 with mid-dorsal setae. Fringe cilia on posterior margin of wings wavy.....*Stenchaetothrips* Bagnall
- Spinula on mesosternum distinct, absent on metasternum.....6
6. Posterior margins of abdominal tergites I-VIII with teeth or scallops. Head small.....*Microcephalothrips* Crawford
- Atmost tergite VIII with a comb. Head wider to as long as wide. Anteocellar only 1 pair. Postoculars in one series and none of these specially developed. Antennae occassionally 8 segmented due to a split of style. Pronotum with 2 long setae at each hind angle and mostly 3 pairs of setae present between the major angulars.*Thrips* Linnaeus
7. Forewings with a regular series of setae on both veins. Pronotum with 4 strong setae on each side (an anteroangular, an anteromarginal and two postangulars); anteromarginals shorter than anteroangulaos.....*Frankliniella* Schmutz
- Forewings without a regular series of setae.....8
8. Intermediate antennal segments (generally 3 & 4) elongate, bottle like, segment 5 broad at apex, 6 broadest near base and broadly joined to 5; sense cones on 3 & 4 long, mostly a broad 'U'. Spinula present on meso-and metasternum.*Dichromothrips* Priesner
- Antennal segments normal; sense cones on 3 & 4 moderately long 9
9. Head with only one pair of anteocellars.*Taeniothrips* Amyot & Serville
- Head with 2 pairs of anteocellars; checks parallel. Postoculars in a single row. Antennae showing sexual demorphism.....*Megalurothrips* Karny
10. Antennae 7 segmented; style 1-segmented; segments 5-7 forming an unit; sense cones on 3 & 4 simple. Head narrowed, posteriorly rounded, vertex with a hump like production. *Astrothrips* Karny
- Antennae 8-segmented, style 2-segmented 11

11. Vertex with an arched ridge at base, cheeks shorter than eyes. Antennal segments 3 & 4 with forked sense cones. Forewings broad with 2 pale cross band, apex brown; upper vein with a gap between setae. *Helionothrips* Bagnall
- Vertex without transverse ridge 12
12. Forewings with both the veins with continuous row of setae. Head with anastomosing striations. Abdominal tergite VIII with a complete comb of microtrichia. *Selenothrips* Karny
- Forewings upper vein without continuous row of setae and without prominent setae on costal margin. Antennal segments 3 & 4 with simple sense-cones..... *Heliothrips* Haliday

Subfamily THIRIPINAE

Genus 1. *Anaphothrips* Uzel

1895. *Anaphothrips* Uzel, *Monogr. Ord. Thysanoptera* : 142

1. *Anaphothrips sudanensis* Trybom

1911. *Anaphothrips sudanensis* Trybom, *Results Sweedish zool. Exped. Egypt*, pt. 4 : 1-4.

1912. *Euthrips flavicinctus* Karny, *Marcellia*, 11 : 115-117.

1978. *Anaphothrips sudanensis* : Bhatti, *Senckenbergiana biol.* 59 (1-2) : 88.

Diagnosis : Body distinctly bicolourous; mostly brown, abdominal tergites, III-VII yellow, VIII-X dark brown. Antenna 8-segmented, segment 6 without suture, segments 3 & 4 with simple sense cone. Prothoracic hind angles without conspicuous setae than the rest on pronotum. Forewing not very broad, setae on veins weak.

Specimen Studied : Shillong : 2♀ ♀ (Z.S.I. Reg. No. 4710/H17:4778/H17), 17.3.1991; 21.3.1991, coll. S. Sen. William Nagar: 1♀ (Z.S.I. Reg. No. 4877/H17), 9.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills) Widely distributed. Elsewhere: Bangladesh; Sudan; Morocco; Egypt; Somalia; South Africa; Taiwan; Central Asia; Sri Lanka; Java; Sumatra; Australia; Puerto Rico; Trinidad and Cuba.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 2. *Dichromothrips* Priesner

1932. *Dichromothrips* Priesner, *Stylops*, 1 : 110.

2. *Dichromothrips nakahari* Mound

1976. *Dichromothrips nakahari* Mound, *Biol. J. Linn. Soc.*, 8 : 258--259.

Diagnosis : General body colour brown; antennal segment 3-5 with pale sub-basal ring, 3-4 neck light brown; all tibiae and tarsi yellow; body setae dark.

Head about as long as wide. Ocellar setae arising within the triangle. Pronotum little shorter than head, weakly sculptured; postangular setae very well developed and with 2 pairs of posteromarginal setae; Metanotum weakly reticulate, median setae placed at anterior margin. Forewings with 13 (10+1+2) upper vein setae. Abdominal tergite II-VII with microtrichia on posterior margin laterally; tergite VIII with a group of 10 microtrichia anterolateral to spiracle.

Specimen Studied : Cherrapunjee : 1♀ (Z.S.I. Reg. No. 4770/H17) 19.3. 1991, coll. S. Sen.

Distribution : Meghalaya (East Khasi Hills); Calcutta.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 3. *Frankliniella* Karny

1910. *Frankliniella* Karny, *Mitt. nat. Ver. Univ. Wien*, 8(2) : 46

1948. *Frankliniella* Moulton, *Revue Ent.*, 19 : 55-114.

3. *Frankliniella intonsa* (Trybom)

1895. *Thrips intonsa* Trybom, *Ent. Tidskr.*, 16 (3) : 188.

1912. *Frankliniella intonsa* : Karny, *Zool. Anz.*, 4 (4) : 334.

Diagnosis : Body brown; antennal segments 1,2, 6-8 brown, 3-5 yellow; legs mostly yellow with femora, mid-and hindtibiae dark at middle; forewings clear. Head transverse, cheeks almost straight. Forewings with 15-18 costal, 12-14 upper vein and 7-9 lower vein setae respectively. Abdominal tergite VIII with comb but sparse.

Specimen Studied : Wari, West Garo Hill's : 3♀ ♀ (Z.S.I. Reg. Nos. 4535-37/H17) 10.10. 1988, coll. K. K. Ray. Shillong: 10♀ ♀ (Z.S.I. Reg. Nos. 4711/H17; 4735/H17; 4766/H17; 4771/H17; 4782/H17; 4832/H17; 4867-68/H17; 4891-92/H17). 16.3. 1991, 17.3. 1991, 18.3. 1991, coll. S. Sen. William Nagar: 18♀ ♀ (Z.S.I. Reg. Nos. 4732-34/H17, 4738-44/H17, 4760-63/H17; 4851-53/H17, 4869/H17). 9.3.1991, 11.3. 1991, Jowai : 6♀ ♀ (Z.S.I. Reg. Nos. 4764-65/H17; 4790-93/H17; 4833/H17). 20.3. 1991, Phulbari, West Garo Hills : 4♀ ♀ , 1 ♂ (Z.S.I. Reg. Nos. 4915-19/H17) 9.3. 1991, coll. H.C. Ghosh

Distribution : India : Meghalaya (West Garo Hills; East Garo Hills; East Khasi Hills; Jaintia Hills). Bihar; West Bengal. Elsewhere : Bangladesh; Japan; Korea; W. Europe.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 4. *Megalurothrips* Bagnall

1915. *Megalurothrips* Bagnall, *Ann. Mag. nat. Hist.*, (8) 15 : 589.

1969. *Megalurothrips* : Bhatti. *Oriental Ins.*, 3 (3) : 240.

Key to the species of *Megalurothrips* from Meghalaya

1. Comb on abdominal tergite VIII complete. Body uniformly light to dark brown including antennae, segment 3 yellowish to light brown. Forewings light brown with a clear distal area and with 23-26 costal setae; 12-21 (10-19+2) Upper vein setae and 13-14 lower vein setae.....*distalis* (Karny)
- Comb on abdominal tergite VIII interrupted. All abdominal sternites of male medially with 70-80 lanceolate setae. Body uniformly yellowish to orange brown; basal fourth and near apex of forewing paler making the appearance of the wing banded. Antennal segment 3 & 4 equal and longer than 6. Forewings with 23-26 costal, 15-16 (13-14+2) upper vein and 13-14 lower vein setae.....*peculiaris* (Bagnall)

4. *Megalurothrips distalis* (Karny)

1913. *Taeniothrips distalis* Karny, *Arch Naturgesch* (A), 79 (2) : 122-124.
 1926. *Taeniothrips distalis* : Karny, *Mem. Dept. Agri. India Ent. Ser.*, 9 (6) : 196.
 1970. *Taeniothrips distalis* : Varshney, *J. Bengal nat. Hist. Soc.*, 36 (1) : 60.
 1969. *Megalurothrips distalis* : Bhatti, *Oriental Ins.*, 3 (3) : 241.
 1988. *Megalurothrips distalis* : Sen et al, *Rec. zool. Surv. India Oce. Pap.* 100 : 12.

Specimen Studied : Shillong : 1♀ (Z.S.I. Reg. No. 1963/H17) 21.4. 1979, coll. Dr. J. K. Jonathan; 2♀ ♀ (Z.S.I. Reg. Nos. 1970-71/H17), 5.11. 1967 and 23.11. 1967, coll. Dr. R. K. Varshney. 14♀ ♀ (Z.S.I. Reg. Nos. 4712-16/H17; 4783/H17; 4835-40/H17; 4871/H17) 16.3. 1991; 18.3. 1991, 21.3. 1991, coll. S. Sen, Machanpani, West Garo Hills : 1♀ (Z.S.I. Reg. No. 4705/H17) 15.10. 1988, coll. K. K. Ray, William Nagar : 7♀ ♀ (Z.S.I. Reg. No. 4745-47/H17; 4855/H17; 4872-73/H17; 4893/H17); 9.3. 1991, 10.3. 1991, 11.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills; West Garo Hills); widely distributed. *Elsewhere* : Very widely distributed from Japan to Australia on one hand and South Asia on the other hand.

Remarks : Varshney (1970) recorded this species from Meghalaya.

5. *Megalurothrips peculiaris* (Bagnall)

1918. *Physothrips peculiaris* Bagnall, *Ann. Mag. nat. Hist.*, (9) 1 : 206-207.
 1933. *Taeniothrips peculiaris* : Steinweden, *Trans. Am. ent. Soc.*, 59 : 273.
 1962. *Taeniothrips* (*Pongamiothrips*) *peculiaris* : Ananthakrishnan, *Proc. R. ent. Soc., Lond.* (B), 31 (7-8) : 90-91.
 1970. *Taeniothrips peculiaris* : Varshney, *J. Bengal nat. Hist. Soc.*, 36 (1) : 60.
 1969. *Megalurothrips peculiaris* : Bhatti, *Oriental Ins.*, 3 (3) : 242
 1988. *Megalurothrips peculiaris* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 13.

Specimen Studied : Shillong : 2♀ ♀ , 5♂♂ (Z.S.I. Reg. Nos. 1972-75/H17 & 2033-35/H17), 1.10.1967, coll. Dr. R. K. Varshney.

Distribution : India : Meghalaya (East Khasi Hills); U.P, Bihar, Tamil Nadu, Manipur.
Elsewhere : Philippine Is.

Remarks : Varshney (1970) recorded this species from Meghalaya.

Genus 5. *Microcephalothrips* Bagnall

1926. *Microcephalothrips* Bagnall, *Ann. Mag. nat. Hist.*, (9) 18 : 113.
 1926. *Stylothrips* Ramakrishna, *Mem. Dept. Agri. India, Ent. Ser.*, 9 (6):205.
 1949. *Microcephalothrips* : Priesner, *Bull. Soc. Fouad Ent. Egypte* 33 : 149.

6. *Microcephalothrips abdominalis* (Crawford)

1910. *Thrips abdominalis* Crawford, *Pomona College J. Ent.*, 2 (1):157.
 1926. *Microcephalothrips abdominalis* : Bagnall, *Ann. Mag. nat. Hist.*, (9) 18 : 113.
 1926. *Stylothrips brevivalpis* Karny, *Mem. Dept. Agri. India Ent. Ser.*, 9 (6) : 206.
 1963. *Microcephalothrips abdominalis* : Ananthakrishnan, *Treubia*, 26 (2) : 105.
 1988. *Microcephalothrips abdominalis* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 14.

Diagnosis : Body brown, antennal segments, tip of forefemora and all tarsi yellow with brownish shade; forewings brown. Head small. Antennae 7-segmented, short; segments 3 & 4 with forked sense cones. Eyes large. Interocular and postocular setae short. Prothorax enlarged; all prothoracic setae short; outer posterior angular setae shorter than inner. Metascutum longitudinally striate. Forewings curved at apex. Posterior margin of abdominal tergite I-VIII with teeth or scallops; segment X almost entirely longitudinally split.

Specimen Studied : Wari, West Garo Hills : 2♀ ♀ (Z.S.I. Reg. Nos. 4515-16/H17) 10.10.1988, coll. K. K. Ray. Asangiri, West Garo Hills : 10♀ ♀ (Z.S.I. Reg. Nos. 4538-39/H17; 4541/H17; 4558- 59/H17) 4644-46/H17, 7.10.1988, coll. K. K. Ray. Ronkhong, West Garo Hills: 2 ♀ ♀ (Z.S.I. Reg. Nos. 4642-43/H17) 22.10.1988, coll. K. K. Ray. Machanpani, West Garo Hills : 4 ♀ ♀ (Z.S.I. Reg. Nos. 4706-09/H17) 15.10.1988, coll. K. K. Ray. William Nagar : 2♀ ♀ (Z. S.I. Reg. Nos. 4863-64/H17). 12.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills; East Garo Hills) Widely distributed.
Elsewhere : Widely distributed in the tropics and subtropics on Compositae flowers.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 6. *Scirtothrips* Shull

1909. *Scirtothrips* Shull, *Ent. News*, 20 (5) : 222.

7. *Scirtothrips dorsalis* Hood

1991. *Scirtothrips dorsalis* Hood, *Insect. Inscit. Menstr.*, 7 : 90-91.

1964. *Scirtothrips dorsalis* : Dev, *Indian J. Ent.*, **26** : 84-94.
 1981. *Scirtothrips dorsalis* : Mound & Palmer, *Bull. ent. Res.*, **71** : 475-476.
 1988. *Scirtothrips dorsalis* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, **100** : 16.

Diagnosis : Very minute forms. Body pale yellow; abdominal tergites with dark transverse antecostal ridge, also dark area occupying median third of tergite. Head with deep two pairs of major median postocular setae. ocellar setae III arising between posterior ocelli. Antennae 8-segmented. Prothorax with four posteromarginal setae. The median pair of metanotal setae placed behind anterior margin. Forewings with 9 (3+3+3) upper vein and with 2 lower vein setae respectively; scale with 4 anteromarginal setae; cilia straight. Lateral microtrichial field on each abdominal tergites with 3 distal setae.

Specimen Studied : Wari, West Garo Hills : 2 ♀ ♀ (Z.S.I. Reg. Nos. 4560-61/H17), 10.10.1988, coll. K. K. Ray. Shillong : 1♀ (Z.S.I. Reg. No. 4854/H17), 16.3.1991, coll. S. Sen. William Nagar : 1♀ (Z.S.I. Reg. No, 4878/H17), 9.3.1991, coll. S. Sen. Jowai : 1♀ (Z.S.I. Reg. No. 4897/H17) 20.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills; East Khasi Hills; East Garo Hills; Jaintia Hills), Tamil Nadu; Kerala; Karnataka; Delhi; Assam and West Bengal. Elsewhere : Pakistan; Bangladesh; Sri Lanka; Thailand; West Malayasia; Java; New Guinea; Solomon Is; Japan and Australia.

Remarks : This species is recorded for the first time from Meghalaya, *S. dorsalis* is a serious pest of chillies.

Genus 7. *Stenchaetothrips* Bagnall

1926. *Stenchaetothrips* Bagnall, *Ann. Mag. nat. Hist.*, (9) **18** : 107.
 1957. *Chloethrips* Preisner, *Zool. Anz.*, **159** (7-8) : 162.
 1982. *Stenchaetothrips* Bhatti, *Oriental Ins.*, **16** (4) : 385-391.

Key to the species of *Stenchaetothrips* from Meghalaya

1. Body including wings uniformly dark brown except foretibiae and all tarsi paler. Abdominal tergites II-VIII with serrations; comb of setae on tergite VIII incomplete medially; segment IX long, 1.6 times as long as X. Head short *biformis* (Bagnall)
- Body distinctly bicolorous; head and thorax yellow, abdomen brown. Abdominal tergites II-VIII without serrations *bicolor* (Ananthakrishnan & Jagadish)

8. *Stenchaetothrips bicolor* (Ananthakrishnan & Jagadish)

1967. *Chloethrips bicolor* Ananthakrishnan & Jagadish, *Zool. Anz.*, **178** (5-6)
 1980. *Stenchaetothrips bicolor* : Bhatti & Mound, *Bull. Ent.*, **21** (1-2) : 14.

Specimen Studied : Damalgiri, West Garo Hills : 1 ♂ (Z.S.I. Reg. No. 4737/H17) 9.10.1988, coll. K. K. Ray.

Distribution : Meghalaya (West Garo Hills) Arvankadu (Andhra Pradesh).

Remarks : This species is recorded for the first time from Meghalaya and forms the first record outside its type locality.

9. *Stenchaetothrips biformis* (Bagnall)

1913. *Bagnallia biformis* Bagnall, *J. econ. Biol.*, 8 (4) : 237-238.

1916. *Thrips oryzae* Williams, *Bull. Ent. Res.*, 6 : 353-355

.1957. *Baliothrips biformis* : Priesner, *Zool. Anz.*, 159 (7-8) : 162.

1982. *Stenchaetothrips biformis* : Bhatti, *Oriental Ins.*, 16 (4) : 397-401.

Specimen Studied : Jowa : 3 ♀ ♀ Z.S.I. Reg. Nos. 4793-94/H17; 4896/H17). 20.3.91, coll. S. Sen. Elephanta Falls. Shillong: 3 ♀ ♀ (Z.S.I. Reg. Nos. 4874-76/H17), 17.3.1991, coll. S. Sen. Shillong : 4 ♀ ♀ (Z.S.I. Reg. Nos. 4894-95/H17; 4928-29/H17), 18.3.1991; 21.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (Jaintia Hills; East Khasi Hills); Widely distributed. Elsewhere : Bangladesh; Nepal. Indonesia; Taiwan; Philippines; Japan; U.K.; Rumaria.

Remarks : Recorded for the first time from Meghalaya. This species is a serious pest of rice, specially the seedlings growing in the South-East Asia.

Genus 8. *Taeniothrips* Amyot & Serville

1843. *Taeniothrips* Amyot & Serville, *Hist. nat. Ins. Hemipteres* : 644.

10. *Taeniothrips major* Bagnall

1916. *Taeniothrips Major* Bagnall, *Ann. Mag. nat. Hist.*, (8) 17 : 216.

1968. *Taeniothrips major* Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.*, 11 : 59.

Diagnosis : Body brown, wings infumate. Head with a distinct constriction behind eyes. Inter and anteocellar setae well developed, ocellar setae III placed on a line joining the posterior ocelli Median pair of metanotal setae placed anterior. Forewings with 3 distal setae on upper vein and lower vein with 16 setae. Abdominal sternites without accessory setae.

Specimen Studied : Shillong : 2 ♀ ♀ (Z.S.I. Reg. No. 4784-85/H17), 17.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hill); Kulhara (U.P.). Elsewhere : Nepal.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 9. *Thrips* Linnaeus

1758. *Thrips* Linnaeus *Systema Naturae*, Ed. 10 : 457.

1980. *Thrips* : Bhatti, *Syst. Ent.*, 5 : 112-113.

Key to the species of *Thrips* from Meghalaya

1. Mouthcone very long and narrow, surpassing base of prosternum; maxillary palpi long and slender.....*beharensis* Ramk. & Marg.
- Mouthcone not very long and surpassing base of prosternum.....2
2. Body yellowish.....3
- Body brownish.....5
3. Abdominal sternites without accessory setae; laterotergite without accessory setae. Antennal segments 4-5 yellow proximally brown distally, 6-7 brown; abdominal segment IX light brown distally, segment X brown, tergites shaded with dark area. Upper vein of forewings with 10(7+3) setae).....*coloratus* Schmutz
- Sternites with accessory setae 4
4. Upper vein of forewings with 4-7 distal setae. Antennal segment 1 light brown rest brown except for bases of 3-5. Postero angulars short but stout.....*tabaci* Lindeman
- Upper vein of forewings with 3 distal setae. Antennae mostly 7 segmented occasionally 8 segmented due to split of segment 7, segment 3 pale yellow, 4-5 yellow at base brown distally, 6-7 brown. Interocellar setae placed within ocellar triangle. Metascutum longitudinally striate, inner pair of setae placed back of anterior margin.....*flavus* Schrank.
5. Prothoracic posteroangular setae short and subequal. Antennal segment 3 longer than 6. Body uniformly light to dark brown, antennal segment 3 yellow, 4-6 yellow at base and brown at tip, 7 dark brown. Metanotum with longitudinal lines of sculpture, inner pair of setae placed back of anterior margin. abdominal sternites with 8-10 pairs of accessory setae, arranged in more than one row; pleurite teeth very characteristic blunt. Forewings with 10(7+3) upper veins setae.....*hispidus* Ananth. & Jagadish
- Posteroangular setae well developed.....6
6. Mesoscutal inner pair of setae placed at anterior margin. Head and thorax light. Antennae usually 7 segmented occasionally 8- segmented due to split of style; segment 4 & 5 light yellow at base. Forewings greyish and with 10-11 (7-8+3) upper vein setae. Comb on abdominal tergite VIII complete.....*hawaiiensis* (Morgan)
- Mesoscutal inner pair of setae placed far back of anterior margin, sculpture composed of longitudinal striations. Antennae brown. Interocellars placed within ocellar triangle, Forewings greyish and with 10 (4+3+3) upper vein setae. Abdominal laterotergites without accessory setae or microtrichia and comb on tergite VIII sparse.....*longiceps* (Bagnall)

11. *Thrips beharensis* (Ramakrishna & Margabandhu)

1939. *Oxyrrhinothrips beharensis* Ramk. & Marg., *Rec. Indian Mus.*, 41 (1) : 29-30.

1942. *Thrips (Oxyrrhinothrips) beherensis* : Shumsher, *Indian J. Ent.*, 4 (2) : 130-131.

1980. *Thrips beharensis* : Bhatti, *Syst. Ent.*, 5 : 127.

Specimen studied : Shillong : 5♀ ♀(Z.S.I. Reg. Nos. 4772-74/H17, 4789/H17; 4795/H17), 16.3.1991, coll. S. Sen. William Nagar : 2♀ ♀(Z.S.I. Reg. Nos. 4921-22/H17), 10.3.1991, (Coll. S. Sen).

Distribution : Meghalaya (East Khasi Hills; East Garo Hills) Pusa(Bihar); Madras(Tamil Nadu).

Remarks : This species is recorded for the first time from Meghalaya.

12. *Thrips coloratus* Schmutz

1913. *Thrips coloratus* Schmutz, *Sitz. Akad. Wiss. Wien*, 122 (7) : 1013-1015.

1926. *Thrips melanurus* Bagnall, *Ann. Mag. nat. Hist.*, (9) 18 : 111-112.

1968. *Thrips coloratus* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.*, 11 : 62.

1970. *Thrips coloratus* Varshney, *J. Bengal nat. Hist. Soc.*, 36 (1) : 58.

1980. *Thrips coloratus* : Bhatti, *Syst. Ent.*, 5 : 130-132.

Specimen studied : Shillong : 1♀ (Z.S.I. Reg. No. 1982/H17), 13.10. 1967, coll. Dr. R. K. Varshney.

Distribution : India : Meghalaya (East Khasi Hills) West Bengal; Punjab; H.P.; Maharashtra. Elsewhere: Sri Lanka, Pakistan; Thailand; Laos; Indonesia; Japan.

Remarks : Varshney (1970) recorded this species from Meghalaya.

13. *Thrips flavus* Schrank

1776. *Thrips flavus* Schrank, *Beitr. zur. Natur.* : 31-33.

1928. *Thrips nilgiriensis* Ramakrishna, *Mem. Dept. Agri. India Ent. Ser.*, 10 (7) : 262-263.

1945. *Taeniothrips rhopalantennalis* Shumsher, *Indian J. Ent.* 7 : 181-182.

1969. *Thrips flavus* : Bhatti, *Oriental Ins.*, 3 (4) : 380-381.

1970. *Thrips flavus* : Varshney, *J. Bengal nat. Hist. Soc.*, 36 (1) : 59.

1980. *Thrips flavus* : Bhatti, *Syst. Ent.*, 5 : 133-136.

Specimen studied : Bolchugiri, West Garo Hills : 1♀ (Z.S.I. Reg. No. 4581/H17), 12.10.1988, coll. K. K. Ray. Asnangiri, West garo Hills : 4♀ ♀(Z.S.I. Reg. Nos. 4579-80/H17; 4647-48/H17), 7.10.1988, coll. K. K. Ray, Shillong : 2♀ ♀(Z.S.I. Reg. Nos. 1396-97/H17), 21.4.1979, coll. Dr. J. K. Jonathan, 16♀ ♀, 1♂ (Z.S.I. Reg. Nos. 4767-68/H17, 4775-76/H17; 4786-88/H17; 4841-45/H17; 4882-83/H17; 4898-900/H17), 16.3.1991, 18.3.91, Coll. S. Sen. Jowai : 5♀ ♀(Z.S.I. Reg. Nos. 4769/H17; 4796/H17; 4846-47/H17; 4901/H17), 20.3.1991, coll. S. Sen. William Nagar: 5♀ ♀, 1♂ (Z.S.I. Reg. Nos. 4866/H17; 4879-81/H17; 4902-03/H17), 9.3.1991; 12.3.1991, Coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills : East Garo Hills; Jaintia Hills; East Khasi Hills). Sikkim; West Bengal; Punjab; H.P.; Tamil Nadu; J. & K. *Elsewhere* : Pakistan; Nepal; Korea; Japan; Europe; N. America; Malawi and Madeira.

Remarks : Varshney (1970) recorded this species from Meghalaya. *T. flavus* is a common species in high altitudes.

14. *Thrips hawaiiensis* (Morgan)

1913. *Euthrips hawaiiensis* Morgan, *Proc. U.S. nat. Mus.*, **46** : 3.

1913. *Thrips florum* Schmutz, *Sitz. Akad. Wiss. Wien*, **122** (7) : 1003-1004.

1970. *Thrips florum* : Varshney, *J. Bengal nat. Hist. Soc.*, **36** (1) : 59.

1966. *Thrips hawaiiensis* : Ananthakrishnan & Jagadish, *Ent. Tidskr.*, **87** (1-2) : 88.

1980. *Thrips hawaiiensis* : Bhatti, *Syst. Ent.*, **5** : 137-140.

Specimen studies : Shillong : 16♀ ♀, 4♂♂ (Z.S.I. Reg. Nos. 1977- 81/H17, 1983-87/H17; 2036-45/H17), 14.9.1967; 13.10.1967, 23.11.1967, 29.11.1967, Coll. Dr. R. K. Varshney. 3♀ ♀ (Z.S.I. Reg. Nos. 4736/H17; 4859/H17; 4884/H17), 16.3.1991, 21.3.1991, Coll. S. Sen. William Nagar 8♀ ♀ (Z.S.I. Reg. Nos. 4748-52/H17; 4856- 58/H17), 9.3.1991, 11.3.1991, Coll. S. Sen. Jowai : 3♀ ♀ (Z.S.I. Reg. Nos. 4912-14/H17), 20.3.1991, Coll. S. Sen. Wari, West Garo Hills: 9♀ ♀, 3♂♂ (Z.S.I. Reg. Nos. 4523-4530/H17, 4562- 63/H17, 4586/H17, 4653/H17), 10.10.1988, Coll. K. K. Ray. Janjal, West Garo Hills: 3♀ ♀ (Z.S.I. Reg. Nos. 4564/H17, 4678-79/H17), 8.10.1988, Coll. K. K. Ray, Adogiri, West Garo Hills 3♀ ♀, 2♂♂ (Z.S.I. Reg. Nos. 4565-69/H17), 6.10.1988, Coll. K. K. Ray Bolchugiri, West Garo Hills : 3♀ ♀, 1♂ (Z.S.I. Reg. Nos. 4582-86/H17), 12.10.1988, Coll. K. K. Ray. Ashangiri, West Garo Hills. 3♀ ♀ (Z.S.I. Reg. Nos. 4649-50/H17; 4652/H17): 7.10. 1988, coll. K. K. Ray, Adogiri, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4651/H17), 6.10.1988, Coll. K. K. Ray, Ronkhong, West garo Hills: 1♀ (Z.S.I. Reg. No. 4680/H17), 22.10.1988, Coll. K. K. Ray.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills; West Garo Hills; Jaintia Hills); Widely distributed. *Elsewhere*: Bangladesh; Pakistan; Sri Lanka; Indonesia; Thailand; Laos; Malayasia; Tahiti; New Guinea; Norfolk Is.; Nigeria; Angola; Mozambique; Uganda; Sierra Leone; China and Japan.

Remarks : Varshney (1970) recorded *T. hawaiiensis* (= *T. florum*) from Meghalaya

15. *Thrips hispidus* Ananth. & Jagadish

1966. *Thrips hispidus* Ananth. & Jagadish, *Ent. Tidskr.*, **87** (1-2): 88-89.

1970. *Thrips hispidus* : Varshney, *J. Bengal nat. Hist. Soc.*, **36** (1) : 59.

1980. *Thrips hispidus* : Bhatti, *Syst. Ent.*, **5** : 141.

Specimen studied : Shillong : 3♀ ♀ (Z.S.I. Reg. Nos. 1988-89/H17; 2046/H17), 14.9.1967, coll. Dr. R. K. Varshney.

Distribution : Meghalaya (East Khasi Hills); Tamil Nadu; Kerala; M. P.

Remarks : Varshney (1970) recorded this species from Meghalaya.

16. *Thrips longiceps* (Bagnall)

1916. *Physothrips longiceps* Bagnall, *Ann. Mag. nat. Hist.*, (8)17 : 220-221.
 1968. *Taeniothrips longiceps* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.* 11 : 58.
 1969. *Thrips longiceps* : Bhatti, *Oriental Ins.*, 3 (4) : 380.
 1980. *Thrips longiceps* : Bhatti, *Syst. Ent.*, 5 : 144-147.

Specimen studied : Shillong : 1 ♀ (Z.S.I. Reg. No. 4753/H17), 21.3.1991, Coll. S. Sen.

Distribution : Meghalaya (East Khasi Hills) Kulhara (U.P.)

Remarks : This species is recorded for the first time from Meghalaya. *T. longiceps* has not been reported from anywhere else since its publication and forms the first record outside its type locality.

17. *Thrips tabaci* Lindeman

1889. *Thrips tabaci* Lindeman, *Bull. soc. Imp. Nat., Moscow*, 1 : 61.
 1960. *Thrips kallarensis* Ananthakrishnan, *J. Bombay nat. Hist. Soc.*, 57 (3) : 557-558.
 1980. *Thrips tabaci* : Bhatti, *Syst. Ent.*, 5 : 157-158.

Specimen studied : Phulbari : West Garo Hills, 1 ♂ (Z.S.I. Reg. No. 4920/H17), 9.3.1991, Coll. H. C. Ghosh.

Distribution : India : Meghalaya (East Khasi Hills, West Garo Hills) Widely distributed.
Elsewhere : Cosmopolitan.

Remarks : Varshney (1970) recorded this species from Shillong. *T. tabaci* is a serious pest of cotton.

Subfamily PANCHAETOTHRIPINAE

Genus 10. *Astrothrips* Karny

1921. *Astrothrips* Karny, *Treubia*, 1 (4) : 215.

18. *Astrothrips parvilimbus* Stannard & Mitri

1962. *Astrothrips parvilimbus* St. & Mitri, *Trans. Am. ent. Soc.*, 88 : 197-199.
 1975. *Astrothrips parvilimbus* : Wilson, *Mem. Am. Ent. Inst.*, 23 : 52-53.

Diagnosis : Body dark yellowish brown; antennae yellow, conical apex shaded with brown, base of forewings golden with 2 dark crossbands. Antennae 6-segmented; narrowed apex of antennal segment 4 shorter, wider and more abruptly constricted than apex of segment 3; apex of sense cone of antennal segment 4 positioned below apex of accessory sense cone. Ocellar hump enlarged; ocellar setae no. 2 developed, no. 1 & 3 minute. Anterior of mesoscutal sculpture moderately notched along mid line.

Specimen studied : Ashangiri, West Garo Hills : 2♀ ♀(Z.S.I. Reg. No. 4641/H17), 7.10.1988, Coll. K. K. Ray.

Distribution : Meghalaya (West Garo Hills), South India; Andaman Is.; West Bengal.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 11. *Helionothrips* Bagnall

1932. *Helionothrips* Bagnall, *Ann. Mag. nat. Hist.*, (10) 10 : 506.

19. *Helionothrips kadaliphilus* (Ramakrishna & Margabandhu)

1931. *Heliothrips kadaliphilus* Ram. & Marg. *J. Bombay nat. Hist. Soc.*, 34 : 1033-34.

1936. *Helionothrips kadaliphilus* : Priesner, *Proc. R. ent. Soc. Lond.* (B), 5 (11) : 208.

1968. *Helionothrips kadaliphilus* : Bhatti, *Oriental Ins.*, 2 (1) : 35.

1975. *Helionothrips kadaliphilus* : Wilson, *Mem. Amer. ent. Inst.*, 23 : 130-131.

Diagnosis : Body dark brown; antennal segment 2 pale yellowish white, 3-5 and base of 6 lemon yellow, 6 brown distally, 7 greyish brown, 8 greyish yellow; distal three fourth of forewing uniformly brown. Antennal segments 4 & 5 elongated, 5 with a sub-basal thickening. Occipital collar slightly arched medially; reticles of collar without wrinkles. Abdominal tergite I with antecostal line; comb on tergite VIII interrupted medially.

Specimen studied : Shillong : 1♀ (Z.S.I. Reg. No. 4779/H17), 17.3. 1991, coll. S. Sen
Elephanta Falls, Shillong : 1♀ (Z.S.I. Reg. No. 4870/H17), 12.3. 1991, coll. S. Sen.

Distribution : Meghalaya (East Khasi Hill), Tamil Nadu; Kerala; Maharashtra; Manipur and West Bengal.

Remarks : This species is recorded for the first time from Meghalaya. *H. kadaliphilus* is a serious pest of banana.

Genus 12. *Heliothrips* Haliday

1836. *Heliothrips* Haliday, *Ent. Mag.*, 3 : 443.

20. *Heliothrips haemorrhoidalis* (Bouche)

1833. *Thrips haemorrhoidalis* Bouche, *Natur. der. Schadlichen and nutzlichen Gaiten-Insekten und die bewahtesten Mittel zur Vertilgung der eisteren*, Berlin : 42.

1838. *Heliothrips haemorrhoidalis* : Burmeister, *Handbuch der Entomologie* 2 : 412.

1926. *Heliothrips haemorrhoidalis* : Karny, *Mem. Dept. Agri. India Ent. Ser.*, (6) 9 : 192.

1975. *Heliothrips haemorrhoidalis* : Wilson, *Mem. Amer. ent. Inst.*, 23 : 146-151.

Diagnosis : Body dark brown; legs pale yellow, antennal segment 1,2, 7 & 8 light brown, 3-5 faint yellow, 6 proximal third faint yellow and brown distally; forewings clear.

Head surface sculptured with hexagonal reticulations; cheeks constricted at base neck-like. Antennae 8-segmented, segments 3 & 4 with simple sense cones. Prothorax sculptured. Metascutal triangle without flange of sculpture. Reticles on abdominal tergites large and those on anterior of antecostal lines on tergites III-VII delicate, ill formed and interrupted; tergites VII and VIII with a complete comb of strong teeth; segment X short, entirely longitudinally split.

Specimen studied : Shillong : 2♀ ♀(Z.S.I Reg. Nos. 4780-81/H17), 17.3.1991, coll. S. Sen. William Nagar : 1♀ (Z.S.I. Reg. Nos. 4865/H17), 12.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills); Tamil Nadu; Karnataka. *Elsewhere* : Surinam; Brazil; U.S.A.; East Africa; Australia.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 13. Selenothrips Karny

1911. *Heliothrips* (*Selenothrips*) Karny, *Ent. Rundschau*, 28 : 179.

1913. *Selenothrips* : Hood, *Insect. Inscit. menstr.*, 1 (12) : 150.

21. *Selenothrips rubrocinctus* (Giard)

1901. *Physopus rubrocinctus* Giard, *Bull. Soc. ent. France*, 15 : 263-265.

1913. *Selenothrips rubrocinctus* : Hood, *Insect. Inscit. menstr.*, 1 (12) 150.

1975. *Selenothrips rubrocinctus* : Wilson, *Mem. Amer. ent. Inst.*, 23 : 230-234.

1979. *Selenothrips rubrocinctus* : Kudo, *Oriental Ins.*, 13 (3-4) : 355.

Diagnosis : Body inclusive of forewings dark brown; antennal segments 1 & 2 brown 3 & 4 light brown at middle, 5 & 6 proximally pale yellow and brown distally; all tarsi pale.

Head constricted at base, surface sculptured with transverse striations. Antennae 8-segmented, segment 4 strongly vasiform with anterior neck elongate, segments 3 & 4 with forked sense- cones. Prothorax with transverse striations. Metascutal triangle broad, median pair of setae long. Setae on abdominal tergite X strong. Forewings with continuous row of long, stout setae on both veins.

Specimen studied : Wari, West Garo Hills : 6♀ ♀(Z.S.I. Reg. No. 4517-4522/H17), 10.10.1988, coll. K. K. Ray. Holloidanga, West Garo Hills : 1♀ (Z.S.I. Reg. No. ♀ 4542/H17), 25.10.1988, coll. K. K. Ray.

Distribution : India : Meghalaya (West Garo Hills); Kerala; Andaman Is.; Assam; Manipur & West Bengal. *Elsewhere* : Burma; Sri Lanka; Honduras; Bangladesh; Philippines; Taiwan; Thailand; Mexico.

Remarks : This species recorded for the first time from Meghalaya.

Key to the Genera of Family Phlaeothripidae from Meghalaya

1. Maxillary stylets slender, never broadened. (Subfamily Phlaeothripinae)

- Maxillary stylets broad, band-like (Subfamily Idolothripinae) 14
2. Sense cones on antennal segment 3 numerous, arranged in a ring. Forefemora with a stout tooth at base on inner margin of female and males with a strong tooth at base and one at apex; fore coxae prolonged considerably in oedymorous males.....*Ecacanthothrips* Bagnall
- Sensecones on antennal segment 3 atmost 2 or 3 number. 3
3. Intermediate antennal segments thin, Mesopraesternum degenerate to well developed. Foretarsi unarmed in both sexes. Wings comparatively narrow.....*Stigmiothrips* Ananthakrishnan
- Intermediate antennal segments well developed and partly elongate.....4
4. Head with a clear notch behind eye 5
- Head without notch behind eyes or only with a slight one 6
5. All tibiae or foretibiae alone with a series of bristle bearing tubercles. Head very slightly produced in front of eyes. Mouth cone short, broadly rounded. Anteromarginals short other prothoracic setae well developed, blunt to expanded at tip; all setae emerging from tubercles. Posterior half of epimeron fused with pronotum. Foretarsi armed in both sexes.....*Tylothrips* Hood
- All tibiae without series of bristle bearing tubercles. Head not produced. Prothoracic anteroangulars and midlateral setae close together; setae expanded at tip. Maxillary stylets oculad, close at middle, mouthcone broadly rounded. Foretarsi generally unarmed in both sexes, rarely with a small tooth in males.....*Apelaunothrips* Karny
6. Cheeks always with a few warts mostly at base, carrying small spines or non warty, but with 1-4 strong spines or cheeks crenulate 7
- Cheeks without strong spines, almost with small scattered setae or smooth.....8
7. Cheeks warty with small spines, mostly at base. Mouthcone pointed. Forefemorae and foretibiae armed in males with two subapical femoral teeth and basal, median and apical tibial teeth; well developed in oedymorous males. Wings narrower, parallel sided with a weak median fold.....*Hoplandrothrips* Hood
- Cheeks not warty; mostly crenulate; slightly but distinctly indented behind eyes. Head much broader. Mouthcone rounded, maxillary stylets mesad, wide apart. Eyes slightly bulged behind forming an angular projection. Forefemora strongly enlarged in both sexes; foretibiae much shorter with an inner tubercle at apex; foretarsi with a strong dagger like too-th in both sexes. B₂ of abdominal segment IX of male short but exceptionally stout.....*Pegothrips* Sen & Muraleedharan
8. Foretarsi unarmed in both sexes; forefemora thin. Head longer than wide and almost twice as long as pronotum. Mouthcone elongate, pointed to narrowly rounded.....*Liothrips* Uzel
- Foretarsi armed in both sexes or armed only in male. 9

9. Tube very much longer than head and pilose. Head very little produced, with a clear notch behind eye; cheeks wide behind eye. Integument strongly sculptured.....*Leeuwenia* Karny
 Tube shorter than head or as long 10.
10. Forewings narrowed at base to middle and parallel sided beyond middle (Mesothripine) Cheeks constricted at base and slightly spinose. Forefemore enlarged.....*Mesothrips* Zimmerman
 Forewings with a distinct constriction at middle (Haplothripine).....11
11. Mouthcone short and broad 12
- Mouthcone pointed, distinctly biconcave. Head elongate. Body long and slender. Abdomen narrow and tapering. Foretarsi armed.....13
12. Hind femora usually enlarged. Antennal segment 3 almost symmetrical, segment 8 broad at base, 7 & 8 closely united segment 3 with 0+1 or 1+1 and segment 4 with 1+2+1 1+2+2 sense cones. Tube setae long and fine about twice as long as tube.....*Karnyothrips* Watson
 - Hind femora not enlarged. Antennal segment 3 not very symmetrical; segment 3 with 1+1 and segment 4 with 2+2 - 2+2+1 sense cones.....*Haplothrips* Serville
13. Abdominal tergite II-VII each with 2 pairs of wing retaining setae. Phallus with membranous pseudovirge.....*Membrothrips* Bhatti
 Abdominal tergite II-VII each with more than 2 pairs of wing retaining setae. Phallus with chitinated pseudovirga. Forefemora enlarged; foretarsi with a distinct tooth..... *Dolichothrips* Priesner
14. Head distinctly produced 16
 Head not produced. 15
15. Tube convex, heavy and with small setae bearing tubercles laterally; rarely with longitudinal ridges at basal third. Foretarsal tooth large in male, small or absent in female.....*Neosmerinthothrips* Schmutz
16. Mesothorax of male with a distinct forked process, lacking in gynaecoid males. Head production short, cheeks strongly setose in oedymorous males, weak in gynaecoids. Oedymorous males with very well developed forefemora and with strong setae; foretibiae with numerous denticles on inner margin and foretarsal tooth very strong.....*Dinothrips* Bagnall
 Mesothorax of males without process. Head production of varied length often more pronounced. Forefemora of males at apex on outer margin with sickle-like seta, foretarsal tooth well developed in males; reduced or absent in females. Antennal segments 3 & 4 in oedymorous males with strongly developed setae. Genal setae well developed.....*Elaphrothrips* Buffa

Family PHLAEOTHIRIPIDAE

Subfamily PHLAEOTHIRIPINAE

Genus 14. *Apelaunothrips* Karny

1925. *Apelaunothrips* Karny, *Notulae Ent.* 5 : 82.

22. *Apelaunothrips bhowalii* (Ananthakrishnan)

1971. *Stigmothrips bhowalii* Ananthakrishnan, *J. Zool. Soc. India*, 23 : 183.

1979. *Apelaunothrips bhowalii* : Okajima, *Syst. Ent.* 4 : 44.

Diagnosis : Body uniformly brown; all tibiae dark brown distally lighter; wings clear.

Head very little longer than broad. Antennal segments 3 & 4 with 1+2 and 2+2 sense cones respectively. Prothoracic anteromarginal setae shorter than anteroangulars. Forewings with 10 double fringers. Pelta roughly bell shaped with polygonal sculpture. B₁ of abdominal tergite IX longer than B₂.

Specimen studied : Cherrapunjee : 1♀ (Z.S.I. Reg. No. 4848/H17), 19.3.1991, coll. S. Sen. William Nagar : 1♀ (Z.S.I. Reg. No. 4927/H17), 11.3.1991, coll. S. Sen.

Distribution : India : (Meghalaya, East Khasi Hills; East Garo Hills); Bhowali (U.P.).
Elsewhere : Thailand.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 15. *Dolichothrips* Karny

1912. *Dolichothrips* Karny, *Zool. Anz.*, 40 : 299.

23. *Dolichothrips citripes* (Bagnall)

1921. *Neoheegeria citripes* Bagnall, *Ann. Mag. nat. Hist.*, (9) 7 : 360-361.

1939. *Dolichothrips gracilipes* Ramakrishna & Margabandhu, *Indian J. Ent.*, 1 (3) : 46-47.

1968. *Dolichothrips citripes* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.*, 11 : 88.

1970. *Dolichothrips citripes* : Bhatti, *Entomon*, 3 (2) : 224.

Specimen studied : Barengapara, West Garo Hills : 1♂ (Z.S.I. Reg. No. 4570/H17), 10.10.1988, coll. K. K. Ray.

Distribution : Meghalaya (West Garo Hills); Orissa; Tamil Nadu; Bihar & West Bengal.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 16. *Ecacanthothrips* Bagnall

1909. *Ecacanthothrips* Bagnall, *Ann. soc. ent. Belg.*, 52 : 348.

1978. *Ecacanthothrips* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, **37** (5) : 156-158.

24. *Ecacanthothrips tibialis* (Ashmend)

1905. *Idolothrips tibialis* Ashmead, *Ent. News*, **16** : 20.

1908. *Acanthothrips sanguineus* Bagnall, *Ann. Mag. nat. Hist.*, (8) **1** : 362.

1913. *Ecacanthothrips sanguineus* : Bagnall, *Rec. Indian Mus.*, **8** (3) : 201.

1978. *Ecacanthothrips tibialis* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, **37** (5) : 161-162.

1988. *Ecacanthothrips tibialis* : Sen et al, *Rec. zoll. Surv. India, Occl. Pap.*, **100** : 52-53.

Diagnosis : Body dark blackish brown; all femora dark brown, foretibiae yellow with brown at base, mid-and hind tibiae light brown, all tarsi yellow; antennal segments 1-4 dark blackish brown, 5-8 brown; forewings infumate except at base and with a median pale brown streak.

Head much longer than broad, narrow at base; surface with transverse striations. Postoculars long but shorter than eyes. All prothoracic setae well developed, anteromarginals shorter than anteroangulars, postangulars much longer than epimarals. Forefemora with basal and apical tooth much pronounced in oedymorous specimens. Forewings with double fringes.

Specimen studied : Mawphlang, 1♂ (Z.S.I. Reg. Nos. 413/H12), 6.9.1975, coll. Dr. N. Muraleedharan, Songsak : 3♂♂ (Z.S.I. Reg. No. 528-530/H17), 21.9.1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Khasi Hill; East Garo Hills); Kerala; Tamil Nadu; West Bengal; Tripura; Manipur. Elsewhere : Sri Lanka; Taiwan; China; Vietnam; Philippines; Borneo; New Guinea; Japan; Indonesia; Singapore; Mauritius; Tanzania; Australia.

Remarks : Sen et al (1988) recorded this species from Meghalaya.

Genus 17. *Haplothrips* Amyot & Serville

1843. *Haplothrips* Amyot & Serville, *Hist. nat. Ins. Hemipteres* : 640.

1976. *Haplothrips* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)*, **34** (4) : 244-245.

Key to the species of *Haplothrips* from Meghalaya

1. Forewings with double fringes 2
- Forewings without double fringes. Antennal segment 3 with 1+1 sense cones. Prothoracic anteromarginals and midlaterals well developed. Abdominal tergites III-VII with 2 pairs of wing retaining setae.....*articulosus* Bagnall
2. Antennal segment 3 with 0+1 sense cone.....3
- Antennal segment 3 with 1+1 sense cone segment 3 of antennae very short, 1.1 times as long as wide; segments 3 & 4 yellowish, 5 more yellow than brown, segments 1-2 and 6-8 brown. Foretarsi with a small burericle. Forewings with 5-8 double fringes. Median setae B₁ on abdominal segment IX pointed.....*gowdeyi* (Franklin)

3. Mid- and hind tibiae entire brown, antennal segments 1-2 brown, 3 brownish yellow, 4-6 successively darker. Forewings with 5-8 double fringes. Median setae B₁ on abdominal segment IX blunt to slightly expanded.....*ganglbaueri* Schmutz

Mid-and hind tibiae proximally brown, distal half to one-third yellow; antennal segments 3-6 yellow, 7-8 brown. Forewings with 6-9 double fringes. B₁ on abdominal segment IX slightly expanded.....*ceylonicus* Schmutz

25. *Haplothrips articulatus* Bagnall

1926. *Haplothrips articulatus* Bagnall, *Ann. Mag. nat. Hist.*, (9) 18 : 548-549.

1968. *Haplothrips (Trybomiella) articulatus* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.*, 11 : 109.

1976. *Haplothrips (Trybomiella) articulatus* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)*, 34 (4) : 257.

Specimen studied : Adogiri, West Garo Hills : 1 ♂ (Z.S.I. Reg. No. 4637/H17), 6.10.1988, coll. K. K. Ray.

Distribution : India : Meghalaya (West Garo Hills), Andhra Pradesh; West Bengal. Elsewhere: Tanzania; Kenya; Sierra Leone.

Remarks : This species is recorded for the first time from Meghalaya.

26. *Haplothrips ceylonicus* Schmutz

1913. *Haplothrips ceylonicus* Schmutz, *Sitz. Akad. Wiss. Wien*, 122 : 1038-1039.

1976. *Haplothrips ceylonicus* : Pitkin, *Bull. Br. Mus. Nat. Hist. (Ent.)* 34 (4) : 248-249.

Specimen studied : Wari, West Garo Hills: 2 ♀ ♀, 1 ♂ (Z.S.I. Reg. No. 4532-34/H17), 10.10.1988, coll. K. K. Ray, Bhatbari, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4574/H17), 26.10.1988, coll. K. K. Ray. William Nagar : 1 ♀ (Z.S.I. Reg. No. 4885/H17), 9.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills; East Garo Hills); Tamil Nadu. Elsewhere : Sri Lanka; Java; Sumatra.

Remarks : This species is recorded for the first time from Meghalaya.

27. *Haplothrips ganglbaueri* Schmutz

1913. *Haplothrips ganglbaueri* Schmutz, *Sitz. Akad. Wiss. Wien.*, 122 : 1034.

1928. *Zygothrips andhra* Ramakrishna, *Mem. Dept. Agri. India ent. Senr.*, 10 : 290-291.

1933. *Haplothrips priesneriarus* Bagnall, *Ann. Mag. nat. Hist.*, (10) 6 : 327-328.

1970. *Haplothrips ganglbaueri* : Varshney, *J. Bengal nat. Hist. Soc.*, 36 (1) : 60.

1976. *Haplothrips ganglbaueri* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)*, 34 (4) : 249-250.

1988. *Haplothrips ganglbaueri* : Sen et al, *Rec. zool. Surv. India occl. pap.* 100 : 58-59.

Specimen studied : William Nagar : 3 ♀ ♀, 1 ♂ (Z.S.I. Reg. Nos. 4728-29/H17; 4754/H17, 4887-88/H17), 9.3.1991, coll. S. Sen. Jowai : 6 ♀ ♀, 1 ♂ (Z.S.I. Reg. Nos.

4797-4801/H17, 4905/H17, 4911/H17), 20.3. 1991, coll. S. Sen. Asangiri, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4593/H17), 7.10. 1988, coll. K. K. Ray. Wari, West Garo Hills: 4 ♀ ♀, 2 ♂ ♂ (Z.S.I. Reg. Nos. 4544/H17; 4546-4550/H17), 10.10.1988, coll. K. K. Ray. Holloidanga, West Garo Hills; 1 ♀ (Z.S.I. Reg. No. 4545/H17), 25.10.1988, coll. K. K. Ray. Adogiri, West Garo Hills: 1 ♀ , 1 ♂ (Z.S.I. Reg. Nos. 4638-39/H17), 6.10.1988, coll. K. K. Ray. Janjal, West Garo Hills: 6 ♀ ♀, 1 ♂ (Z.S.I. Reg. No. 4672-73/H17) 4681-85/H17), 8.10.1988, coll. K. K. Ray. Machanpani, West Garo Hills: 1 ♀ (Z.S.I. Reg. Nos. 4698/H17), 15.10. 1988, coll. K. K. Ray. Shillong, 1 ♀ (Z.S.I. Reg. Nos. 1900/H17), 19.9. 1967, coll. Dr. R. K. Varshney. 6 ♀ ♀, 3 ♂ ♂ (Z.S.I. Reg. Nos. 4717-20/H17; 4777/H17; 4860-62/H17; 4904/H17), 16.3.1991, 21.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (East Garo Hills; West Garo Hills; Jaintia Hills; East Khasi Hills); Widely distributed. **Elsewhere** : Bangladesh; Sri Lanka; Pakistan; Java; Solomon Is; Philippines.

Remarks : Varshney (1970) recorded this species from Meghalaya.

28. *Haplothrips gowdeyi* Franklin

1908. *Anthothrips gowdeyi* Franklin, *Proc. U.S. nat. Mus.*, 33 : 724.

1921. *Haplothrips gowdeyi* : Watson, *Fla. Ent.*, 4 : 38.

1939. *Haplothrips gowdeyi* : Ramakrishna & Margabandhu, *Indian J. Ent.*, 1 (3) : 47-48.

1976. *Haplothrips gowdeyi* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)* 34 (4) : 250-252.

Specimen studied : Holloidanga, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4551/H17), 25.10. 1988, coll. K. K. Ray, Wari, West Garo Hills. 2 ♀ ♀ (Reg. No. 4552/H17, 4578/H17), 10.10.1988, coll. K. K. Ray. Asangiri, West Garo Hills: 2 ♀ ♀ (Z.S.I. Reg. Nos. 4575- 76/H17), 7.10.1988, coll. K. K. Ray. Adogiri, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4577/H17), 6.10.1988, coll. K. K. Ray. Bolchugiri, West Garo Hills. 2 ♀ ♀ (Z.S.I. Reg. No. 4591-92/H17), 12.10.1988, coll. K. K. Ray. Bokongiri, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4654/H17), 23.10.1988, coll. K. K. Ray. William Nagar : 1 ♀ (Z.S.I. Reg. No. 4906/H17), 20.3.1991, coll. S. Sen. Shillong : 1 F. (Z.S.I. Reg. No. 4910/H17), 18.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills; East Garo Hills; East Khasi Hills); Tamil Nadu; Rajasthan; Andaman Is.; West Bengal. **Elsewhere** : Sri Lanka; Bangladesh.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 18. *Hoplandrothrips* Hood

1912. *Hoplandrothrips* Hood, *Proc. ent. Soc. Wash.*, 14 : 145.

29. *Hoplandrothrips flavipes* Bagnall

1923. *Hoplandrothrips flavipes* Bagnall, *Ann. Mag. nat. Hist.* (9) 12 : 628-629.

1939. *Phlaeothrips indicus* Remakrishna & Margabandhu, *Indian J. Ent.*, 1 : 43-44.

1968. *Hoplandrothrips flavipes* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.) Suppl.*, 11 : 120.

1988. *Hoplandrothrips flavipes* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 60-61.

Specimen studied : Shillong : 2♀ ♀(Z.S.I. Reg. Nos. 575-576/H12), 12.9.1975, ex. dry leaves, coll. Dr. N. Muraleedharan, Songsak, Garo Hills : 2♀ ♀(Z.S.I. Reg. Nos. 577-578/H12), 19.9.1975, ex. dry leaves, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills) Kerala; Karnataka; Tamil Nadu; Tripura; Manipur. Elsewhere : Kenya.

Remarks : Sen et al (1988) recorded this species from Meghalaya.

Genus 19. *Karnyothrips* Watson

1922. *Karnyia* Watson, *Fla. Ent.*, 6 (1) : 6.

1924. *Karnyothrips* Watson, *Univ. Fla. Agri. Exp. Stn. Bull.*, 168 : 23.

Key to the species of *Karnyothrips* from Meghalaya

1. Body brown 2

Body bicolorous; head, thorax and abdominal segments VIII-X brown, segments II-VII yellow; antennal segments 1 & 6 pale brown, 2-5 yellow; 7-8 brown. antennal segments 3 & 4 with 1+1 and 1+1+1 sensecones respectively. Pronotal anteromarginal setae vestigial. Forewings with double fringes.....*melaleucus* (Bagnall)

2. Foretarsi with a strongly curved tooth. Antennal segments 3 & 4 with 1+1 and 1+2+1 sensecones respectively. Prothorax heavy, anteromarginal vestigial. B₁ on abdominal tergite IX expanded at tip.....*flavipes* (Jones)

Foretarsi unarmed. B₁ on abdominal tergite IX knobbed, B₂-B₃ pointed.....*fungulus* Ananthakrishnan

30. *Karnyothrips flavipes* (Jones)

1912. *Anthothrips Flavipes* Jones, *Tech. Ser. Bur. Ent. U.S.*, 23 : 18-19.

1927. *Karnyothrips flavipes* : Hood, *Pan-pacif. Ent.*, 3 : 175.

1969. *Karnyothrips flavipes* : Ananthakrishnan, *CSIR Zool. Monog.* 1 : 139.

1976. *Karnyothrips flavipes* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)* 34 (4) : 262-263.

Specimen studied : Holloidanga, West Garo Hills : 1♀ (Z.S.I. Reg. No. 4593/H17), 25.10.1988, coll. K. K. Ray.

Distribution : India : Meghalaya (West Garo Hills). Elsewhere : U.S.A.; Egypt. Cyprus

Remarks : This species is recorded for the first time from Meghalaya.

31. *Karnyothrips fungulus* Ananthakrishnan

1973. *Karnyothrips fungulus* Ananthakrishnan, *Occl. Publ. 2, Ent. Res. Unit. Loyola College, Madras* : 38.

1988. *Karnyothrips fungulus* : Sen et al, *Rec. zool. Surv. India Occl. Pap.* 100 : 64.

Specimen studied : Wari, West Garo Hills : 1♀ (Z.S.I. Reg. No. 4655/H17), 10.10.1988, coll. K. K. Ray. Janjal, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4670/H17), 8.10.1988, coll. K. K. Ray. Adogiri, West Garo Hills : 1♀ (Z.S.I. Reg. No. 4671/H17), 8.10.1988, coll. K. K. Ray.

Distribution : India : Meghalaya (West Garo Hills) Tamil Nadu, Andhra Pradesh, Kerala; U.P. and Tripura.

Remarks : This species is recorded for the first time from Meghalaya.

32. *Karnyothrips melaleucus* (Bagnall)

1911. *Hindsiana melaleuca* Bangall, *Entomologist's Mon. Mag.*, 47 : 61-62.

1927. *Karnyothrips melaleuca* : Hood, *Pan-Pacif. Ent.*, 3 : 176.

1976. *Karnyothrips melaleucus* : Pitkin, *Bull. Br. Mus. nat. Hist. (Ent.)*, 34 (4) : 263.

Specimen studied : Shillong : 1♀ (Z.S.I. Reg. No. 4721/H17), 21.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills); Tamil Nadu; Kerala; Andaman is., West Bengal. **Elsewhere** : Denmark; Vietnam; China; North America; Hawaii Is., South Africa and Egypt.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 20. *Leeuwenia* Karny

1912. *Leeuwenia* Karny, *Marcellia*, 11 : 161.

33. *Leeuwenia karnyiana* Priesner

1925. *Leeuwenia karnyi* Ramakrishna, *J. Bombay nat. Hist. Soc.* 30 : 791-792.

1929. *Leeuwenia karnyiana* Priesner, *Trenbia*, 10 (4) : 448.

1970. *Leeuwenia ramakrishnae* : Ananthakrishnan *Oriental Ins.*, 4 : 51-53.

1975. *Leeuwenia karnyiana* : zur Strassen, *Senckenbergiana biol.*, 56 (1-3) : 82.

Diagnosis : Head longer than broad; cheeks constricted behind eyes and thin almost parallel, strongly converging in front and width shortest across eyes. Eyes large, postoculars about half the length of eyes, placed much below eyes and blunt. Mouthcone long and broadly round at apex. Prothoracic anteroangulars short, epimerals moderately developed and all other prothoracic setae absent. Forefemora fairly swollen; foretarsi unarmed. Forewings without double fringes and basal wing setae B₁-B₃ very short and subequal. Tube about 5 times longer than head, not swollen at middle, almost parallel sided entirely and setae moderately long.

Specimen studied : Cherrapunjee : 2♀ ♀(Z.S.I. Reg. Nos. 4849- 50/H17), 19.3.1991, coll. S. Sen.

Distribution : Meghalaya (East Khasi Hills); Tamil Nadu; Karnataka; Assam and West Bengal. .

Remarks : This species is recorded for the first time from Meghalaya.

Genus 21. *Liothrips* Uzel

1895. *Liothrips* Uzel, *Mon. Ord. Thys.* : 261.

Key to the species of *Liothrips* from Meghalaya

1. Head elongate, 1.5 times as long as broad. Antennal segment 3 five times as long as wide. Postoculars longer than eyes. Anteromarginals shorter, than anteroangulars; postangulars and epimerals subequal. Mesopraesternum constricted at middle. Forewings clouded with 9-12 double fringes. Tube as long as head and setae on abdominal segment IX shorter than tube.....*himalayanus* Ananth. & Jagadish
- Head shorter. Antennal segments 3-4 yellow, 5-6 yellow at base light brown beyond, 7-8 light brown. Postoculars about as long as eyes. Anteroangulars and anteromarginals subequal, epimerals longer than postangulars. Mesopraesternum incomplete, restricted to two lateral plates. Forewings with 12-16 double fringes. Tube little shorter or as long as head.....*spectabilis* Ananthakrishnan

34. *Liothrips himalayanus* Ananthakrishnan & Jagadish

1970. *Liothrips himalayanus* Ananth. & Jagadish, *Oriental Ins.*, 4 (3) : 259-260.

1988. *Liothrips himalayanus* : Sen et al, *Rec. zoll. Surv. India Occl. Pap.*, 100 : 74-76.

Specimen studied : Shillong : 5 F. F. (Z.S.I. Reg. No. 4722-26/H17), 21.3.1991, coll. S. Sen. William Nagar : 1 F. (Z.S.I. Reg. Nos. 4727/H17). 9.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills) : Darjeeling District (West Bengal).

Remarks : This species is recorded for the first time from Meghalaya.

35. *Liothrips spectabilis* Ananthakrishnan

1972. *Liothrips (Zopyrothrips) spectabilis* Ananthakrishnan, *Marcellia*, 37 (5) : 11-12.

1974. *Liothrips spectabilis* : Ananthakrishnan & Muraleedharan, *Oriental Ins. Suppl.* 4 : 13, fig. 47.

1988. *Liothrips spectabilis* : Sen et al, *Rec. zool surv. India Occl. Pap.*, 100 : 79.

Specimen studied : Songsak, Garo Hills : 1 ♀ (Z.S.I. Reg. No. 1332/H17), 22.9. 1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Garo Hills); Kotagiri, Nilgiri Hills (Tamil Nadu).

Remarks : Sen et al (1988) recorded this species from Meghalaya.

Genus 22. MEMBROTHRIPS Bhatti

1978. *Membrothrips* Bhatti, *Entomon*, 3 (2) : 226-227.

36. *Membrothrips indicus* (Hood)

1919. *Neoheegeria indica* Hood, *Insec. Inscit. menstr.*, 7 (3):96- 98.
 1935. *Dolichothrips indicus* : Priesner, *Philippine J. Sci.*, 57 : 363.
 1978. *Membrothrips indicus* : Bhatti, *Entomon*, 3 (2) : 227.
 1988. *Membrothrips indicus* Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 79.

Diagnosis : Head longer than broad, cheeks almost parallel; antennae 8-segmented, segments 3 & 4 with 3 & 4 sensecones respectively. Mouthcone long and pointed at tip. Maxillary palpi 2-segmented. All prothoracic setae well developed and dilated at tip. Forewings constricted at middle and with double fringes. Legs slender and foretarsi armed in both sexes. Pelta triangular. Abdominal tergites II-VII each with 2 pairs of sigmoid wing retaining setae. Tube shorter than head.

Specimen studied : Adogiri, West Garo Hills : 2♀ ♀(Z.S.I. Reg. Nos. 4656-57/H17), 6.10.1988, coll. K. K. Ray. Chaipuni, West Garo Hills : 1♂ (Z.S.I. Reg. No. 4658/H17). 14.10. 1988, coll. K. K. Ray, Janjal, West Garo Hills : 2♀ ♀(Z.S.I. Reg. Nos. 4668- 69/H17), 8.10.1988, coll. K. K. Ray.

Distribution : India : Meghalaya (West Garo Hills); Tamil Nadu; West Bengal.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 23. *Mesothrips* Zimmerman

1900. *Mesothrips* Zimmerman, *Bull. Inst. Bot. Buit.*, 7 : 16.
 1976. *Mesothrips* : Ananthakrishnan, *Oriental Ins.*, 10 (1) : 185- 191.

37. *Mesothrips extensivus* Ananthakrishnan & Jagadish

1969. *Mesothrips extensivus* Ananth. & Jagadish, *Marcellia*, 36 (1- 2) : 58-59.
 1976. *Mesothrips extensivus* : Ananthakrishna, *Oriental Ins.*, 10 (2) : 1988.
 1988. *Mesothrips extensivus* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 85.

Diagnosis : Body brown; antennal segments 1,2,7, & 8 brown, 3-5 yellow, 6 proximal half yellow distally brown; foretibiae and all tarsi yellow with brownish shade; forewings clear excepting base.

Head longer than broad, constricted at base. Intermediate antennal segments elongate. Mouthcone long, round at tip. All prothoracic setae well developed, anteroangulars longer than anteromarginals and postangulars longer than epimerals. Mesopraesternum continuous, more narrowed at middle and expanded along sides. Pelta triangular, constricted at apex. Forewings basal wing setae long and with double fringes. Tube shorter than head.

Specimen studied : Songsak, Garo Hills : 2♀ ♀(Z.S.I. Reg. Nos. 368/H12; 1333/H17), 22.9. 1975, ex. gall of *Mallotus* sp., coll. Dr. N. Muraleedharan.

Distribution : Meghalaya (East Garo Hills); Tamil Nadu; Kerala; Assam.

Remarks : Sen et al (1988) recorded this species from Meghalaya.

Genus 24. Pegothrips Sen & Muraleedharan

1977. *Pegothrips* Sen & Muraleedharan, *Entomon*, 1 (2) : 175.

38. *Pegothrips* Meghalaya Sen & Muraleedharan

1977. *Pegothrips* meghalaya Sen & Muraleedharan, *Entomon.*, 1 (2) : 175-178.

1988. *Pegothrips* meghalaya : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 94-96.

Female (Male) : General body colour dark brown, antennal segment 1 dark brown, 2 dark brown at proximal half and margin, 3-8 yellow; all femora; mid-and hind tibiae dark brown, foretibiae yellow with a brownish shade at proximal half and margin, all tarsi yellow; wings clear. All setae hyaline to light brown and pointed.

Head longer than broad, 240-256 (200) long, 188 (168) wide across eyes, 192-208 (172-176) across cheeks, 188-196 (164-168) across base; cheeks finely crenulate with 2-5 very minute setae. Eyes small with slight angular projection behind, 80-84 (64-68) long 56-60 (44-48) wide; all ocelli 20-24 wide, median ocelli overhanging between bases of antennae. Postoculars thin and pointed 96-104 (64-72) long. Antennal segments 3-6 subpedicellate, 4-6 symmetrical, segments 1-8 length (width).

	I	II	III	IV
Female:	52-56 (40-48);	52-60 (36);	64-72 (32-36);	52-60 (36-40)
Male:	40-44 (36-40);	44-48 (28-32);	52-56 (28-32);	48-52 (28-36)
	V	VI	VII	VIII
Female :	56-64 (32-36);	56-60 (28-36);	52-56 (24-28);	44-48 (12- 16)
Male :	52-56 (32-36);	48-56 (28-32);	40-48 (24-28);	36-40 (16)

Mouthcone short and broad, 104-112 (80-88) long, 120-128 (108- 116) wide at base and 104-112 (84-92) at apex; maxillary stylets retracted mesad, wide spart 'V' shaped.

Prothorax 208 (184-196) long, 240 (208-228) wide at anterior margin and 380 9328-340) at posterior margin. Prothoracic setae anteroangulars placed away from the lateral margin 56-60 (24-36), anteromarginals vestigial, midlaterals 80 (36-40), postangulars 100-120 (78- 84) and epimerals 88-100 (60-72) long respectively; epimeral suture complete. Forefemora 260-300 (228-240) long, 128 (108-116) wide; foretibiae with a tubercle at apex, foretarsi with a downwards curved daggerlike tooth 30-40 (32) long. Pterothorax 440-460 (380-400) long, 460-480 (400-420) wide across meso-and 420-440 (380-400) across metathorax. Forewings broad, uniformly wide, 884-918 (782-816) long and with 2-4 double fringes, basal wing setae B₁-B₃: 44-48 (44-48); 80-84 (52-60) and 80-88 (56-68) long respectively. Mesopraesternum incomplete, restricted to two very small sclerites.

Abdomen 432 (372-392) wide at base, 420-432 (350-360) at middle 320 (268-280) across segment VIII and 192-200 (168-180) across segment IX. Pelta roughly triangular with apex flat. B₂ of segment IX of male exceptionally stout, B₁-B₃ of segment IX : 184-200 (160-168); 168-180 (36-40) and 184-200 (168-180) long respectively. Tube 200-208 (164) long, anal setae 164-172 (140) long.

Total body length : 2.31-2.35 (1.99-2.04) mm.

Specimen studied : Songsak : Garo Hills : *Holotype*♀ (Z.S.I. Reg. No. 474/H12) allotype♀ (Z.S.I. Reg. No. 475/H12) paratype 12♀ ♀, 5♂♂ (Z.S.I. Reg. Nos. 476-492/H12) ex. leaf galls of wild plant, 22.9. 1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Garo Hills); Darjeeling Dt. (West Bengal); Uttarkashi (U.P.).

Remarks : Sen and Muraleedharan (1977) described this genus and species from Meghalaya and restricted to high altitudes.

Genus 25. *Stigmothrips* Ananthakrishnan

1964. *Stigmothrips* Ananthakrishnan, *Ent. Ts. Arg.*, **85** (3-4): 231.

1971. *Stigmothrips* : Ananthakrishnan, *J. Zool. Soc. India*, **23** (2) : 175-185.

39. *Stigmothrips okajimai* Muraleedharan and Sen

1981. *Stigmothrips okajimai* Muraleedharan & Sen, *Rec. zool. Surv. India*, **79** : 227-229.

1988. *Stigmothrips okajimai* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, **100** : 99-101.

Female : General body colour light brown with plenty of red pigmentation; head, thorax and tube darker; antennal segment 1,2,7 & 8 brown, 4 & 5 bicoloured pale in proximal third and rest brown, 6 pale yellow with faint brown shade in distal third; all femora golden yellow with brownish shade, fore-and hind tibiae yellow, midtibiae yellow with shaded brown, all tarsi whitish yellow; forewings faint grey with a median streak in basal half. All setae hyaline, knobbed to dilated at tip.

Head very little longer than broad, 168-176 long, 140-148 wide across eyes, 156-170 across cheeks, 152-160 across base, cheeks finely crenulate with 2.3 spines; surface reticulate; vertex subconical. Eyes 76-78 long, 48-50 wide, all ocelli 24-28 wide, very close to each other. Postoculars 36-38 long, dilated at tip. Antennal segments 3-6 subpedicellate; segments 3-8 length (width): I : 24-28 (32); II : 42(24-28); III : 56-58 (26-28) IV : 52-56 (24); V : 52-58 (20); VI 46-50 (20); VII : 40-42 (16); VIII : 28 (12); sense cones 24-28 long. Mouthcone very short and broad 54-60 long; 114-118 with at base, 64-88 at apex; maxillary stylets ocular, somewhat close and parallel sided.

Prothorax weakly sculptured, about half as long as head, 95-120 long, 172-176 wide at anterior margin, 202-206 at posterior margin. Prothoracic chaetotaxy : anteroangulars 38, anteromarginals 24-32, midlaterals 36-38, posteroangulars 38 and epimerals 46 long respectively; epimeral suture incomplete. Pterothorax 228-248 long, 240-256 wide across meso-and 258-260 across metathorax. Forewings narrow 600-610 long, 32-54 wide with 4-5 double fringes, basal wing setae B₁-B₃: 38; 38

& 62 long respectively; B₁-B₂ equal and dilated at tip, B₃ blunt. Mesopraesternum parallel sided, expanded laterally.

Abdomen 240-244 wide at base, 222-228 at middle, 164-172 across segment VIII, 114-116 across segment IX short: 54; 46 and 64-76 long respectively. Tube 100-104 long, anal setae 76-80. long.

Total body length : 1.56-1.65 mm.

Specimen studied : Songsok, Garo Hills : Paratypes 3♀ (Z.S.I. Reg. Nos. 248-250/H17) ex. Dry leaves, 19.9. 1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Garo Hills); Tripura; Manipur.

Remarks : Muraleedharan & Sen (1981) described this species from Tripura and Meghalaya.

Genus. 26. *Tylothrips* Hood

1932. *Tylothrips* Hood, *Revta Ent. Rio de J.*, 7 (4) : 494.

40. *Tylothrips indicus* Sen & Muraleedharan

1977. *Tylothrips indicus* Sen & Muraleedharan, *Entomon*, 1 (2) : 180-182.

1988. *Tylothrips indicus* : Sen et al, *Rec. zool. Surv. India Occl. Pap.*, 100 : 103-105.

Female (Male) : General body colour inclusive of antennae and legs bark brown with a blackish shade along the outer margin of antennae, cheeks and legs; forewings grey with a median streak. All setae dark brown, lighter at tip, long, stout and knobbed at tip.

Head a little produced in front of eyes, notched behind eyes, 248-280 (228) long, 172-180 (160) wide across eyes, 200 (168) across cheeks and 192-196 (152) across base; cheeks warty with 3 moderately strong spines, sides convex, converging at base, surface strongly reticulate. Eyes bulged 76-80 (80) long, 48-56 (44-48) wide; all ocelli 20-24 wide. Postoculars 1.5 times longer than eyes, 120-136 (104-112) long, stout, expanded at tip. Antennae very long 2.5 times longer than head, segments 3-6 subpedicellate, pedicel of 3 crenulate, 8 constricted at base; segments 1-8 length (width).

	I	II	III	IV
Female :	52-60 (44-48);	60-64 (32-36);	100-108 (32-36);	96-104 (36-40)
Male :	52 (40);	56 (32);	92 (28);	96 (28)
	V	VI	VII	VIII
Female :	88-96 (28-32);	64-76 (28-32);	84-92 (24-28);	76-84 (24- 28)
Male :	88 (28);	68 (24);	72 (24);	76 (24)

Mouthcone very short and broad, 80-92 (80) long, 120-132 (116) broad at base and 72-80 (80) at apex; maxillary stylets retracted mesad, wide apart.

Prothorax 140-180 (136) long, 234-240 (180) wide at anterior margin, 300-340 (260) at posterior margin. Prothoracic chaetotaxy; anteroangulars absent, anteromarginals very weak 16- 20, midlaterals 123-136 (112), posteroangulars 140-148 (104-112) and epimerals 140-156 (120-128) long respectively; all setae arise from cone like tuberculate projection, the cone of epimerals more prominent. Forefemora with minute tubercles foretibiae inner margin with 10-11 prominent teeth like tubercles bearing setae, foretarsi with an incurved tooth 20 (24) long. Pterothorax 460-529 (400) long, 420-500 (355) wide across meso- and 400-520 (360) across metathorax. Forewings 1.037-1.105 mm. (918) long, 88 (76) wide at base, 60 (56) at middle and 28-40 (48) at apex; double fringes absent basal wing setae B₁-B₃ long, stout and expanded at tip; 38-100 (80); 116-120 (72) and 96-100 (80) long respectively. Mesopraesternum very well developed with a median crest.

Abdomen 460-500 (364) wide at base, 440-580 (300) at middle, 288- 320 (216) across segment VIII and 180-196 (132) across segment IX. Pelta roughly triangular with apex flat. B₁-B₃ or segment IX knobbed; 160-168 (136-140); 160-176 (44-48) and 164-172 (160) long respectively. Tube 200 (160) long and anal setae 100-120 (100) long.

Total body length : 2.5-2.7 (1.94) mm.

Specimen studied : Mawphlang, Shillong : Holotype♀ (Z.S.I. Reg. No. 509/H12) allotype♂ (Z.S.I. Reg. No. 510/H12) paratypes 2♀ ♀(Z.S.I. Reg. Nos. 511-12/H12), 6.9.1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Sen & Muraleedharan (1977) recorded the genus *Tylothrips* first time from India and described the species *T. indicus* from Meghalaya.

Subfamily *Idolothripinae*

Genus 27. *Dinothrips* Bagnall

1908. *Dinothrips* Bagnall, *Trans. nat. Hist. Soc. Northumb.*, 3 : 190.

1983. *Dinothrips* : Mound & Palmer, *Bull. Br. Mus. nat. Hist. (Ent.)* 46 (1) : 64.

41. *Dinothrips sumatrensis* Bagnall

1908. *Dinothrips sumatrensis* Bagnall, *Trans. nat. Hist. Soc. Northumb.* 3 : 191.

1926. *Dinothrips sumatrensis* : Karny, *Mem. Dept. Agri. India Ent. ser.*, 9 (6) : 239.

1978. *Dinothrips sumatrensis* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, 37 (5) : 170-171.

1983. *Dinothrips sumatrensis* : Mound & Palmer, *Bull. Br. Mus. nat. Hist. (Ent.)*, 46 (1) : 64.

1988. *Dinothrips sumatrensis* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 109-110.

Diagnosis : Body dark brown including legs; antennal segments 1,2,4-8 brown, segment 3 yellow and brownish at extreme base and distally; wings weakly infumate with a median dark longitudinal band. All setae hyaline.

Head little produced; longer than broad. Cheek setae very long in oedymorous males. Eyes large, postoculars shorter than eyes. Forked process of mesothorax of oedymorous males long and absent in gynaecoid males. Forefemora stout, very much pronounced in oedymorous males; foretarsal tooth of oedymorous very strong. Forewings with double fringes and basal wing setae B₁ much shorter than B₂ and B₃. Tube longer than head.

Specimen studied : Shillong : 1♂ (Z.S.I. Reg. No. 563/H12), 6.9. 1975. coll. Dr. N. Muraleedharan. Songsak : 1♂ (Z.S.I. Reg. No. 532/H12), 21.9. 1975, coll. Dr. N. Muraleedharan. Dainadubi, Garo Hills : 10♀ ♀, 7♂♂ (Z.S.I. Reg. Nos. 441-457/H12), 10.9. 1975, coll. Dr. N. Muraleedharan.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills); Tamil Nadu; Karnataka; Kerala; Tripura; Assam; Arunachal Pradesh. Elsewhere : Sumatra; Sri Lanka; Bhutan; Malaya; Java; Borneo.

Remarks : Sen et al (1988) recorded this species from Meghalaya.

Genus 28. *Elaphrothrips* Buffa

1909. *Elaphrothrips* Buffa, *Redia*, 5 : 162-163.

1973. *Elaphrothrips* : Ananthakrishnan, *Pacific Insects*, 15 : 273.

1978. *Elaphrothrips* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, 37 (5) : 171-174.

Key to the species of *Elaphrothrips* from Meghalaya

1. Cephalic production pronounced, about 0.9-1.2 times as long as wide. Oedymorous males devoid of sickle like setae at the apex of forefemora. All tibiae basally more brownish and yellowish beyond middle. Antennal segment 3 yellowish with a tinge of brown at apex, 4 & 5 distinctly yellowish at basal half, rest brownish.....*denticollis* (Bagnall)
- Cephalic production much shorter, distinctly wider than long, at most 0.5 times as long as wide..... 2
2. Foretarsi of females unarmed; fore-, mid- and hind tibiae basally more brownish and rest yellowish. Prothoracic anteromarginals shorter than anteroangulars; midlaterals, epimerals and postangulars almost subequal.....*curvipes* Preiesner
- Foretarsi of females with a stump like to a well developed tooth; all tibiae uniformly brownish..... 3
3. Body setae hyaline; forewings with 42-55 double fringes.....*spiniceps* Bagnall
- Body setae brownish. Forewings with 25-29 double fringes.....*procer* Schmutz.

42. *Elaphrothrips curvipes* Priesner

1929. *Elaphrothrips curvipes* Priesner, *Trenbia*, 11 : 206
 1973. *Elaphrothrips secus* Ananthakrishnan, *Pacific Insects*, 15 (2) : 278.
 1983. *Elaphrothrips curvipes* : Mound & Plamer, *Bull. Br. Mus. nat. Hist. (Ent.)*, 46 (1) : 66.
 1988. *Elaphrothrips curvipes* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 111-112.

Specimen studied : Shillong : 1♀ (Z.S.I. Reg. Nos. 562/H12), 6.9. 1975, coll. Dr. N. Muraleedharan. William Nagar 3♀ ♀(Z.S.I. Reg. Nos. 4758-59/H17; 4888/H17), 11.3. 1991, 12.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (East Khasi Hills; East Garo Hills), Darjeeling Dt. (West Bengal); Manipur. Elsewhere : Bhutan; Laos; Thailand; Malaya; Sumatra; Mentawel Is.; Java.

Remarks : Sen et al (1988) Recorded this species from Meghalaya.

43. *Elaphrothrips denticollis* (Bagnall)

1909. *Dicaiothrips denticollis* Bagnall, *Trans. nat. Hist. Soc. Northumb*, 3 : 527.
 1934. *Elaphrothrips beesoni* Remakrishna, *Indian For. Rec.*, 20 (4) : 7.
 1935. *Elaphrothrips productus* Priesner, *Konowia*, 14 : 170.
 1978. *Elaphrothrips denticollis* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, 37 (5) : 179-180.
 1988. *Elaphrothrips denticollis* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.*, 100 : 113.

Specimen studied : Dainadubi, Garo Hills: 11♀ ♀, 4♂♂ (Z.S.I. Reg. Nos. 414-422/H12, 556-561/H12), 12.9.1975, coll. Dr. N. Muraleedharan. Songsak : 1♀ (Z.S.I. Reg. No. 533/H12), 21.9. 1975, coll. Dr. N. Muraleedharan. Wari, West Garo Hills : 1♂ (Z.S.I. Reg. No. 4531/H17), 10.10. 1988, coll. K. K. Ray. Dalu, West Garo Hills : 1♀ , 3♂♂ (Z.S.I. Reg. Nos. 4587-90/H17), 18.10. 1988, coll. K. K. Ray. Bhatbari, West Garo Hills : 1♀ , 2♂♂ (Z.S.I. Reg. Nos. 4571-73/H17), 26.10.1988, coll. K. K. Ray. William Nagar : 2♂♂ (Z.S.I. Reg. Nos. 4730-31/H17), 9.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Garo Hills; West Garo Hills) Kerala; Tamil Nadu; Karnataka; Tripura; Assam; Sikkim. Elsewhere : Sri Lanka; Burma; Malaya; Java; Nias; Borneo.

Remarks : Sen et al (1988) recorded this species from Meghalaya.

44. *Elaphrothrips procer* (Schmutz)

1913. *Dicaiothrips procer* Schmutz, *Sitz. Akad. Wiss. Wien*, 122 : 1063.
 1954. *Elaphrothrips eranthemi* Seshadri & Ananthakrishnan, *Indian J. Ent.*, 14 (3) : 224.
 1968. *Elaphrothrips procer* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, *Suppl.*, 11 : 98.
 1973. *Elaphrothrips procer* : Ananthakrishnan, *Pacific Insects*, 15 (2) : 181.
 1978. *Elaphrothrips procer* : Palmer & Mound, *Bull. Br. Mus. nat. Hist. (Ent.)*, 37 (5) : 183.

Specimen studied : Bokongiri, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4674/H17), 23.10. 1988, coll. K. K. Ray. William Nagar : 1♀, 2♂♂ (Z.S.I. Reg. No. 4755-57/H17). 11.3.1991, 12.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills: East Garo Hills) Kerala; Karnataka; Tamil Nadu; Maharashtra; Manipur; Sikkim; West Bengal. Elsewhere : Sri Lanka; Laos.

Remarks : This species is recorded for the first time from Meghalaya.

45. *Elaphrothrips spiniceps* Bagnall

1932. *Elaphrothrips spiniceps* Bagnall, *Ann. Mag. nat. Hist.*, (10) 10 : 514

1934. *Elaphrothrips graveleyi* Bagnall, *Ann. Mag. nat. Hist.*, (10) 13 : 628.

1978. *Elaphrothrips spiniceps* : Palmer & Mound, *Bull. Br. Mus. nat. Hist (Ent.)* 37 (5) : 184.

1988. *Elaphrothrips spiniceps* : Sen et al, *Rec. zool. Surv. India, Occl. Pap.* 100 : 114-115.

Specimen studied : William Nagar : 1♀ (Z.S.I. Reg. No. 4889/H17), 9.3.1991, coll. S. Sen.

Distribution : India : Meghalaya (East Garo Hills) Gangtok (Sikkim); Kurseong, Darjeeling Dt. (West Bengal); Kathgodam (U.P.). Elsewhere : Nepal; Burma; Taiwan; Java.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 29. *Neosmerinthothrips* Schmutz

1913. *Neosmerinthothrips* Schmutz, *Sitz. akad. Wiss. wien*, 122 : 1051.

46. *Neosmerinthothrips fructuum* Schmutz

1913. *Neosmerinthothrips fructuum* schmutz, *Sitz. Akad. Wiss. Wien*, 122 : 1052-1053.

1935. *Nesothrips formosensis karnyi* Priesner, *Philipp. J. Sci.*, 57 (3) : 370.

1964. *Nesothrips formosensis karnyi* : Ananthakrishnan, *Oppusc. ent. Suppl.*, 25 : 102.

1974. *Neosmerinthothrips fructuum* : Mound, *Bull. Br. Mus. nat. Hist. (Ent.)* 31 (5) : 152-153.

Specimen studied : Janjal, West Garo Hills: 2♀ ♀(Z.S.I. Reg. Nos. 4594/H17; 4686/H17), 8.10. 1988, coll. K. K. Ray. Adogiri, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4596/H17), 6.10. 1988, coll. K. K. Ray Wari, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4597/H17), 10.10. 1988, coll. K. K. Ray: Ashangiri, West Garo Hills: 3♀ ♀, 1♂ (Z.S.I. Reg. No. 4595/H17; 4598/H17; 4640/H17; 4656/H17), 7.10. 1988, coll. K. K. Ray. Bokongiri, West Garo Hills: 1♀ (Z.S.I. Reg. No. 4660/H17). 23.10.1988, coll. K. K. Ray. William Nagar : 1♀ (Z.S.I. Reg. No. 4926/H17). 10.3. 1991, coll. S. Sen.

Distribution : India : Meghalaya (West Garo Hills; East Garo Hills) Andhra Pradesh; Kerala; Karnataka; Tamil Nadu; M.P.; West Bengal. Elsewhere : Sri Lanka.

Remarks : This species is recorded for the first time from Meghalaya.

Genus 30. *Nesothrips* Kirkaldy

1907. *Nesothrips* Kirkaldy, *Proc. Hawaii ent. Soc.*, 1 : 103.

1913. *Rhaebbothrips* Karny, *H. santer's Formosa Ausbente Suppl. Ent.*, 2 : 128.

1983. *Nesothrips* : Mound & Palmer, *Bull. Br. Mus. nat. Hist. (Ent.)* 46 (1) : 47.

47. *Nesothrips lativentris* (Karny)

1913. *Rhaebbothrips lativentris* Karny, *H. Santer's Formosa Ausbente Suppl. Ent.*, 2 : 129-130.

1973. *Rhaebbothrips lativentris* : Ananthakrishnan, *Occl. Publ. 2, Ent. Res. Unit. Loyola College, Madras*: 127-128.

1983. *Nesothrips lativentris* : Mound & Palmer, *Bull. Br. nat. Hist. (Ent.)*, 46 (1) : 48.

Diagnosis : Body dark brown; antennal segments 1-2 & 6-8 brown, 3-5 yellowish brown; foretibiae light brown all femora and tibiae lighter at tip; wings infumate with a longitudinal brown streak; all body setae yellowish brown and slightly blunt at apex.

Head longer, about 1.5 times as long as wide, cheeks almost parallel sided. Median ocellus directed forward. Mouthcone short and broad, maxillary stylets 'V' like retracted slightly behind postoculars.

Prothorax much shorter than head, all prothoracic setae except anteromarginals well developed. Epimeral suture complete. Forefemora of male incrassate, strongly angulate inwards along inner margin at base, in oedymorous male, foretarsi of male armed. Wings broad, parallel sided with double fringes. Pelta hat shaped.

Specimen studied : Barengapara, West Garo Hills : 1 ♀, 3 ♂♂ (Z.S.I. Reg. Nos. 4553-4556/H17), 17.10.1988, coll. K.K. Ray, Bagmara, West Garo Hills, 2 ♀♀ (Z.S.I. Reg. No. 4557/H17); 16.10.1988, coll. K.K. Ray. Hollaidanga, West Garo Hills : 1 ♀ (Z.S.I. Reg. No. 4600/H17), 25.10.1988, coll. K.K. Ray. Bamandanga, West Garo Hills : 2 ♀♀ (Z.S.I. Reg. Nos. 4661/H17; 4667/H17), 27.10.1988, coll. K.K. Ray. Bokongiri, West Garo Hills : 7 ♀♀, 1 ♂ (Z.S.I. Reg. Nos. 4662-66/H17; 4702-04/H17), 23.10.1988, coll. K.K. Ray. Janjal, West Garo Hills : 2 ♀♀, 1 ♂ (Z.S.I. Reg. Nos. 4699-701/H17), 8.10.1988, coll. K.K. Ray. William Nagar : 1 ♀ (Z.S.I. Reg. No. 4890/H17), 9.3.1991, coll. S. Sen.

Distribution : India : Meghalaya, West Garo Hills; East Garo Hills; West Bengal; Tripura; Arunachal Pradesh. Elsewhere : Mauritius; Philippines; Japan; Guam; Queensland; Hawaii; Jamaica; Virgin Is.

Remarks : This species is recorded for the first time from Meghalaya.

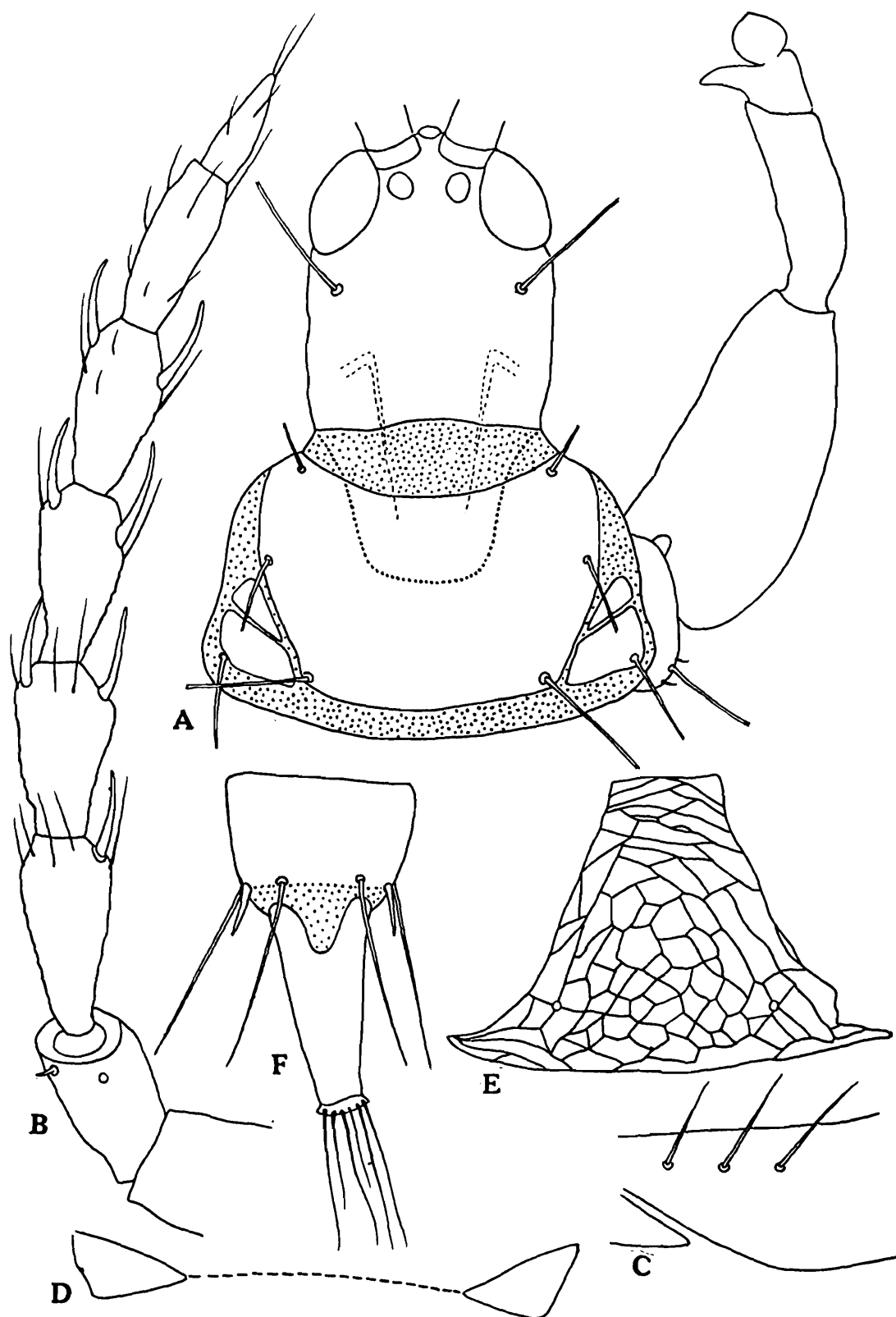


Fig. 1. *Pegoythrips meghalaya* Sen & Muraleedharan
A. Head and Prothorax. **B.** Antennae. **C.** Basal Wing setae. **D.** Mesorasternum
E. Pelta. **F.** Segment IX of abdomen and tube of male.

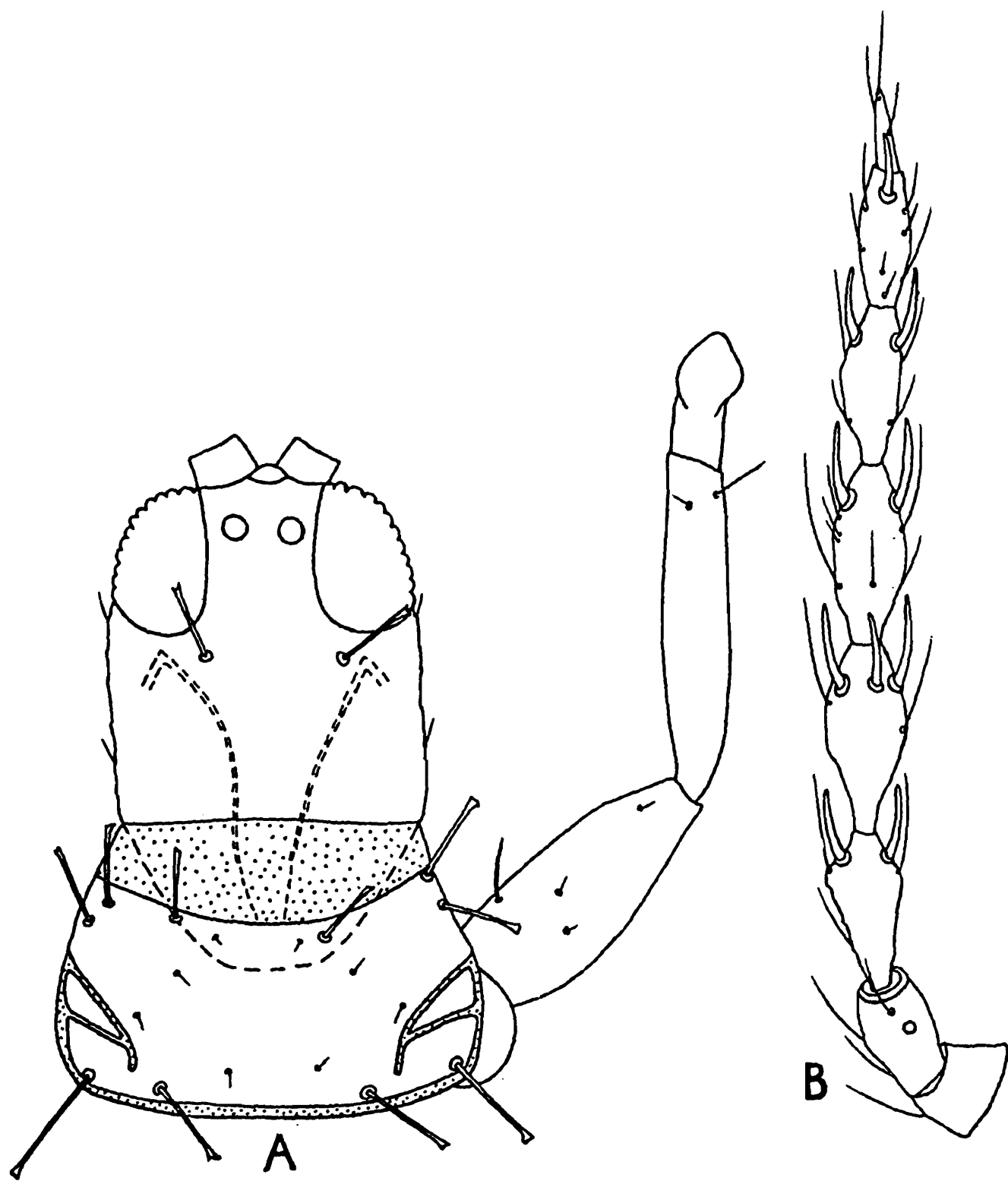


Fig. 2. *Stigmothrips okajimai* Muraleedharan & Sen
A. Head and Prothorax. B. Antennae.

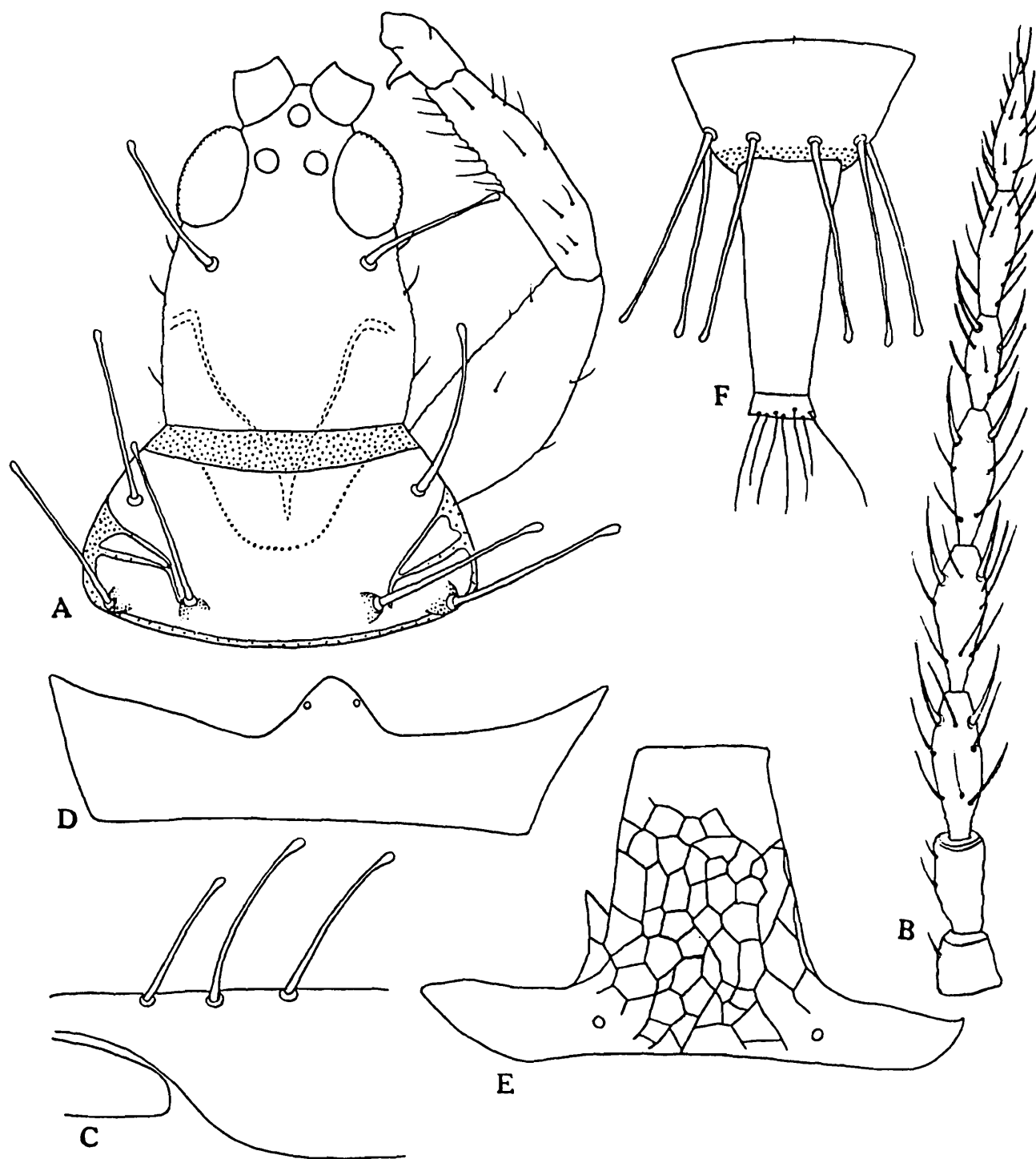
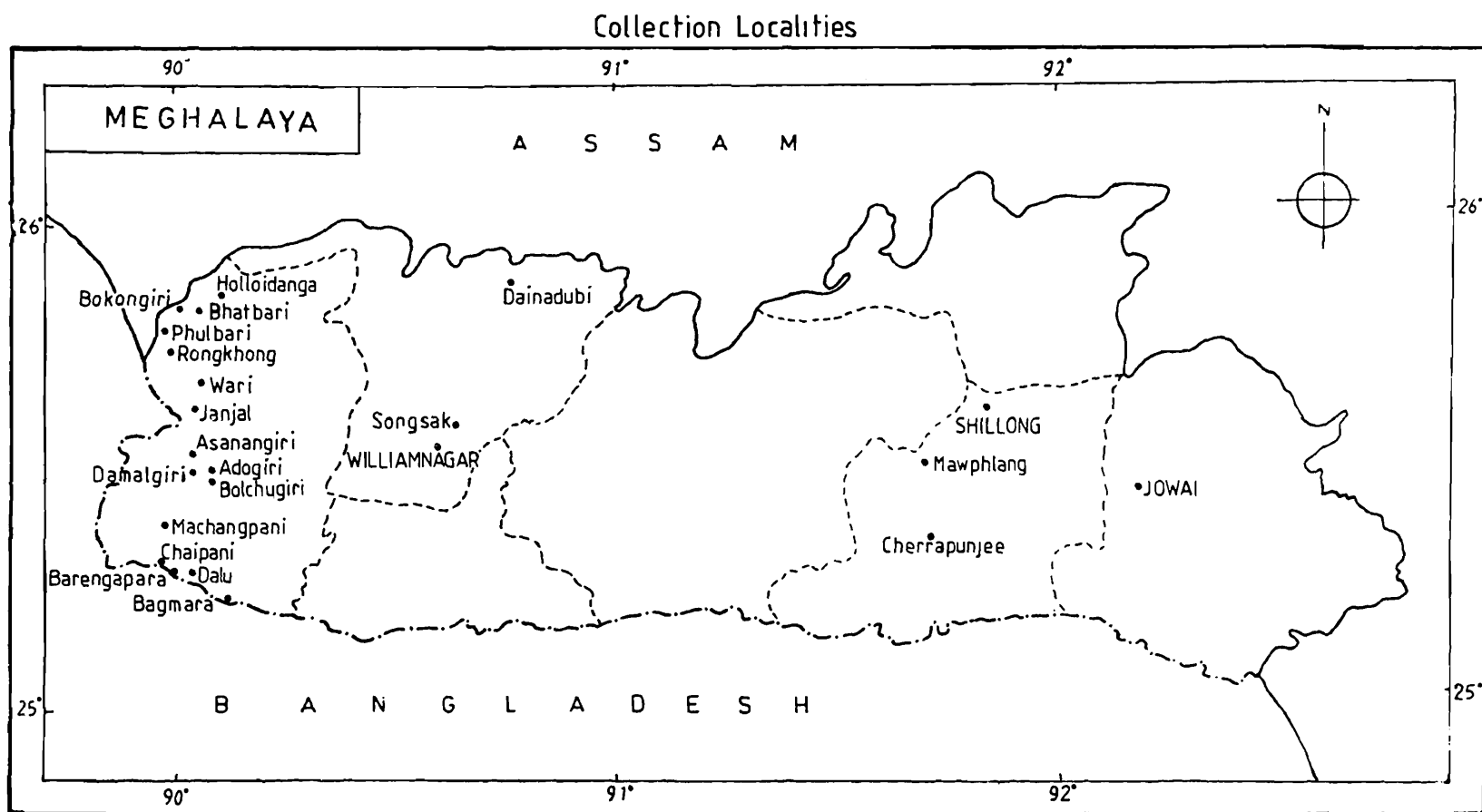
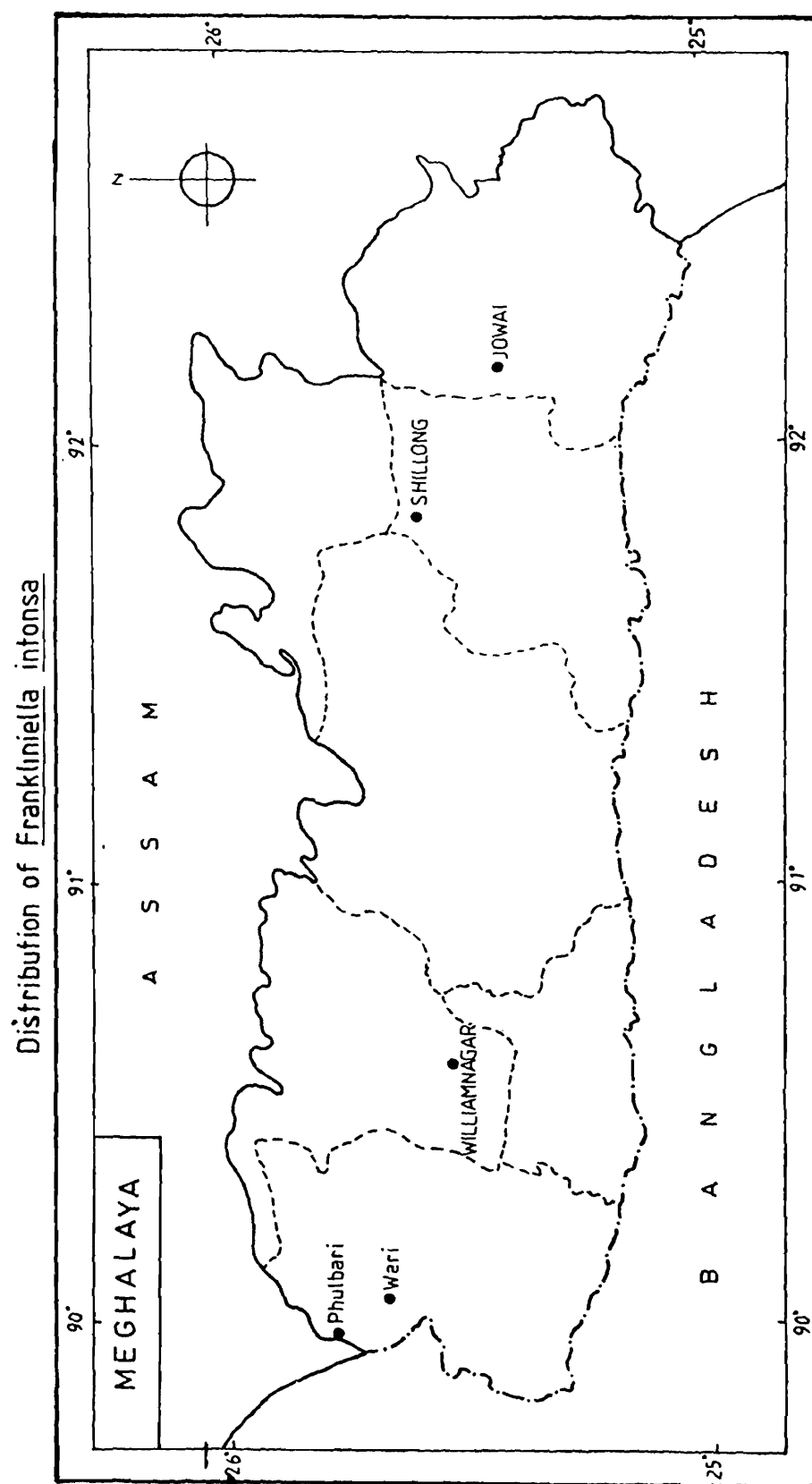


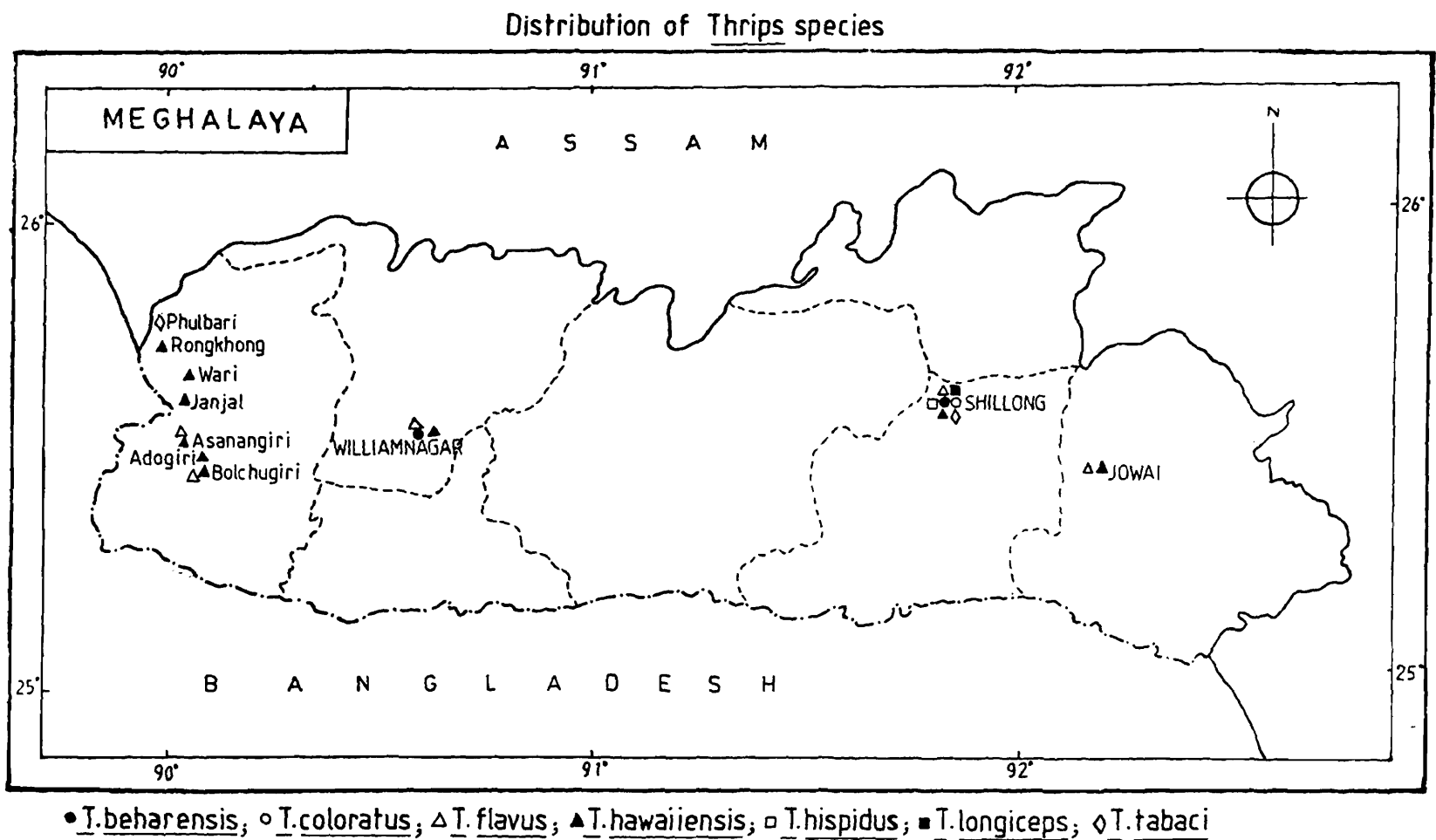
Fig. 3. *Tylothrips indicus* Sen & Muraleedharan
 A. Head & Prothorax. B. Antennae. C. Basal wing setae. D. Esopraesternum.
 E. Pelta. F. Segment IX of abdomen and tube.



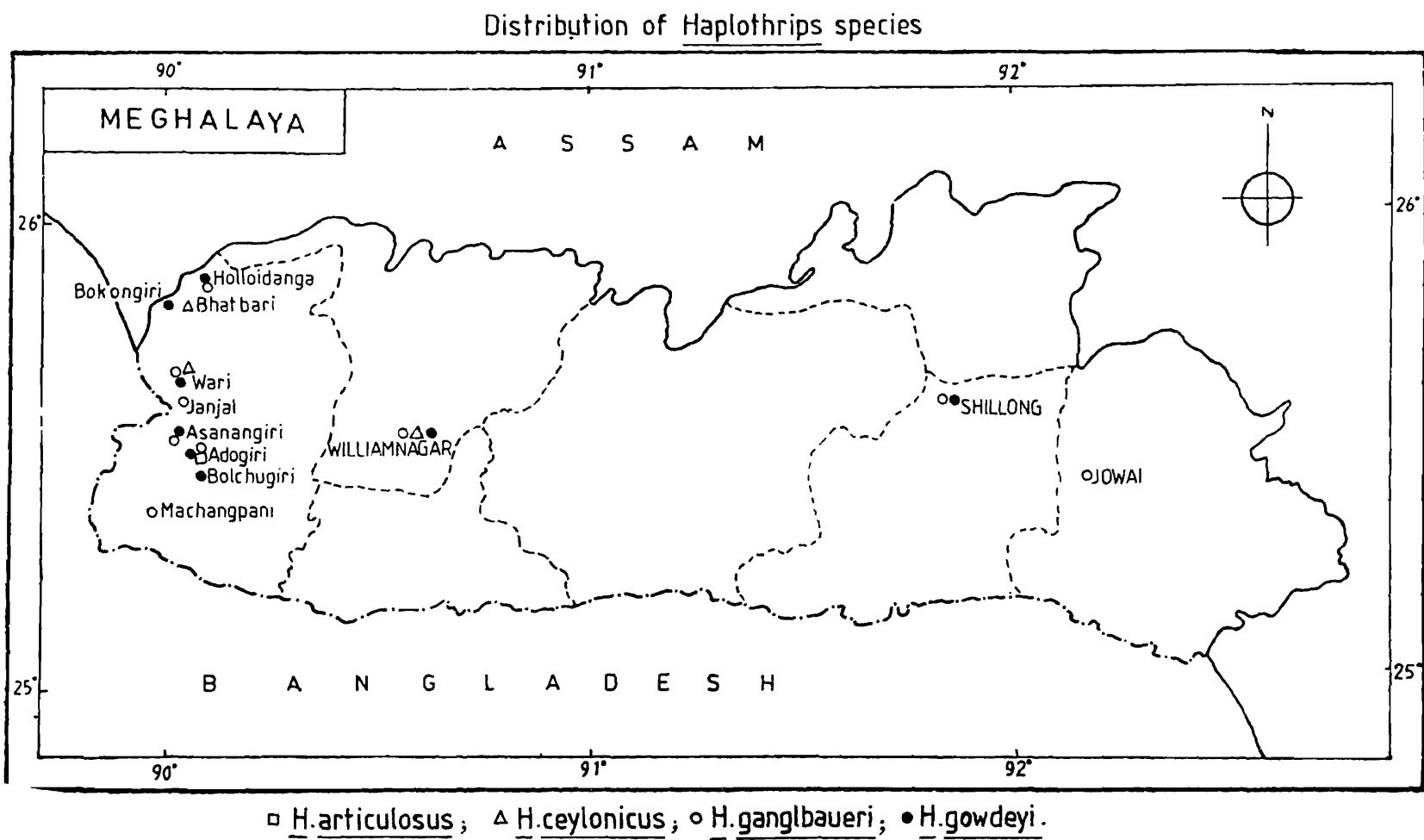
Map-1. Collection Localities

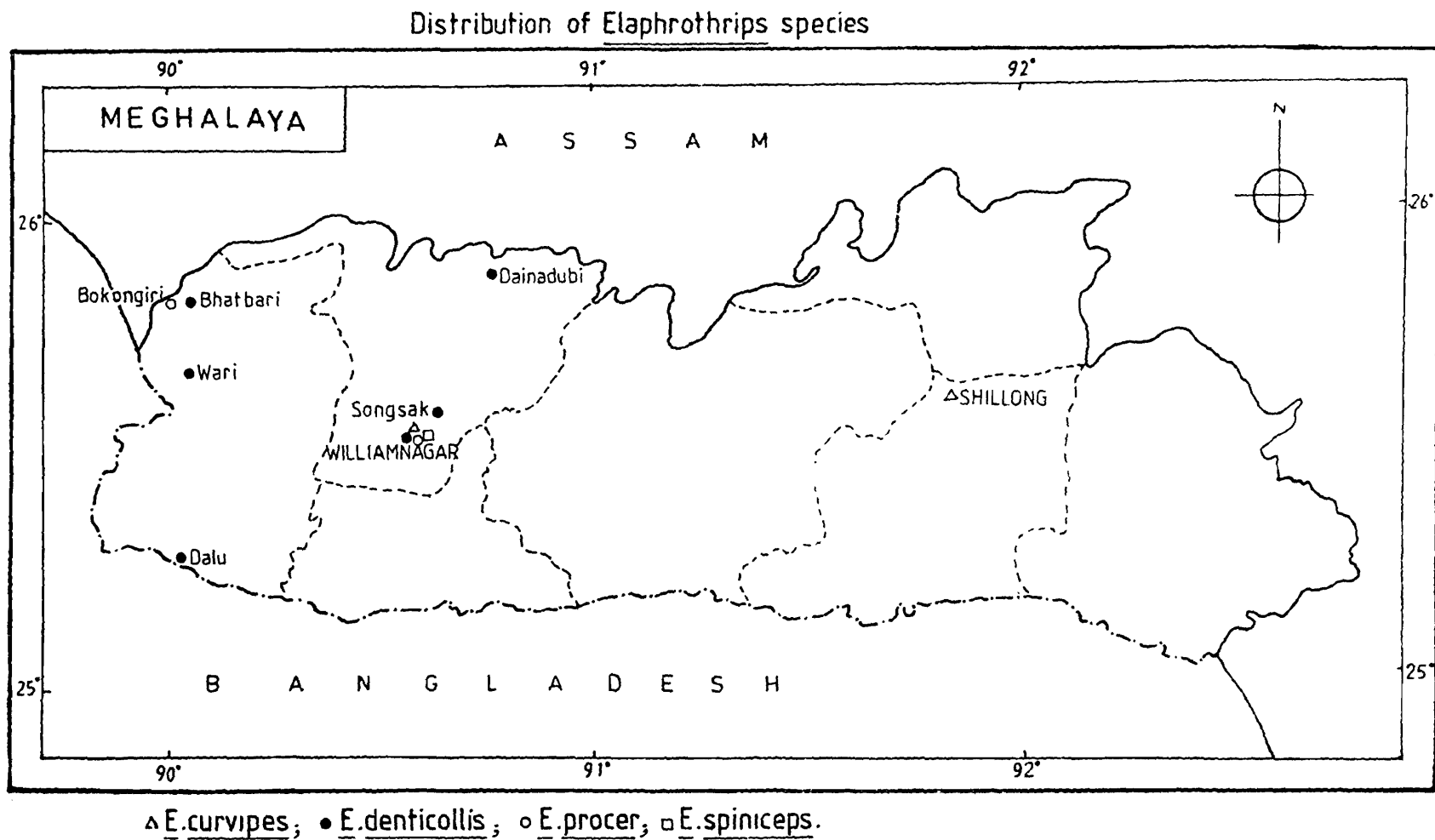


Map-2. Distribution of *Frankliniella intonsa* in Meghalaya.



Map-3. Distribution of *Thrips* species in Meghalaya

Map-4. Distribution of *Haplothrips* species in Meghalaya



Map-5. Distribution of *Elaphrothrips* species in Meghalaya

List Of Species With District-wise Distribution

Sl. No.	Name of the species	1	2	3	4	5	6	7
1.	<i>Anaphothrips sudanensis</i>		+				+	
2.	<i>Dichromothrips nakahari</i>						+	
3.	<i>Frankliniella intonseae</i>	+	+				+	+
4.	<i>Megalurothrips distalis</i>	+					+	
5.	<i>Megalurothrips peculiaris</i>						+	
6.	<i>Microcephalothrips abdominalis</i>	+	+					
7.	<i>Scirtothrips dorsalis</i>	+	+				+	+
8.	<i>Stenchaetothrips bicolor</i>	+						
9.	<i>Stenchaetothrips biformis</i>						+	
10.	<i>Taeniothrips major</i>						+	
11.	<i>Thrips beharensis</i>		+				+	
12.	<i>Thrips coloratus</i>						+	
13.	<i>Thrips flavus</i>	+	+				+	+
14.	<i>Thrips hawaiiensis</i>	+	+				+	+
15.	<i>Thrips hispidus</i>						+	
16.	<i>Thrips longiceps</i>						+	
17.	<i>Thrips tabaci</i>	+					+	
18.	<i>Asthrothrips parvilimbus</i>	+						
19.	<i>Helionothrips kadaliphilus</i>						+	
20.	<i>Heliothrips haemorrhoidalis</i>		+				+	
21.	<i>Selenothrips rubrocinctus</i>	+						
22.	<i>Apelaunothrips bhowalii</i>		+				+	
23.	<i>Dolichothrips citripes</i>	+						
24.	<i>Ecacanthothrips tibialis</i>		+				+	

Sl.No.	Name of the species	1	2	3	4	5	6	7
25.	<i>Haplothrips articulatus</i>	+						
26.	<i>Haplothrips ceylonicus</i>	+	+					
27.	<i>Haplothrips ganglbaueri</i>	+	+				+	+
28.	<i>Haplothrips gowdeyi</i>	+	+				+	
29.	<i>Hoplandrothrips flavipes</i>		+				+	
30.	<i>Karnyothrips flavipes</i>	+						
31.	<i>Karnyothrips fungulus</i>	+						
32.	<i>Karnyothrips melaleucus</i>						+	
33.	<i>Leeuwenia karnyana</i>						+	
34.	<i>Liothrips himalayanus</i>		+					
35.	<i>Liothrips spectabilis</i>		+					
36.	<i>Membrothrips indicus</i>	+						
37.	<i>Mesothrips extensus</i>		+					
38.	<i>Pegothrips meghalaya</i>		+					
39.	<i>Stigmothrips okajimai</i>		+					
40.	<i>Tylothrips indicus</i>						+	
41.	<i>Dinothrips sumatrensis</i>		+				+	
42.	<i>Elaphrothrips curvipes</i>		+				+	
43.	<i>Elaphrothrips denticollis</i>	+	+					
44.	<i>Elaphrothrips procer</i>	+	+					
45.	<i>Elaphrothrips spiniceps</i>		+					
46.	<i>Neosmerinthothrips frunctuum</i>	+	+					
47.	<i>Nesothrips lativentris.</i>	+	+					

SUMMARY

The monograph deals with the Thysanoptera Fauna of Meghalaya. Altogether 47 species pertaining to 30 genera under 2 families have been recorded. Before undertaking the work only 8 species were known (Varshney, 1970) and subsequently Sen & Muraleedharan (1977). Muraleedharan & Sen (1981), Sen et al (1988) added 9 species including 1 new genus, 3 new species and 1 genus new record from India. As a result of present study another 30 species have been recorded from the State. Key to the suborders, families, genera and species; description of species described from the area and short diagnostic characters in case of single species represent a genus have been provided.

ACKNOWLEDGEMENTS

We are grateful to Director, Zoological Survey of India for providing necessary facilities to carry out this work. We also record our gratitude to Dr. S.K. Bhattacharyya, Scientist-SG; Dr. T. Sen Gupta, Scientist-SE; Dr. K. Rai, Scientist SE and Dr. B. C. Das, Scientist-SD for their manifold help.

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INSECTA : NEUROPTERA

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INTRODUCTION

The order Neuroptera erected by Linnaeus (1758) are valuable allies of man. A large number of species belonging to families of Hemerobiidae, Chrysopidae and Coniopterygiidae are known to be predacious on the Agri-horticultural pests like aphids, coccids, thrips, mites, small moths etc. Therefore, these insects take active part in biological control measures. They are generally found in herbages, bushes, trees, different types of vegetations including crops in the Himalayan, Desert, terrestrial and insular ecosystems of India.

Amongst a total of about 5000 species reported from the whole world and about 315 species in 13 families hitherto recorded from India, altogether 45 species in 9 families, 13 subfamilies and 35 genera are dealt with. Of these 45 species, two genera and two species are for the first time recorded from India, one species has been newly combined, a species has been redescribed and 21 species constitute new locality records for Meghalaya (marked*). The literature review of 11 species (marked**) has been incorporated in the paper as the material are not available for study.

Some of the noted contributions of the Scientists may be referred to the taxonomic studies of Indian Neuroptera. In the later part of eighteenth century and early part of this century, Walker (1853), MacLachlan (1869-1870, 1873), Weele (1907, 1908 & 1910), Needham (1909), Navas (1905, 1910, 1912-1914, 1923-1924, 1929-1931), Banks (1911, 1913-1914, 1939), Fraser (1922), Withycombe (1925) made valuable contributions on Indian Neuroptera. In the later part of this century, Kimmins (1940, 1942-1943, 1949), Nakahara (1955, 1971), Meinander (1972) and Ghosh (1980-1981, 1983-1985, 1987-1988) also contributed to the study of Indian Neuroptera. Very few papers have hitherto been published on the fauna of Meghalaya. However, the works of Weele (1908, 1910), Needham (1909), Kimmins (1940, 1942, 1943), Nakahara (1971) and Ghosh (1981) may be referred to.

In the paper, a brief account of collections and preservation, general morphology, list of taxa along with the keys of the material examined, generic and species references have been incorporated. Besides, the distribution of each species including those reviewed from literature in India and other Zoo- geographical regions of the world alongwith new records and remarks, wherever applicable, have been included. Over and above, a summary and literature references have also been provided at the end.

COLLECTION AND PRESERVATION

The adults may be collected in day time by sweeping the herbage or vegetation infested with aphids, coccids, thrips etc. By beating the bushes, shrubs or branches over a white sheet of paper, cloth or umbrella, a good number of specimens may be collected. The specimens available either by beating

or sweeping may be picked up individually either with forceps or with the help of a brush moistened with alcohol. Aerial netting for the insects on flight during day time and use of light trap at night are essential for the collection. The larvae may be collected by aquatic net while the terrestrial ones under bark, in vegetation or below sand and dust are collected by hand-picking or with forceps.

The adults may be killed in vapour of cyanides, ethyl acetate or benzene and preserved dry in set and pinned condition. 80% ethyl alcohol is used for small and soft bodied insects. Larvae can be killed in 80% ethyl alcohol.

GENERAL MORPHOLOGY

Head : ~~Hypognathus~~; mouth parts : biting type with well developed labium, chitinous mandibles, a pair of maxillae with 5-segmented palpi and a labium with 3-segmented palpi; antenna: variable, elongate or short, filiform, moniliform, pectinate, clavate or capitate; compound eyes: large and widely separated; ocelli: 3, when present; wings: two pairs, held roof-like or flat over body at rest, transparent or cloudy or covered with fine powdery wax, normally similar in size and form; venation: variable with a network of veins; branches of veins rarely bifurcate at margin of wings (Megaloptera) and usually bifurcate at margin (Planipennia), generally with complete series of costal veinlets, radial sector with closely parallel branches; with many longitudinal veins and irregular crossveins, with or without pterostigma; leg: thin or robust with coxa, trochanter, femur, tibia and tarsal segments; abdomen : 10-segmented with 8 pairs of abdominal spiracles; male genitalia: with a gonarcus and female with a pair of gonapophysis lateralis. [For illustrations, *vide* Ghosh (1984)].

LIST OF TAXA

Suborder	(A)	Megaloptera
Family	(a)	Corydalidae
Subfamily	I.	Chauliodinae
Genus	I.	<i>Neochauliodes</i>
	1.	<i>N. simplex</i> (Walker)
	2.	<i>N. indicus</i> (Weele)
	**3.	<i>N. khasianus</i> (Weele)
Subfamily	II.	Neurominae
Genus	2.	<i>Protohermes</i> Weele
	4.	<i>P. albipennis</i> Walker
Genus	3.	<i>Neoneuromus</i> Weele
	5.	<i>N. latratus</i> (MacLachlan)
	5a.	<i>N. l. latratus</i> (MacLachlan)
Genus	4.	<i>Neuromus</i> Ramour

6. *N. decemmaculatus* (Walker)
7. *N. maculipennis* (Gray)
- Genus 5. *Hermes* Gray
- **8. *H. costostriata* Weele
- **9. *H. selysi* Weele
- Genus 6. *Acanthacorydalis* Weele
- **10. *A. horrenda* Navas
- Family (b) Inocellidae
- Genus 7. *Inocellia* Schneider
- *11. *I. crassicornis* (Schummel)
- Suborder (B) Planipennia
- Family (c) Coniopterygidae
- Subfamily III. Coniopteryginae
- Genus 8. *Coniopteryx* Curtis
- *12. *C. (Coniopteryx) ambigua* Withycombe
13. *C (C) .exigua* Withycombe
- Genus 9. *Conwentzia* Enderlein
- *14. *C. inverta* Withycombe
- Subfamily IV. Aleuropteryginae
- Genus 10. *Heteroconis* Enderlein
- *15. *H. terminalis* (Banks)
- Genus 11. *Coniocompsa* Enderlein
- *16. *C. indica* Withycombe
- Family (d) Mantispidae
- Subfamily V. Mantispinae
- Genus 12. *Mantispa* Illiger

- *17. *M. nodosa* Westwood
- *18. *M. indica* Westwood
- Family (e) Osmylidae
- Subfamily VI. Osmylinae
- Genus 13. *Hyposmylus* MacLachlan
19. *H. punctipennis* (Walker)
- Subfamily VIa. Spilosmylinae
- Genus 14. *Thyridosmylus* Krüger
- **20. *T. pastulatus* Kimmins
21. *T. langii* (MacLachlan)
- **21a. *T. l. angustus* Kimmins
- Family (f) Hemerobiidae
- Subfamily VII. Hemerobiinae
- Genus 15. *Hemerobius* Linnaeus
- *22. *Hemerobius* sp.
- Genus 16. *Drepanacrella* Kimmins
- **23. *D. khasiana* Kimmins
- Genus 17. *Neuronema* MacLachlan
- **24. *N. assamensis* Kimmins
- Subfamily VIII. Microminae
- Genus 18. *Micromus* Rambur
25. *M. kapuri* (Nakahara)
- *26. *Micromus* sp.
- Family (g) Chrysopidae
- Subfamily IX. Chrysopinae
- Genus 19. *Ankylopteryx* Brauer

- *27. *A. octopunctata* (Fabricius)
- Genus 20. *Semachrysa* Brooks
- *28. *Semachrysa* sp.
- Genus 21. *Italochrysa* Principi
- *29. *I. robusta* (Nedham)
- *30. *I. flavobrunnea* Ghosh
- Genus 22. *Chrysopa* Leach
- *31. *C. hasegawai* Nakahara
- Genus 23. *Mallada* Navas
- *32. *M. alcestes* (Banks) comb. nov.
- Subfamily X. Nothochrysinæ
- Genus 24. *Nothochrysa* MacLachlan
- **33. *N. lefroii* Needham
- Family (h) Myrmeleontidae
- Subfamily XI. Myrmeleontinae
- Genus 25. *Distoleon* Banks
- *34. *D. audax* (Walker)
- Genus 26. *Hagenomyia* Banks
35. *Hagenomyia* sp.
- Genus 27. *Myrmeleon* Linnaeus
- *36. *Myrmeleon* sp.
- Genus 28. *Stiphronneura* Gerstaecker
- *37. *S. inclusa* (Walker)
- Family (i) Ascalaphidae
- Subfamily XII. Hoplogleniinae
- Genus 29. *Idricerus* MacLachlan

38. *I. decrepitus* Walker
- Genus 30. *Protidricerus* Weele
- **39. *P. elwesi* (MacLachlan)
- Subfamily XIII. Ascalaphinae
- Genus 31. *Suphalomitus* Weele
40. *S. verbosus* (Walker)
- Genus 32. *Ascalaphus* Fabricius
- *41. *A. prothoracicus* (Kimmins)
- *42. *A. dicax* Walker
- Genus 33. *Acheron* Lefebvre
43. *A. trux* (Walker)
- Genus 34. *Hybris* Lefebvre
44. *H. angulata* (Westwood)
- Genus 35. *Agrionosoma* Weele
- **45. *A. swinhoei* Weele

SYSTEMATIC ACCOUNT

Key to suborders of Order Neuroptera

- Branches of veins rarely bifurcated at margin of wings; Rs with a few additional branches
Megalopectera
- Branches of veins usually bifurcated at margin of wings; Rs generally with numerous branches.
Planipennia

Key to families of suborder Megalopectera

Prothorax not greatly elongated; Sc long, fused distally with R₁..... Corydalidae

Prothorax forming an elongated neck; Sc shorter, not fused with R₁..... Inocellidae

Family CORYDALIDAE

Key to subfamilies of the family Corydalidae

- Head triangular; antenna moniliform, serrate or pectinate in male and moniliform, subserrate or rarely pectinate in female; wings normally with not more than 3-crossveins between R and Rs; male with a single pair of appendages . Chauliodinae
- Head nearly quadrangular; Antenna moniliform or filiform in both sexes, never pectinate; wings with more than 3- crossveins between R and Rs; male with two pairs of appendages .. Neurominae

Subfamily I Chauliodinae

Genus 1. *Neochondiodes* Weele

1909. *Neochondiodes* Weele, *Notes Leyden Mus.*, 30 : 259.

1910. *Neochondiodes*, Weele, *Coll. Zool. Edm. Selys Longc* ; 5 (1) : 60.

Diagnostic characters : Antenna : pectinate in male, subserrate in female; wings: rather broad and short, with rounded or curved tips; wing pattern varying from simple round spots to oblique bands, combined with dark, distinct points; male genitalia : with short, truncated appendices superiores, each with a tuberculum laterally at base; penis simple and acute at tip.

Key to species of genus *Neochondiodes*

- Both wings with a small spot on either side of pterostigma; costal area with indistinct spots; subcostal area immaculate; apical area without white spot; penis long and slender throughout with borders narrowly raised; appendix superiores usually truncate .*simplex*
- Both wings with an elongate spot on either side of pterostigma; forewing having costal area with distinct vinaceous and round spots in basal two-thirds; subcostal area maculate and apical area with prominent white spots; hindwing without such markings; penis broad and stout at base, with borders thickly raised; appendix superiores strongly quadrate. .*indicus*

1. *Neochondiodes simplex* (Walker)

1853. *Chauliodes simplex* Walker, *Cat. Brit. Mus. Neur.*, 2 : 200.

1910. *Neochondiodes simplex*, Weele, *Coll. Zool. Edm. Selys longc.*, 5 (1) : 61.

1981. *Neochondiodes simplex*, Ghosh, *Bull. zool. Surv. India*, 4 (2) 201.

Diagnostic characters : Vide Key.

Material examined : 5 exs. (♂♀) : India, Meghalaya, Shillong, Ward lake, 12. v. 1959 (Coll. nil); Mauglong, 20. v. 1971 (Coll. R.S. Pillai); Risa Colony, 16. viii. 1973 & 14. vii. 1981 (Coll. J. K. Prasad); Motinagar, Fruit Garden, 17. vii. 1982 (Coll. M.S. Jyrwa).

Distribution : India : Meghalaya. Elsewhere : Bangladesh.

2. *Neochauliodes indicus* (Weele)

1907. *Chauliodes indicus* Weele, *Notes Leyden Mus.*, **28** : 255.
 1910. *Neochauliodes indicus*, Weele, *Coll. Zool. Edm. Selys Longc.* **5** (1) : 62.
 1981. *Neochauliodes indicus* Ghosh, *Bull. zool. Surv. India*, **4** (2) : 201.

Diagnostic characters : Vide Key.

Material examined : 1 (♀) : India, Meghalaya, Shillong, 11. viii. 1973 (Coll. R.S. Giri).

Distribution : India : Meghalaya; Assam; Sikkim. Elsewhere : Bhutan.

**3. *Neochauliodes khasianus* (Weele)

1907. *Chauliodes pusillus* Weele, *Notes Leyden Mus.*, **28** : 256.
 1909. *Neochauliodes khasianus*, Weele, *Notes Leyden Mus.*, **30** : 259.
 1981. *Neochauliodes khasianus*, Ghosh, *Bull. zool. Surv. India*, **4** (2) : 201.

Distribution : India : Meghalaya (Khasi Hills).

Remarks : Ghosh (1981) reviewed the species from the literature and provided the diagnostic characters of species in the key.

Subfamily II. Neurominae

Key to genera of subfamily Neurominae

First anal vein of forewing forking twice; appendix superiores in males acute or bifurcate
Protohermes

First anal vein of forewing forking but once; appendix superiores clubbed at apex.
... *Neoneuromus*

Genus 2. *Protohermes* Weele.

1907. *Protohermes* Weele, *Notes Leyden Mus.*, **28** : 243.
 1962. *Protohermes*, Kuwayama, *Pacific insects*, **4** (2) : 327.

4. *Protohermes albipennis* (Walker)

1853. *Protohermes albipennis* Walker, *Cat. Brit. Mus. Neur.*, **2** : 206.
 1907. *Protohermes albipennis*, Weele, *Notes Leyden Mus.*, **28** : 245.

Redescription : ♂ : Vertex : yellow; occiput : with a black spot on either side; frons and clypeus : brownish yellow; labrum : dark brown; maxilla : yellowish brown; mandible : dark brown : maxillary and labial palpi : dark brown; eyes : black, middle ocellus smaller than other two; antenna : black except two basal yellow segments; pronotum : very broad, yellow with two black spots on either side; meso- and metanotum : blackish but more black laterally; forewing : longer and narrower than hindwing; costal margin yellow and costal veinlets dark brown; Sc and R₁ yellow; some indistinct whitish spots on basal and apical portions; all other veins and crossveins mainly yellow except some brown patches on some veins; legs : fore- and hind femora yellow; tibia and tarsus black with short

yellow bristles; claws reddish with pulvillus; abdomen : mainly brownish, very short; appendix superiores bifurcate; appendix inferiores claw-like with dark tip; genital valves large and triangular; paramere straight with acute tips; gonarcus arch-shaped.

Measurements : 6 (♂ ♂) : length of forewing, 35-37 mm; hindwing, 33-35 mm.

Material examined : 6 (♂ ♂) India, Meghalaya, Shillong, Rauza (Coll. nil); Risa Colony, 26. vi. 1971 (Coll. J.K. Prasad); Shillong, 7. ix. 1972 (Coll. S. Biswas); fruitgarden, 4. vi. 1981 & 26. v. 1981; Motinagar, 10. vi. 1981 (Coll. M.S. Jyrwa).

Distribution : India : Meghalaya. Elsewhere : Nepal.

Genus 3. *Neoneuromus* Weele

1909. *Neoneuromus* Weele, *Notes Leyden Mus.*, 30 : 252.

5. *Neoneuromus latratus* (MacLachlan)

1869. *Neuromus latratus* MacLachlan, *Ann. Mag. nat. Hist.*, 4 (4) : 43.

5. *N. latratus latratus* (MacLachlan)

1910. *Neoneuromus latratus latratus* (MacLachlan), *Coll. Zool. Edm. Selys Longc.*, 5 (1) : 26.

Diagnostic characters : Body : colour black; wings : hyaline spots comparatively larger between Rs and Cu; Minute hyaline spots in apical parts; male genitalia : appendix superiores more curved to one another and more thickened but without incurvation at tip.

Material examined : 2 exs. (♀ ♀) : India, Meghalaya, Khasi hills, Shillong, Police Bazar, 5. viii. 1965 (Coll. B.K. Tikader); Ward lake, 29. vii. 1973 (Coll. K. Deb).

Distribution : India : Meghalaya.

Genus 4. *Neuromus* Rambur

1842. *Neuromus* Rambur, *Hist. nat. Neurop.*, p. 441.

Key to species of the genus *Neuromus*

Large-size insect with forewing length not less than 40 mm; wings hyaline, whitish but without spot. *decemmaculatus*

Small size insect with forewing length less than 40 mm; wings brown with round spot .. *maculipennis*

6. *Neuromus decemmaculatus* (Walker)

1860. *Hermes decemmaculatus* Walker, *Trans. ent. Soc. Lond.*, (2) 5 : 180.

1909. *Neuromus decemmaculatus* Needham, *Rec. Indian Mus.*, 3 : 194.

Diagnostic characters : Vide key.

Material examined : 2 exs. (damaged) : India, Meghalaya, Khasi hills, date nil, (Coll. Annandale & Godwin-Austen).

Distribution : India : Meghalaya.

7. *Neuromus maculipennis* (Gray)

1907. *Hermes maculipennis* Gray, *Notes Leyden Mus.*, 28 : 142.

1909. *Neuromus maculipennis*, Needham, *Rec. Indian Mus.*, 3 : 195.

Diagnostic Characters : Vide Key.

Material examined : 1 ex. (damaged) : India, Meghalaya, Khasi hills, date-nil (Coll. nil).

Distribution : India : Meghalaya.

Genus 5. *Hermes* Gray

1832. *Hermes* Gray, *In Cuviers Animal Kingdom*, Ed. Griffith II : 331.

1910. *Hermes*, Weele, *Coll. Zool. Edm. Selys Longc.*, 5 (1) : 40.

**8. *Hermes costostriata* Weele

1907. *Hermes costostriata* Weele, *Notes Leyden Mus.*, 28 : 249.

1910. *Hermes costostriata*, Weele, *Coll. Zool. Edm. Selys Longc.*, 5 (1) : 44.

Distribution : India (Meghalaya : Khasi hills).

Remarks : The material is not available for study. However, Weele (1907) pointed out that the species is closely allied to *H. maculifera* Walker and *H. maculipennis* Gray but is distinct by its larger size, robust body and yellow-margined costal veins in forewing.

**9. *Hermes selysi* Weele

1909. *Hermes selysi* Weele, *Notes Leyden Mus.*, 30 : 256.

1910. *Hermes selysi*, Weele, *Coll. Zool. Edm. Selys Longc.*, 5 (1) : 43.

Distribution : India (Meghalaya : Khasi hills and Assam). Elsewhere : Bangladesh.

Genus 6. *Acanthacorydalis* Weele

1907. *Acanthacorydalis* Weele, *Notes Leyden Mus.*, 28 : 228.

1910. *Acanthacorydalis*, Weele, *Coll. Zool. Edm. Selys Longc.*, 5 (1) : 24.

****10. *Acanthacorydalis horrenda* Navas**

1931. *Acanthacorydalis horrenda* Navas, *Rev. Acad. Cienc.*, 26 : 73.

Distribution : India (Meghalaya).

Remarks : As the material is not available for study so no comment is possible on the species.

Family (b). Inocellidae**Genus 7. *Inocellia* Schneider**

1843. *Inocellia* Schneider, *Monografia generis Rhabdidae Linnaei. Typis Officinae Grassii, Barthii et Socii, Vratislaviae* : 32, 84.

1962. *Inocellia*, Kuwayama, *Pacific insects*, 4 (2) : 333.

Diagnostic Characters : Ocelli : absent but three tubercles prominent; mandible : toothed within; wings : little longer than body; forewing : costal area more or less dilated; costal veinlets simple, Sc joining C before pterostigma, R₁ connected with Sc by a single crossvein at base and other near the point where Sc joining costa, pterostigma large but without veinlets; hindwing : R₁ connected with Sc by one crossvein; hind leg : third tarsal segment concealing short fourth segment; abdomen : female with long ovipositor.

11. *Inocellia crassicornis* (Schummel)

1832. *Raphidia crassicornis* Schummel, *Versuch* : 15.

1842. *Inocellia crassicornis*, Schneider, *Monogr.* : 89.

Diagnostic Characters : Ocelli : absent; pro, meso- and metanotum: black and shiny; wings : pterostigma elongated, dark brown; hindwing shorter than forewing; legs : pale.

Material examined : 1 (♂) : India, Meghalaya, Shillong, Insectary, 27. v. 1972 (Coll. K. Deb).

Distribution : India (Meghalaya). Elsewhere : Europe; Japan and Siberia.

Remark : The species is for the first time recorded from India and Meghalaya.

Suborder B. Planipennia**Key to families of suborder Planipennia**

1. Wings and most of the body covered with whitish, waxy powder; costal area without or with only one or two crossveins near root; veins without terminal twiggings. Coniopterygidae
- Wings and body not covered with whitish powder; costal area with many crossveins; usually with terminal twiggings. 2
2. Prothorax long; forelegs raptorial with strongly thickened femur. Mantispidae

- Prothorax short; forelegs normal and cursorial. . 3
3. Antenna never clubbed, nor with thickened apex. . . 4
- Antenna clubbed or with thickened apex. .6
4. With ocelli; discal area of wings with many crossveins; marginal area without crossvein but with many forked veinlets. .Osmylidae
- Without ocelli; arrangement of crossveins of wings different. .5
5. Forewing with atleast two apparent sectors arising from R. Hemerobiidae
- Forewing with only a single sector arising from R near its base. .Chrysopidae
6. Antenna short, weakly clubbed or flattened toward apex; hypostigmatic cell of wings elongated. Myrmeleontidae
- Antenna long, strongly clavate apically; hypostigmatic cell not differentiated. .Ascalaphidae

Family (c). Coniopterygidae

Key to subfamilies of the family Coniopterygidae

- A single radio-medial crossvein in forewing; in hindwing, Rs branching off not from very near base. .Coniopteryginae
- Two radio-medial crossvein in forewing; in hindwing, Rs branching off from very near base. .Aleuropteryginae
- ..

Subfamily III. Coniopteryginae

Key to genera of the Subfamily Coniopteryginae

- M of hindwing unforked. .*Coniopteryx*
- M of hindwing forked. *Conwentzia*

Genus. 8. *Coniopteryx* Curtis

1834. *Coniopteryx* Curtis, *British Entomology*, 1 : 528.

1972. *Coniopteryx*, Meinander, *Acta Zool. Fennica*, 134 : 193.

1977. *Coniopteryx*, Ghosh, *Rec. zool. Surv. India*, 73

Key to species of the genus *Coniopteryx*

- Median apical incision atleast as deep as half the breadth of hypandrium in males. .*ambigua*
- Median apical incision not deeper than a third the breadth of hypandrium in males. .*exigua*

12. *Coniopteryx (Coniopteryx) ambigua* Withycombe

1925. *Coniopteryx ambigua* Withycombe, *Mem. Dep. Agric. India*, (Ent. ser.) 9 : 13.

1972. *Coniopteryx (Coniopteryx) ambigua*, Meinander, *Acta Zool. Fennica*, 136 : 237.

Diagnostic Characters : Vide key.

Material examined : 5♂♀: India, Meghalaya, East Garo hills, Tasek forest rest house, vill. Nafa, 3. vii. 1988; Rongrengiri reserve forest near forest rest house farm, 8. vii. 1988; West Garo hills, Chhambal Badmagri, 1 Km. east of Sibbari P.W.D. Bungalow., 15. vii. 1988 (Coll. R. K. Ghosh and party). Shillong, Elephanta falls, 30. iii. 1991; Maujrang, 20 kms. from Shillong, 4. iv. 1991 (Coll. S. K. Ghosh and party).

Distribution : India : (Meghalaya; Assam; Bihar; Uttar Pradesh. Elsewhere : Sri Lanka and Malaya.

Remark : The species constitutes a new locality record for Meghalaya.

13. *Coniopteryx (Coniopteryx) exigua* Withycombe

1925. *Coniopteryx exigua* Withycombe. *Mem. Dept. Agric. : India*, (Ent. ser.) 2-12.

1972. *Coniopteryx (Coniopteryx) exigua*, Meinander, *Acta Zool. Fennica*, 136 : 342-343.

Diagnostic Characters : Vide Key.

Material examined : 1 ex. : India, Meghalaya, East Garo hills, Rongrengiri reserve forest, near F.R.H. farm, 8. vii. 1988 (Coll. R. K. Ghosh and party).

Distribution : India (Meghalaya, Bihar and Jammu & Kashmir). Nepal and Pakistan.

Remarks : Meinander (1972) synonymised *Coniopteryx pusana* described by Withycombe (1925) from Bihar with *C. exigua* Withycombe. The species is for the first time recorded from Meghalaya.

Genus 8. *Conwentzia* Enderlein

1905. *Conwentzia* Enderlein, *Westpreuss. Bot. Zool. Ver. Ber.*, 26/27 : 10.

1972. *Conwentzia*, Meinander, *Acta Zool. Fennica*, 136 : 294.

1977. *Conwentzia*, Ghosh, *Rec. zool. Surv. India*, 73 : 280.

14. *Conwentzia inverta* Withycombe

1925. *Conwentzia inverta* Withycombe, *Mem. Dept. Agric. India*, (Ent. Ser.) 9 : 10.

1972. *Conwentzia inverta*, Meinander, *Acta Zool. Fennica*, 136 : 299.

Diagnostic Characters : Antenna : scape and pedicel light brown, flagellum dark brown; forewing : membrane tinged with fuscous; hindwing : reduced; male genitalia : outer process of ectoproct almost square in lateral view; parameres with a dorsal process anteriorly at tip.

Material examined : 1 ex. : India, Meghalaya, West Garo hills, Chhombal, Badmagiri, 1 km. west of Sibbari P.W.D. Inspection Bungalow, 15. vii. 1988 (Coll. R.K. Ghosh and party).

Distribution : India (Meghalaya and Bihar).

Remark : The species is for the first time recorded from Meghalaya.

Subfamily IV. Aleuropteryginae

Key to genera of the Subfamily Aleuropteryginae

M forked in both wings.

Heteroconis

M not forked in either wing.

Coniocompsa

Genus 10. *Heteroconis* Enderlein

1905. *Heteroconis* Enderlien, *Zool. Anz.*, **29** : 226.

1972. *Heteroconis*, Meinander, *Acta zool. Fennica*, **136** : 59.

1977. *Heteroconis*, Ghosh, *Rec. Zool. Surv. India*, **73** : 278.

15. *Heteroconis terminalis* (Banks)

1913. *Malacomyza terminalis* Banks, *Trans. Amer. Ent. Soc.*, **39** : 220.

1972. *Heteroconis terminalis*, Meinander, *Acta Zool. Fennica*, **136** : 90.

Diagnostic Characters : Antenna : bicolorous, basal and terminal segments of flagellum whitish and middle blackish, not interrupted by some whitish segments; forewing : membrane almost unicolorous; basal crossvein Rs-M between median thickenings; hindwing : almost hyaline; abdomen : ninth sternite very narrow and anteriorly prolonged into fourth segment.

Material examined : 3 exs. : India, Meghalaya, East Garo hills, Rongrengiri Reserve forest, near forest rest house, 8. vii. 1988; Rongrengiri reserve forest, 1 km. from forest rest house, 9. vii. 1988; West Garo hills, Chhombal, Badmagiri, 1 Km. east of Sibbari P.W.D. Bungalow, 15. vii. 1988 (Coll. R.K. Ghosh and party).

Distribution : India : Meghalaya and Karnataka.

Remark : The species is for the first time recorded from Meghalaya.

Genus 11. *Coniocompsa* Enderlein

1905. *Coniocompsa* Enderlein, *Zool. Anz.*, **29** : 225.

1972. *Coniocompsa*, Meinander, *Acta. Zool. Fennica*, 136 : 96.

1977. *Coniocompsa*, Ghosh, *Rec. zool. Surv. India*, 73 : 278.

***16. *Coniocompsa indica* Withycombe**

1925. *Coniocompsa indica* Withycombe, *Mem. Dept. Agric. India*, 9 : 9.

1972. *Coniocompsa indica*, Meinander, *Acta Zool. Fennica*, 136 : 96.

Diagnostic Characters : Thorax : fuscous with diffuse brown shoulder spots; forewing : membrane hyaline with greyish brown spots at end of longitudinal veins Sc₁-Cu₂ and surrounding distal crossveins; hindwing : membrane hyaline with apex slightly tinged with fuscous male genitalia : penis broad, posteriorly shallowly bifurcate in lateral view; style short.

Material examined : 2 exs : India, Meghalaya, Shillong, Botanical Garden, 1400 m. 29. ii. 1991; near Elephanta falls, 1700 m., 30. iii. 1991 (Coll. S.K. Ghosh and party).

Distribution : India : Meghalaya, Bihar and Tamil Nadu.

Remark : The species constitutes a new locality record for Meghalaya.

Family (d). Mantispidae

Subfamily V. Mantispinae

Diagnostic Characters : Fore tarsi with one claw; fore coxae divided more or less plainly into two parts.

Genus 12. *Mantispa* Illiger

1798. *Mantispa* Illiger, *Kugelann verz. Kafer Preussens Gebaur*, Halle, p 499.

1977. *Mantispa* Ghosh, *Rec. zool. Surv. India*, 73 : 282.

Diagnostic Characters : Wing : radial cells of both wings wide and somewhat angulated and with two crossveins which form 3 radial cells; Cu in hindwing bending down towards anal, touching or connected with it by a very short crossvein; pterostigma short; male genitalia : appendix superiores strong; penis long, slender and curved at tip; hypandrium short.

Key to species of the Genus *Mantispa*

Pronotum nodose; costal half of forewing fulvous, base brown, an oblique brown band before middle of forewing. *nodosa*

Pronotum without node; without fulvous costal half, brown base and oblique brown band. *.indica*

***17. *Mantispa nodosa* Westwood**

1848. *Mantispa nodosa* Westwood, *Cabinet Orient. Ent*, p. 70.

Diagnostic characters : Vide Key.

Material examined : 1 ex. : India, Meghalaya, West Garo hills, Shibbari P.W.D. Bungalow, 14. vii. 1988 (Coll. R. K. Ghosh and party).

Distribution : India : Meghalaya and Assam.

Remark : The species constitutes a new locality record for Meghalaya.

***18. *Mantispa indica* Westwood**

1852. *Mantispa indica* Westwood, *Trans. R. Ent. Soc. Lond.*, (N.S.) 1 : 268.

1933. *Mantispa indica*, Banks, *Indian Forest Rec.* (18) 6 : 2.

Diagnostic characters : Vide Key.

Material examined : 1 ex. : India, Meghalaya, East Garo hills, Sangsok, Tasek forest rest house, 3. vii. 1988 (Coll. R.K. Ghosh, and party).

Distribution : India : Meghalaya, Assam, West Bengal, Western Himalayas and Karnataka.

Remark : The species is for the first time recorded from Meghalaya.

Family (c). Osmylidae

Subfamily Vi. Osmylinae

Diagnostic characters : In forewing, costal crossveins mostly furcate; in hindwing, Cu₂ long running parallel to Cu₁ for some distance.

Genus 13. *Hyposmylus* MacLachlan

1870. *Hyposmylus* MacLachlan, *Ent. monthly Mag.*, 6 : 200.

Diagnostic characters : costal veinlets united by transverse veinlets to form several irregular rows of small costal cellules in forewing; hindwing with a single row of costal cells; vertex : much inflated; ocelli : in downward slopes of vertex above antenna.

19. *Hyposmylus punctipennis* (Walker)

1859. *Osmylus punctipennis* Walker, *Trans. R. ent. Soc. Lond.*, (N.S.) 5 : 183.

1870. *Hyposmylus punctipennis*, MacLachlan, *Ent. monthly Mag.*, 6 : 200.

Diagnostic characters : Head : two large oval tubercles posteriorly partly below eyes; ocelli : small, in ocellar triangle; wings : long and broad; pterostigmal region yellowish; forewing : costal veinlets united to form several irregular rows of cellules, fuscous dots on gradate series of veinlets, a smoky corneous dot in one of the discal cellules near middle; abdomen : clothed with brown hairs.

Material examined : 2 exs. (♀ ♀) : India, Meghalaya, Khasi hills, Maflong, 5900 ft., 6. ix. 1915 (Coll. S.W. Kemp); Shillong, 30. ix. 1965 (Coll. S. Biswas).

Distribution : India (Meghalaya).

Remarks : The species was recorded by Walker (1859) from “India Septentrional” and by MacLachlan (1870) from “Kunawer”. So, from literature, the exact locality of the species is hitherto unknown. However, for the first time the species is recorded from Meghalaya.

Subfamily VIa. Spilosmylinae

Diagnostic characters : In forewing costal cross veins mostly simple; in hindwing, Cu₂ very short and not parallel to Cu₁.

**Genus 14. *Thyridosmylus* Krüger

1913. *Thyridosmylus* Krüger, *Stettin. ent. Ztg.*, 75:87.

1977. *Thyridosmylus*, Ghosh, *Rec. zool. Surv. India*, 73:286.

**20. *Thyridosmylus pastulatus* Kimmins

1942. *Thyridosmylus pastulatus* Kimmins, *Ann. Mag. nat. Hist.*, (1) 9:849.

Distribution : India (Meghalaya and Himachal Pradesh).

Remarks : Kimmins (1942) while describing the species referred to “Khasi Hills” under Assam and “Simla” under Punjab. But presently, these two places are considered in Meghalaya and Himachal Pradesh respectively.

21. *Thyridosmylus langii* (MacLachlan)

1870. *Osmylus langii* MacLachlan, *Ent. monthly mag.*, 6:197.

1913. *Thyridosmylus langii*, Krüger, *Stettin, ent. Ztg.*, 74:87.

**21a. *Thyridosmylus langii angustus* Kimmins

1942. *Thyridosmylus langii angustus* Kimmins, *Ann. Mag. nat. Hist.*, (11) 9 : 849.

Distribution : India : Meghalaya.

Remarks : Kimmins (1942) while describing the subspecies distinguished it from the nearest subspecies chiefly by the character of wings as the genitalia could not be studied by him due to the damaged condition of abdomen. However, from the description it appears to be a valid subspecies.

Family (f) Hemerobiidae

Key to subfamilies of the family Hemerobiidae

- Forewing with a recurrent humeral veinlet. Hemerobiinae
- Forewing without a recurrent humeral veinlet. Microminae

Subfamily VII. Hemerobiinae

Genus *15. *Hemerobius* Linnaeus

1758. *Hemerobius* Linnaeus, *Syst. Nat, Ed. X.*, 1 : 549.

1977. *Hemerobius*, Ghosh, *Rec. zool Surv. India*, 73 : 288.

1988. *Hemerobius*, Monserrat, *Proceedings of the Third International Symposium on Neuropterology* : 219.

Diagnostic characters : Maxillary palpi : 6 segmented; labial palpi : 4-segmented; forewing : with recurrent humeral veinlet; 3 branches of Rs; 2 complete series of gradate crossveins; hindwing: M forks far beyond origin of first branch of Rs; one complete series of outer gradates; Cu₂ completely atrophied; abdomen : anal plate in males with spinous projection; aedeagus paired; parameres not fused.

*22. *Hemerobius* sp.

Material examined : 50 exs. (♂♀) : India, Meghalaya, Shillong, Botanical garden, 1400 m., 29. iii. 1991; near Elephanta falls, 1700 m, 30. iii. 1991; Quinton Road, 5. iv. 1991; around tourist lodge, Polobazar, 7. iv. 1991; Charfarlong, 1450 m., 9. iv. 1991; near Maura, Polo hills forest, 1500 m., 10. iv. 1991; side of G.S. Road, 12. iv. 1991 (Coll. S.K. Ghosh and party).

Distribution : India : Meghalaya.

Remarks : The male genitalic characters and the spots in the wings are the characters of interest. So, the account of the species will be published in due course after further study. However, the genus *Hemerobius* in which the species belongs, is for the first time recorded from Meghalaya.

Genus 16. *Drepanacrella* Kimmins

1942. *Drepanacrella* Kimmins, *Ann. Mag. nat. Hist.*, (11) 6:222.

1988. *Drepanacrella*, Monserrat, *Proceedings of the Third International Symposium on Neuropterology* : 217.

**23. *Drepanacrella khasiana* Kimmins

1940. *Drepanacrella khasiana* Kimmins, *Ann. Mag. nat. Hist.*, (11) 6:222.

Distribution : India : Meghalaya.

Remarks : The material is not available for study. However, the genitalic characters as referred to by Kimmins (1940) appear sufficient to consider the species as a valid one.

Genus 17. *Neuronema* MacLachlan

1869. *Neuronema* MacLachlan, *Ent. monthly Mag.*, 6 : 27.

1988. *Neuronema*, Monserrat, *Proceedings of the Third International Symposium on Neuropterology* : 231.

****24. *Neuronema assamensis* Kimmins**

1943. *Neuronema assamensis* Kimmins, *Ann. Mag. nat. Hist.*, (11) 10 : 44.

Distribution : India (Meghalaya).

Remarks : Though the material is not available for study yet the structure of the anal plates, tenth tergite and parameres in males and also of subgenital plate in females as described by Kimmins (1943) appear quite distinctive for the species.

Subfamily VIII. Microminae**Genus *18. *Micromus* Rambur**

1842. *Micromus* Rambur, *Rorets Suite a Buffon Neuropteres* : 416.

1988. *Micromus* Monserrat, *Proceedings of the Third International Symposium on Neuropterology* : 226.

Diagnostic Characters : Maxillary palpi : 5-segmented; labial palpi: 3-segmented; forewing: costal space narrowed at base, seldom with a recurrent humeral vein; abdomen: tergite 9 and ectoprocts fused in both sexes; male genitalia : parameres fused in their proximal parts.

25. *Micromus kapuri* (Nakahara)

1971. *Eumicromus kapuri* Nakahara, *Kontyu*, 39 : 11.

1988. *Micromus kapuri* Monserrat, *Proceedings of the Third International Symposium on Neuropterology* : 228.

Diagnostic characters : Forewing : unmarked except a short brown streak in basal medio-cubital space, six branches to Rs, M₂+3 completely separated, 8 crossveins to inner and 10 or 11 to outer gradate series; male genitalia : without serration in ventral process of anal plate; aedeagus single, broad at base and pointed at apex.

Material examined : 1 (male, holotype) : India, Meghalaya, Cherrapunji, 4000 ft., 2. viii. 1914 (Coll. S. W. Kemp).

Distribution : India : Meghalaya.

Remarks : Nakahara (1971) described the species from Cherrapunji which was included under Assam. But presently Cherrapunji is under the jurisdiction of Meghalaya.

***26. *Micromus* sp.**

Material examined : 25 exs. (♂♀) : India, Meghalaya, Shillong, Botanical Garden, 1400 m., 29. iii. 1991; Ward Lake, 1400 m., 29. iii. 1991; Tourist Lodge, Polobazar, 7. iv. 91 (Coll. S.K. Ghosh and party).

Distribution : India (Meghalaya).

Remarks : The species is interesting specially of the male genetalic structures. So, it requires further study. However, the genus *Micromus* in which the species belongs, is for the first time recorded from Meghalaya.

Family (g) Chrysopidae

Key to subfamilies of the family Chrysopidae

Psm of forewing merges with outer gradate series; tympanal organ present but without jugal lobe in forewing. Chrysopinae

Psm of forewing merges with inner gradate series; without tympanal organ but with well-developed jugal lobe. .Nothochrysinae

Subfamily IX. Chrysopinae

Key to genera of the subfamily Chrysopinae

1. Sc very short; 1-2 crossveins below pterostigma. *Ankylopteryx*
 Sc long; atleast 3-4 crossveins below pterostigma. .2
2. Frons with 2-3 black spots; weakly expanded basal costal area in forewing. . *Semachrysa*
 Frons without spots; costal area of forewing at first narrow then gradually widening. 3
3. Small to medium- sized insects; cell im short. 4
 Robust insect; cell im long. *Italochrysa*
4. Without arcessus but with pseudopenis in male genitalia. *Chrysopa*
 With arcessus but without pseudopenis in male genitalia. . *Mallada*

Genus 19. *Ankylopteryx* Brauer

1864. *Ankylopteryx* Brauer, *Verh. Zool.-Bot. Ges. in Wien*, 17:899.

1990. *Ankylopteryx*, Brooks & Barnard, *Bull. Brit. Mus. (nat. Hist.) Ent. Ser.*, 59 (2) : 155.

*27. *Ankylopteryx octopunctata* (Fabricius)

1793. *Hemerobius octopunctatus* Fabricius, *Ent. Syst.*, 2 : 85.

1909. *Ankylopteryx octopunctata*, Weele, *Notes Leyden Mus.*, 31 : 57.

1980. *Ankylopteryx octopunctata*, Ghosh, *Rec. zool. Surv. India*, 77:251.

Diagnostic characters : Mouth : dark; thorax: with some dark spots; forewing: costa steep at base; with a dark spot over lower base of inner gradate series, pterostigma and near end of anal vein.

Material examined : 1♂ : India, Meghalaya, East Garo hills, Darugiri forest rest house, i. iii. 1988 (Coll. R. K. Ghosh & party).

Distribution : India : Meghalaya, Western Himalayas, South India and Andamans. Elsewhere : China and Insulinde.

Remarks : Ghosh (in press) observed an interesting morphovariation regarding division of third cubital cell by the intramedian cell while examining the species from West Bengal. However, the species is for the first time recorded from Meghalaya.

Genus 20. *Semachrysa* Brooks

1983. *Semachrysa* Brooks, *Bull. Brit. Mus. (nat. Hist.)*, 47 : 6.

*28. *Semachrysa* sp.

Material examined : 1 ex. : India, Meghalaya, Cherrapunji, 1250 m., 22. ix. 1991 (Coll. R.K. Varshney and party).

Distribution : India : Meghalaya.

Remarks : The genus as well as species is for the first time recorded from India. Due to the paucity of the material the specimen could not be identified upto species.

Genus 21. *Italochrysa* Principi

1946. *Italochrysa* Principi, *Bol. Istituto. ent. Univ. Bologna*, 15:86.

1990. *Italochrysa*, Brooks & Barnard, *Bull. Brit. Mus. (nat. Hist), Ent. Ser.*, 59 (2) : 175.

Key to species of the genus *Italochrysa*

Antenna brownish; basal costal crossveins entirely black; wing roots stained with brown; gradate crossveins in only inner series black alongwith connecting veins. *robusta*

Antenna black except two basal segments; basal costal crossveins pale yellow; wing root without brown stain; gradate crossveins in both outer and inner series black but the connecting veins pale yellow. *flavobrunnea*

*29. *Italochrysa robusta* (Needham)

1909. *Nothochrysa robusta* Needham, *Rec. Indian Mus.*, 3 : 202.

Diagnostic Characters : Vide Key.

Material examined : 2 exs. (♂♀) : India, Meghalaya, Shillong, 14. vi. 1964 (Coll. A.K. Mandal); Risa Colony, 16. vi. 1975 (Coll. K. Deb).

Distribution : India : Meghalaya and Assam.

Remarks : The species has been placed under the genus *Italochrysa* vide Ghosh (in press). However, the species constitutes a new locality record for Meghalaya.

***30. *Italochrysa flavobrunnea* Ghosh**

1981. *Italochrysa flavobrunnea* Ghosh, *Bull. zool. Surv. India*, **3** (3) : 145.

Diagnostic characters : Vide Key.

Material examined : 2 (♀ ♀) : India, Meghalaya, Shillong, Barapani Road, 1050 m. (Coll. R. K. Varshney and party).

Distribution : India : Meghalaya and Tamil Nadu.

Remark : The species constitutes a new locality record for Meghalaya.

Genus 22. *Chrysopa* Leach

1815. *Chrysopa* Leach, Artikel entomology-Brewster, *Edinburgh Encyclopaedia*, **9** (1) : 138.

1990. *Chrysopa*, Brooks & Barnard, *Bull. Brit. Mus. (nat. Hist.) Ent. Ser.*, **59** (2) : 201.

31. *Chrysopa hasegawai* Nakahara

1955. *Chrysopa hasegawai* Nakahara, *Kontyu*, **23**:145.

Diagnostic characters : Forewing : an elongated fuscous brown spot near middle of inner gradate series and veins within the spot being fuscous black; a very tiny fuscous brown spot over the first crossvein of inner gradate series at the junction of the branch of Rs. and M; a small fuscous brown spot near base of wing where Cu₁ and 1A bend towards hind margin; within these spots veins are fuscous black; hindwing : immaculate; abdomen : in male, 10th tergite protruding slightly beyond the end of subgenital plate.

Material examined : 3 exs. (♀ ♀) : India, Meghalaya, Shillong, Botanical Garden, 1400 m. 19. iii. 1991 (coll. S.K. Ghosh and party).

Distribution : India (Meghalaya). Taiwan (Taihoku).

Remarks : Nakahara (1955) described the species from Taiwan (Formosa). The brown markings of forewing of the species is very conspicuous among its congeners. The species is for the first time recorded from India and also from the state of Meghalaya.

Genus 23. *Mallada* Navas

1925. *Mallada* Navas, *Rev. Acad. Cienc. Zaragoza*, **9** : 24.

1990. *Mallada*, Brooks & Barnard, *Bull. Brit. Mus (nat. Hist.) Ent. Ser.*, **59** (2) : 223.

32. *Mallada alcestes* (Banks) Comb. nov.

1911. *Chrysopa alcestes* Banks, *Proc. ent. Soc. Wash.*, **13** : 102.

Diagnostic characters : Pronotum: as long as broad; wings: crossveins entirely black or black at ends only; forewing : divisory veinlets ending at or beyond crossvein; 5 black crossveins in inner and

six in outer gradate series; inner row equidistant to Rs and outer gradate series; hindwing: four veinlets in inner and 5 or 6 in outer gradate series.

Material examined : 1 ex. damaged; 1 ♀ : India, Meghalaya, Shillong, Risa Colony, 27.vi.1971 (Coll. S. Biswas); lower Cherrapunji, 1300 m., 2. iv. 1991 (Coll. S. K. Ghosh and party).

Distribution : India : Meghalaya, Bihar and West Bengal. Elsewhere : Bonin Is.

Remarks : Ghosh (in press) placed the species under the genus *Anisochrysa* Nakahara while studying the species from West Bengal. Brooks and Barnard (1990) synonymized *Anisochrysa* with *Mallada* Navas. Therefore, the species has been redesignated as *Mallada alcestes*, a new combination. The species is for the first time recorded from Meghalaya.

Subfamily X. Nothochrysinæ

Genus 24. *Nothochrysa* MacLachlan

1868. *Nothochrysa* MacLachlan, Trans. R. ent. Soc. Lond., pp. 145-224.

Diagnostic characters : Wings : gradate crossveins arranged in two series; forewing: cell im narrow, quadrangular, measuring more than 14 mm; 1A forked; hindwing: Sc and C not fused; male genitalia: without tignum, gonapsis, median plate, pseudopenis, gonocristae and spinellae; with long and spoon-shaped entoprocessus; arcuate gonarcus and long arcessus.

**33. *Nothochrysa lefroii* Needham

1909. *Nothochrysa lefroii* Needham, Rec. Indian Mus., 3 : 203.

Distribution : India (Meghalaya, Assam, Bihar, Punjab and Western Himalayas).

Remarks : Needham (1909) while describing the species laid emphasis only on colouration, From the description no definite comment can be made on the identity of the species and also to consider it as true *Nothochrysa*.

Family (h) Myrmeleontidae

Subfamily Xi. Myrmeleontinae

Diagnostic characters : Forewing : Cup short or sometimes long and fused with 1A in its course; hindwing : M and Cu but not 1A running parallel; Cu with distinct fork.

Key to genera of the subfamily Myrmeleontinae

1.	Spurs of hind tibia always longer than two basal tarsal segments taken together.	. <i>Distoleon</i>
	Spurs of hind tibia not longer than two basal tarsal segments taken together.	.2
2.	In forewing, Rs. arising before cubital fork.	. <i>Hagenomyia</i>
	In forewing, Rs. arising much beyond cubital fork.	3

3. In forewing, only a single series of costal cells before pterostigma. . *Myrmeleon*

In forewing, two series of costal cells before pterostigma. . *Stiphroneura*

Genus 25. *Distoleon* Banks

1910. *Distoleon* Banks, *Ann. ent. soc. Amer.*, **3** : 42.

1984. *Distoleon*, Ghosh, *Rec. zool. Surv. India, Occ. Paper*, **52** : 48.

*34. *Distoleon audax* (Walker)

1853. *Distoleon audax* Walker, *Cat. Brit. Mus. Neur.*, **2** : 338.

1980. *Distoleon audax*, Ghosh, *Rec. zool. Surv. India* **77** : 253.

Diagnostic characters : Vertex : with two rows of black markings; pronotum: brown with three luteous stripes median one narrow and lateral ones irregular; forewing : longitudinal veins spotted with white; pterostigma whitish and with a dark spot at the junction of R & Sc; apical part with pale oblique lines where the veins being white; abdomen : shorter than wings.

Material examined : 1 ex. (damaged) : India, Meghalaya, East Garo hills, Songsok, 13. iv. 1973 (Coll. S. Biswas).

Distribution : India : Meghalaya, Maharashtra, Andaman and Nicobar Islands. Elsewhere : Sri Lanka; China; Japan; Insulinde (Malayan & Papuan Archipelago) and Australia.

Remarks : The species is for the first time recorded from Meghalaya.

Genus 26. *Hagenomyia* Banks

1911. *Hagenomyia* Banks, *Ann. ent. Soc. Am.*, **4** : 8.

1984. *Hagenomyia*, Ghosh, *Rec. zool. Surv. India, Occ. Paper*, **52**:18.

35. *Hagenomyia* sp.

Material examined : 1 (♀) : India, Meghalaya, Shillong, Risa Colony, 4. ix. 1974 (Coll. R. Mathew).

Distribution : Meghalaya.

Remarks : The species is very characteristic due to distinct, irregular, milk-white patches in the region of pterostigma of both wings which is found in *H. eurystictus* (Gerst.) (= *M. eurystictus* Gerst.). Due to the paucity of material, specially of males, it is not possible to identify the species by Ghosh (1984).

Genus 27. *Myrmeleon* Linnaeus

1867. *Myrmeleon* Linnaeus, *Syst. Nat., Ed.*, 12 : 913.

1984. *Myrmeleon*, Ghosh, *Rec. zool. Surv. India, Occ. paper* 52:21.

36. *Myrmeleon* sp.

Material examined : 1 (♂) : India, Meghalaya, Shillong, 22. iv. 1969 (Coll. S. Biswas).

Distribution : India : Meghalaya.

Remarks : Though the genus *Myrmeleon* is cosmopolitan in distribution yet it is for the first time recorded from Meghalaya. Species is indetermined as more material are needed for confirmation.

Genus 28. *Stiphroneura* Gerstaecker

1885. *Stiphroneura* Gerstaecker, *Mitt. naturw. ver. neu Vorpom u. Rugen*, 16 : 91.

1885 *Stiphroneura*, Shosh, *Rec. Zool. Surv. India, Occ. paper*, 52:25.

*37. *Stiphroneura Inclusa* (Walker)

1853. *Myrmeleon inclusus* Walker, *Cat. Brit. Mus. Neur.*, 2:327.

1984. *Stiphroneura inclusa*, Ghosh, *Rec. zool. Surv. India, Occ. paper*, 52:26.

Diagnostic characters : Body : dark ferrugineous; wings: greyish; pterostigma whitish; costal crossveins divided by transverse veinlets from near base to pterostigma; forewing: with numerous limpid spots along borders and at tip and alternate with some pale brown spots; a few dark brown spots at base, one at tip and one in disc between first sector of radius and cubitus near their tips; hindwing : with some alternate pale-brown and limpid spots along borders towards apex; two large, brown, nearly, rounded spots-one near fore border at five-sixth of the length and other near hind border at two thirds of the length.

Material examined : 1 ex. (damaged) : India, Meghalaya,, East Garo hills, Rongrengiri, 12.x.1982 (Coll. J.R.B. Alfred).

Distribution : India : Meghalaya, Sikkim and Himachal Pradesh. Elsewhere : East Indies.

Remark : The species is for the first time recorded from Meghalaya.

Family (i). Ascalaphidae

Key to subfamilies of the family Ascalaphidae

Eyes entire.

Hoplogleniinae

Eyes equally or unequally divided into two parts.

.Ascalaphinae

Subfamily XII Hoplogleniinae

Genus 29. *Idricerus* MacLachlan

1871. *Idricerus* MacLachlan, *J. Linn. Soc.*, 11:200.

1988. *Idricerus*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 168.

Diagnostic characters : Antenna : shorter than wings; eyes; entire; thorax : very villose; wing : slightly dilated at middle; forewing: with a semi-circular excision at the very base of inner margin followed by a small obtusely angular dilatation but not appendiculate; leg: spur of hind tibia hardly as long as first two tarsal segments taken together; abdomen : shorter than wings.

38. *Idricerus decrepitus* (Walker)

1859. *Ascalaphus decrepitus* Walker, *Trans. R. ent. Soc. Lond.*, (2) 5 : 197.

1871. *Ascalaphus decrepitus*, MacLachlan, *J. Linn. Soc.*, 11 : 240.

1988. *Idricerus decrepitus*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 168.

Diagnostic Characters : Antenna : brown above but yellow beneath; thorax; greyish black above; wings : hyaline with pointed apex; all crossveins more or less marked with small black spots; pterostigma black with 2-4 crossveins in forewing and with only 4 crossveins in hindwing; appendix of forewing broad and blunt, apical field in both wings with two rows of cells.

Material examined : 2 (♀ ♀), 1 ex. damaged) : India, Meghalaya, Shillong, Risa Colony, 19. vii. 1973 (Coll. R. Rynth); Motinagar, 16. iv. 1969. (Coll. M.S. Jyrwa).

Distribution : India (Meghalaya, Jammu & Kashmir). Elsewhere : Turkestan.

Genus 30. *Protidricerus* Weele

1908. *Protidricerus* Weele, *Cat. coll. Selys*, 8 : 61.

**39. *Protidricerus elwesi* MacLachlan)

1891. *Idricerus elwesi*, MacLachlan, *Trans. R. Ent. Soc. Lond.*, p. 512.

1908. *Protidricerus elwesi*, MacLachlan, *Cat. Coll. Selys*, 8 : 63.

Distribution : India : Meghalaya (Khasi hills).

Remarks : The species was reported from Khasi hills under the jurisdiction of Assam. Presently 'Khasi hills' falls under the state of Meghalaya.

Subfamily XIII Ascalaphinae

Key to the genera of Subfamily Ascalaphinae

1. Ectoproct in both sexes short.

- Ectoproct in both sexes specially in male long. .3
2. Abdomen of male as long or longer than hindwing; antenna straight; legs slender
Suphalomitus
- Abdomen of male distinctly shorter than hindwing; antennae in either sex specially in male distinctly bent; legs stout. . *Ascalaphus*
3. Wing tip angular; abdomen longer than wings in males; antenna denticulate internally at base.
Acheron
- Wing tip rounded. abdomen much shorter than wings; antenna without teeth at base.
Hybris

Genus 31. *Suphalomitus* Weele

1908. *Suphalomitus* Weele, *Cat. Coll. selys*, 8:181.

1988. *Suphalomitus*, Ghosh, *Rec. zool. Surv. India*, 85(2) : 173.

40. *Suphalomitus verbosus* (Walker)

1853. *Ascalaphus verbosus* Walker, *Cat. Brit. Mus. Neur.*, 2:426.

1949. *Suphalomitus verbosus*, Kimmins, *Ann. Mag. nat. Hist.*, (12) 2:4.

1988. *Suphalomitus verbosus*, Ghosh, *Rec. zool. Surv. India*, 85 (2), 174.

Diagnostic Characters : Labrum & Clypeus : yellowish; frons: dark brown with pale margins; vertex: black with greyish-black hairs; forewing: axillary angle obtuse; pterostigma elongate, brown and with 4-5 crossveins; apical field with two rows of cells; hindwing: shorter than forewing; with two rows of cells at apex; male genitalia: superior appendages extensively brown; 9th sternite yellowish; apices of claspers armed with numerous acute teeth.

Material examined : 1 (♀) : India, Meghalaya, Shillong, Motinagar, 5. v. 1973 (Coll. M.S. Jyrwa).

Distribution : India : Meghalaya, West Bengal and Karnataka. Elsewhere : Sri Lanka.

Genus 32. *Ascalaphus* Fabricius

1775. *Ascalaphus* Fabricius, *Syst. Ent.* : 313.

1988. *Ascalaphus*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 183.

Key to species of the genus *Ascalaphus*

Posterior lobe of prothorax in male with two rounded processes, each with a dense tuft of moderately long fuscous hairs. . *prothoracicus*

Posterior lobe of prothorax in male normal in size and without any process. . *dicax*

***41. *Ascalaphus prothoracicus* (Kimmins)**

1949. *Ascalaphus prothoracicus* Kimmins, *Ann. Mag. nat. Hist.*, (12) 2:6.

1988. *Ascalaphus prothoracicus*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 184.

Diagnostic characters : Vide Key.

Material examined : 2 exs (♂♂) : India, Meghalaya, Damalgiri, 21. iv. 1991; Rangsakgiri, 1.v.1991 (Coll. B.N. Das and party).

Distribution : India : Meghalaya, Assam, Sikkim and West Bengal.

Remark : The species is for the first time recorded from Meghalaya.

***42. *Ascalaphus dicax* Walker**

1853. *Ascalaphus dicax* Walker, *Cat. Brit. Mus. Neur.*, 2:423.

1988. *Ascalaphus dicax*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 186.

Diagnostic Characters : Vide key.

Material examined : 5 exs. (♀♀) : India, Meghalaya, Barangapsca, 23.iv.1991; Shibbari, 26. iv. 1991; Rongra, 29. iv. 1991; Rongsakgiri; 1.v.1991 (Coll. B.N. Das and party).

Distribution : India (Meghalaya, Assam, West Bengal and Orissa). Elsewhere : Sri Lanka; Indonesia, the Philippines; New Guinea; China; Japan and Arabia.

Remark : The species is for the first time reported from Meghalaya.

Genus 33. *Acheron* Lefebvre

1842. *Acheron* Lefebvre, *Guer. Mag. zool.*, 92:6.

1988. *Acheron*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 175.

43. *Acheron trux* (Walker)

1853. *Ascalaphus trux* walker, *Cat. Brit. Mus. Neur.*, 2:432.

1922. *Acheron trux*, Fraser, *Rec. Indian Mus.*, 24:526.

1988. *Acheron trux*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 175.

Diagnostic Characters : Antenna : joints armed with teeth at base in males; thorax: with testaceous streaks; wings : long, subcostal region slightly tinged with brown in male but more prominently marked in females; pterostigma pale brown with 6 crossveins; hindwing : shorter and narrower than forewing; abdomen : nearly as long as wings.

Material examined : 4 exs. (♂♀) : India, Meghalaya, Shillong, Tura, vi-vii. 1917 (Coll. S.W. Kemp); Maupat, 31. viii. 1967 (Coll. R. K. Varshney); Risa Colony, 4.ix. 1974 (Coll. R. Mathew); East Garo hills, Tasek forest rest house, Songsok, 5. vii. 1988 (Coll. R.K. Ghosh and party).

Distribution : India : Meghalaya, Assam, West Bengal and Sikkim. Elsewhere : Bhutan and Burma.

Genus 34. *Hybris* Lefebvre

1842. *Hybris* Lefebvre, *Guer. Mag. zool.*, 91:6.

1988. *Hybris*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 179.

44. *Hybris angulata* (Westwood)

1848. *Ascalaphus (Ogcogaster) angulatus* Westwood, *Cabinet Orient. Ent.*, p.69.

1873. *Hybris angulata*, MacLachlan, *J. Linn. Soc.*, 11:267.

1988. *Hybris angulata*, Ghosh, *Rec. zool. Surv. India*, 85 (2) : 180.

Diagnostic Characters : Pronotum : a broad black stripe on either side; wings: membrane with brownish tinge specially in apical half; pterostigma dark brown with 5 crossveins; apical field with 4 rows of cells; hindwing: shorter and narrower than forewing; leg: fore tibia with comb-like hairs at inner margin; male genitalia: ectoproct dark brown, forcipate with an yellow spot at base, also with long, black hairs at base and short, black bristles at tip; 9th sternite large, black and with two lateral protruberances.

Material examined : 3 exs. (♂♀) : India, Meghalaya, Loharband, 3.x.1975 (Coll. N. Muraledharan and party); West Garo Hills, Tura, 1.x.1991 (Coll. R. K. Varshney and party).

Distribution : India (Meghalaya, Assam and West Bengal). Elsewhere : Bangladesh and Burma.

Genus 35. *Agrionosoma* Weele

1908. *Agrionosoma* Weele, *Cat. coll. selys*, 8:169.

1988. *Agrionosoma*, Ghosh, *Rec. zool. Surv. India*, 85(2) : 169.

**45. *Agrionosoma swinhoei* Weele

1908. *Agrionosoma swinhoei* Weele, *Cat. Coll. Selys*, 8:169.

Distribution : India : Meghalaya.

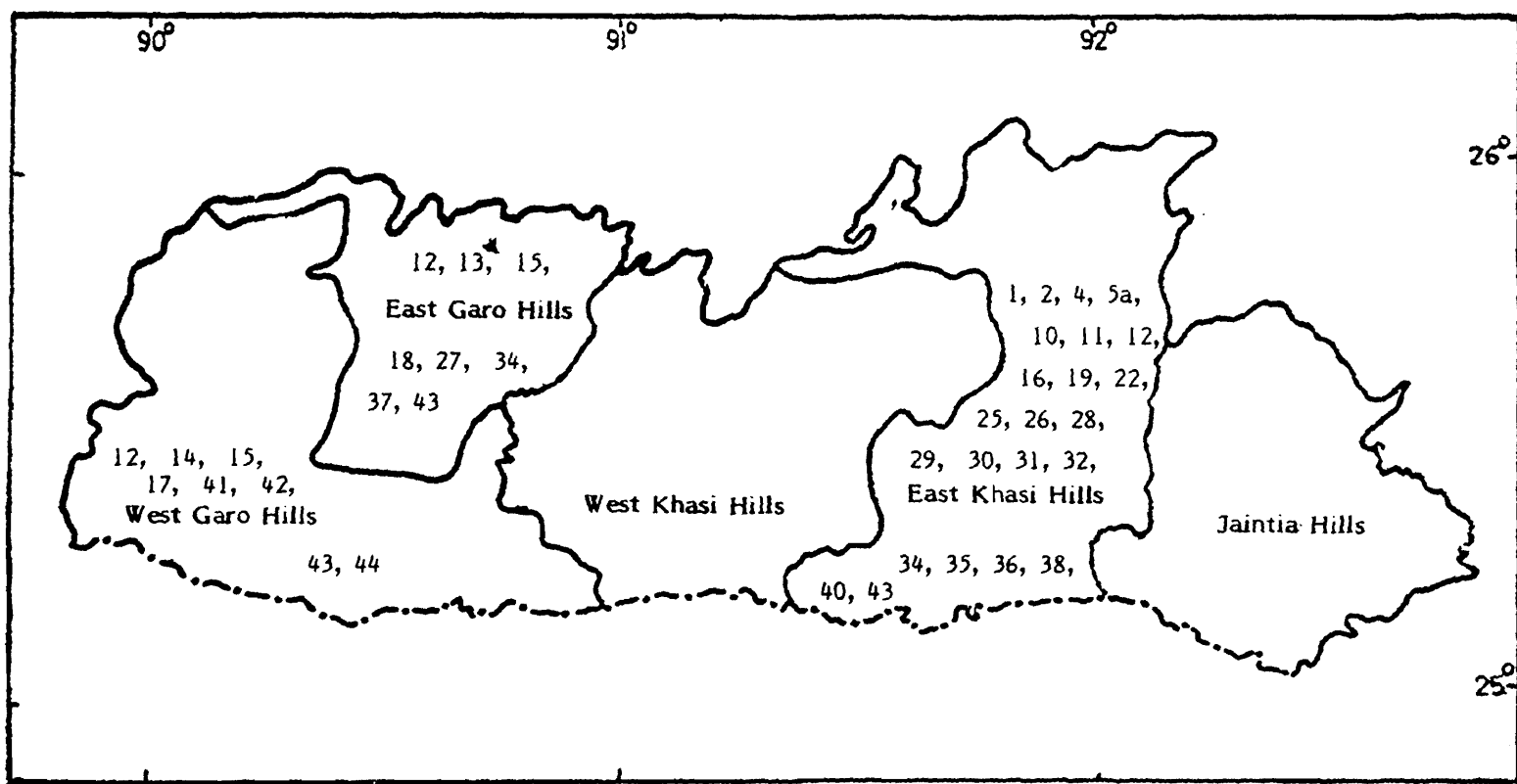
Remarks : The species was reported from Khasi Hills, Meghalaya. Due to the non-availability of the material for study, it is not possible to make any comment on the species.

Table Showing the distribution of species in the Districts of Meghalaya

		Jaintia hills	East Khasi hills	West Khasi hills	East Garo hills	West Garo hills	No mention dist.
Sl.No.	Name of the species	1	2	3	4	5	6
1.	<i>Neochauliodes simplex</i> (Walker)		+				
2.	<i>Neochauliodes indicus</i> (Weele)		+				
3.	<i>Neochauliodes khasianus</i> (Weele)						+
4.	<i>Protohermes albipennis</i> (Walker)		+				
5a.	<i>Neoneuromus latratus latratus</i> (MacLachlan)		+				
6.	<i>Neuromus decemmaculatus</i> (Walker)						+
7.	<i>N. maculipennis</i> Gray						+
8.	<i>Hermes costostriata</i> (Weele)						+
9.	<i>Hermes selysi</i> (Weele)						+
10.	<i>Acanthacorydalis horrenda</i> Navas		+				
11.	<i>Inocellia crassicornis</i> (Schummel)		+				
12.	<i>Coniopteryx (Coniopteryx) ambigua</i> Withycombe		+		+	+	
13.	<i>C (C). exigua</i> Withycombe				+		
14.	<i>Conwentzia inverta</i> Withycombe					+	
15.	<i>Heteroconis terminalis</i> (Banks)				+	+	
16.	<i>Coniocompsa indica</i> Withycombe		+				
17.	<i>Mantispa nodosa</i> Westwood					+	
18.	<i>Mantispa indica</i> Westwood				+		
19.	<i>Hyposmylus punctipennis</i> (Walker)		+				
20.	<i>Thyridosmylus pastulatus</i> Kimmins						+
21.	<i>T. langii angustus</i> Kimmins						+
22.	<i>Hemerobius</i> sp.		+				
23.	<i>Drepanacrella khasiana</i> Kimmins						+
24.	<i>Neuronema assamensis</i> Kimmins						+
25.	<i>Micromus kapuri</i> (Nakahara)		+				

	1	2	3	4	5	6
26. <i>Micromus</i> sp.		+				
27. <i>Ankylopteryx octopunctata</i> (Fabricius)				+		
28. <i>Semachrysa</i> sp.		+				
29. <i>Italochrysa robusta</i> (Needham)		+				
30. <i>I. flavobrunnea</i> Ghosh		+				
31. <i>Chrysopa hasegawai</i> Nakahara		+				
32. <i>Mallada alcestes</i> (Banks)		+				
33. <i>Nothochrysa lefroi</i> Needham						+
34. <i>Distoleon audax</i> (Walker)				+		
35. <i>Hagenomyia</i> sp.		+				
36. <i>Myrmeleon</i> sp.		+				
37. <i>Stiphroneura inclusa</i> (Walker)				+		
38. <i>Idricerus decrepitus</i> (Walker)		+				
39. <i>Protidricerus elwesi</i> (MacLachlan)						+
40. <i>Suphalomitus verbosus</i> (Walker)		+				
41. <i>Ascalaphus prothoracicus</i> (Kimmins)					+	
42. <i>A. dicax</i> Walker					+	
43. <i>Acheron trux</i> (Walker)		+		+	+	
44. <i>Hybris angulata</i> (Westwood)					+	+
45. <i>Agrionosoma swinhoei</i> Weele						+

Map showing the distribution of species in different districts of Meghalaya



SUMMARY

The paper incorporates the taxonomic account alongwith earlier investigations, collection and preservation, external morphology and geographical distribution of the species belonging to the Order Neuroptera from Meghalaya. Amongst a total of 45 species, two genera, namely, *Myrmeleon* and *Simachrysa* and two species, namely, *Inocellia crassicornis* (Schummel) and *Chrysopa hasegawai* Nakahara are for the first time recorded from India. *Protohermes albipennis* (Walker) has been redescribed and *Mallada alcestes* (Banks) has been newly combined. Besides, 21 species have been recorded for the first time from Meghalaya and 11 species have been reviewed from literature. Running keys to all the taxa examined, remarks wherever applicable, table showing the distribution of species in the districts at Meghalaya, and relevant references have been provided. Thus an account of 45 species in 9 families, 13 subfamilies and 35 genera has been furnished in the paper.

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INSECTA : HYMENOPTERA : VESPIDAE

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INTRODUCTION

The family Vespidae belongs to superfamily Vespoidea which includes true wasps. The superfamily Vespoidea is one of the seven recently recognised superfamilies of Aculeate Hymenoptera. Carpenter (1982) considered Vespidae as the only family under the superfamily Vespoidea. The family Vespidae is divided into five subfamilies, viz., Euparagiinae, Masarinae, Stenogastrinae, Vespinae and Polistinae. The former two subfamilies do not occur in India. There are about 700 species known under Vespidae from the world.

The complex social organisation and nest architecture make these wasps fascinating insects. Whereas their painful sting may, sometimes, prove fatal yet their venom has its utilization in immunisation. Despite their interesting features and economic importance, they are chiefly predators of insect larvae and some of the species serve as effective predators for the control of some insect pests of agricultural crops.

Our knowledge about these wasps is very poor. The important works available on Indian wasps are by Bingham (1897), Das and Gupta (1977, 1983, 1989). Besides these, there are some important contributions on wasps of Oriental Region by van der Vecht (1935-1979), Archer (1980-1987), Kojima (1982-1988), Yamane *et al.* (1974-1987) and Williams (1983-1988). Jonathan, Roy and Kundu (1993) had published a consolidated account of the family Vespidae of the state of West Bengal.

An attempt has been made here to provide a consolidate information on the Vespidae fauna of the state of Meghalaya, India. The present work is based on the collection of this family made by several survey parties of the Zoological Survey of India and material received from other institutions in India. A major collection of this family was received through the mopping survey of Meghalaya by G.S. Arora and party, 1975; J.K. Jonathan and party, 1979; S.B. Roy and party, 1979; A.R. Lahiri and party, 1988; M.S. Shishodia and party, 1990; R.K. Varshney and party, 1991; B.N. Das and party, 1991; and other collections of Zoological Survey of India made by Puri 1976; H.S. Rao, 1930; S.W. Kemp, 1914 & 1917. Gupta collection was also examined at Delhi University.

The family Vespidae is characterised by the following characters : antennae 13-segmented in male and 12-segmented in female; eyes emarginate; pronotum extending back to tegula, and mesopleurum without any oblique suture; wings longitudinally folded in repose (except in Masarinae and Stenogastrinae), fore wing with first discoidal cell elongate and longer than submedian cell, hind wing with an anal cell and enclosed cells; legs of normal proportions and without spines, trochanters not divided and trochantellus absent, middle tibiae with one or two apical spurs, tarsal claws toothed, bifid

or simple; thorax and gaster joined together by a long and slender or short petiole, the latter without any scales or nodes; gaster with spiracles on 1-7 segments and a sting without sheaths; male genitalia with characteristic spiniform parameres.

SYSTEMATICS

There are about 700 species of Vespidae known from the world and are classified under five subfamilies. In India, the family is represented by about 135 species/subspecies, 11 genera/subgenera under three subfamilies.

In Meghalaya, the Vespidae is represented by three subfamilies, viz., Stenogastrinae, Vespinae and Polistinae. The present work records 44 species/subspecies from this state under 8 genera and 7 subgenera.

The keys to the subfamilies, tribes, genera, subgenera, species and subspecies are provided for the identification of various taxa of this region. Illustrations of taxonomic terms used in the present work, distributional tables and maps are included for ready reference.

MATERIAL AND METHODS

Most wasps are found in tropical climate and only a few representatives are reported from temperate climate. The members of this family build nests of various shape, size and of variety of material. Each nest has a colony, where one and more females, males and several workers live together. These wasps could be collected by locating their nests in houses, trees, shrubs etc. They are active fliers and visit flowers for honey dew and nectar. They also fly over the ground surface in search of larvae and grubs. During such visits these wasps are caught by insect-net and preserved dry in paper envelopes. All Vespids are set, pinned and labelled in usual manner and stored in insect drawer/boxes for study purposes.

Male genitalia : The male genitalia shows variation in its various components, especially in the presence and absence of spine on paramere. The methodology for the extraction and mounting of male genitalia is as follows:

Genital capsule could be extracted after relaxing the specimen for about 24 to 48 hours. The genitalia is pulled out through the apical aperture with the help of a pair of forceps by applying pressure to the third and the following gastral segments. The genitalia and subgenital plate are left in 10% KOH solution over night or boiled in 10% KOH for 3-4 minutes. The genitalia is washed in distilled water to remove KOH and mounted on a slide after dehydration.

Abbreviations used in the text :

- Sex : M, F, W are used to cite male, female and worker sex of the taxa described.
- preocc : The name is preoccupied by an earlier author.
- n. comb. : The species was transferred to another genus for the first time by that author.
- Distr. : The place from where the species/subspecies was recorded is given.
- Misdet. : The name used is from an incorrect determination of some other species.

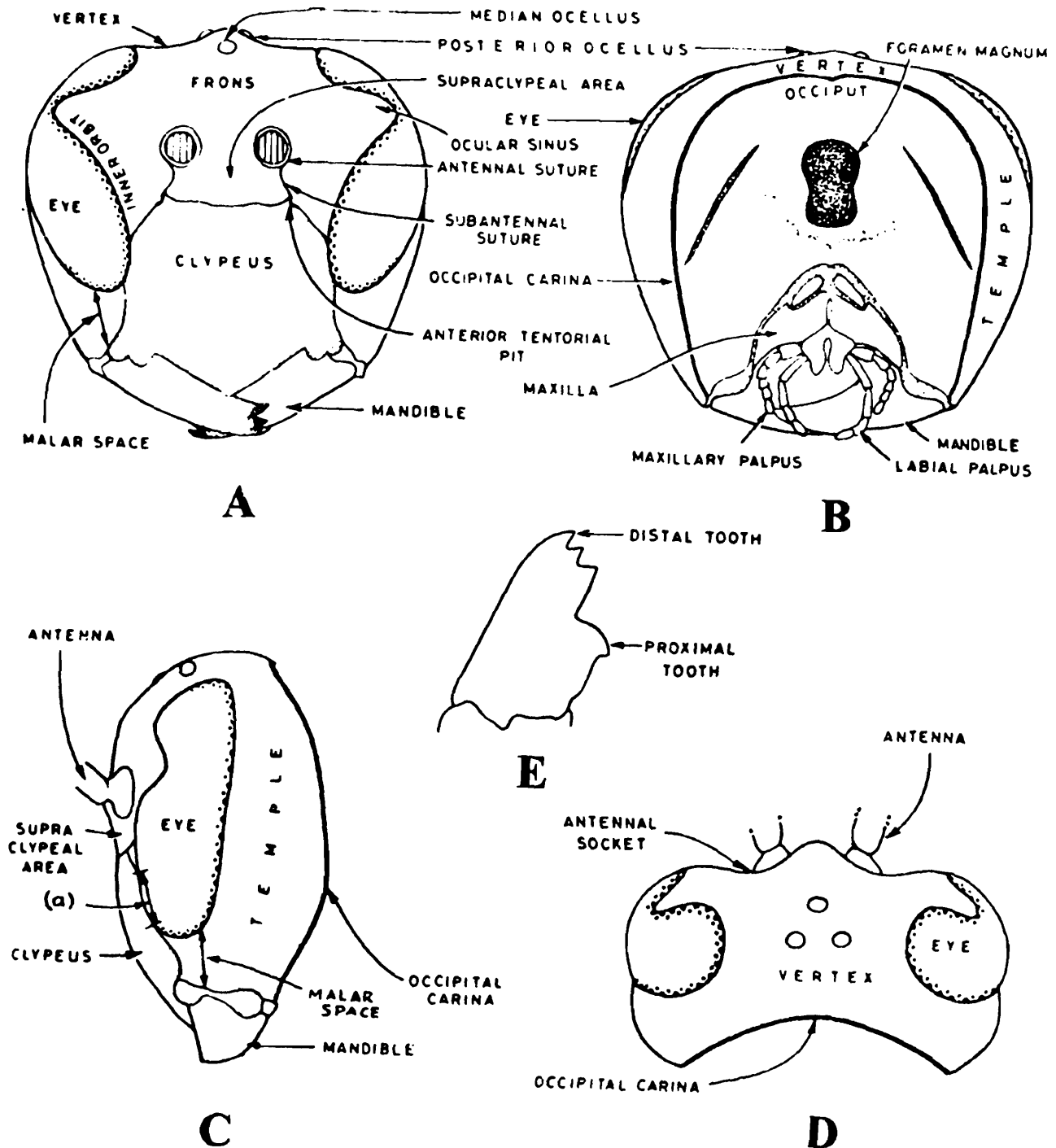


Figure 1. Structure of head of Vespidae : A, front view; B, posterior view; C, side view (a) lateral margin of clypeus that lies along inner eye margin; D, dorsal view; E, mandible (after Das and Gupta, 1989).

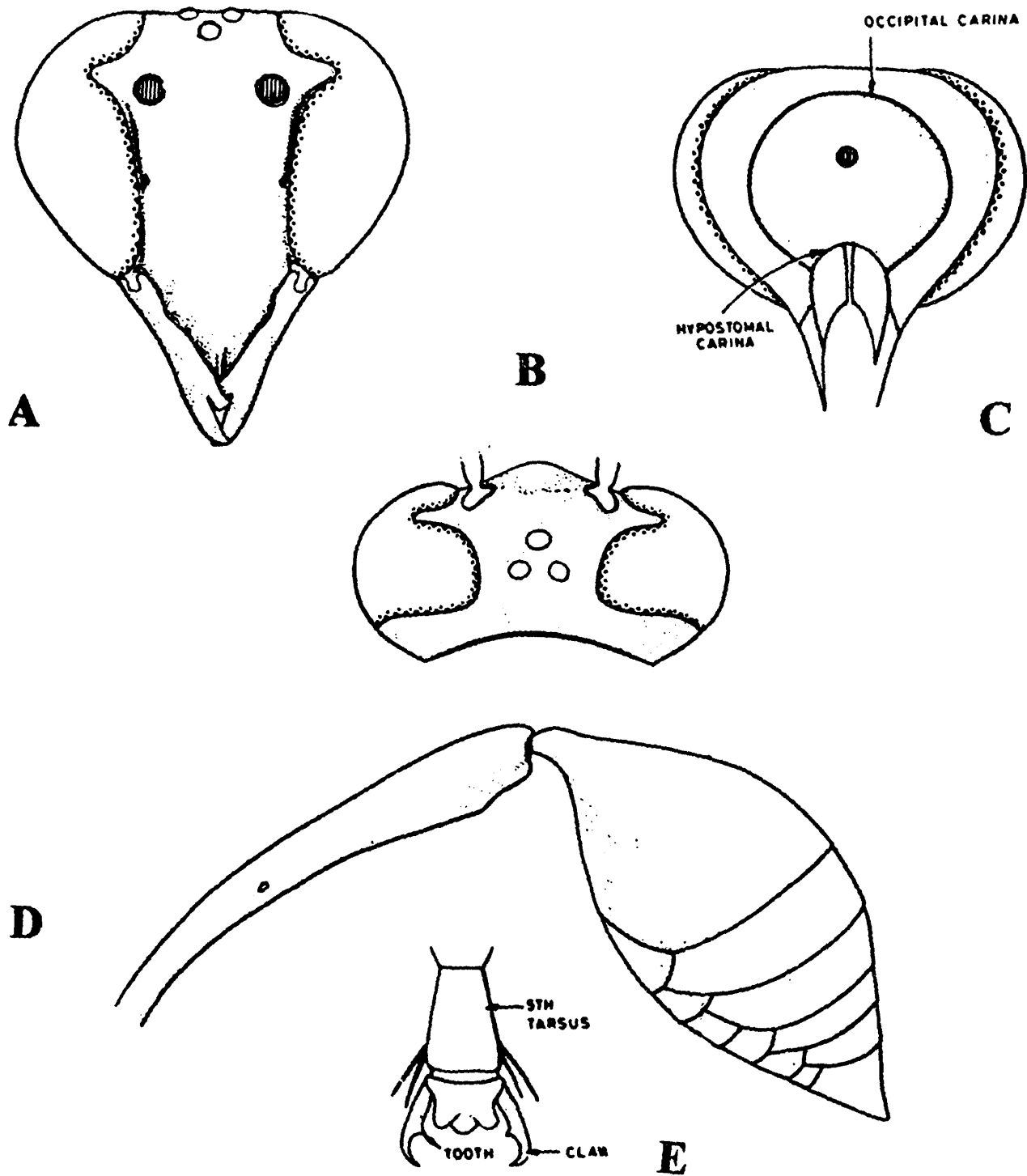


Figure 3. Structure of head, thorax, fifth tarsal segment and gaster of Stenogastrinae : A, head, front view; B, head, dorsal view; C, head, posterior view; D, gaster; E, fifth tarsal segment (after Das and Gupta, 1989).

- ex.** : Number of specimen/example(s).
cat. : The reference itself is a catalogue.
key. : A key is provided in the publication to identify the species.
syn. : The synonymy or taxonomic position of the species.
des. : The species is described or there is a descriptive note.
fig. : The species is illustrated in whole or in part.
tax. : A revision or the taxonomic position of the species is discussed.

TAXONOMIC TERMINOLOGY

The morphological terms used in the present work are mainly based on the works of Richards (1956, 1973), Sehgal (1963), van der Vecht (1941, 1975) and Das and Gupta (1989). The morphological terms used in the text are illustrated in figures 1, 2 and 3.

SYSTEMATIC ACCOUNT

Family VESPIDAE

1. Subfamily Stenogastrinae

1. Genus *Eustenogaster* van der Vecht, 1969

1. *scitula* (Bingham, 1897)

2. Genus *Parischnogaster* Schulthess, 1914

2. *mellyi* (Saussure, 1852)

2. Subfamily Polistinae

1. Tribe Polistini

3. Genus *Polistes* Latreille, 1802

1. Subgenus *Polistes* (*Nygmopolistes*) Richards, 1973

3. *tenebricosus sulcatus* Smith, 1852

2. Subgenus *Polistes* (*Megapolistes*) van der Vecht, 1968

4. *olivaceus* (de Geer, 1773)

5. *wattii* Cameron, 1900

6. *rothneyi rothneyi* Cameron, 1900

7. *rothneyi sikkimensis* van der Vecht, 1968
8. *rothneyi krombeini* van der Vecht, 1968
3. Subgenus *Polistes (Stenopolistes)* van der Vecht, 1972
 9. *khasianus* Cameron, 1900
 10. *nigritarsis* Cameron, 1900
4. Subgenus *Polistes (polistella)* Ashmead, 1904
 11. *ephippium* Cameron, 1900
 12. *lepcha* Cameron, 1900
 13. *adustus* Bingham, 1897
 14. *santoshae* Das and Gupta, 1989
 15. *similis* Das and Gupta, 1989
 16. *stigma tamula* (Fabricius, 1798)
 17. *sagittarius* Saussure, 1853
 18. *hoplitus* Saussure, 1853, n. comb.
2. Tribe Ropalidiini
 4. Genus *Ropalidia* Guérin, 1838
 5. Subgenus *Repalidia (Anthreneida)* White, 1841
 19. *marginata marginata* (Lepeletier, 1836)
 20. *santoshae* Das and Gupta, 1989
 21. *rufocollaris rufocollaris* (Cameron, 1900)
 22. *stigma stigma* (Smith, 1858)
 23. *stigma rufa* van der Vecht, 1941
 24. *hongkongensis juncta* van der Vecht, 1941
 25. *mathematica nigroplagiata* (Cameron, 1900)
 26. *sumatrae sumatrae* (Weber, 1801)
 27. *fasciata* (Fabricius, 1804)

6. Subgenus *Ropalidia* (*Ikarielia*) Dalla Torre, 1904

28. *scitula* (Bingham, 1897)

29. *flavopicta ornaticeps* (Cameron, 1900)

3. Tribe Polybiini

5. Genus *Parapolybia* Saussure, 1853

30. *indica indica* (Saussure, 1853)

31. *indica tinctipennis* (Cameron, 1900)

32. *indica fulvinerva* (Cameron, 1900)

33. *varia* (Fabricius, 1787)

34. *nodosa* van der Vecht, 1966

3. Subfamily Vespinae

6. Genus *Vespa* Linnaeus, 1758

7. Subgenus *Vespa* (*Vespa*) Linnaeus, 1758

35. *analis nigrans* Buysson, 1903

36. *basalis* Smith, 1852

37. *bicolor* Fabricius, 1787

38. *mandarinia magnifica* Smith, 1852

39. *mocsaryana* Buysson, 1905

40. *orientalis* Linnaeus, 1771

41. *tropica tropica* (Linnaeus, 1758)

42. *velutina auraria* Smith, 1852

7. Genus *Provespa* Ashmead, 1903

43. *anomala* (Saussure, 1853)

8. Genus *Vespula* Thomson, 1869

44. *koreensis stizoides* (Buysson, 1905)

Family VESPIDAE

Key to the Subfamilies of Vespidae

1. Wings not folded longitudinally when at rest. Tarsal claws with one tooth. Mandible elongate. Occipital carina either joining with or almost reaching near to hypostomal carina. Antennal sockets far apart, separated from the basal margin of clypeus by a long supraclypeal area. In male clypeus and mandible produced like a beak. Nervulus distinct. Second cubital cell rectangular. Thorax short, globular; first gastral segment petiolate, longer than rest of the gaster. .1. STENOGASTRINAE

Wings folded longitudinally when at rest. Tarsal claw simple, without tooth. Mandibles of normal shape. Occipital carina joining with or running towards the base of mandible. Antennal sockets not very far apart and separated from the basal margin of clypeus by short supraclypeal area. In male clypeus and mandible normal, not beak shaped. Nervulus short. First cubital cell larger than second cubital cell. Thorax normal. First gastral segment petiolate or subpetiolate or sessile, not much longer than the rest of the gaster . .2

2. Hind wing usually with an anal lobe. Hind coxa without a dorsal carina. Mesepimeron not completely or not at all separated from the mesepisternum. Dorsal episternal groove and epicnemial carina present or absent. Gaster petiolate or subpetiolate. 1st tergite gradually curving from base to apex. Occipital carina always present. Apical margin of clypeus in female gradually tapering into a sharp or blunt tooth. Apical margin of postscutellum not at all or weakly produced in the middle of propodeum at base. Propodeum transversely rugose and curved at sides, its apical orifice elongate. Mandibles smaller, not expanded apically. Male antenna with a hook-like bend at apex. Smaller, more slender species with nest consisting of a single horizontal or vertical naked comb that is not enclosed by papery envelopes (*Ropalidia* has species which may build an envelope round the comb; some species have more than one comb) 2. POLISTINAE

Hind wing without an anal lobe. Hind coxa with a dorsal carina on posterior surface. Mesepimeron completely separated from mesepisternum. Dorsal episternal groove and epicnemial carina always absent. Gaster sessile; 1st tergite anteriorly truncate with an anterior vertical face and a posterior horizontal face, the two making a right angle. Occipital carina absent dorsally, usually present laterally but may or may not reach base of mandible. Apical margin of clypeus broadly truncate or emarginate medially forming two lateral sharp or blunt lobes. Apical margin of postscutellum produced in the middle forming a long triangular lobe in the basal part of propodeum. Propodeum almost vertical and without rugosities, with a circular apical orifice. Mandibles large with an expanded apical margin. Male antenna straight apically, without a hook-like bend. Larger, stouter species with nest consisting of several combs on a horizontal plane and wrapped by a papery envelope. 3. VESPINAE

1. Subfamily STENOGASTRINAE

The Stenogastrinae, a primitive group of wasps, are occupying an intermediate position between solitary Eumenidae and social Polistinae and Vespinae of family Vespidae. The members of this subfamily show diversity in social behavior from solitary to primitively social to eusocial

behavior. They build their nests in different forms with masticated vegetable fibres or soil particles on stones, leaves and bark of the trees. More than one female may be present in one nest. The adult wasps do not fold their wings when at rest. Bingham (1890) reported that the solitary nests are made by a single pair of the large size species, while the several members amongst the smaller species made the celled social nests in tier which are cylindrical or bell-like or hexagonal in shape.

The subfamily Stenogastrinae is represented by seven genera : *Liostenogaster* van der Vecht, 1969; *Eustenogaster* van der Vecht, 1969; *Parischnogaster* Schulthess, 1914; *Anischnogaster* van der Vecht, 1969; *Meischnogaster* van der Vecht, 1969; *Holischnogaster* van der Vecht, 1969 and *Stenogaster* Guérin, 1831. Of these, first three genera occur in Indian subregion. Only two genera, viz., *Eustenogaster* and *Parischnogaster* have been reported from Meghalaya (Das and Gupta, 1989).

Diagnostic characters : Body elongate; clypeus generally convex basally, but slightly depressed below middle and convex apically, apical margin of clypeus with a pointed tooth; in male clypeus and mandible produced like a beak; supraclypeal area very long; occipital carina joining or reaching near hypostomal carina; in female antenna 12-segmented and in male 13-segmented; pronotal carina absent; pronotal fovea absent, apical margin of pronotum laterally with an oval area; scutellum without median groove, but median carina may or may not present; mesepimeron totally separated from mesepisternum; propodeum with or without distinct median groove and striations; middle and hind tibia with one long and one short tibial spur; tarsal claw unidentate; fore wing with 4 cubital cells; first cubital cell shorter than second cubital cell; nervulus distinct; first gastral segment petiolate, much longer than the rest of the gaster.

Key to the Genera of Stenogastrinae

1. Second segment of maxillary palpus more than 2x as long as third segment; hind wing with brownish narrow band on ventral margin at base; larger species. *Eustenogaster*
- Second segment of maxillary palpus less than 2x as long as third segment; hind wing without brownish narrow band; usually smaller species 2
2. Occipital carina meeting hypostomal carina; gastral petiole more than 1.5x as long as thorax; second gastral segment petiolate at base; mouth parts short, extended slightly beyond the tip of clypeus; antenna strongly swollen beyond seventh segment. *Parischnogaster*
- Occipital carina not meeting hypostomal carina; gastral petiole about 1.5x as long as thorax; second gastral segment not petiolate at base; mouth parts long, extended far beyond the tip of clypeus; antenna gradually swollen apically not recorded from Meghalaya *Liostenogaster*

1. Genus *Eustenogaster* van der Vecht

1969. *Eustenogaster* van der Vecht. *Nature and Life in S.E. Asia*, 6 : 165; Das and Gupta, 1989. *Oriental Ins. Monogr.*, 11 : 22.

Type-species : *Ischnogaster micans* Saussure, 1852.

This genus is represented by four species, viz., *scitula* (Bingham, 1897); *hauxwellii* (Bingham, 1894); *eximia* (Bingham, 1890) and *fraterna* (Bingham, 1897) from Indian subregion. Of these, *E. scitula* is the only species recorded here from the state of Meghalaya.

1. *Eustenogaster scitula* (Bingham)

1897. *Ischnogaster scitula* Bingham. *Fauna of British India, Hymenoptera*, 1 : 377, 379, F, key, des. Type : F, India : Assam : Margherita; Sikkim : Ranjit Valley (British Museum).
1989. *Eustenogaster scitula* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 24.

Diagnostic characters : Male : Body 16 mm long. Body except head shiny, covered with silvery pubescence. Head as wide as throx, with scattered short pubescence; clypeus 1.4x as long as wide, not continuous with inner eye margin; mandible smooth apically rounded with distinct subapical blunt tooth; supraclypeal area reticulate; interantennal space, frons, vertex upto posterior ocelli, pronotum on sides, mesoscutum, scutellum, mesepisternum above dorsal episternal groove and mesepimeron rugoso-reticulate. interocular distance at clypeus as long as at vertex; pronotum smooth in the middle; mesepisternum below dorsal episternal groove deeply punctured; postscutellum, dorsal and ventral metapleuron and propodeum with fine punctures; dense short golden pubescence present on tibia and tarsi of all legs; gaster spindle-shaped, with fine punctures, densely covered with long pubescence; subgenital plate with a few scattered punctures, longer than broad at base; gaster widest at second segment.

Body colour variable, largely black with yellow markings. Yellow are : a mark on clypeus, pronotum with a band, interrupted in the middle on upper margin, a large ventral mark on mesepisternum, fore tibia below, third gastral segment basally on each side.

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 1 male, 13.iv. 1966, coll. Dauli Ram (Gupta collection).

Distribution : India : Meghalaya (Jaintia Hills), Assam, Sikkim. Elsewhere : Burma and Thailand.

Remarks : This species is readily distinguished by having gaster widest at second segment and clypeus not continuous with inner eye margin. Propodeum entirely black (Das and Gupta, 1989).

2. Genus *Parischnogaster* Schulthess

1914. *Parischnogaster* Schulthess. *Zool. Jahrb. Syst.*, 37 : 255; Das and Gupta, 1989. *Oriental Ins. Monogr.*, 11 : 20.
- Type-species : *Ischnogaster mellyi* Saussure, 1852.

This genus is represented only by a single species, *P. mellyi* (Saussure, 1852) in Indian subregion.

2. *Parischnogaster mellyi* (Saussure)

1852. *Ischnogaster mellyi* Saussure. *Ann. Soc. Ent. France*, 2 (10) : 25, fig. Type : ?, Java (Geneva Museum).
1989. *Parischnogaster mellyi* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 21.

Diagnostic characters : Female : Body 10 mm long; Body narrow, covered with fine silvery pubescence. Head wider than thorax; clypeus slightly longer than wide, with a pointed tooth apically; supra-clypeal area, interantennal space, frons, vertex upto posterior ocelli, mesoscutum, scutellum, mesopleuron rugoso-reticulate; inner orbit, ocular sinus generally smooth; interocular distance on vertex as long as clypeus; postscutellum with a few punctures in the middle; propodeum with irregular narrow striations and distinct median groove; gastral petiole long, strongly swollen towards apex and slightly narrowed at apex; gaster widest at both second and third segment.

Head and thorax in general dark brown. Antenna, pronotum, mesopleuron, metapleuron (except the yellow marks), sides of propodeum, legs (except the yellow marks), gaster reddish-brown. Yellow are : clypeus at apex, mandible, antennal scape, a band on pronotum, three spots on mesoscutum, two circular marks on scutellum, postscutellum at base, two marks on mesepisternum, a mark on dorsal metapleuron, two marks at the apex of propodeum, fore coxa in front, femora apically, a line below fore and middle tibiae, a short line on gastral petiole on side at apex, another line on the side of second gastral tergite and elongate mark on either side of third to fifth tergite, second sternite on sides and third to sixth sternites largely.

Material examined : No material of this species was available for study from Meghalaya.

Distribution : India : Meghalaya (District not known), Assam, Sikkim. Elsewhere : Burma, Indonesia, Malaysia, Thailand, Vietnam.

Remarks : Das and Gupta (1989) give a detailed account of this species.

2. Subfamily POLISTINAE

These are commonly called paper wasps. The nests consist of a single comb which is not enclosed in a paper envelope. In most of the Temperate zone species the nests are annual each being founded by one or more overwintering females. One of the females becomes dominant and is the only one to lay eggs.

The normal larval food consists of dismembered caterpillars. Some species of *Polistes* exert considerable predator pressure on economically important insects, such as, the tobacco horn worm and cotton ball worm. In an attempt to utilize the wasps as a biological control agent, shelters are sometimes placed in cultivated fields to afford nesting sites to founding females (Krombein and Burks, 1979).

Diagnostic characters : Body usually elongate; apical margin of clypeus tapering into a sharp or blunt tooth. Occipital carina always present; apical margin of postscutellum truncate to weakly produced in the middle at the base of propodeum; mesepimeron not completely or not at all separated from mesepisternum. Hind wing usually with an anal lobe; 1st gastral segment petiolate or subpetiolate.

Key to the Tribes of Polistinae

1. First gastral segment always petiolate and usually strongly swollen apically; pronotal lobe apically in front of tegula without a carina; dorsal episternal groove always absent; subtegular area basally in front of pronotal lobe not margined with a carina; second gastral tergite and sternite usually fused Ropalidiini

First gastral segment either petiolate or subpetiolate; pronotal lobe apically in front of tegula with a distinct carina; dorsal episternal groove either present or absent; subtegular area basally in front of pronotal lobe margined with distinct carina, second gastral tergite and sternite never fused .2

2. First gastral segment subpetiolate; shorter than second segment; muscle slit of propodeum long and narrow; subdiscoideus joins postnervulus at or close to middle; mesepisternum with or without epicnemial carina; apical margin of postscutellum usually almost truncate Polistini

First gastral segment petiolate; not shorter than second segment; muscle slit of propodeum short and wider; subdiscoideus joins postnervulus below middle; mesepisternum without epicnemial carina; apical margin of postscutellum weakly produced in the middle just at the base of propodeum .Polybiini

1. Tribe Polistini

This tribe is represented by a single genus in Indian subregion.

3. Genus *Polistes* Latreille

This Genus is subdivided into eleven subgenera (Richards, 1973, 1978). Of these, six, viz., *Polistes (Polistes)* Latreille, 1802; *P. (Gyrostoma)* Kirby and Spence, 1826; *P. (Nygmpolistes)* Richards, 1973; *P. (Megapolistes)* van der Vecht, 1968; *P. (Stenopolistes)* van der Vecht, 1972 and *P. (Polistella)* Ashmead, 1904 are represented in Indian subregion. In Meghalaya four subgenera have been reported. These can be recognised by the following key.

Key to the Subgenera of *Polistes*

1. Pronotal fovea present; clypeus not extending far beyond the anterior tentorial pits; anal lobes hind wing large and separated from the rest of the wing membrane by a smooth incision .2

Pronotal fovea absent; clypeus extending far beyond the anterior tentorial pits; anal lobe of hind wing more or less reduced .3

2. Mesepisternum without epicnemial carina. Subgenital plate, in males, not squarish, narrow at apex, without apophyses, digitus long and narrow . *Nygmpolistes*

Mesepisternum with distinct epicnemial carina. Subgenital plate, in males, squarish, with a pair of apophyses; digitus basally wide . *Megapolistes*

3. Anal lobe of hind wing much reduced, at apex rounded, separated from the rest of the wing membrane by a wide gap. Interocellar distance as long as, or less than the diameter of posterior ocellus. First gastral sternite without a well developed margin at base . *Stenopolistes*

Anal lobe of hind wing large, apex nearly straight and separated from the rest of the wing membrane by a small gap. Interocellar distance more than the diameter of posterior ocellus. First gastral sternite usually bounded by well developed margin at base . *Polistella*

1. Subgenus *Polistes* (*Nygmopolistes*) Richards

1973. *Polistes* (*Nygmopolistes*) Richards. *Rev. Bras. Ent.*, 17 (13) : 91, 93, 98, 99.

Type-species : *Polistes sulcatus* Smith, 1852 (= *Polistes rugifrons* Cameron, 1900).

This is a small subgenus, represented by a single species, viz., *P. (N.) tenebricosus* Lapeletier, 1886 in whole of Oriental region. Two subspecies, viz., *tenebricosus tenebricosus* Lapeletier 1886 and *tenebricosus sulcatus* Smith 1852 are known from Oriental region. Of these, only one subspecies *tenebricosus sulcatus* is reported here from the state of Meghalaya.

3. *Polistes* (*Nygmopolistes*) *tenebricosus sulcatus* Smith

1852. *Polistes sulcatus* Smith. *Trans. Ent. Soc. London*, (2) 2 : 38, M, F, des. Type : Female, China : Near Ning-po-foo (British Museum).

1989. *Polistes* (*Nygmopolistes*) *tenebricosus sulcatus* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 49.

Diagnostic characters : Female. antennae black, its first, second and third segments apically reddish. Head reddish, with a black mark on frons and vertex. Pronotum reddish with a black mark below. Gaster reddish, its basal half of first tergite, second tergite at base, first, second and third sternites (except for two reddish marks on both sides), black. Legs in general black, except apical half of fore femur, fore tibia, middle and hind tibiae apically, all tarsi, reddish, Wings wholly yellowish.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Khasi and East Garo Hills.), Arunachal Pradesh, Assam, Kashmir, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : China, Japan, Java, Nepal.

Remarks : This species resembles with *P. (Polistella) sagittarius* Saussure, 1853, but can be differentiated by the presence of pronotal foveae. This subspecies is mainly found in the hilly area.

2. Subgenus *Polistes* (*Megapolistes*) van der Vecht

1968. *Polistes* (*Megapolistes*) van der Vecht. *Bijdr. Dierk.*, 38 : 97.

Type- species : *Vespa olivacea* (De Geer, 1773).

This is a moderate size subgenus and widely distributed in Oriental region. Three species, viz., *olivaceus* (De Geer, 1773); *wattii* Cameron, 1900 and *rothneyi* Cameron, 1900 known from Indian

region are also reported from Meghalaya. These can be recognised by the following key (Das and Gupta, 1989 : 51).

Key to the Species of *Polistes* (*Megapolistes*)

1. Transverse striations of propodeum strong; metapleuron ventrally with distinct punctures. In males apophyses longer than wide, with sparse pubescence. *rothneyi*

Transverse striations of propodeum weak; metapleuron ventrally impunctate or with scattered fine punctures. .2

2. Occipital carina in female incomplete. In males apophyses flattened and spatulate at apex, shiny and without pubescence *.olivaceus*

Occipital carina in female complete. In males apophyses long and narrow with dense pubescence *wattii*

4. *Polistes* (*Megapolistes*) *olivaceus* (De Geer)

1773. *Vespa olivacea* De Geer. *Mem. Hist. Insect.*, 3 : 582, fig. Type : Sex ? (Stockholm Museum).

1787. *Vespa hebraea* Fabricius. *Mant. Ins.*, 1 : 292.

1897. *Polistes hebraeus* : Bingham. *Fauna British India, Hymenoptera*, 1 : 398, F, W, des, fig., syn.

1989. *Polistes* (*Megapolistes*) *olivaceus* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 52.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 8-13.v. 1979, 2 exs., coll. J. K. Jonathan and party and 1 ex., coll. S.B. Roy and party; Narangiri, 1 ex., 25.v. 1990, coll. M.S. Shishodia and party; South Garo Hills : Nongwalbibra, 1 ex., 1.x. 1991, coll. R.K. Varshney and party.

Distribution : India : Meghalaya (East and South Garo Hills.), Arunachal Pradesh, Assam, Himachal Pradesh, Kashmir, Karnataka, Madhya Pradesh, Manipur, Sikkim, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Widely distributed in Oriental region and Oceanic islands. Richards (1978) recorded a few specimens from Australia and New Zealand.

Remarks : This species is very close to *P. wattii cameron*, 1900 It can be distinguished by the characters given in the key. This species has been recorded for the first time from Meghalaya.

5. *Polistes* (*Megapolistes*) *wattii* Cameron

1900. *Polistes wattii* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 416, F, des. Type : F, India : West Bengal (British and Oxford Museums).

1989. *Polistes* (*Megapolistes*) *wattii* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 53.

Distribution : India (Meghalaya : East Khasi Hills), Delhi, Gujarat, Himachal Pradesh, Orissa, Punjab, Uttar Pradesh, West Bengal. Elsewhere : China, Iran, Pakistan.

Remarks : This species is recognised by uniformly yellow colour of head and thorax. Occipital carina in female complete; apophyses of male subgenital plate long and narrow, not flattened at apex and densely pubescent. No material of this species was available for study from Meghalaya.

***Polistes (Megapolistes) rothneyi* Cameron**

Das and Gupta (1989) reported five subspecies, viz., *rothneyi rothneyi* Cameron, 1900; *rothneyi sikkimensis* van der Vecht., 1968; *rothneyi krombeini* van der Vecht.; *rothneyi carletoni* van der Vecht, 1968 and *rothneyi vechti* Das and Gupta, 1989 from India. Of these, three subspecies are known from Meghalaya. These can be distinguished by the following key.

Key of the Subspecies of *rothneyi*

1. Pronotum partly yellow and partly reddish; thorax predominantly marked with yellow spots; (legs partly yellow and partly black). *.rothneyi krombeini*
- Pronotum reddish; thorax predominantly marked with red. 2
2. Propodeum black or without narrow yellow marks. First gastral tergite reddish with black base and a median transverse black line; mesepisternum usually with one large reddish mark above dorsal episternal groove. .. *.rothneyi rothneyi*
- Propodeum black with four reddish or yellow marks. First gastral tergite black with broad yellowish apical band; mesepisternum with three reddish mark. *.rothneyi sikkimensis*

6. *Polistes (Megapolistes) rothneyi rothneyi* Cameron

1900. *Polistes rothneyi* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 410, M, des. Type : M, India : West Bengal : Barrackpore (Oxford Museum).

1989. *Polistes (Megapolistes) rothneyi rothneyi* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 56.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1 female, 14.x. 1976, coll. Puri; 1 female, Khasi Hills, no data.

Distribusiton : India : Meghalaya (East Khasi Hill), Delhi, Uttar Pradesh, West Bengal. Elsewhere : Nepal.

7. *Polistes (Megapolistes) rothneyi sikkimensis* van der Vecht

1968. *Polistes (Megapolistes) rothneyi sikkimensis* van der Vecht. *Bijdr. Dierk.*, 38 : 100, 102, F, key, des., distr. Type : F, India : Sikkim : Ranjit Valley (British Museum).

1989. *Polistes (Megapolistes) rothneyi sikkimensis* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 57.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Assam, Bihar, Sikkim, West Bengal. Elsewhere : Nepal.

8. *Polistes (Megapolistes) rothneyi krombeini* van der Vecht

1968. *Polistes (Megapolistes) rothneyi krombeini* van der Vecht. *Bijdr. Dierk.*, 38 : 100, F, key, des., fig. Type : F. India : Tamil Nadu (Washington Museum); Das and Gupta, 1989. *Oriental Ins. Monogr.*, 11 : 59.

Distribution : India : Meghalaya (East Khasi Hills), Karnataka, Tamil Nadu, Uttar Pradesh.

Remarks : This subspecies is easily distinguished by having pronotum partly yellow and reddish; thorax marked with yellow and legs marked with yellow and black. No material was available for study from Meghalaya. Das and Gupta (1989) recorded the subspecies from Shillong in Meghalaya, in addition to Karnataka and Tamil Nadu states.

3. Subgenus *Polistes (Stenopolistes)* van der Vecht

1972. *Polistes (Stenopolistes)* van der Vecht. Entomological Essays to commemorate the retirement of Professor K. Yasumatsu, p. 89, 101.

Type-species : *Polistes lateritius* Smith, 1857.

Das and Gupta (1989) reported three species, viz., *khasianus* Cameron, 1900; *nigritarsis* Cameron, 1900 and *delhiensis* Das and Gupta, 1989 from India. Of these, *khasianus* and *nigritarsis* have been reported from Meghalaya. These two species recognised by the following key.

Key to the Species of *Polistes (Stenopolistes)*

1. Fore wing without subapical fuscous cloud; first gastral tergite distinctly angled at base; clypeus distinctly longer than wide; in female lateral margin of clypeus along inner eye margin slightly shorter than malar space; propodeum with moderately defined lateral edges; apical four joints of hind tarsus pale yellow. *.khasianus*
2. Fore wing with a subapical fuscous cloud; first gastral tergite not angled at base; clypeus about as wide as long; in female lateral margin of clypeus along inner eye margin as long as malar space; propodeum without lateral edges; hind tarsus almost black. *.nigritarsis*

9. *Polistes (Stenopolistes) khasianus* Cameron

1900. *Polistes khasianus* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 413, F, des. Type : F, India : Meghalaya : Khasi Hills (Oxford Museum).
1989. *Polistes (Stenopolistes) khasianus* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 62.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1358 m, 2 exs., 23-26.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Khasi Hills), Haryana.

Remarks : This species can easily be recognised by the characters mentioned in the key. Das and Gupta (1989) gave a detailed account of the species.

10. *Polistes (Stenopolistes) nigratarsis* Cameron

1900. *Polistes nigratarsis* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 413, M, des. Type : M, India : West Bengal : Barrackpore (Oxford Museum).

1989. *Polistes (Stenopolistes) nigratarsis* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 64.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal.

Remarks : No material of this species was available for study from Meghalaya. Yamane and Yamane (1979) reported this species from Meghalaya. Das and Gupta (1989) gave detailed account of this species.

4. Subgenus *Polistes (Polistella)* Ashmead

1904. *Polistella* Ashmead. *Proc. U.S. Natl. Mus.*, 28 : 133.

Type- species : *Polistes manilensis* Saussure, 1853.

Das and Gupta (1989) reported twelve species, viz., *ephippium* Cameron, 1900; *dawnae* Dover and Rao, 1922; *lepcha* Cameron 1900; *adustus* Bingham, 1897; *santoshae* Das and Gupta, 1989; *similis* Das and Gupta, 1989; *stigma* (Fabricius, 1793); *latinis* Das and Gupta, 1989; *strigosus* Bequaert, 1940; *sagittarius* Saussure, 1853; *assamensis* Bingham, 1897 and *maculipennis* Saussure, 1853 from Indian subregion. *Polistes hopitus* Saussure, 1853 which was referred by Das and Gupta (1989) to subgenus *Polistes (Nygmpolistes)* is also belonged to *polistes (Polistella)*, because of the absence of pronotal fovea. Of these, eight species are reported from Meghalaya and these may be identified by the following key.

Key to the Species of *Polistes (Polistella)*

1. Gaster black with reddish-brown or red or yellow markings. .2
 Gaster coloured other than black. .6
2. First and apical gastral segments reddish. *ephippium*
 Gaster with red or yellow apical bands. .3
3. Second gastral sternite angular at base, propodeum with sharp lateral edges .4
 Second gastral sternite rounded at base, propodeum with rounded lateral edges .5
4. Apical margin of first and fourth gastral tergites with red band; legs completely black. In males subgenital plate without central tubercle, apical antennal segment about as long as twelfth segment. *lepcha*
 Apical margin of first to fifth gastral tergites with broad red band; legs not completely black. In males subgenital plate with central tubercle; apical antennal segment 1.5x as long as twelfth segment *adustus*

5. Propodeum shiny and with sharp striations; postscutellum with a carina at base. .*santoshae*
 Propodeum dull and with weak striations; postscutellum without a carina at base .*similis*
6. Fore wing with subapical fuscous cloud; median groove of propodeum shallow with fine striations; first gastral sternite without distinct margin as base. Tergite 2 and 3 with small basal spots; tergites 1,3 and 4 extensively yellow .*stigma tamula*
 Fore wing without subapical fuscous cloud; median groove of propodeum deep with strong transverse striations; first gastral sternite with distinct margin at base . .7
7. Larger species about 23 mm long; thorax strongly rugoso-punctate. *hoplitus*
 small species about 16-18 mm long; thorax weakly rugose appears to be granulose in certain lights. .*sagittarius*

11. *Polistes (Polistella) ephippium* Cameron

1900. *Polistes ephippium* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 415, des. Type : F, India : Meghalaya : Khasi Hills (British Museum).
1989. *Polistes (Polistella) ephippium* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 67.

Material examined : No specimen of this species was available for study from Meghalaya. The species is known by original description given by Cameron, 1900 from Khasi Hills in Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is easily recognised by having mandible, interantennal space, inner orbit upto lower half of ocular sinus, temple, scutellum, postscutellum, sides of propodeum, first and apical gastral segments, reddish.

12. *Polistes (Polistella) lepcha* Cameron

1900. *Polistes khasianus* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 415, F, des. Type : F, India : Meghalaya : Khasi Hills (British & Oxford Museums). Name preocc. by *khasianus* Cameron, 1900 : 413.
1900. *Polistes lepcha* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 506. New name.
1989. *Polistes (Polistella) lepcha* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 69.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1358 m, 2 females, 9.v. 1975, coll. G.S. Arora and party; Umtyngar, 1800 m, 1 ex., 21. ix. 1991, coll. R.K. Varshney and party.

Distribution : India : Meghalaya (East Khasi Hills), Haryana, Manipur.

Remarks : This species is distinguished by having apical margin of first and fourth gastral tergites with red band. This species is close to *adustus* Bingham, 1897, but can be differentiated by not having red bands on second and third gastral tergites.

13. *Polistes (Polistella) adustus* Bingham

1897. *Polistes adustus* Bingham. *Fauna British India, Hymenoptera*, 1 : 397, F, key, des. Type : F, India : Sikkim (British Museum).

1989. *Polistes (Polistella) adustus* : Das and Gupta, *Oriental Ins. Monogr.*, 11 : 70.

Distribution : India : Meghalaya (East Khasi Hills), Delhi, Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal. Elsewhere : Nepal.

Remarks : This species is very close to *lepcha* Cameron, 1900 and *similis* Das and Gupta, 1989, but can be distinguished by having angular second gastral sternite at base and propodeum with sharp lateral edge (Das and Gupta, 1989).

14. *Polistes (Polistella) santoshae* Das and Gupta.

1989. *Polistes (Polisella) santoshae* Das and Gupta. *Oriental Ins. Monogr.*, 11 : 72.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1524 m, 1 female, no date of collection given, coll. T. La Touche.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Nepal.

Remarks : This species is very close to *adustus* Bingham, 1897, but differs by having head wider than high; clypeus as wide as long; temple wider than eye in profile; postscutellum with a carina at base; propodeum with round lateral edges, its surface shiny with sharp transverse striations.

15. *Polistes (Polistella) similis* Das and Gupta

1989. *Polistes (Polistella) similis* Das and Gupta, *Oriental Ins. Monogr.*, 11 : 72.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1, female, date not given, coll. T. La Touche and 2 females, no further data.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species shows affinities with *santoshae* Das and Gupta 1989 and *adustus* Bingham, 1897. However, this species can be distinguished by having round lateral edges of propodeum and second gastral tergite not angulated basally.

16. *Polistes (Polistella) stigma tamula* (Fabricius)

1798. *Vespa tamula* Fabricius. *Ent. Syst. Suppl.*, : P. 263, F, Des. Type : F, "in India Orientali, Dom Daldorff" (Kiel Museum).

1989. *Polistes (Polistella) stigma tamula* : Das and Gupta, *Oriental Ins. Monogr.*, 11 : 76.

Material examined : India : Meghalaya : West Garo Hills : Kherapara, 1 ex., 24.iv.1991, coll. B.N. Das and party.

Distribution : India : Meghalaya (West Garo Hills), Delhi, Himachal Pradesh, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Aru Island, Burma, Ceram, China, Indonesia, Malaysia, Nepal, Philippines, Sri Lanka, Taiwan, Thailand.

Remarks : This subspecies has been recorded here for the first time from Garo Hill in Meghalaya state.

This subspecies is conspicuous and separable from all other subspecies by the extensive yellow areas of the gastral segments 3 and 4; mesopleurum with ventral yellow marks (Petersen, 1987).

17. *Polistes (Polistella) sagittarius* Saussure

1853. *Polistes sagittarius* Saussure, *Études Famille Vespides*, 2 : 56, F, des. Type : F, China. "Indes Orientales" (Geneva Museum).

1989. *Polistes (Polistella) sagittarius* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 82.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 1 ex., 2.v. 1979, coll. J.K. Jonathan and party; East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East and West Garo Hills), Assam, Delhi, Himachal Pradesh, Manipur, Nagaland, Tripura, Uttar Pradesh and West Bengal. Elsewhere : Burma, China, Greece, Hong-Kong, Malaya, Nepal, Sulawesi, Thailand.

Remarks : This species has been reported for the first time from Meghalaya.

18. *Polistes (Polistella) hoplitus* Saussure, n. comb.

1853. *Polistes hoptitus* Saussure. *Études Famille Vespides*, 2 : 55, F, des. Type : F, "Indes Orientales" (Geneva Museum).

1897. *Polistes hopites* : Bingham. *Fauna British India, Hymenoptera*, 1 : 395, F, des.

1989. *Polistes (Nygmopolistes) tenebricosus hoplitus* : Das and Gupta, *Oriental Ins. Monogr.*, 11 : 50.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979. coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Burma, China, Indonesia.

Remarks : This species has been recorded for the first time from Meghalaya and also form a new combination with *Polistes (Polistella)*. This species resembles *Polistes (Polistella) sagittarius* Saussure, 1853, but can be differentiated by having body comparatively larger in size and thorax strongly rugoso-punctate.

2. Tribe Ropalidiini

This tribe is represented by a single genus, *Ropalidia* Guérin, 1838 (= *Icaria* Saussure, 1853), which is widely distributed in the tropical parts of the Old World.

4. Genus *Ropalidia* Guérin

This genus is subdivided into five subgenera, viz., *Ropalidia* (*Anthreneida*) White, 1841; *R. (Icarielia)* Dalla Torre, 1904; *R. (Paraicaria)* Gribodo, 1892; *R. (Polistratus)* Cameron, 1900 and *R. (Ropalidia)* Guérin, 1838. Of these, first three subgenera occur in Indian subregion. In the state of Meghalaya only two subgenera, viz., *R. (Anthreneida)* and *R. (Icarielia)* have been reported (Das and Gupta, 1989). A key to the subgenera of *Ropalidia* is given below:

Key to the Subgenera of *Ropalidia*

1. Mesopleuron with distinct epicnemial carina	Subgenus <i>Anthreneida</i>
- Mesopleuron without an epicnemial carina	Subgenus <i>Icarielia</i>

5. Subgenus *Ropalidia* (*Anthreneida*) White

1841. *Anthreneida* White. *Ann. Mag. Nat. Hist.*, (1) 7 : 321.

Type-species : *Vespa sumatrae* Weber, 1801 (= *Anthreneida coronata* White, 1841).

This is a large subgenus, widely distributed in the Oriental, Wallacea and Australian regions. Das and Gupta (1989) reported 22 species from Indian subregion. From the state of Meghalaya, seven species/subspecies have been recorded here and these can be distinguished by the following key.

Key to the Species and Subspecies of *Ropalidia* (*Anthreneida*)

1. Propodeum at base with a pair of carinae. (Head wider than thorax in front of tegulae; second gastral tergite reddish-brown with narrow yellow marking. In males clypeus nearly as wide as long)	
	<i>.marginata marginata</i>
Propodeum without such carinae	.2
2. Second gastral tergite and sternite not fused	.3
- Second gastral tergite and sternite fused	.10
3. Median groove of propodeum deep and almost complete; petiole of gaster 1.7x as long as wide; scutellum with strong dense reticulate punctures.	<i>.santoshae</i>
Median groove of propodeum not so deep, obsolete at base; petiole of gaster more than 2 as long as wide	.4
4. Third antennal segment at least 3x as long as wide at apex; sides of second gastral tergite at base marked with yellow.	<i>.rufocollaris rufocollaris</i>
third antennal segment less than 3x as long as wide at apex; sides of second gastral tergite at base marked variously.	.5
5. Metapleuron smooth ventrally	.6

- Metapleuron punctate ventrally 7
6. Antennal scape with a yellow line below; interantennal space yellow; clypeus yellow at base; temple with a broad yellow line; yellow spots at the base of second gastral tergite and sternite large .*stigma stigma*
- Antennal scape without a yellow line below; interantennal space not yellow; clypeus reddish at base; temple with one short yellow line; yellow low spots at the base of second gastral tergite and sternite small or absent . . *stigma rufa*
7. metapleuron ventrally with few scattered and superficial punctures; gastral petiole 2.4x as long as wide, swollen apically and narrowed again at apex; temple about as wide as eye in profile .*hongkongensis.* 8
- Metapleuron ventrally with comparatively deep punctures; gastral petiole more than 2.5x as long as wide, not much narrowed again at apex; temple slightly narrower than eye in profile .*mathematica.* 9
8. Clypeus with deep close punctures at base; propodeum with strong striations, second gastral tergite with strong punctures at base. Not reported from India, including Meghalaya
hongkongensis hongkongensis
- Basal two-thirds of clypeus with fine punctures and apical one-third with a few scattered large punctures; propodeum finely closely striated .*hongkongensis juncta*
9. Two yellow marks on mesopleuron; scutellum yellow; second gastral tergite with large yellow marks at base; broad yellow mark on propodeum on sides. Not reported from India, including Meghalaya. *mathematica mathematica*
- No yellow mark on mesopleuron. scutellum not yellow; yellow mark on second gastral tergite at base small and that on the sides of propodeum reduced. *mathematica nigroplagiata*
10. Suture between second gastral tergite and sternite distinctly visible all along its course; ocellocular distance 3x as long as interocellar distance. Radial cell dark-brown. (Clypeus with broad yellow band at apex and mandible with a yellow spote at base) . *sumatrae sumatrae*
- Suture between second gastral tergite and sternite visible only at its basal 0.4; ocellocular distance 1.2-2.2x the interocellar distance. Fore wing at apex (including radial cell) broadly dark-brown. (Propodeum with narrow and uniform median groove; second gastral tergite petiolate at base and apically obliquely truncate). *fasciata*

19. *Ropalidia (Anthreneida) marginata marginata* (Lepeletier)

1793. *Vaspa ferruginea* Fabricius. *Ent. syst.*, 2 : 280, des. Type : F (Copenhagen Museum); preocc. by *Vespa ferruginea* Gmelin, 1790 and Oliver, 1791.
1836. *Epipona marginata* Lepeletier. *Hist. Nat. Ins. Hymenoptera*, 1 : 541, M, F, des. Type : ? (Loc. unknown).
1989. *Ropalidia (Anthreneida) marginata marginata* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 118.

Material examined : India : Meghalaya : West Garo Hills : Tura, Damalgiri, 1 ex., 21.iv. 1991, coll. B.N. Das and party; East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (West Garo Hills), Andhra Pradesh, Bihar, Gujarat, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Orissa, Punjab, Rajasthan, Tamil Nadu, West Bengal. Elsewhere : Burma, Ceram, Indo-China, Flores, Kalimantan, Malacca, Malaya, Pakistan, Sri Lanka, Sulawesi.

Remarks : This subspecies is different from another subspecies, viz., *marginata rufitarsis* van der Vecht, 1941 from Burma, in having second gastral tergite reddish-brown with a narrow yellow apical fascia: fore coxa yellow in front; scutellum and postscutellum with yellow marks. This is the first record of this subspecies from Meghalaya.

20. *Ropalidia (Anthreneida) santoshae* Das and Gupta

1989. *Ropalidia (Anthreneida) santoshae* Das and Gupta. *Oriental Ins. Monogr.*, 11 : 123, M, F, des. Type : M, India : Meghalaya : Shillong (Gupta collection).

Material examined : India : Meghalaya : East Khasi Hills : Shillong : Mawmluh, 1 male (Type), 14.x. 1975, coll. V.K. Gupta (Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Sikkim, West Bengal.

Remarks : This is a distinct species by having median groove of propodeum deep and almost complete; head and thorax with strong reticulate punctures and petiole of gaster 1.7x as long as wide.

21. *Ropalidia (Anthreneida) rufocollaris rufocollaris* (Cameron)

1900. *Icaria rufocollaris* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 497, F, des. Type : F, India : Meghalaya : Khasi Hills (British Museum).

1989. *Ropalidia (Anthreneida) rufocollaris rufocollaris* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 125.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Uttar Pradesh, Sikkim, Tripura, West Bengal. Elsewhere : Burma, Thailand, Tibet.

Remarks : This subspecies is mainly recognised from other members of this group in having a yellow mark at the base of second gastral tergite and propodeum black at sides. In males aedeagus is longer and narrower than any other species. No material of this subspecies was available for study from Meghalaya.

22. *Ropalidia (Anthreneida) stigma stigma* (Smith)

1858. *Polybia stigma* Smith. *J. Proc. Linn. Soc. Zool.*, 2 : 114, M. Type : M, Malaysia : Sarawak (Oxford Museum).

1989. *Ropalidia (Anthreneida) stigma stigma* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 127.

Material examined : India : Meghalaya : Ri-Bhoi : Nongpoh, 4 Males, 15. x. 1975, coll. V.K. Gupta (Gupta collection).

Distribution : India : Meghalaya (Ri-Bhoi), Assam, Bihar, Kerala, Madhya Pradesh, Maharashtra, Manipur, Orissa, Sikkim, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Burma, Indonesia, Indo- China, Malaysia, Philippines, Sri Lanka, Thailand.

Remarks : The species is chiefly recognised by having body reddish with black and yellow markings. Das and Gupta (1989) gave a detailed account of this species.

23. *Ropalidia (Anthreneida) stigma rufa* van der Vecht

1941. *Ropalidia stigma rufa* van der Vecht. *Treubia*, 18 (1) : 130, F, des. Type : F, India : Assam : Sadiya (Z.S.I. Calcutta).

1989. *Ropalidia (Anthreneida) stigma rufa* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 129.

Material examined : No material of this subspecies was available for our study from Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills), Assam. Elsewhere : Nepal, South China.

Remarks : This subspecies differs from *stigma stigma* (Smith, 1858) by having interantennal space, inner orbit below ocular sinus, temple, scutellum, mesopleuron and hind coxa reddish, not marked with yellow and by the characters given in the key (Das and Gupta, 1989).

24. *Ropalidia (Anthreneida) hongkongensis juncta* van der Vecht

1941. *Ropalidia hongkongensis juncta* van der Vecht. *Treubia*, 18 (1) : 141, M, F, des. Type : F, West Java : Tjiburial near "Buitenzorg" = Bogor (Leiden Museum).

1989. *Ropalidia (Anthreneida) hongkongensis juncta* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 132.

Distribution : India : Meghalaya (East Khasi Hills), Manipur. Elsewhere : Burma, Indonesia.

Remarks : No material of this subspecies was available for study from Meghalaya. van der Vecht (1941) reported this subspecies from Khasi Hills in Meghalaya. This subspecies is distinguished from *hongkongensis hongkongensis* (Saussure, 1853) by having clypeus finely punctate at basal two-third and with a few scattered punctures in apical one-third; propodeum finely closely striated.

25. *Ropalidia (Anthreneida) mathematica nigroplagiata* (Cameron)

1900. *Icaria nigroplagiata* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 487, F, des. Type : F, India : Meghalaya : Khasi Hills (Oxford Museum).

1989. *Ropalidia (Anthreneida) mathematica nigroplagiata* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 134.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh and Tripura.

Remarks : No material of this subspecies was available for study from Meghalaya. However, this subspecies can be differentiated from *mathematica mathematica* (Smith, 1960) by not having any yellow mark on mesopleuron and scutellum; yellow marks on second gastral tergite at base and on the sides of propodeum very much reduced.

26. *Ropalidia (Anthreneida) sumatrae sumatrae* (Weber)

1801. *Vaspa sumatrae* Weber. *Observ. Ent. Kiliae*, p. 103, des. Type : ? (? Berlin Museum).

1989. *Ropalidia (Anthreneida) sumatrae sumatrae* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 136.

Material examined : India : Meghalaya : West Garo Hills : Darangiri, 1 ex., 30.iv. 1979, coll. J.K. Jonathan and party; Tura, 1412 m, 1 ex., 2.v. 1979, 1 ex., 3.v. 1979, coll. J.K. Jonathan and party; East Garo Hills : Dainadubi, 340 m, 8-13.v. 1979, 3 exs., coll. J.K. Jonathan and party and 6 exs., coll. S.B. Roy and party; Darugiri, 400 m, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East and West Garo Hills), Assam. Elsewhere : Bangka Island, Burma, Indo-China, Malaysia, Sumatra, Thailand.

Remarks : This species shows a great degree of colour variation : yellow colour on clypeus, face, marks on propodeum, basal mark on second tergite; black areas on mesopleuron, propodeum, are more extensive in some specimens. This is new record of this subspecies from India.

27. *Ropalidia (Anthreneida) fasciata* (Fabricius)

1804. *Eumenes fasciata* Fabricius. *Syst. Piez.*, p. 290, des. Type : M?, Java (Copenhagen Museum).

1989. *Ropalidia (Anthreneida) fasciata* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 140.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 6 exs., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Arunachal Pradesh, Assam, Maharashtra, Sikkim, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Burma, Indonesia, Malaysia, Nepal, Ryukyu, South China, Philippines.

Remarks : This is the first record of this species from the state of Meghalaya.

6. Subgenus *Ropalidia (Icarielia)* Dalla Torre

1904. *Icarielia* Dalla Torre. *Genera Insectorum*, 19 : 72.

Type-species : *Icaria flavopicta* Smith, 1857.

1989. *Ropalidia (Icarielia)* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 148.

This is a small subgenus, represented in Indian subregion by 4 species, viz., *scitula* Bingham, 1897; *flavopicta* (Smith, 1857); *montana* (Carl, 1930) and *malaisei* van der Vecht, 1962. The first two species are reported from Meghalaya and these can be identified by the following key.

Key to the Species of *Ropalidia* (*Icarielia*)

1. Propodeum rugose to striate; mesoscutum usually without yellow lines. (Scutellum and postscutellum reddish-orange). *.scitula*
 Propodeum almost smooth; mesoscutum with or without yellow lateral lines. *.flavopicta.....2*
2. clypeus yellow with dark basal band, if entirely yellow, markings on vertex, temple and gastral petiole reduced; lateral lines on mesoscutum absent, yellow marks on frons and vertex reduced to spots. Not recorded from India *.flavopicta*
flavopicta
- Clypeus entirely yellow; mesoscutum, as a rule, with lateral short yellow lines; frons and vertex with yellow marks. *.flavopicta ornaticeps*

28. *Ropalidia* (*Icarielia*) *scitula* (Bingham)

1897. *Icaria scitula* Bingham. *Fauna British India, Hymenoptera*, 1 : 387, 392, W, key, des. Type : W, India : Sikkim : Ranjit Valley (British Museum).

1989. *Ropalidia* (*Icarielia*) *scitula* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 152.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 1 ex., 30.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (West Garo Hills), Sikkim, West Bengal. Elsewhere : Burma.

29. *Ropalidia* (*Icarielia*) *flavopicta ornaticeps* (Cameron)

1900. *Icaria ornaticeps* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 496, F, des. Type : F, India : Meghalaya : Khasi Hills (Oxford Museum).

1989. *Ropalidia* (*Icarielia*) *flavopicta ornaticeps* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 151.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Tripura. Elsewhere : Burma, Indo-China, Malaysia.

Remarks : No material of this subspecies was available for study from Meghalaya. This subspecies can be identified from its nominative subspecies by the characters mentioned in the key.

3. Tribe Polybiini

This tribe is represented by three genera, viz., *Parapolybia* Saussure, 1853; *Polybioides* Buysson, 1913 and *Belonogaster* Saussure, 1853 in India. Only one genus, viz., *Parapolybia* has been reported here from Meghalaya.

5. Genus *Parapolybia* Saussure

1853. *Parapolybia* Saussure. *Étude Famille Vespides*, 2 : 207.

Type- species : *Polybia* (*Parapolybia*) *indica* Saussure, 1853.

Three species, viz., *indica* (Saussure, 1853); *varia* (Fabricius, 1787) and *nodosa* van der Vecht, 1966 are distributed in India and these can be identified by the following key as given by Das and Gupta (1989).

Key to the Species of *Parapolybia*

1. Occipital carina complete, interocular distance more at clypeus than at vertex level; gastral petiole 1.3x as long as head width *.indica*
- Occipital carina incomplete; interocular distance at clypeus about as long as or shorter than at vertex level; gastral petiole shorter than head width .. 2
2. Median groove of propodeum shallow; second gastral tergite with yellow marked at base. *.varia*
- Median groove of propodeum wide; second gastral tergite without yellow marked at base *.nodosa*

***Parapolybia indica* (Saussure)**

Das and Gupta (1989) reported four subspecies from India and neighbouring countries. Of these, the following species, viz., *indica indica* (Saussure, 1853); *indica fulvinerva* (Cameron, 1900) and *indica tinctipennis* (Cameron, 1900) are known from Meghalaya. These can be distinguished by the following key.

Key to the Subspecies of *Parapolybia indica*

1. Second gastral tergite without yellow spot. *.fulvinerva*
- Second gastral tergite with yellow spots of variable size. .2
2. Gasteral petiole 1.3x as long as head width *indica*
- Gasteral petiole 2.8x as long as head width *.tinctipennis*

30. *Parapolybia indica indica* (Saussure)

1853. *Polybia indica* Saussure. *Étude Famille Vespides*, 2 : 207, F, des., fig. Type : F, China (Paris Museum).

1989. *Parapolybia indica indica* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 178.

Material examined : No material of the subspecies was available for study from Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills), Assam, West Bengal. Elsewhere : Burma, China, Indonesia, Japan, Korea.

Remarks : This subspecies is characterised by having second and the following gastral tergites with yellow spots.

31. *Parapolybia indica tinctipennis* (Cameron)

1900. *Icaria tinctipennis* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 503, F, des, Type : F, India : Meghalaya : Khasi Hills (Oxford Museum).

989. *Parapolybia indica tinctipennis* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 179.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1355 m, 1 female, 5.iv. 1966, coll. Dauli Ram, coll. No. T 171 (Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills), Assam.

32. *Parapolybia indica fulvinerva* (Cameron)

1900. *Icaria fulvinerva* Cameron. *Ann. Mag. Nat. Hist.*, (7) 6 : 504, F. Lectotype : F, India : Meghalaya : Khasi Hills (Oxford Museum).

1989. *Parapolybia indica fulvinerva* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 179.

Material examined : India : Meghalaya : West Khasi Hills : Nongstoin, 19 exs., 21. ix. 1988, 16 exs., 23.ix. 1988, 40 exs., 25.ix. 1988, coll. A.R. Lahiri and party.

Distribution : India : Meghalaya (West Khasi Hills).

Remarks : This subspecies is readily distinguished by having head, thorax and legs largely reddish-brown and covered with fine hairs. Clypeus, face, mandibles, frons, outer orbit, a line at the base of postscutellum and lateral marks on dorsal propodeum, yellow.

33. *Parapolybia varia* (Fabricius)

1787. *Vaspa varia* Fabricius. *Mant. Insect.*, 1 : 293, des. Type : China (Copenhagen Museum).

1989. *Parapolybia varia* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 180.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 2 exs., 30.iv. 1979, 2 exs., 2.v. 1979, coll. J.K. Jonathan and party; East Garo Hills : Darugiri, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East and West Garo Hills, East Khasi Hills), Arunachal Pradesh, Assam, Delhi, Himachal Pradesh, Manipur, Punjab, Sikkim, Uttar Pradesh and West Bengal. Elsewhere : Burma, China, Indonesia, Japan, Malaysia, Nepal, Philippines.

Remarks : This is a highly variable species, several colour variants have been identified from various localities (Das and Gupta, 1989).

34. *Parapolybia nodosa* van der Vecht

1966. *Parapolybia nodosa* van der Vecht. *Zool. Verh.*, 82 : 39, F, key, des., fig., distr. Type : F, Taiwan : Pilan (Leiden Museum).

1989. *Parapolybia nodosa* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 183.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1346 m, 1 female, 5.iv. 1966, coll. Dauli Ram; Shillong, Mawmluh, 19 males, 14.x. 1975, coll. V.K. Gupta; Ri-Bhoi : Nongpoh, 1 female, 15.x. 1975, coll. Mohan (all in Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills and Ri-Bhoi), Delhi, Haryana. Elsewhere : Burma, China, Nepal, Taiwan, Thailand.

Remarks : Das and Gupta (1989) gave a detailed account of this species.

3. Subfamily VESPINAE

This is morphologically the most specialized subfamily of the social wasps. Component species are commonly called hornets (those nesting above ground) and yellow jackets (those nesting usually subterraneously). The nests consist of several to many combs of hexagonal cells composed of paper; cells constructed early in the year may be used for several larvae in succession. The combs are usually enclosed in a paper envelope. The nests are annual, new queens and males being produced late in the summer or early in the fall; the newly fertilized queens overwinter and begin new nests in the spring. There are relatively a few precise records of the nests used to feed vespine larvae; apparently dismembered and masticated adult Diptera and honeybees are commonly used; the wasps may also obtain bits of flesh from fresh and decaying carcasses. Adult vespines feed on liquid foods, primarily nectar or honey; some species are known to prey upon adult honey bees, which they kill and extract nectar from the crop.

Diagnostic characters : Apical margin of clypeus broadly truncate or concave medially and emarginate laterally, ending in two rounded lateral lobes; mandibles short and wide; maxillary palps 6-segmented; labial palps 4-segmented; antenna 12-segmented in female and worker and 13-segmented in male; mesepimeron separated from mesepisternum by a suture; hind margin of postscutellum produced in the middle forming a long, triangular lobe wedged in the upper part of the propodeum; gaster subsessile, first tergite with a distinct edge or rounded angle between the anterior vertical and the posterior horizontal face.

This subfamily is represented by four genera, viz., *Vespa* Linnaeus, 1758; *Provespa* Ashmead, 1903; *Vespula* Thomson, 1869 and *Dolichovespula* Rohwer, 1916 from Indian subregion. Of these, the first three genera have been reported from Meghalaya. These can be distinguished by the following key.

Key to the Genera of Vespinae

1. Head small, with short vertex and narrow temples; ocelli very large, posterior ocelli much closer to the eyes than to each other, about as far from the occiput as from the eyes; carina on hind coxa incomplete, absent ventrally from posterior surface; fore wing with large stigma, basal vein joining subcosta close to stigma; first cubital cell very long, as long as the distance of its apex to the tip of the wing; first gastral segment cup-shaped, the tergite convex anteriorly. Coloration uniformly brown, clypeus sometimes brownish. Nocturnal in habits. Colonies founded by swarming . . . *Provespa*

Head large, with long vertex and broad temples. Ocelli normal (except in *Vespa binghami*); interocellar distance shorter than ocellocular distance; hind coxa with a carina on its posterior surface; fore wing with short to inconspicuous stigma, basal vein joining subcosta at a distance of 1.0-3.0x the length of stigma; first cubital cell shorter than the distance between its apex and the tip of fore wing; first gastral segment transverse, the tergite truncate and abruptly sloping anteriorly. Coloration predominantly yellow, brown and/or black. Large size; length varying from 14-40 mm. Diurnal in habits. Colonies founded by female only 2

2. Large sized wasps usually over 20 mm long; clypeus with short hairs; pronotal carina strong and bent forwards dorsally, with a pit near its lower 0.3; hind wing with hamuli originating before the tip of subcostella. Male antenna with tyloids. *Vespa*

Medium sized wasps, less than 20 mm long; clypeus with long hairs on its whole surface; pronotal carina weak or absent; hind wing with hamuli originating at the tip of subcostella. Male antenna without distinct tyloids. (Antenna with long scope). *Vespula*

6. Genus *Vespa* Linnaeus

This genus is divided into two subgenera : *Vespa (Vespa)* Linnaeus, 1758 and *Vespa (Nyctovespa)* van der Vecht, 1959. Only *Vespa (Vespa)* is represented in the state of Meghalaya.

7. Subgenus *Vespa (Vespa)* Linnaeus

1758. *Vespa* Linnaeus. *Systema Naturae*, (10th Ed.), 1 : 343.

Type- species : *Vespa crabro* Linnaeus, 1758.

1904. *Macrovespa* Dalla Torre. *Genera Insectorum*, 19 : 64.

Type- species : *Vespa crabro* Linnaeus, 1758.

Eighteen species/subspecies are recognised from India. Of these, eight species are known to occur in the state of Meghalaya. These can be recognised by the following key:

Key to the Species and Subspecies of *Vespa (Vespa)*

(Female and worker : antenna 12-segmented, gaster 6-segmented)

(After van der Vecht, 1957, 1959)

1. Apical margin of clypeus with a broad and deep apical emargination, forming lateral lobes and with a median triangular tooth projecting only half the length of the lateral lobes. 6th gastral segment yellow. *analis*

Head wholly yellow or orange-yellow, at most vertex with a black spot around ocelli.

analis nigrans

Apical margin of clypeus emarginate or broadly truncate, but without a median tooth.

2

2. Head strongly widened and produced behind the eyes; temple in profile view more than 2x as wide as eye. Clypeus coarsely punctate, strongly emarginate apically; temple and mesopleuron finely and sparsely punctate in lower half. *mandarinia magnifica*
head normal; temple almost 1.5x as wide as eye. 3
3. Clypeus coarsely punctate or lower vertical area of pronotum with distinct transverse striation; thorax black and head black to red, not marked with yellow; gaster brown with tergite 2 yellow. .. .4
Clypeus subpolished, with scattered punctures; lower vertical area of pronotum without distinct transverse ridges; head, thorax and gaster black to brown, with reddish or yellow areas. .5
4. Apical margin of clypeus hairy and with a blunt triangular tooth on each side of the median emargination; body covered with stiff hairs; pronotum with strong transverse striations in its lower vertical area near the pronotal pit; tergite 2 yellow. *.tropica*
Second sternite with an orange band, band emarginate basally, the dark basal area extending to or beyond the middle of the sternite, the band often interrupted by a dark line; first discoidal cell almost entirely yellow. .. *.tropica tropica*
Apical margin of clypeus less hairy, with short rounded lobes on each side of the median emargination; striations on pronotum fine to indistinct. (Vertex, temple, postscutellum and propodeum sparsely and finely punctate, scutellum and metapleurum almost impunctate). *.mocsaryana*
5. Clypeus rather flat and elongate, as wide as long or little longer, with moderate sized punctures, yellow. Hairs on head and thorax short, sparse, bristle-like; gaster dorsally almost without hairs. Body brown with clypeus, frons and tergites 3-4 yellow. *.orientalis*
Clypeus convex, wider than long, not elongate, its lateral emarginations short, punctures on clypeus fine. Head and thorax dorsally covered with dense, long black or yellowish-brown hairs; gaster dorsally with hairs; body largely black or yellow. 6
6. Gaster largely black; apical half of clypeus impunctate, its apical emargination shallow and without lateral lobes, middle tibia with long hairs, hairs longer than the width of tibia; postscutellum brown. Body hairs yellowish- brown. *.basalis*
- Gaster black or yellow; apical 0.33 of clypeus with more crowded punctures, its apical margin clearly emarginate forming lateral lobes; middle tibiae with a few long hairs. Body hairs black. .7
7. Gaster largely yellow, frons, vertex and mesoscutum sparsely hairy; gaster covered with dense erect hairs; hairs on second tergite about as long as the width of hind basitarsus; body largely yellow with mesoscutum black. *.bicolor*

Gaster largely black; frons, vertex and mesoscutum with dense long hairs; gaster with short, less conspicuous hairs; hairs on second tergite shorter than the width of hind basitarsus; body extensively black, or the mesoscutum partly orange-yellow. .. *velutina*

Head, thorax and gaster smooth with a fine silky appearance, hairs scattered and erect; mesoscutum dark-brown with a U- shaped mark. Wings brownish-hyaline. . *velutina auraria*

(Male : antenna 13-segmented, gaster 7-segmented)

1. Head large and swollen (as in the worker) (Malar space comparatively longer, tyloids present on segments 4-13, apical margin of 6th and 7th tergites shallowly emarginate).

. *mandarinia magnificia*

Head normal.

2

2. Sides of clypeus not touching the eyes, separated from them by narrow extensions of inner orbits.

3

Sides of clypeus touching the eyes.

.5

3. Emargination of 6th gastral sternite broad and semi-elliptical, its sides curving gradually towards sides of hind margin; fourth antennal segment with only the basal tyloid; clypeus rather coarsely punctate.

tropica tropica

Emargination of 6th gastral sternite as wide as deep, with angular edges; fourth antennal segment with 2 tyloids; clypeus finely punctate.

.4

4. Body yellow, vertex and mesoscutum black; junction of postscutellum and propodeum with a Y-shaped black mark.

. *bicolor*

Body more extensively black, or mesoscutum partly orange, yellow.

. *Velutina*

Fore femur basally in front, fore coxa posteriorly and middle and hind coxae and femora black; middle tibia except at apex and hind tibia in front and a spot at apex, black

velutina auraria

5. Antenna long and slender, fourth segment 2.0x0 as long as wide, without tyloids; clypeus sparsely and shallowly punctate; middle and hind tibiae densely covered with long hairs.

basalis

Antenna relatively short, fourth segment less than 2.0x as long as wide, with 2 distinct tyloids; clypeus more closely punctate; middle and hind tibiae with short and sparse hairs.

6

6. Apical margin of clypeus depressed, the depression often produced medially into a groove reaching middle of clypeus; incision of 6th sternite semi-elliptical, wider than deep. Head wholly yellow or orange yellow, sometimes with a black spot near ocelli; first to fifth tergites narrowly yellow at apex.

. *analis nigrans*

Apical margin of clypeus hardly depressed, with short and blunt carina; incision of 6th sternite almost as deep as wide; head thinner and body more slender. *.mocsaryana*

(Note : *Vespa (Vespa) orientalis* Linnaeus is known by its female and worker castes. The male of this species is not known, therefore, this species could not be included in the above key to the species).

35. *Vespa (Vespa) analis nigrans* Buysson

1903. *Vespa nigrans* Buysson. *Bull. Soc. Ent. France*, : 175, M, des. Type : M, China (Paris Museum).
 1939. *Vespa analis nigrans* : Bequaert. *Trans. Amer. Ent. Soc.*, **65** : 41, key, fig., tax.
 1939. *Vespa analis* (subsp) *barbouri* Bequaert. *Trans. Amer. Ent. Soc.*, **65** : 40, W, key, des. Type : W, India : Sikkim (Cambridge, Mass. Museum). Syn. by Das and Gupta, 1989.
 1983. *Vespa (Vespa) analis nigrans* : Das and Gupta. *Oriental Ins.*, **17** : 437, syn., ref., cat., distr.
 1989. *Vespa analis nigrans* Buysson : Das and Gupta. *Oriental Ins. Monogr.*, **11** : 208.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Burma, China, Indo-China, Malaysia, Nepal.

Remarks : No material of this subspecies was available for study from Meghalaya.

36. *Vespa (Vespa) basalis* Smith

1852. *Vespa basalis* Smith. *Trans. Ent. Soc. London (N.S.)*, **2** (2) : 46, F, des. Type : F, Nepal (British Museum).
 1852. *Vespa obliterated* Smith. *Trans. Ent. Soc. London (N.S.)*, **2** (2) : 47. Type : W. "Indes Orientales" (British Museum). Syn. by Bingham, 1897.
 1983. *Vespa (Vespa) basalis* : Das and Gupta. *Oriental Ins.*, **17** : 438, syn., ref.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Assam, Sikkim, West Bengal. Elsewhere : Burma, China, Indo-China, Japan, Nepal, Taiwan, Thailand, Sri Lanka, Sumatra.

37. *Vespa (Vespa) bicolor* Fabricius

1787. *Vespa bicolor* Fabricius. *Mant. Insectorum*, **1** : 288, des. Type : ? sex, "in China D. Pflug" (Copenhagen Museum).
 1905. *Vespa auraria* var. *citriiventris* Buysson. *Ann. Soc. Ent. France*, **73** : 552, F, W, des. Lectotype (Designated by van der Vecht, 1959) : F, India : Sikkim (Paris Museum). India : West Bengal : Darjiling; China. Syn. by Das and Gupta, 1989.
 1983. *Vespa (Vespa) bicolor bicolor* : Das and Gupta. *Oriental Ins.*, **17** : 439, cat., syn., distr.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Bhutan, China, Indo-China, Japan.

Remarks : This species is readily recognised by having body colour predominantly yellow with head and thorax black dorsally and body dorsally covered with dense blackish hairs. No material of this species was available for study from Meghalaya.

38. *Vespa (Vespa) mandarinia magnifica* Smith

1852. *Vespa magnifica* Smith. *Trans. Ent. Soc. Lond.* (N.S.), 2 (2) : 45, des. Type : Nepal (British Museum).

1959. *Vespa (Vespa) mandarinia magnifica* : van der Vecht. *Zool. Meded.*, 36 (13) : 220; Das and Gupta, 1983. *Oriental Ins.*, 17 : 440, cat., syn.

Material examined : India : Meghalaya (East Khasi Hills) : Shillong, 1 ex., 15.xi. 1930, coll. H.S. Rao.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Assam, Himachal Pradesh, West Bengal. Elsewhere : Bhutan, Burma, China, Indi-China, Malaysia, Nepal, Sri Lanka, Taiwan, Thailand.

Remarks : This is a distinct subspecies having the head orange-red, thorax black and gaster reddish-brown with narrow apical bands on 1st to 5th tergites, the tip of gaster yellowish-brown.

39. *Vespa (Vespa) mocsaryana* Buysson

1905. *Vespa mocsaryana* Buysson. *Ann. Soc. Ent. France*, 73 : 490, 495, 537, M, F, W, key, des. Type : M, Burma : Tenasserim : Thagata (Genoa Museum). India : Meghalaya : Khasi Hills; Sikkim; Malaya.

1983. *Vespa (Vespa) mocsaryana* : Das and Gupta. *Oriental Ins.*, 17 : 441, cat., syn., ref., distr.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Burma, China, Indo-China, Malaya, Sumatra.

Remarks : No material of this species was available for study from Meghalaya. This species can be identified by the characters mentioned in the key. Das and Gupta (1989) gave a detailed description of this species.

40. *Vespa (Vespa) orientalis* Linnaeus

1771. *Vespa orientalis* Linnaeus. *Mant. Plantarum altera*, 2 : 540, W, des. Type : W, “*Vespa ex. oriente*”, “*Orientalis ex. descr. Mant. 540*” (Linn. Soc. London).

1983. *Vespa (Vespa) orientalis* : Das and Gupta. *Oriental Ins.*, 17 : 441, cat., syn., ref., distr.

Material examined : India : Meghalaya : Ri-Bhoi : Nongpoh, 1 ex., 29.ix. 1988, coll. A.R. Lahiri and party.

Distribution : India : Meghalaya (Ri-Bhoi), Bihar, Delhi, Punjab, Uttar Pradesh, West Bengal. Elsewhere : Egypt, Pakistan, Middle East and the Mediterranean region.

Remarks : This is the first record of this species from the state of Meghalaya.

41. *Vespa (Vespa) tropica tropica* (Linnaeus)

1758. *Sphex tropica* Linnaeus. *Systema Naturae*, (10 ed.), 1 : 571, F, des. Type : F. "in Indiis" (Uppsala Museum).
1775. *Vespa cincta* Fabricius. *Systema Entomologiae*, P. 362. India : Malabar (Not of De Geer, 1773 or Drury, 1775). misdet.; Bingham, 1897. *Fauna British India, Hymenoptera*, 1 : 420, F, W, des., fig.
1936. *Vespa tropica tropica* : Bequaert. *Treubia*, 15 : 328, key, des, fig.; Das and Gupta, 1989. *Oriental Ins. Monogr.*, 11 : 218, syn., des., distr.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo and East Khasi Hills), Arunachal Pradesh, West Bengal. Elsewhere : Bhutan, Burma, Hong-Kong, Indo-China, Malaysia, Indonesia, Wallacea, Australian and Palearctic regions.

Remarks : This is one of the most common hornet of the Oriental region. They are large black or reddish-brown wasps with first and second or only second gastral segment partly or wholly orange or orange-brown.

42. *Vespa (Vespa) velutina auraria* Smith

1852. *Vespa auraria* Smith. *Trans. Ent. Soc. London*, (N.S.), 2 : 46, F. des., fig. Type : F, Northern India (British Museum).
1957. *Vespa velutina auraria* : van der Vecht. *Zool. Verh.*, 34 : 34.
1983. *Vespa (Vespa) velutina auraria* : Das and Gupta, *Oriental Ins.*, 17 : 446, cat., syn., ref., distr.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 2 exs., coll. La Touche (No other data); Cherrapunjee, 1358 m, 1 ex., 2-8.x. 1914, coll. S.W. Kemp (Mus. colln.); 1 ex., 23-26.iv. 1979, coll. J.K. Jonathan and party; Umtyngar, 1800 m, 1 ex., 21.ix. 1979, coll. R.K. Varshney and party; West Khasi Hills : Nongstoin (Near Civil Hospital), 1 ex., 26.ix. 1988, coll. A.R. Lahiri and party; West Garo Hills : Tura, 1000-1150 m, 1 ex., 15.vii-15.viii, 1917, coll. S.W. Kemp (Z.S.I. Reg. No. 980/H3).

Distribution : India : Meghalaya (East and West Khasi, Jaintia and West Garo Hills), Assam, Himachal Pradesh, Uttar Pradesh. Elsewhere : Burma, Nepal.

7. Genus *Provespa* Ashmead

1903. *Provespa* Ashmead. *Ent. News*, 14 : 182.
Type-species : *Vespa anomala* Saussure, 1853 (= *V. dorylloides* Saussure, 1853).

Provespa is known by three species : *P. anomala* (Saussure, 1853); *P. barthelemyi* (Buysson, 1905) and *P. nocturna* van der Vecht, 1936. Only *P. anomala* is known from India including Meghalaya (Das and Gupta, 1989).

43. *Provespa anomala* (Saussure)

1853. *Vespa anomala* Saussure. *Étude Famille Vespides*, 2 : 112, F, des., fig. Type : F, Java (British Museum).
1853. *Vespa dorylloides* Saussure. *Étude Famille Vespides*, 2 : 256 (different name used in errata); Bingham, 1897. *Fauna British India, Hymenoptera*, 1 : 400, F, W, des.
1989. *Provespa anomala* : Das and Gupta, *Oriental Ins. Monogr.*, 11 : 227.

Diagnostic characters : Female and worker : Head, thorax and gaster impunctate, largely smooth and shiny; head and thorax somewhat densely and gaster sparsely pubescent. Head as broad as thorax; clypeus slightly longer than wide; vertex narrow; eyes touching the base of mandible and on vertex almost close to lateral ocelli. Scutellum and metascutellum raised; gaster long and narrow.

Body colour brownish-yellow (honey colour). Inner emarginate area of eye, area around ocellar triangle, apical tarsal segment, hind margin of first two-third gastral tergites, yellowish-brown. Wings clear hyaline, colour largely variable.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 1 ex., 3.v. 1979, coll. J.K. Jonathan and party; Jaintia Hills : Garampani, 2 exs., 22.v. 1990, coll. M.S. Shishodia and party; East Khasi Hills : Cherrapunjee, 1 ex., 24.v. 1990, coll. M.S. Shishodia and party; East Garo Hills : Matahokgiri, 1 ex., 7.v. 1991, coll. B.N. Das and party.

Distribution : India : Meghalaya (East Khasi, East and West Garo and Jaintia Hills), Arunachal Pradesh, Sikkim, Uttar Pradesh. Elsewhere : Burma, Malaysia, Indonesia.

Remarks : This is the first record of this species from the state of Meghalaya.

8. Genus *Vespula* Thomson

1869. *Vespula* Thomson. *Opuscula Ent.*, 1 : 79.
Type-species : *Vespa austriaca* Panzer, 1799.
1881. *Pseudovespa* Schmiedeknecht. *Ent. Nachr.*, 7 : 314.
Type-species : *Vespa austriaca* Panzer, 1799.
1938. *Paravespula* Blüthgen. *Konowia*, 16 : 271.
Type-species : *Vespa vulgaris* Linnaeus, 1758.
1943. *Allovespula* Blüthgen. *Stettiner Ent. Ztg.*, 104 : 149.
Type-species : *Vespa rufa* Linnaeus, 1758.
1982. *Rugovespula* Archer. *Kontyû*. 50 : 264. Syn. by Carpenter, 1987.
Type-species : *Vespa koreensis* Radoszkowski, 1887.

The members of this genus are commonly called yellow jackets. They make their nests in the ground or in cavities. This genus is represented by eight species/subspecies, viz., *flaviceps flaviceps* (Smith, 1872); *vulgaris* (Linnaeus, 1758); *structor* (Smith, 1872); *germanica* (Fabricius, 1793); *orbata*

orbata (Buysson, 1902); *nursei* Archer, 1981; *austriaca* (Panzer, 1799) and *koreensis stizoides* (Buysson, 1905) from India. Only *koreensis stizoides* has been reported from the state of Meghalaya.

44. *Vespula koreensis stizoides* (Buysson)

1905. *Vespa germanica* var. *stizoides* Buysson. *Ann. Soc. Ent. France*, 73 : 615, W, Des. Type : W, "North India" (British Museum).

1981. *Vespula stizoides* : Archer. *Kontyû*, 49 : 56, des.

1989. *Vespula koreensis stizoides* : Das and Gupta. *Oriental Ins. Monogr.*, 11 : 242.

Diagnostic character : This is a large species. Queen and worker: Third mandibular tooth slightly concave along its mesal margin; occipital carina strong and reaching base of mandible; frontal suture absent in front of anterior ocellus; apical margin of clypeus weakly emarginate; thorax punctate and propodeum rugoso-striate; prebasal depression on first tergite distinct.

Male : Occipital carina present in upper 0.66 of temple; antenna without distinct tyloid; terminal segment not slender, nearly parallel sided and curved in profile; thorax punctate with distinct striations on propodeum; last gastral tergite with the apical lobe not flat and deeply incised medially.

Coloration of female mainly yellow.

Distribution : India : Meghalaya (East Khasi Hills), North India. Elsewhere : China, Indo-China.

Remarks : No material of this subspecies was available for study from Meghalaya. Above account is based on the details given by Das and Gupta (1989).

SUMMARY

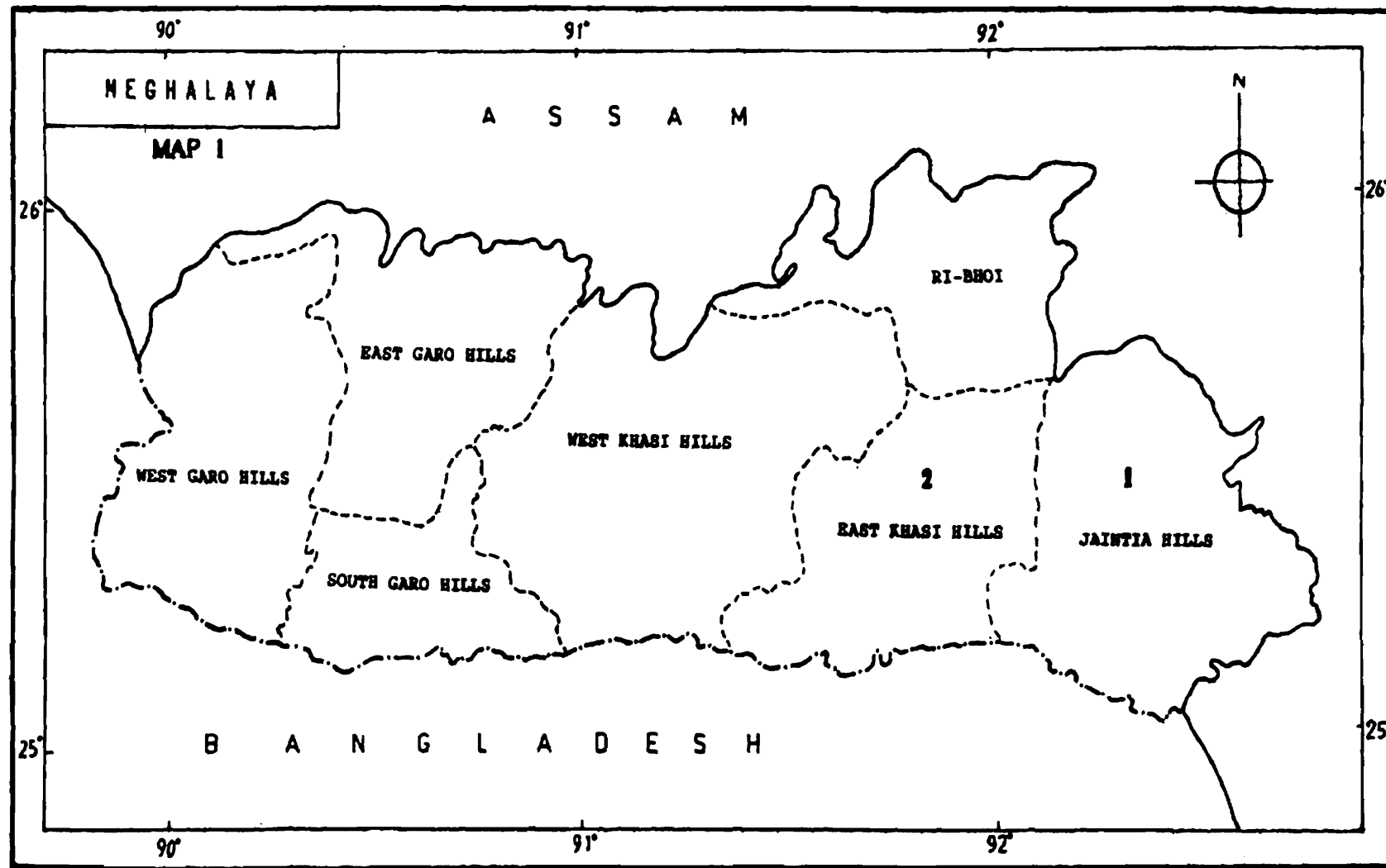
The present paper deals with the Vespidae fauna of Meghalaya, India. Altogether 44 species/subspecies under 8 genera and 7 subgenera are treated in the text belonging to 3 subfamilies. Eight species/subspecies have been recorded for the first time from the state of Meghalaya. *Polistes* (*Nygmopolistes*) *tenebricosus hoplitus* Saussure, 1853 forms new combination with *Polistes* (*Polistella*). The keys for identification for subfamilies, tribes, genera, subgenera, species and subspecies are provided. Distributional table, maps and illustrations of morphological characters are given.

The family Vespidae contains potter wasps, paper wasps, hornets or yellow jackets. Most of these wasps are beneficial, since the insects they feed their larvae are mostly injurious or at least not useful species. By their predatory habits they destroy a large number of insect pests and may be used as effective predators for the control of some of the species.

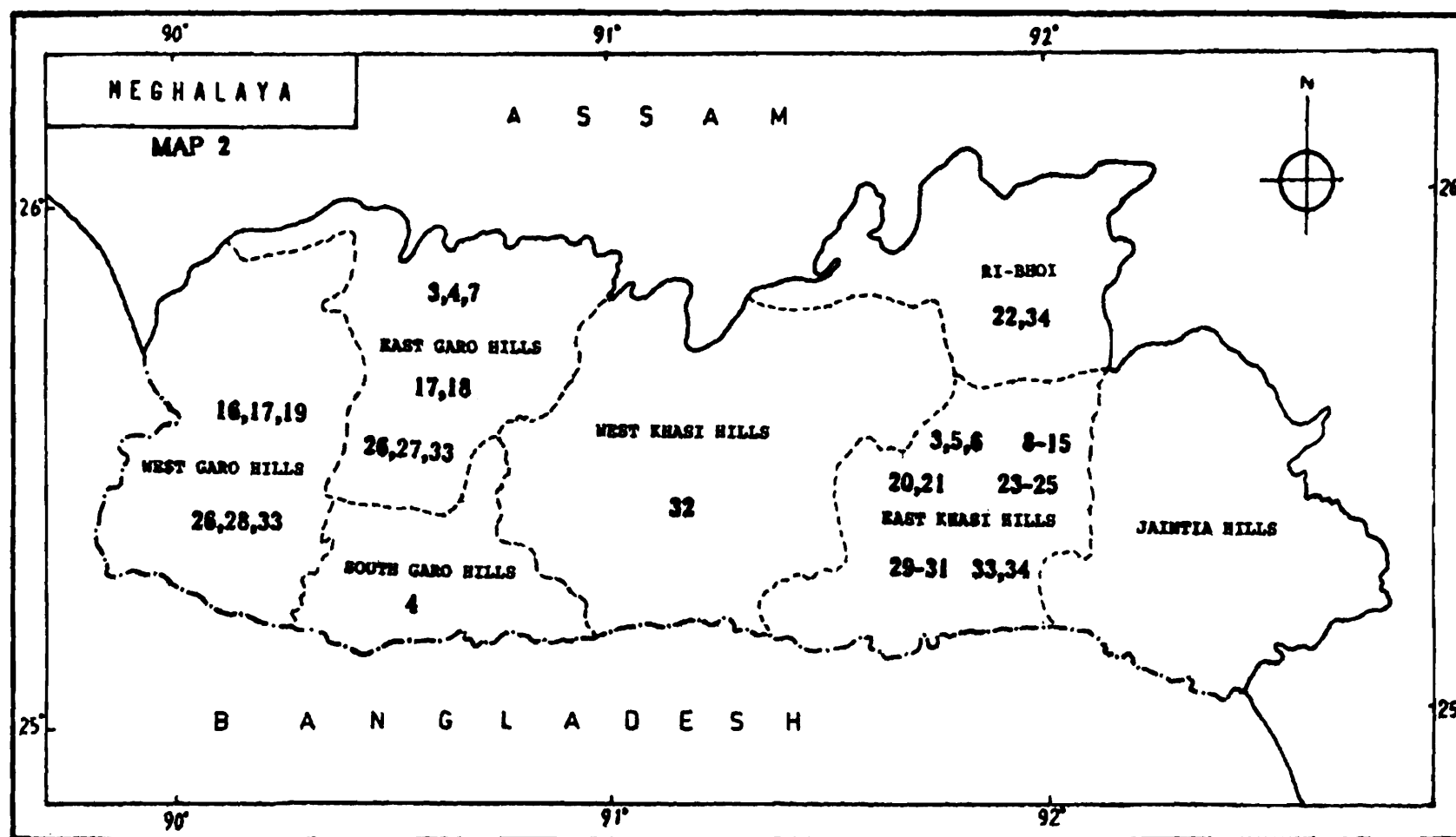
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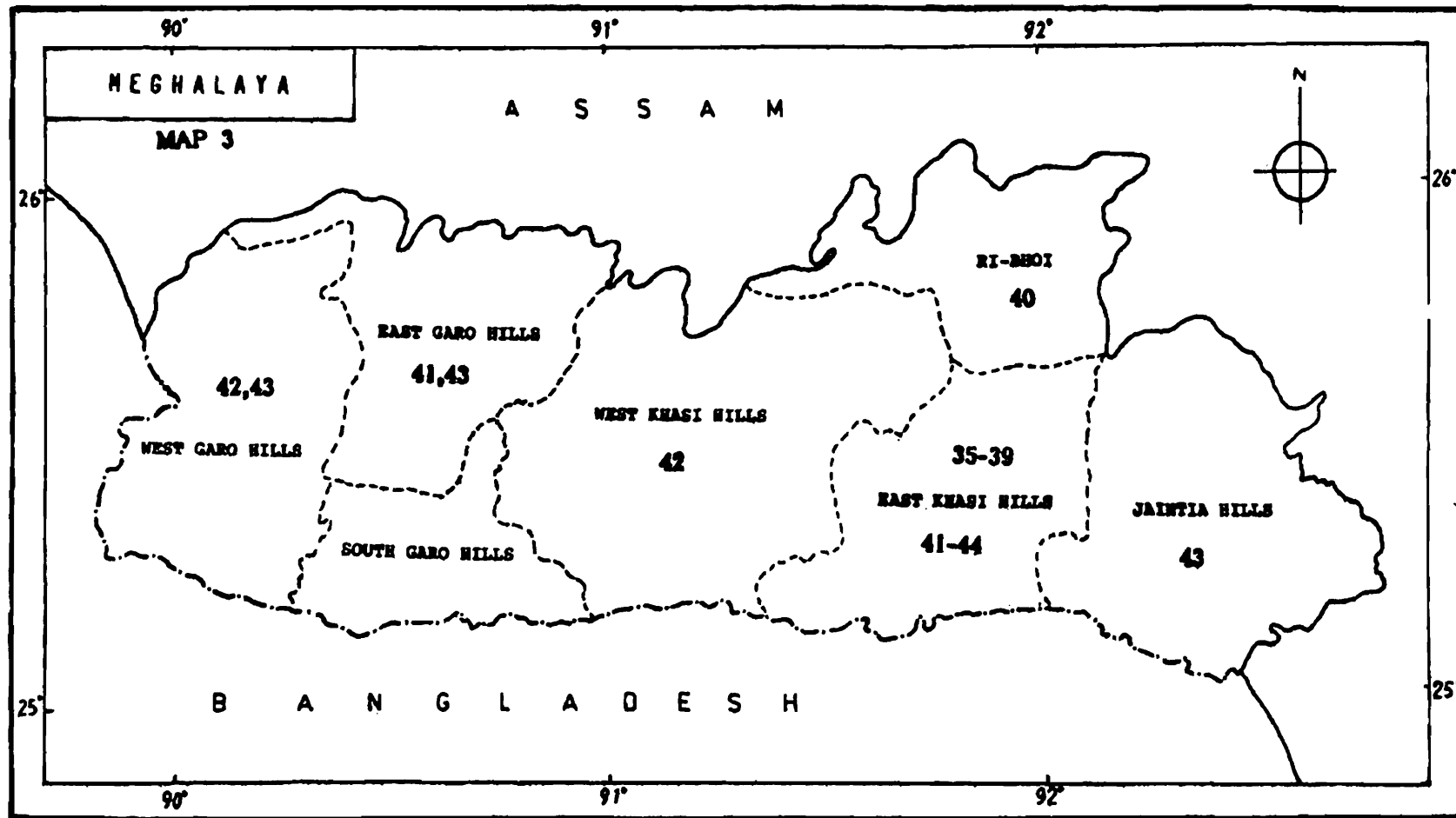
We acknowledge the generous supply of literature and other publications from Dr. (Mrs.) Bina Pani Das (Delhi),



Map 1. Distribution of taxa of subfamily Stenogastrinae in Meghalaya. Number indicates the name of the taxa as treated in the text



Map 2. Distribution of taxa of subfamily Polistinae in Meghalaya. Number indicates the name of the taxa as treated in the text.



Map 3. Distribution of taxa of subfamily Vespinae in Meghalaya. Number indicates the name of the taxa as treated in the text.

TABLE SHOWING DISTRIBUTION OF SPECIES/SUBSPECIES OF FAMILY VESPIDAE
IN MEGHALAYA

Sl. No.	Systematic List	1	2	3	4	5	6	7
	1. Subfamily Stenogastrinae							
	1. Genus <i>Eustenogaster</i> v.d. Vecht, 1969							
1.	<i>sciula</i> (Bingham, 1897)				+			
	2. Genus <i>Parischnogaster</i> Schulthess, 1914							
2.	<i>mellyi</i> (Saussure, 1852)				+			
	2. Subfamily Polistinae							
	1. Tribe Polistini							
	3. Genus <i>Polistes</i> Latreille, 1802							
	1. Subgenus <i>Polistes</i> (<i>Nygmopolistes</i>) Richards, 1973							
3.	<i>tenebricosus sulcatus</i> Smith, 1852	+				+		
	2. Subgenus <i>Polistes</i> (<i>Megapolistes</i>) v.d. Vecht, 1968							
4.	<i>olivaceus</i> (De Geer, 1773)					+		+
5.	<i>wattii</i> Cameron, 1900	+						
6.	<i>rothneyi rothneyi</i> Cameron, 1900	+						
7.	<i>rothneyi sikkimensis</i> v.d. Vecht, 1968					+		
8.	<i>rothneyi krombeini</i> v.d. Vecht, 1968	+						
	3. Subgenus <i>Polistes</i> (<i>Stenopolistes</i>) v.d. Vecht, 1972							
9.	<i>khasianus</i> Cameron, 1900	+						
10.	<i>nigritarsis</i> Cameron, 1900	+						
	4. Subgenus <i>Polistes</i> (<i>Polistella</i>) Ashmead, 1904							
11.	<i>ephippium</i> Cameron, 1900	+						
12.	<i>lepcha</i> Cameron, 1900	+						
13.	<i>adustus</i> Bingham, 1897	+						

Sl. No.	Systematic List	1	2	3	4	5	6	7
14.	<i>santoshae</i> Das & Gupta, 1989	+						
15.	<i>similis</i> Das & Gupta, 1989	+						
16.	<i>stigma tamula</i> (Fabricius, 1798)						+	
17.	<i>sagittarius</i> Saussure, 1853					+	+	
18.	<i>hoplitus</i> Saussure, 1853, n. comb.					+		
	2. Tribe Ropalidiini							
	4. Genus <i>Ropalidia</i> Guérin, 1838							
	5. Subgenus <i>Ropalidia</i> (<i>Anthreneida</i>) White, 1841							
19.	<i>marginata marginata</i> (Lepeletier, 1836)						+	
20.	<i>santoshae</i> Das & Gupta, 1989	+						
21.	<i>rufocollaris rufocollaris</i> (Cameron, 1900)	+						
22.	<i>stigma stigma</i> (Smith, 1858)				+			
23.	<i>stigma rufa</i> v.d. Vecht, 1941	+						
24.	<i>hongkongensis juncta</i> v.d. Vecht, 1941	+						
25.	<i>mathematica nigroplagiata</i> (Cameron, 1900)	+						
26.	<i>sumatrae sumatrae</i> (Weber, 1801)					+	+	
27.	<i>fasciata</i> (Fabricius, 1804)					+		
	6. Subgenus <i>Ropalidia</i> (<i>Icarielia</i>) Dalla Torre, 1904							
28.	<i>scitula</i> (Bingham, 1897)						+	
29.	<i>flavopicta ornaticeps</i> (Cameron, 1900)	+						
	3. Tribe Polybiini							
	5. Genus <i>Parapolybia</i> Saussure, 1853							
30.	<i>indica indica</i> (Saussure, 1853)	+						
31.	<i>indica tinctipennis</i> (Cameron, 1900)	+						

Sl. No.	Systematic List	1	2	3	4	5	6	7
32.	<i>indica fulvinerva</i> (Cameron, 1900)		+					
33.	<i>varia</i> (Fabricius, 1787)	+				+	+	
34.	<i>nodosa</i> v.d. Vecht, 1966	+			+			
3. Subfamily Vespinae								
6. Genus <i>Vespa</i> Linnaeus, 1758								
7. Subgenus <i>Vespa</i> (<i>Vespa</i>) Linnaeus, 1758								
35.	<i> analis nigrans</i> Buysson, 1903	+						
36.	<i>basalis</i> Smith, 1852	+						
37.	<i>bicolor</i> Fabricius, 1787	+						
38.	<i>mandarinia magnifica</i> Smith, 1852	+						
39.	<i>mocsaryana</i> Buysson, 1905	+						
40.	<i>orientalis</i> Linnaeus, 1771				+			
41.	<i>tropica tropica</i> (Linnaeus, 1758)	+				+		
42.	<i>velutina auraria</i> Smith, 1852	+	+	+			+	
7. Genus <i>Provespa</i> Ashmead, 1903								
43.	<i>anomala</i> (Saussure, 1853)	+		+		+	+	
8. Genus <i>Vespula</i> Thomson, 1869								
44.	<i>koreensis stizoides</i> (Buysson, 1905)	+						

1 = East Khasi Hills.

2 = West Khasi Hills.

3 = Jaintia Hills.

4 = Ri-Bhoi.

5 = East Garo Hills.

6 = West Garo Hills.

7 = South Garo Hills.

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INSECTA : HYMENOPTERA : SPHECIDAE

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INTRODUCTION

The family Sphecidae belongs to superfamily Sphecoidea which includes blue mud-dauber, black and yellow mud-dauber, digger or sand wasps. This sphecid wasp made their presence on earth when the primitive men established their home in forest. These wasps followed men from their forested habitats to mud dwelling houses to build mud nest in their houses. These sphecid wasps are mainly beneficial to man and cause no harm to him (Bohart and Menke, 1976).

The members of this family Sphecidae show complexities in their behaviour, and are always being subject of biological studies. Some species are ground nesters, and known as digger wasp; some species nest in pre-existing cavities used by beetle larvae, old insect galls; some construct their own mud cells. The majority of the members of this family are predatory on a great variety of terrestrial insects; but some are cleptoparasitic, that is their larvae develop on the provision in the nest of other wasps. Because of their predatory and cleptoparasitic habits, it may be possible to exploit them for the control of insect pests.

Our knowledge of Indian Sphecidae is very limited. The only reference manual available on Indian Sphecidae is by Bingham (1897). Besides this, there are several some to large publications on Indian/Oriental Sphecidae by Brothers (1975); Cameron (1899- 1905); Carpenter (1945, 1953); Hingston (1925); Krombein (1981- 1991); Nurse (1914); Tsuneki (1956-1973); Turner (1911-1929) and van der Vecht (1949-1973). Bohart and Menke (1976) published a generic reclassification of world species of Sphecidae. The classification proposed by them has been followed here. However, Krombein (1979) has restored the subfamilies recognised by Bohart and Menke, to family rank.

The family Sphecidae characterised by the following characters: Pronotum essentially fixed with the mesothorax; its posterior margin in dorsal view nearly straight and usually separated from the scutum by a constriction that contributes to the formation of raised collar; pronotal lobe well separated from the tegula, so that the mesoscutum and mesopleuron are in contact with each other, but in some cases the pronotal lobe is very close to tegula or in narrow contact. Hind leg with a cleaning pecten or brush in a basal depression on the inner side of the basitarsus; this apparatus is opposed by the pectinate inner tibial spur. The setae simple and unbranched. Inner eye margin not notched or emarginate, except for Trypoxylonini and Philanthini. Cerci on tenth tergum on male absent in most higher sphecids, but are present in Dolichurini, some Sphecini, most Sceliphronini, Astatini. The thorax with an episternal sulcus on the mesopleuron.

SYSTEMATICS

The family Sphecidae is represented by 9 subfamilies. This is a moderately large family, having more than 1,500 species known from the world, of these 450 species known to occur in India, which is only a fraction of those awaiting discovery.

In Meghalaya, the Sphecidae is represented by 7 subfamilies. 75 species/subspecies have been recorded from the state of Meghalaya under 20 genera.

MATERIAL AND METHOD

An attempt has been made here to provide a consolidated account of the fauna of Sphecidae of the state of Meghalaya, India based on a collection present at the Zoological Survey of India. The material was mainly received through Mopping Survey of Meghalaya by the following parties and individuals : N. Muraleedharan and party, 1975; S.B. Roy and party, 1979, and J.K. Jonathan and party, 1979; and collection made by Godwin-Austin, La Touche and S.W. Kemp, 1915.

The keys to the subfamilies, tribes, genera, subgenera, species and subspecies are provided for the identification of various taxa. Taxonomic terms used in the present work have been explained with the help of illustrations, and distributional tables and maps are given for ready reference.

TAXONOMIC TERMINOLOGY

The terms of morphological characters used in the present work are mainly based on the works of Bingham (1897), Bohart and Menke (1976) and Krombein (1981-1991). The morphological terms are illustrated in figures 1-4.

SYSTEMATIC ACCOUNT

FAMILY SPHECIDAE

1. Subfamily Ampulicinae

1. Tribe Dolichurini

1. Genus *Dolichurus* Latreille, 1809

- * 1. *taprobane* Smith, 1869
- 2. *bipunctatus* Bingham, 1896

2. Tribe Ampulicini

2. Genus *Ampulex* Jurine, 1807

- 3. *aborensis* Nurse, 1914
- 4. *assamensis* Cameron, 1903
- 5. *carinifrons* Cameron, 1903

- * New record from Meghalaya

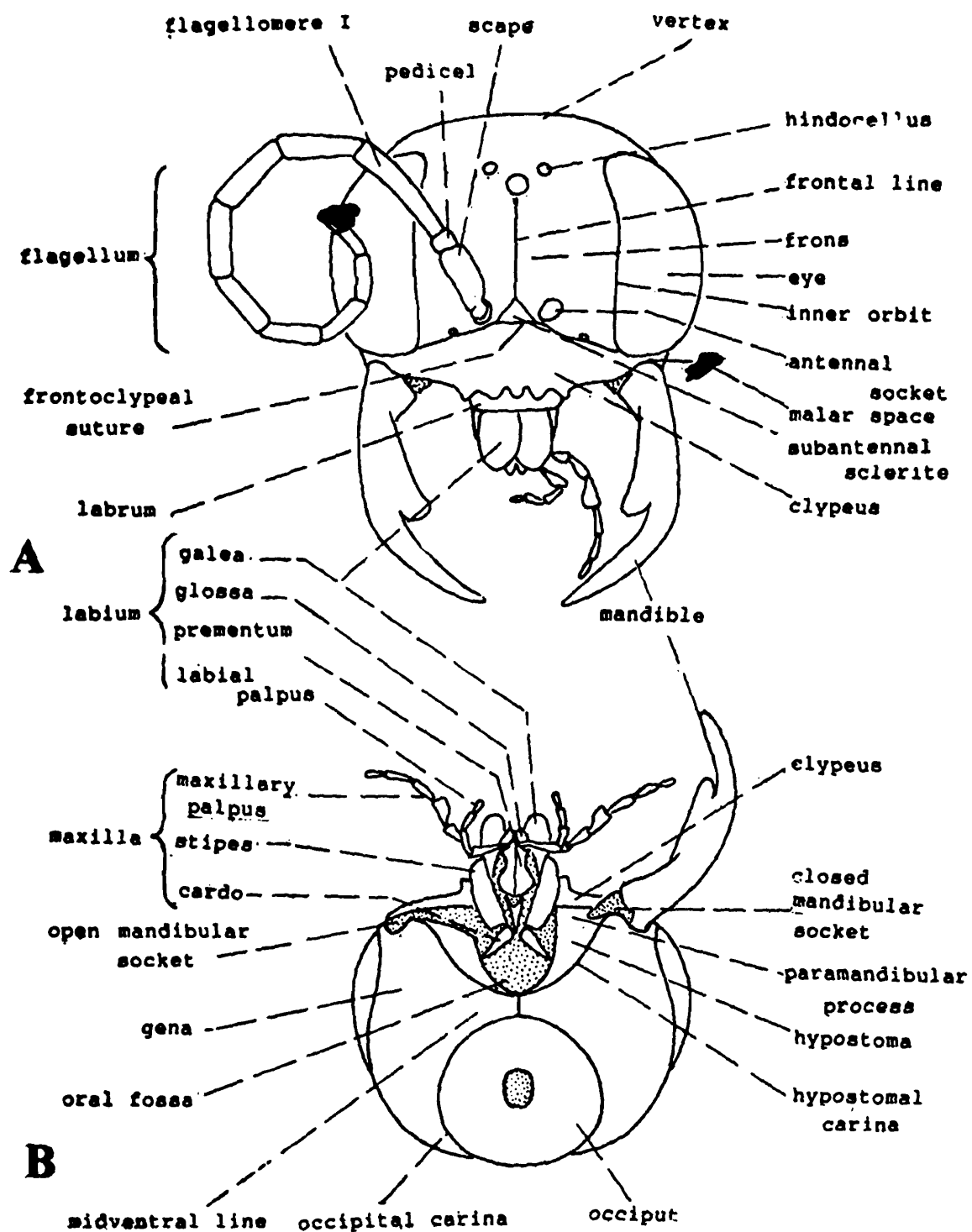


Fig. 1. Morphology of the sphecid head.

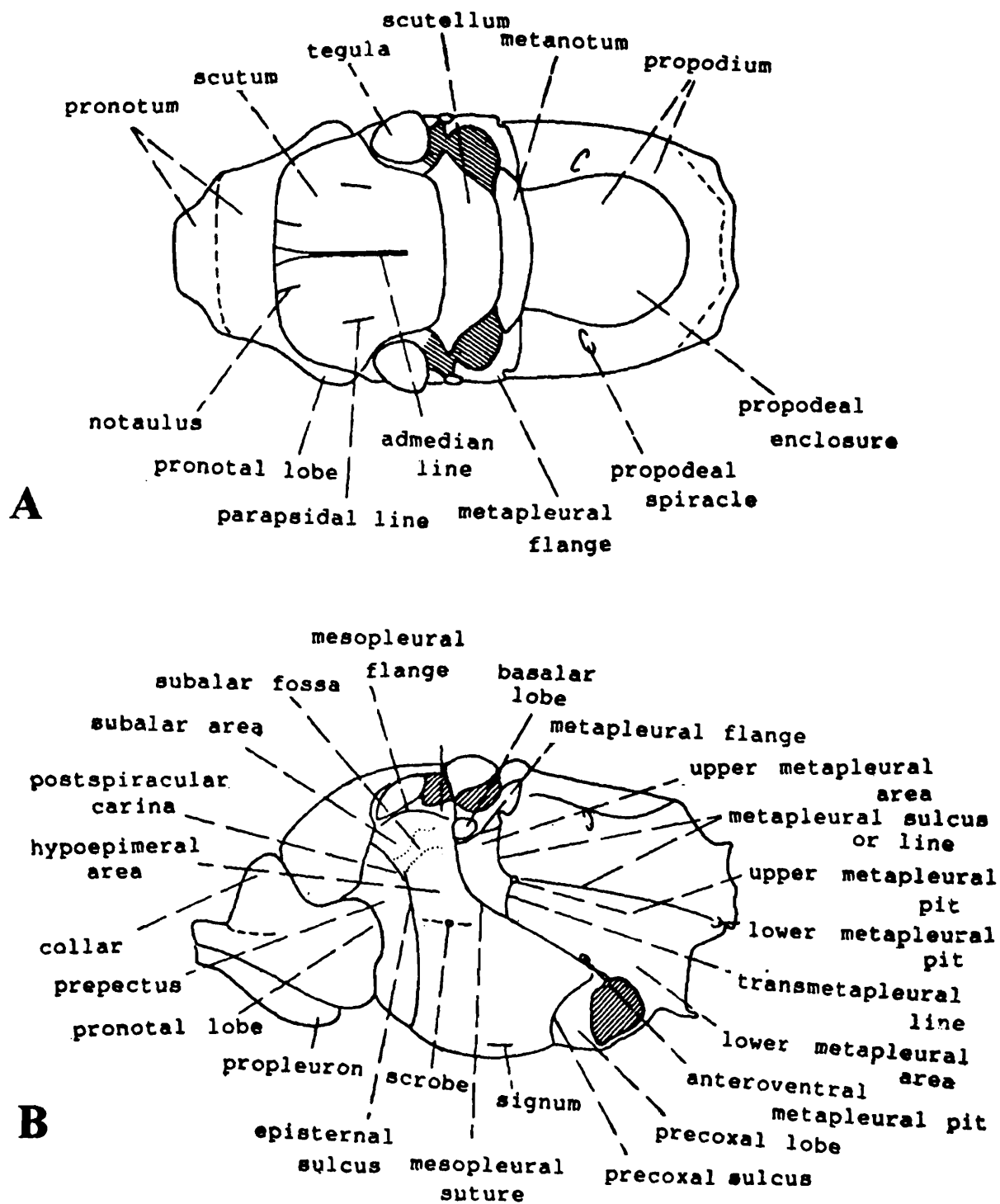


Fig. 2. Morphology of the generalised sphecid thorax, *Ammophila* (Ammophilini).
A : dorsal; B : lateral

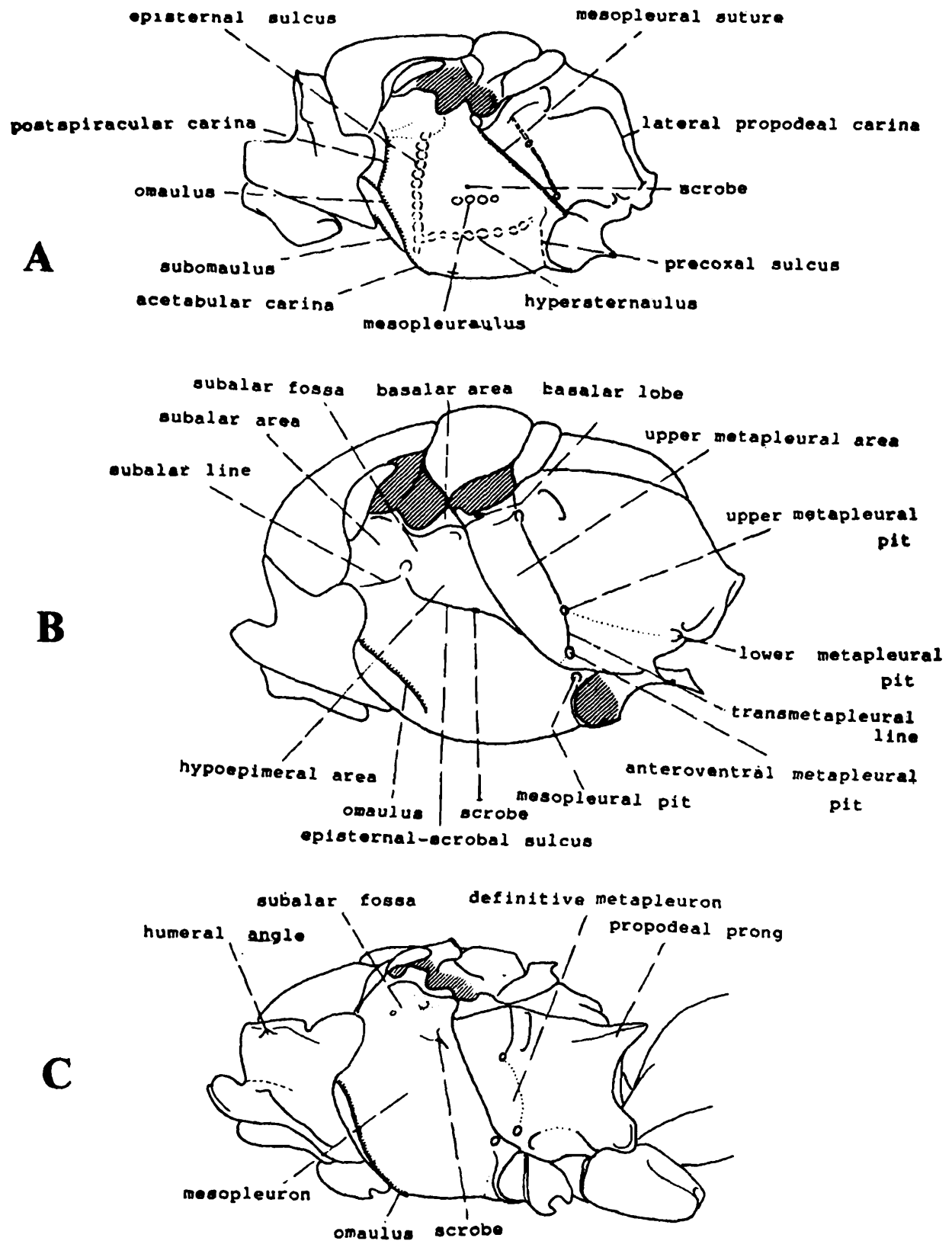


Fig. 3. Morphology of the sphecid thorax.

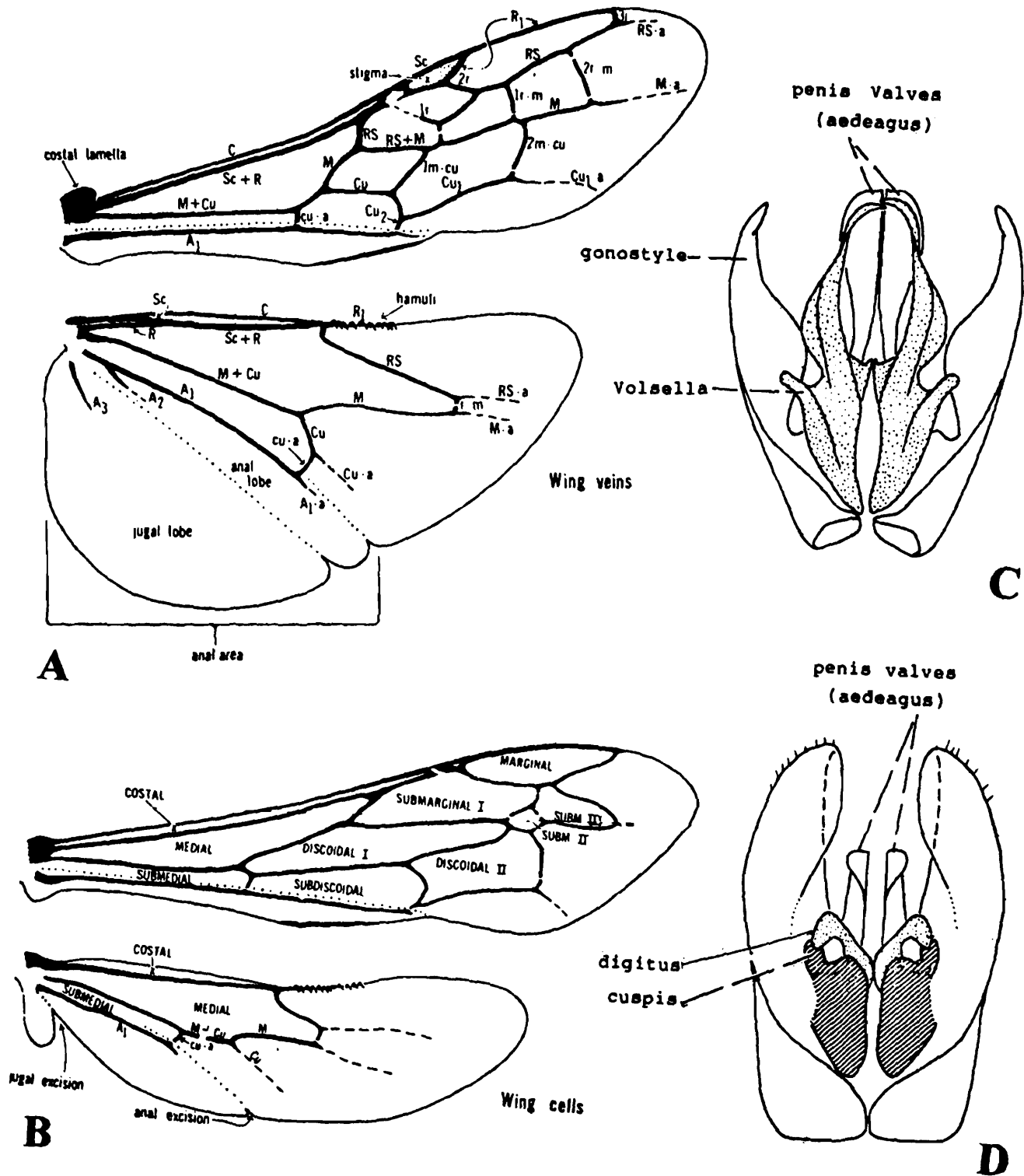


Fig. 4. A, B, Sphecid wing morphology; C, D, Male genitalia of the two main types.

6. *campressa* (Fabricius), 1775
7. *crudelis* Bingham, 1897
8. *himalayensis* Cameron, 1903
9. *hospes cognata* Kohl, 1893
10. *interstitialis* Cameron, 1903
11. *khasiana* Cameron, 1903
12. *latifrons* Kohl, 1893
13. *longicollis* Cameron, 1903
14. *montana* Cameron, 1903
15. *nigricans* Cameron, 1899
16. *pilosa* Cameron, 1900
17. *rothneyi* Cameron, 1902
18. *ruficoxis* Cameron, 1902

2. Subfamily Sphecinae

3. Tribe Sceliphronini

3. Genus *Chlorion* Latreille, 1802

- * 19. *lobatum* (Fabricius), 1775

4. Genus *Chalybion* Dahlbom, 1843

1. Subgenus *Chalybion* (*Chalybion*) s. str.

- * 20. *spinolae* (Lepeletier), 1845

21. *bengalense* Dahlbom, 1845

5. Genus *Sceliphron* Klug

2. Subgenus *Sceliphron* (*Sceliphron*) S. str.

22. *madraspatanum* (*madraspatanum*) (Fabricius), 1781

3. Subgenus *Sceliphron* (*Prosceliphron*) van der Vecht, 1968

- * 23. *formosum* (Smith), 1856

24. *deforme tibiale* Cameron, 1899

4. Tribe Sphecini

6. Genus *Sphex* Linnaeus, 1758

4. Subgenus *Sphex* (*Sphex*) s. str.

* 25. *argentatus* Fabricius, 1787

26. *sericeus fabricii* Dahlbom, 1793

27. *subtruncatus* Dahlbom, 1843

5. Tribe Ammophilini

7. Genus *Ammophila* Kirby, 1798

* 28. *basalis* Smith, 1889

* 29. *atripes* Smith, 1852

30. *laevigata* Smith, 1856

3. Subfamily Pemphredoninae

6. Tribe Psenini

8. Genus *Psen* Latreille, 1796

31. *fuscinervis* (Cameron), 1899

4. Subfamily Larrinae

7. Tribe Larrini

9. Genus *Larra* Fabricius, 1793

* 32. *carbonaria* (Smith), 1858

* 33. *erratica* Bingham, 1897

34. *femorata* (Cameron), 1900

10. Genus *Liris* Fabricius, 1804

5. Subgenus *Liris* (*Leptolarra*) Cameron, 1900

35. *aciculata* (Cameron), 1905

36. *appendiculata* (Cameron), 1901

- 37. *aureosericea* (Cameron), 1901
- 38. *elegans* (Bingham), 1897
- 39. *fuscinerva* (Cameron), 1905
- 40. *khasiana* (Cameron), 1905
- 41. *laboriosa* (smith), 1856
- 42. *strenua* (Cameron), 1905
- 43. *sulcifrons* (Cameron), 1905
- 44. *testaceicornis* (Cameron), 1905
- 45. *tegularis* (Cameron), 1905
- 46. *tristis* (Smith), 1856
- 47. *vivax* (Cameron), 1905
- 11. Genus *Tachytes* Panzer, 1806
 - 48. *fervidus* Smith, 1856
 - * 49. *modestus* Smith, 1856
 - * 50. *nitidulus* (Fabricius), 1775
 - 51. *saundersii* Bingham, 1897
 - 52. *tarsalis* (Dalla Torre), 1897
- 12. Genus *Tachysphex* Kohl, 1883
 - 53. *bituberculatus* Cameron, 1905
- 8. Tribe Mischophini
 - 13. Genus *Lyroda* Say, 1837
 - 54. *formosa* Smith, 1859
- 9. Tribe Trypoxylonini
 - 14. Genus *Trypoxylon* Latreille, 1796
 - 55. *geniculatum* Cameron, 1902
 - 56. *khasiae* Cameron, 1904

57. *pileatum* Smith, 1856

58. *trochanteratum* Cameron, 1902

5. Subfamily Carbroninae

10. Tribe Oxybelini

15. Genus *Oxybelus* Latreille, 1805

* 59. *lamillatus squamosus* Smith, 1875

11. Tribe Crabronini

16. Genus *Dasyproctus* Lepeletier and Brulle, 1834

* 60. *agilis* (Smith), 1858

17. Genus *Ectemnius* Dahlbom, 1845

61. *chrysites* (Kohl), 1892

62. *flavopilosellus* (Cameron), 1902

63. *melonotarsis* (Cameron), 1902

64. *trichiosomus* (Cameron), 1904

6. Subfamily Nyssoninae

12. Tribe Gorytini

18. Genus *Ammatomus* A. Costa, 1859

* 65. *alipes* (Bingham), 1897

13. Tribe Bembicini

19. Genus *Bembix* Fabricius, 1775

66. *khasiana* Cameron, 1904

7. Subfamily Philanthinae

14. Tribe Cercerini

20. Genus *Cerceris* Latreille, 1802-03

* 67. *instabilis* Smith, 1856

68. *bimaculata* Cameron, 1905

69. *fortinata* Cameron, 1902
- * 70. *kirbyi* Bingham, 1897
71. *latibalteata* Cameron, 1904
72. *lepcha* Cameron, 1905
73. *nebulosa* Cameron, 1890
74. *unifasciata* Smith, 1856
75. *violaceipennis* Cameron, 1904

Key to the Indian subfamilies of family Sphecidae

(After Bohart and Menke, 1976)

1. Gaster with cylindrical petiole composed of sternum only, except in *Ammophila* with two sections; jugal lobe of hind wing large, with an anal vein. .SPHECINAE
- Gaster variable, if petiolate and petiole composed of sternum only, than jugal lobe of hind wing very small. 2
2. Middle tibia with two apical spurs or none. 3
- Middle tibia with only one apical spur. .5
3. Claws with one inner tooth; notauli usually present and very long. .AMPULICINAE
- Claws simple. .4
4. Hind wing with jugal lobe less than half the length of anal area; mandible not notched nor strongly angulate externo-ventrally .NYSSONINAE
- Hind wing with jugal lobe usually much more than half the length of anal area, but if not, than mandible notched to externo-ventrally. .ASTATINAE*
5. Middle coxae contiguous; jugal lobe of hind wing subequal to the length of anal area, and ocelli normal. .LAPHYRAGOGINAE*
- Middle coxae variable, but if contiguous, then hind wing jugal lobe one-half or less as long as anal area, or hind ocelli deformed. .6
6. Gaster with petiole composed of sternum only. PEMPHREDONINAE (in part)
- Gaster sessile or with petiole composed of both tergum and sternum. .7
7. Gaster sessile, fore wing with two or few submarginal cells and either (a) stigma as large as single discoidal cell; or (b) stigma nearly equal in area to first discoidal cell, two submarginal

* Not recorded from Meghalaya

- cells present; mandible simple; inner eye margin not angulate and median vein in hind wing at or before *Cu-a*. PEMPHREDONINAE (in part)
- Gaster variable, but if sessile, fore wing with three submarginal cells or if less than stigma much smaller than first discoidal cell; or not agreeing as above. 8
8. Hind ocelli deformed or greatly reduced. 9
- Hind ocelli normal. .10
9. Jugal lobe of hind wing subequal to length of anal area, rarely two-third as long as anal area. LARRINAE (Tribe Larrini)
- Jugal lobe of hind wing at most a little more than half the length of anal area. NYSSONINAE (in part)
10. Scutal carina present, oblique; episternal-scröbal sulcus often present; metapleuron broad below, not tapering. NYSSONINAE (Tribe Stizini)
- Scutal carina absent. .11
11. Antennal sockets above frontoclypeal suture by at least one- third of a socket diameter, fore wing with three submarginal cells; mandibular socket closed by forward extension of the hypostoma. .PHILANTHINAE
- Antennal sockets contiguous with fronto clypeal suture, or if not contiguous, fore wing with fewer than three submarginal cells; mandibular socket usually open. 12
12. Middle coxae with a dorso-lateral carina or crest-like elevation. Fore wing usually with three submarginal cells, or with one cell which is not confluent with first discoidal, or with none. .LARRINAE
- Middle coxae without a dorso-lateral carina; fore wing with one submarginal cell or this cell is fused with first discoidal cell. .CRABRONINAE

1. Subfamily AMPULICINAE

The members of this subfamily are commonly known as ‘‘Cockroach Wasps’’. They prey upon cockroaches, one of the most primitive insect order. They occur principally in the tropic of Old and New World.

Diagnostic characters : Inner orbits entire; ocelli normal; antennae inserted low on face, sockets contiguous with fronto-clypeal suture, male with 13 and female with 12 segments. Clypeus strongly nasiform; mandible without a notch on externo-ventral margin. Pronotal lobe close to or touching tegula. Notauli long and deep. Propodeum moderately long with U-shaped to nearly triangular enclosure. Middle tibia with two spurs. Claws with a single tooth or bifid. Fore wing with two or three submarginal cells and two recurrent veins, first recurrent received by submarginal I or II, second recurrent received by II or III. Gaster sessile or with a short petiole. Male genitalia : Volsella with movable digitus and cuspis; aedeagus with teeth on ventral edge; cerci present or absent.

In India this subfamily is represented by two Tribes. These can be distinguished by the following key:

Key to the tribes of Ampulicinae

1. Antennal sockets with an over hanging frontal lobe; metasternum Y-shaped. Gastral petiole inserted between and on same level as hind coxae. .AMPULICINI
- Antennal sockets not covered or both over laid by a single median platform-like lobe; metasternum not Y-shaped. Gastral petiole inserted above and somewhat after hind coxae. .DOLICHURINI

1. Tribe DOLICHURINI

This tribe is represented by a single genus, viz., *Dolichurus* Latreille, 1809 from India, including Meghalaya. *Dolichurus* is the most generalised member of the tribe, having large number of species.

1. Genus *Dolichurus* Latreille

1809. *Dolichurus* Latreille, *Gen. Crust. et. Ins.*, 4:387.

Type-species : *Dolichurus corniculus* Spinola, 1808.

1904. *Thyreosphex* Ashmead, *Canad. Ent.*, 36:282.

Type-species : *Thyreosphex stantoni* Ashmead, 1904. Monotypic.

This is a small genus of mostly small and inconspicuous species, represented in India by five species, viz., *bipunctatus* Bingham, 1896; *clavipes* Cameron, 1897; *gilberti* Turner, 1912; *taprobana* Smith, 1869 and *reticulatus* Cameron 1899. Only two species have been reported from the state of Meghalaya. These can be distinguished by the following key.

Key to the species of *Dolichurus*

1. Head and Thorax entirely black; lateral angles of pronotum slightly produced, but not tuberculate. *taprobane* Smith

Head and thorax black, apex of tubercle above base of antennae and lateral tubercles on pronotum whitish yellow. *bipunctatus* Bingham

1. *Dolichurus taprobane* Smith

1869. *Dolichurus taprobane* Smith, *Trans. ent. Soc.*, p. 304.

Type : Male in British Museum, London, Loc. Burma, Sri Lanka.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1358 m, 1 ex., 23-26.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Burma, Sri Lanka.

Remarks : This species is readily distinguished by having head and thorax entirely black; pronotum not produced laterally. This is the first record of this species from Meghalaya.

2. *Dolichurus bipunctatus* Bingham

1896. *Dolichurus bipunctatus* Bingham. *Jour. Linn. soc.*, p.439

Type : Male in British Museum, London. Loc. Burma.

1899. *Dolichurus reticulatus* Cameron. *Ann. Mag. Nat. Hist.*, (7) 4:56.

Type : Meghalaya : Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim. Elsewhere : Burma.

Remarks : This species is recognised by having head and thorax black except tubercle above the base of antennae and pronotal tubercles, whitish-yellow. No material of this species was available for study from Meghalaya.

2. Tribe AMPULICINI

This tribe represents majority of the species in the subfamily. All the these species are under the genus *Ampulex* Jurine, 1807.

2. Genus *Ampulex* Jurine

1807. *Ampulex* Jurine. *Nouv. Meth. Class. Hym. Dipt.*, 1 : 132.

Type-species : *Sphex compressus* Fabricius. Designated by Audouin, 1822.

1809. *Pronoeus* Latreille. *Gen. Crust. Ins.*, 4:56.

Type-species : *Dryinus aeneus* Fabricius. Monotypic.

1844. *Rhinopsis* Westwood. *Arcana. Ent.*, 2:68.

Type-species : *Rhinopsis abbottii* Westwood. Monotypic.

1874. *Waagenia* Kriechbaumer. *Stettin Ent. Ztg.*, 35:55.

Type-species : *Waagenia sikkimensis* Kriechbaumer. Monotypic

1976. *Ampulex* Jurine : Bohart and Menke. *University Calif. Press*, p. 74, Syn.

This as a moderately large genus comprising most of the species of the subfamily Ampulicinae. In India this genus is represented by 22 species/subspecies, viz., *aborensis* Nurse, 1914; *aenea* Spinola, 1841; *approximata* Turner, 1912; *assamensis* Cameron, 1903; *carinifrons* Cameron, 1903; *constanceae* (Cameron, 1891); *crudelis* Bingham, 1897; *compressa* (Fabricius, 1775); *formosa* Kohl, 1893; *himalayensis* Cameron, 1903; *hospes cognata* Kohl, 1893; *interstitialis* Cameron, 1903; *khasiana* Cameron, 1903; *latifrons* Kohl, 1893; *longicollis* Cameron, 1902; *montana* Cameron, 1903; *nigricans* Cameron, 1899; *pilosa* Cameron, 1900; *rothneyi* Cameron, 1902; *ruficoxis* Cameron, 1902; *sikkimensis* (Kriechbaumer, 1874) and *sodalicia* Kohl, 1893.

In Meghalaya this genus is represented 16 species. These species/subspecies can be distinguished by the following key:

Key to the species of *Ampulex*

1. Wings fuscous or smoky. (Wing colour not known in *assamensis* and *latifrons*; these may be traced through either half of the couplet). 2
 - Wings fusco-violaceous. 11
2. Thorax and legs entirely black. Body 8 mm long. *.nigricans* Cameron
 - Thorax and legs variously coloured. Body more than 8 mm long (12-27 mm). .3
3. Body covered with thick long pubescence. (Head and thorax with brassy tint; abdomen and propodeum purple in colour). *.pilosa* Cameron
 - Body with short, not so thick pubescence. 4
4. Third antennal segment as long as the combined length of fourth and fifth segments. Basal half of hind femora red. 5
 - Third antennal segment short, usually equal to fourth and fifth segment; or little longer than fourth segment. Hind femora variously coloured. 6
5. Antennae bare. Legs in general black. Head and thorax black with violet patches. *.rothneyi* Cameron

Antennae thickly covered with a pale down. Legs in general dark blue. Head and thorax purple, mixed with dark green. *himalayensis* Cameron
6. Median longitudinal carina on clypeus bifurcating near apical third. .7
 - Median longitudinal carina on clypeus not bifurcating. 8
7. Central portion of pronotum as long as broad; middle femora not red; all tarsi black. *latifrons* Kohl
 - Central portion of pronotum much broader than long; middle femora red; basal segment of tarsi red. *hospes cognata* Kohl
8. Propodeum with seven longitudinal carinae, area between these carinae with fine transverse ridges. Abdomen smooth and shiny. 9
 - Propodeum and abdomen variously sculptured. 10
9. Head, thorax and abdomen entirely smooth. Body metallic blue. Middle and hind femora red. Forewing with two cubital cells. *crudelis* Bingham

- Head with large coarse punctures; thorax not entirely smooth; mesopleura with scattered coarse punctures. Head and thorax deep metallic green; abdomen metallic blue with bright purple effulgence. All femora red. Fore wing with three cubital cells. *.compressa* (Fabricius)
10. Middle femora metallic green; hind femora red with purplish tint at apex. (Median carina of clypeus not bifurcated; apical margin of clypeus with three prominent teeth). *aborensis* Nurse
Middle and hind femora red. 11
11. mesoscutum in the middle bare, brownish in colour; its lateral lobes punctate and brassy. scape without pubescence. *interstitialis* Cameron
Mesoscutum punctate, blue in colour; scape thickly covered with pale pubescence. *.assamensis* Cameron
12. Hind coxae red. (Legs in general dark blue; trochanters and middle and hind femora red). *.ruficoxis* Cameron
Hind coxae colour various. 13
13. Third antennal segment little shorter than the fourth segment. Face with thick long white hairs. *.carinifrons* Cameron
Third antennal segment equal or 2x as long as fourth segment. Face without long hairs. 14
14. Median longitudinal carina of clypeus bifurcating near apical third. 15
Median longitudinal carina of clypeus not bifurcating near apical third. 16
15. Basal half of hind femora red and apical half purple. pronotum raised triangularly. *.khasiana* Cameron
Hind femora entirely red, apically not purple. Pronotum not raised, cubical and almost flat. *.latifrons* Kohl
16. Third antennal segment equal the combined length of fourth and fifth segments. (Body metallic blue, green; head green with bluish tint; abdomen green with blue and purple tint). *.montana* Cameron
Third antennal segment equal or little longer than the fourth segment. 17
17. Middle and hind femora bright red. Prothorax without long black hairs. (Clypeus covered with thick long white hairs; its apical margin with one median tooth). *assamensis* Cameron
- Middle and hind femora not bright red; legs in general dark blue. Prothorax with long black hairs. (Head thickly covered with long black hairs). *longicollis* Cameron

3. *Ampulex aborensis* Nurse

1914. *Ampulex aborensis* Nurse, *Rec. Ind. Mus.*, 8:239.

1976. *Ampulex aborensis* Nurse : Bohart and Menke, *University Calif. Press*, p. 77.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1615-2000 m, 1 ex., 29.viii-5.ix. 1915, coll. S.W. Kemp.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal (new record).

Remarks : This species is close to *latifrons* Kohl by having central portion of pronotum as long as broad and all tarsi black. However, this species is readily distinguished by having three distinct teeth at the margin of clypeus and median longitudinal carinae of clypeus not bifurcated.

4. *Ampulex assamensis* Cameron

1903. *Ampulex assamensis* Cameron, *Trans. Ent. Soc. London*, (Part 1-2) : 236.

1976. *Ampulex assamensis* Cameron : Bohart and Menke. *University Calif. Press*, P. 77.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species is close to *interstitialis* Cameron in having middle and hind femora red. However, this species is distinguished by its scape covered with thick pale pubescence, and mesoscutum punctate, blue.

5. *Ampulex carinifrons* Cameron

1903. *Ampulex carinifrons* Cameron, *Trans. Ent. Soc. London*, (Part 1-2) : 237.

1976. *Ampulex carinifrons* Cameron : Bohart and Menke, *University Calif. Press*, P. 77.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species is mainly distinguished by having thick long white hairs on face.

6. *Ampulex compressa* (Fabricius)

1775. *Sphex compressa* Fabricius, *Ent. Syst.*, 2 : 206.

1976. *Ampulex compressa* (Fabricius) : Bohart and Menke, *University Calif. Press*, p. 77.

Material examined : India : Meghalaya : East Khasi Hills; 1 example, no further data.

Distribution : India : Meghalaya (East Khasi Hills), Throughout India. Elsewhere : Australia, Ethiopia, Burma, Sri Lanka, Chagos Archipelago, East Indies, Hawaii, Mauritius, New Caledonia, Seychelles and St. Helena.

Remarks : This species is close to *crudelis* Bingham in having seven longitudinal carinae on propodeum, but readily distinguished by having all femora red; forewing with three cubital cells and the characters given in the key.

7. *Ampulex crudelis* Bingham

1897. *Ampulex crudelis* Bingham, *Fauna Brit. India. Hymenoptera*, 1:258.

1976. *Ampulex crudelis* Bingham : Bohart and Menke, *University Calif. Press*, p. 77.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : This is a distinct species by having thorax and abdomen smooth and shining; pronotum elevated posteriorly into a blunt tubercle; propodeum with seven longitudinal carinae, area between these carinae with fine transverse ridges.

8. *Ampulex himalayensis* Cameron

1903. *Ampulex himalayensis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 10:320.

1976. *Ampulex himalayensis* Cameron : Bohart and Menke, *University Calif. Press*, p. 77.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species is close to *rothneyi* Cameron in having third antennal segment as long as the combined length of fourth and fifth segments. However, this can be distinguished by having antennae covered with a thick pale down; legs in general dark blue, and head and thorax purple, mixed with dark green.

9. *Ampulex hospes cognata* Kohl

1893. *Ampulex cognata* Kohl, *Ann. Naturhist Hofmus. Wien*, 8:462.

1976. *Ampulex hospes cognata* Kohl : Bohart and Menke, *University Calif. Press*, p. 77.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This subspecies is similar to *latifrons* Kohl in having median longitudinal carina on clypeus bifurcating near apical third. This subspecies is distinguished by having central portion of pronotum much broader than long; middle femora and basal segment of tarsi, red.

10. *Ampulex interstitialis* Cameron

1903. *Ampulex interstitialis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 11:321.

1976. *Ampulex interstitialis* Cameron : Bohart and Menke, *University Calif. Press*, p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *assamensis* Cameron in having middle and hind femora red. This species can be distinguished by having mesoscutum in the middle bare, brownish in colour; its lateral lobes punctate and brassy; scape without pubescence.

11. *Ampulex khasiana* Cameron

1903. *Ampulex khasiana* Cameron, *Trans. Ent. Soc. London*, 1903 (Part 1-2) : 234.

1976. *Ampulex khasiana* Cameron : Bohart and Menke, *University Calif. Press*, p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *latifrons* Kohl in having median longitudinal carina of clypeus bifurcating near apical third. However, this species is distinguished with highly raised pronotum and basal half of hind femora red and apical half purple.

12. *Ampulex latifrons* Kohl

1893. *Ampulex latifrons* Kohl, *Ann. Naturhist. Hofmus. Wien*, 8:461.

1976. *Ampulex latifrons* Kohl : Bohart and Menke, *University Calif. Press*, p. 78.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : This species is distinguished from its closely related species, viz., *khasiana* Cameron in having hind femora entirely red; pronotum not raised, cubical and almost flat.

13. *Ampulex longicollis* Cameron

1902. *Ampulex longicollis* Cameron, *Entomologist*, 35:263.

1902. *Ampulex trichiosoma* Cameron, *Ann. Mag. Nat. Hist.*, (7) 10:55.

1976. *Ampulex longicollis* Cameron. Bohart and Menke, *University Calif. Press.*, p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. However, this species is distinguished by having thick long black hairs on head and prothorax; legs in general dark blue.

14. *Ampulex montana* Cameron

1903. *Ampulex montana* Cameron, *Ann. Mag. Nat. Hist.* (7) 11:319.

1976. *Ampulex montana* Cameron, Bohart and Menke, *University Calif. Press*, p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is identified by having body metallic blue-green; head with bluish tint and abdomen with purple tint; third antennal segment equal to the combined length of fourth and fifth segment.

15. *Ampulex nigricans* Cameron

1899. *Ampulex (Rhinopsis) nigricans* Cameron, *Ann. Mag. Nat. Hist.*, (7) 4:57.

1976. *Ampulex nigricans* Cameron, Bohart and Menke, *University Calif. Press.* p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. However, this species from Meghalaya having abdominal petiole linear at base and nodose at apex. Thorax and legs entirely black; body 8 mm.

16. *Ampulex pilosa* Cameron

1900. *Ampulex pilosa* Cameron, *Ann. Mag. Nat. Hist.*, (7) 5:37.

1976. *Ampulex pilosa* Cameron : Bohart and Menke, *University Calif. Press.* p. 78.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Borneo.

Remarks : This species is mainly recognised by having much more thick and long pubescence than any of the other Indian species.

17. *Ampulex rothneyi* Cameron

1902. *Ampulex rothneyi* Cameron, *Ann. Mag. Nat. Hist.*, (7) 10:54.

1976. *Ampulex rothneyi* Cameron : Bohart and Menke, *University Calif. Press.* p. 78.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species is distinguished by its bare antennae; black legs and head and throx black with violet patches.

18. *Ampulex ruficoxis* Cameron

1902. *Ampulex ruficoxis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 10:56.

1976. *Ampulex ruficoxis* Cameron : Bohart and Menke, *University Calif. Press.* p. 78.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : No material of this species was available for study from Meghalaya. This species is easily distinguished by having fuscoviolaceous wings; hind coxae and femora red, while legs in general dark blue.

2. Subfamily SPHECINAE

The members of this subfamily are commonly called as “Digger wasps” or “Sand wasps”. They are commonly found in fields, forests and also in human habitats.

Diagnostic characters : Inner orbit entire converging, diverging, or parallel; ocelli normal. Antennae in male 13 and in female 12-segmented. Mandible without notch or annulations. Pronotal lobe broadly separated from tegula. Middle tibia usually with two apical spurs; middle coxal cavities and coxae usually approximate, middle coxae without dorso lateral carinae; procoxal lobe present; hind femur simple apically; claws with one to five teeth, or simple; arolium usually large. Propodeum usually long with or without U-shaped enclosure. Fore wing with three submarginal cells excepting *Ammophila*. Gaster with cylindrical petiole composed of sternum only unless it has two sections. Jugal lobe of hind wing large containing an anal vein.

This subfamily is subdivided into three tribes. A key to the tribes is given below (Bohart and Menke, 1976:82).

Key to the tribes of Sphecinae

1. Tarsi with plentulae and or claws of some legs with one basal tooth on inner margin.
.SCELIPHRONINI
- Tarsi without plentulae; claw simple or with one or more basal teeth on inner margin. 2
2. Claw with two or more teeth; second recurrent vein usually received by submarginal cell III, but if not then claw with at least three teeth or apicoventral setae of hind tarsomere V very broad, separated at base by no more than 1.5x of setal widths; tarsi without plantulae.
.SPHECINI
- Claw usually simple or with one tooth, if with two teeth then apico-ventral setae of hind tarsomere V narrow, separated by three or more setal widths; second recurrent vein usually received by submarginal cell II; tarsi some times with plentulae.
.AMMOPHILINI

3. Tribe SCELIPHRONINI

This tribe is represented by three genera in India, they are also found in the state of Meghalaya. A key to distinguish these genera is given below.

Key to the genera of Sceliphronini

1. Propodial dorsum at most with a median, longitudinal groove. (Mandibles simple or with a subapical tooth on inner margin; third anal vein of hindwing broadly separated from wing margin; body usually metallic blue or black and yellow).
. *Chalybion* Dahlbom
- Propodeum with U-shaped dorsal enclosure defined posteriorly by a semicircular sulcus or furrow. 2
2. Both recurrent veins received by second sub-marginal cell; spiracular groove absent.; body usually with yellow areas; female without fore tarsal rake.
. *Sceliphron* Klug

Second recurrent vein received by third sub-marginal cell or interstitial between II and III; spiracular groove present; body often with metallic blue or green. Antennal sockets contiguous with fronto-clypeal suture in female, separated by less than the diameter of a socket in male.

.. *.Chlorion* Latreille

3. Genus *Chlorion* Latreille

1802. *Chlorion* Latreille. *Hist. Nat. Crust. Ins.*, 5:333.

Type-species : *Sphex lobata* Fabricius. Monotypic.

This is a widely distributed genus, found in most regions of the globe. In India this genus is represented by two species, viz., *lobatum* (Fabricius, 1775) and *splendidum* Fabricius, 1804. Only *lobatum* has been reported from Meghalaya.

19. *Chlorion lobatum* (Fabricius)

1775. *Sphex lobatum* Fabricius, *Syst. Ent.*, p. 348

1791. *Sphex? smaragdinus* Christ, *Naturg. Ins.*, p. 308

1791. *Sphex chrysis* Christ, *Naturg. Ins.*, p. 310, Plate, fig.

1828. *Chlorion azurium* Lepeletier & Serville, *Encycl. Meth.*, 10:451. Lectotype : Female designated by Menke.

1897. *Sphex lobatus* : Bingham, *Fauna Brit. India, Hymenoptera*, 1:242.

1976. *Chlorion lobatum* : Bohart and Menke, *University Calif. Press*, p. 90.

Diagnostic characters : Female : 24-32 mm. Body largely smooth and polish; head and thorax with fine scattered punctures; clypeus transverse, convex in the middle, apical margin anteriorly emarginate. Propodeum long, cylindrical transversely striated. Legs long spinous. Abdomen petiolate. Body brilliantly blue-green and face with silvery pubescence.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party; Dainadubi, 340 m, 4 exs., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), throughout India. Elsewhere : African region, Burma, China, Malaysia, Sri Lanka.

Remarks : This species is readily distinguished by having unidentate claws and body metallic blue or green. This is the first record of this species from Meghalaya.

4. Genus *Chalybion* Dahlbom

The members of this genus make nest in pre-existing cavities, commonly in abandoned nests of mud-daubers, but also in holes in wood, bamboo and plant stems, and crevices walls (Krombein *et al.*, 1979). This genus is divided into two subgenera, viz., *Chalybion* Dahlbom 1843 and *Hemichalybion* Kohl, 1918. Only the typical subgenus *Chalybion* occurs in Indian subregion, and is represented by two species, *bengalense* Dahlbom, 1845 and *spinolae* (Lepeletier, 1845). They have also been recorded from Meghalaya.

1. Subgenus *Chalybion* (*Chalybion*) Dahlbom1843. *Chalybion* Dahlbom, *Hym. Europaea*, 5:21.Type-species : *Sphex cyanea* Fabricius. Designated by Patton, 1880.1976. *Chalybion* Dahlbom : Bohart and Menke, *University Calif. Press*, p. 102. Syn.Key to the species of *Chalybion* (*Chalybion*)

1. Body colour is general black and yellow, with black pubescence. Apices of femora tibiae and basal 2 or 3 segments of tarsi of fore and middle legs, reddish-yellow. Mesoscutum finely striate; petiole smooth and abdomen longitudinally striate. Female and male 27-30 mm.
.spinolae (Lepeletier)

Body dark shiny, deep blue with glisterin silvery pubescence. Apical segments of antennae and tarsi, bull black. Mesoscutum punctate; petiole and abdomen smooth and polished. Female 15-20 mm; male 11-16 mm.
bengalense Dahlbom

20. *Chalybion* (*Chalybion*) *spinolae* (Lepeletier)1845. *Pelopoeus spinolae* Lepeletier, *Hym.*, 3:307. Type : Female.1976. *Chalybion* (*Chalybion*) *spinolae* (Lepeletier) : Bohart and Menke, *University Calif. Press*, p. 103.

Material examined : India : Meghalaya : West Garo Hills : Tura, 340-430 m, 1 ex., vi-vii. 1917, coll. S.W. Kemp.

Distribution : India : Meghalaya (West Garo Hills), Orissa, Sikkim, South India, Maharashtra. Elsewhere : Sri Lanka.

Remarks : This is the first record of this species from Meghalaya.

21. *Chalybion* (*Chalybion*) *bengalense* Dahlbom1845. *Chalybion bengalense* Dahlbom, *Hym. Europaea*, 1 : 433.1775. *Sphex violacea* Fabricius, *Ent. Syst.*, 2:201.1976. *Chalybion* (*Chalybion*) *bengalense* : Bohart and Menke, *University Calif. Press*, p. 102.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 female, 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Andaman Is., Bihar, Goa, Himachal Pradesh, Kashmir, Orissa, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal.

5. Genus *Sceliphron* Klug

This genus is found in all of the temperate and tropical continental areas of the world and many islands. The species of this genus are moderately small to large (12-32 mm) in size; usually black in

The genus has been divided into two subgenera, viz., *Prosceliphron* van der Vecht, 1968 and *Sceliphron* s. str. These two can be distinguished in the presence of carci and the short hyposternal carina in *Prosceliphron* (Bohart and Menke, 1976).

1. Eighth tergite without cerci in male, hypostomal carina long, ending near the base of mandible.
.Sceliphron (Sceliphron) Klug

Eighth tergite of male with cerci; hypostomal carina evanescent, extending about half way to the base of mandible. ..*Sceliphron (Prosceliphron)* van der Vecht

1801. *Sceliphron* Klug, *Neue Schrift. Ges. Naturf. Freunde Berlin*, 3:561.
Type-species : *Splex spirifex* Linnaeus. Designated by Bingham, 1897.

In India this subgenus is represented by five species/subspecies, viz., *intrudens* (Smith), 1859; *javanum nalandicum* Strand, 1915; *javanum petiolare* Kohl, 1918; *madraspatanum madraspatanum* (Fabricius, 1781) and *madraspatanum andamanicum* Kohl, 1918. Only one subspecies has been recognised from Meghalaya, which is discussed below.

1781. *Sphex madraspatanus* Fabricius, *Ent. Syst.*, 2:204.
1852. *Pelopaeus bilineatus* Smith, *Ann. Mag. Nat. Hist.*, (2) 9:47.
1852. *Pelopaeus separatus* Smith, *Ann. Mag. Nat. Hist.*, (2) 9:47.

Diagnostic characters : *Female and Male* : Body length 16-22 mm. Head finely and closely punctate. Pronotum in front, mesoscutum and propodeum transversely striated. Scutellum and Postscutellum longitudinally striated. Propodeum with the enclosed portion at base raised and also with a broad medium longitudinal shallow groove. Petiole and abdomen largely smooth and shiny.

Black. The yellow are as follows : Scape of antennae above, a line on the pronotum (sometimes absent), tegulae, post-scutellum, apices of femora and tibiae of fore and middle legs, trochanters, bases of femora and tibiae of hind legs and petiole. Clypeus and face at sides covered with short fine silvery pile. Wings hyaline with brownish tint.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 5 exs., 8-13.v. 1979, coll. S.B. Roy and party; Darugiri, 400 m, 2 exs., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), throughout India. Elsewhere : Burma, Indonesia, Malaysia, Maldives, Sri Lanka, Vietnam.

Remarks : This is one of the common and widely distributed subspecies in India and adjoining countries. This species is readily distinguished by having yellow bands on legs.

3. Subgenus *Sceliphron* (*Prosceliphron*) van der Vecht

1968. *Sceliphron* (*Prosceliphron*) van der Vecht, *Tijdschr. Ent.*, 111:192.

Type-species : *Sceliphron coromandalicum* (Lepeletier), 1845 [= *Pelopaeus coromandalicus* Lepeletier, 1845], Original designation.

1976. *Sceliphron* (*Prosceliphron*) van der Vecht : Bohart and Menke, *University Calif. Press*, p. 39, 106.

This genus is represented by 5 species/subspecies, viz., *coromandalicum* Lepeletier, 1845; *curvatum* Smith, 1817; *deforme tibiale* Cameron, 1899; *formosum* Smith, 1856 and *rectum* Kohl, 1918. Only 2 species have been reported from Meghalaya.

Key to the species of *Sceliphron* (*prosceliphron*)

1. Body largely chestnut brown, legs also reddish chestnut, shaded with brownish black. Propodeum with soft, sparse hairs. scutellum largely smooth. *.formosum* Smith

Body largely black. Legs reddish, except coxae trochanter, tibiae and hind femur (above), black. propodeum thickly covered with long brownish hairs. Scutellum distinctly longitudinally striated. *.deforme tibiale* Cameron

23. *Sceliphron* (*Prosceliphron*) *formosum* (Smith)

1856. *Pelopaeus formosus* Smith, *Cat. Hym. Brit. Mus.*, 4 : 230. Type : Female.

1976. *Sceliphron* (*Prosceliphron*) *formosum* : Bohart and Menke, *University Calif. Press*, p. 106.

Material examined : India : Meghalaya : East Garo Hill : Songsak, 420 m, 5 exs., 5-6.v. 1979, coll. J.K. Jonathan and party; Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party; Darugiri, 400 m, 1 ex. 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal. Elsewhere : Australia, Burma and China.

Remarks : This is the first record of this species from Meghalaya. This species is largely recognised by its chestnut brown body; propodeum hairy and scutellum smooth.

24. *Sceliphron* (*Prosceliphron*) *deforme tibiale* Cameron

1899. *Sceliphron tibiale* Cameron, *Ann. Mag. Nat. Hist.*, (7) 4:53, Type : Meghalaya : Khasi Hills.

1900. *Sceliphron lineatipes* Cameron, *Ann. Mag. Nat. Hist.*, (7) 5:36.

1976. *Sceliphron* (*Prosceliphron*) *deforme tibiale* Cameron : Bohart and Menke, *University Calif. Press.*, p. 106.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this subspecies was available for study from Meghalaya.

4. Tribe Sphecini

This tribe is represented by three genera, viz., *Sphex* Linnaeus, 1758; *Isodontia* Patton, 1881 and *Prionyx* van der Linden, 1827 from India. Of these, *Sphex* subgenus *Sphex* Linnaeus has been recorded from Meghalaya.

6. Genus *Sphex* Linnaeus

This genus has been divided into two subgenera, *Sphex* S. str. and *Fernaldina* Bohart and Menke. *Sphex* (*Fernaldina*) has been reported from Holartic region. Indian species/subspecies fall under *sphex* (*Sphex*).

4. Subgenus *Sphex* (*Sphex*) Linnaeus

1758. *Sphex* Linnaeus. *Syst. Nat.* (10th ed.) 1:569.

Type-species : *Sphex flavipennis* Fabricius. Designated by Internatl. Comn. Zool. Nomencl., Op. 180, 1946.

1820. *Ammobia* Billberg. *Fnum. Ins.* : p. 105.

Type-species : *Pepsis argentata* Fabricius. Designated by Rohwer. 1911.

1905 *Proterosphex* Fernald. *Ent. News*, 16 : 165.

Type-species : *Sphex maxillosus* Fabricius. Original designation.

1979. *Sphex* (*Sphex*) Linnaeus : Krombein *et al.*, *Cat. Hym. Amer. North of Mexico*, 2:1579.

Five species/subspecies, viz., *argentatus* Fabricius, 1787; *diabolicus* Smith, 1858; *sericeus fabricii* Dahlbom, 1843; *subtruncatus* Dahlbom, 1843 and *predator melanopoda* Strand, 1915, are referable to this subgenus from India. Meghalaya is represented by three species/subspecies of *Sphex* (*Spex*). These can be distinguished by the following key.

Key to the species/subspecies of *Sphex* (*sphex*)

1. Postscutellum not notched (not tuberculate); wings flavohyaline. Propodeum covered with fine velvety hairs, dorsally with a well developed longitudinal median groove.

subtruncatus Dahlbom

Postscutellum longitudinally notched (bituberculate); wings clear hyaline, with or without iridescent tint. .2

2. Head and thorax black, covered with silvery-white hairs, legs red. *argentatus* Fabricius

Head and thorax variegated with red and black, covered with reddish hairs. Legs red.

.sericeus fabricii Dahlbom

25. *Sphex* (*Sphex*) *argentatus* Fabricius

1787. *Sphex argentatus* Fabricius, *Ent. Syst.*, 2 : 200.

1787. *Sphex unicolor* Fabricius, *Ent. Syst.*, 2 : 200.

1791. *Sphex umbrosus* Chirst, *Naturg. Ins.*, p. 293, Type : Female.

1897. *Sphex umbrosus* : Bingham, *Fauna British India, Hymenoptera*, 1 : 258. Syns.

1976. *Sphex (Spex) argentatus* Fabricius : Bohart and Menke, *University Calif. Press*, p. 114.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 4 exs., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills); throughout India (Bingham, 1897 : 250). Elsewhere : African middle east, Australian and Eastern Palaearctic regions, Burma, China, Japan, Malaysia, Sri Lanka.

Remarks : This species is readily distinguished by having post-scutellum bituberculate, body largely black with silvery white hairs. This is probably the first record of this species from Meghalaya.

26. *Sphex (Sphex) sericeus fabricii* Dahlbom

1793. *Sphex aurulentus* Fabricius. *Mant. Ins.*, 1 : 274.

1843. *Sphex fabricii* Dahlbom. *Hym. Europaea*, 1 : 27. Female.

1845. *Sphex ferrugineus* Lepeletier. *Hym.*, 3 : 345. Female.

1976. *Sphex (Spex) sericeus fabricii* Dahlbom : Bohart and Menke. *University Calif. Press*, p. 116.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills) : throughout India. Elsewhere : Australian region, Burme, China, Malaysia, Sri Lanka.

Remarks : Bingham (1897) reported this as a common Indian subspecies. This subspecies is recognised by having head and thorax variegated with black and red, covered with reddish hairs.

27. *Sphex (Sphex) subtruncatus* Dahlbom

1843. *Sphex subtruncatus* Dahlbom, *Hym. Europaea*, 1:

1856. *Sphex nigripes* Smith, *Cat. Hym. Brit. Mus.*, 4 : 254. Female.

1889. *Sphex erythropoda* Cameron, *Mem. Manch. Lit. Phil. Soc.*, (4) 2.: 108, 110.

1976. *Sphex (Sphex) subtruncatus* Dahlbom : Bohart and Menke, *University Calif. press*, p. 117.

Material examined : India : Meghalaya : East Garo Hills : Darugiri 400 m, 15 exs., 14-20.v. 1979, coll. S.B. Roy and party; Khasi Hills : Loc. ?, 1 ex., coll. Godwin-Austin, No other data.

Distribution : India : Meghalaya (East Garo and Khasi Hills), Kerala, Sikkim, Uttar Pradesh, Tripura, West Bengal. Elsewhere : Burma, China, Ethiopian region, Indonesia, Sri Lanka.

Remarks : This species is variable in colour of legs and wings. It is mainly distinguished by having a longitudinal median groove on propodeum; postscutellum not notched (not tuberculate) and propodeum covered with fine velvety hairs.

5. Tribe Ammophilini

This tribe is represented by three genera, viz., *Ammophila* Kirby, 1798; *Parapsammophila* Taschenberg, 1869 and *Podalonia* Fernald, 1927. Only *Ammophila* has been reported from Meghalaya.

7. Genus *Ammophila* Kirby

1798. *Ammophila* Kirby, *Trans. Linn. Soc. London*, 4:199.

Type-species : *Sphex sabulosa* Linnaeus. Designated by Internatl. Comn. Zool. Nomencl. Op. 180, 1946.

1807. *Miscus* Jurine, *Nouv. Meth. Class. Hym. Dipt.* p, 130. No species included.

Type-species : *Ammophila campestris* Latreille. Designated by Shuckard, 1837.

1845. *Coloptera* Lepeletier, *Hist. Nat. Ins., Hym.*, 3 : 387.

Type-species : *Coleoptera barbata* Lepeletier. Monotypic.

1928. *Argyrammophila* Gussakovskij, *Leningrad Inst. Zool. Appl. Phylopath.*, Bul. 4 : 7.

Type-species : *Ammophila induta* Kohl. Original designation.

1961. *Apynemia* Leclercq, *EOS*, 37 : 211.

Type-species : *Ammophila fallax* Kohl. Original designation.

In India this genus is represented by seven species/subspecies, viz., *atripes* Smith, 1852; *basalis* Smith, 1856; *laevigata* Smith, 1856; *punctata* Smith, 1856; *tyrannica* Cameron, 1890, *brevipennis* Bingham, 1897 and *philomela* Nurse, 1903. Only three species *atripes* and *laevigata* have been reported from the state of Meghalaya. A key to the species is as follows:

Key to the species of *Ammophila*

1. Pronotum and mesoscutum punctate, propodeum striate at sides, punctate along the middle line. Legs red in females, except coxae, trochanters and femora above, tibiae at apex and tarsi of hind legs, black; male unknown. *laevigata* Smith
- Pronotum, mesoscutum and propodeum striate; propodeum dorsally along the middle line sometimes reticulate. Legs red in female and black in male. 2
2. Propodeum dorsally and laterally transversely striate. Abdomen largely bluish-black. Body large, female- 18-30 mm, male-23-27 mm. *atripes* Smith
- Propodeum dorsally reticulate and striate along the sides. Abdomen largely red. Body short, female-20-22 mm, male-16-18 mm. *basalis* Smith

28. *Ammophila basalis* Smith

1856. *Ammophila basalis* Smith, *Cat. Hym. Brit. Mus.*, 4 : 214. Type : Female.

1856. *Ammophila nigripes* Smith, *Cat. Hym. Brit. Mus.*, 4 : 215. Type : Male.
1889. *Ammophila orientalis* Cameron, *Mem. Manch. Lit. Phil. Soc.*, 2(4) : 93 and 96.
1976. *Ammophila basalis* Smith : Bohart and Menke, *University Calif. Press*, p. 151.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1 example, La touche (no other data).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Maharashtra, Orissa, Sikkim, Madhya Pradesh, Uttar Pradesh and West Bengal. Elsewhere : Pakistan.

Remarks : This species is very much allied to *atripes* Smith, but can be distinguished by the characters given in the key to the species. This is the first record of the species from Meghalaya.

29. *Ammophila atripes* Smith

1852. *Ammophila atripes* Smith, *Ann. Mag. Nat. Hist.*, (2) 9 : 46.
1856. *Ammophila simillima* Smith, *Cat. Hym. Brit. Mus.*, 4 : 217.
1856. *Ammophila pulchella* Smith, *Cat. Hym. Brit. Mus.*, 4 : 218.
1867. *Ammophila humbertiana* Saussure, *Novara Reise, Hym.*, 2 : 23.
1867. *Ammophila longiventris* Saussure, *Novara Reise, Hym.*, 2 : 24.
1873. *Ammophila spinosa* Smith, *Ann. Mag. Nat. Hist.*, (4) 12 : 259.
1889. *Ammophila buddha* Cameron, *Mem. Manch. Lit. Phil. Soc.*, (4) 2 : 93 & 94.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 1 ex., 2.v. 1979, coll. J.K. Jonathan and party; East Garo Hills : Songsak, 4 exs., 21.ix. 1975, coll. N. Muralidharan and party.

Distribution : India : Meghalaya (West and East Garo Hills), Assam, Madhya Pradesh, Orissa, Sikkim, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Burma, China, Sri Lanka.

Remarks : This is a distinct species by having pronotum and mesoscutum largely striated; legs largely red in females and black in males. This is the first record of this species from Meghalaya.

30. *Ammophila laevigata* Smith

1856. *Ammophila laevigata* Smith, *Cat. Hym. Brit. Mus.*, 4 : 215.
1976. *Ammophila laevigata* Smith : Bohart and Menke, *University Calif. Press*, p. 152.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Arunachal Pradesh, Bihar, Gujarat, Himachal Pradesh, Karnataka, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Sri Lanka.

Remarks : This species is readily distinguished by having pronotum and mesoscutum punctate, legs in female largely red.

3. Subfamily PEMPHREDONINAE

This members of this subfamily are to very small, the smallest being 2 mm. The most of the species prey on Homoptera, Thysanoptera or Collembola. They usually nest in ground or use pre-existing cavities in the twigs, galls etc.

Diagnostic characters : Inner orbits essentially parallel, converging, usually widely separated; ocelli normal. Antennal sockets contiguous with or well separated from fronto-clypeal suture; male with 13 and female with 12-antennal segments. Mandible without notch, apex sometimes bi-to pentadentate. Pronotal lobe and tegula well separated, but sometimes very close to each other. Middle tibiae with one spur; claws simple. Propodeum short to moderately long. Fore wings with three, two, one, or no submarginal cell and one or two recurrent veins. Jugal lobe small without an anal vein. Gaster sessile or petiolate, the petiole usually composed of sternum I only. Volsella with digitus and cuspis, cerci absent.

This subfamily is represented by two tribes in India. Of these, only Psenini has been reported from Meghalaya.

Key to the tribes of Pemphredoninae

1. Fore wing with three submarginal cells; antennal sockets placed well above clypeal margin, usually near middle of face. PSENINI
- Fore wing with no more than submarginal cells; antennal sockets usually placed just above clypeal margin (not recorded from Meghalaya). PEMPHREDONINI

6. Tribe Psenini

This tribe contains three genera, viz., *Psenulus* Kohl, 1896; *Mimumesa* Melloch, 1933 and *Psen* Latreille, 1796 in India. Of these, only *Psen* has been reported from Meghalaya.

8. Genus *Psen* Latreille

1796. *Psen* Latreille, *Precis Caract. Gen. Ins.*, p. 122. No species.
Type-species : *Sphex atra* Fabricius. First included species.
1829. *Psenia* Stephens, *System. Cat. Brit. Ins.*, p. 361.
Type-species : *Sphex atra* Fabricius. Designated by Pate, 1937.
1849. *Dahlbomia* Wissman, *Stettin. Ent. Ztg.*, 10 : 9.
Type-species : *Sphex atra* Fabricius. Monotypic.

1899. *Caenopsen* Cameron, *Ann. Mag. Nat. Hist.*, (7) 4 : 55

Type-species : *Caenopsen fuscinervis* Cameron. Monotypic.

1968. *Punctipsen* van Lith, *Tijdschr. Ent.*, 111 : 125.

Type-species : *Mimesa exarata* Eversmann. Original designation.

This is a moderately large genus represented in India by 14 species/subspecies, viz., *assamensis* van Lith, 1965; *clavatus* Cameron, 1890; *elisabethae mdrasiensis* van Lith, 1968; *eurypygus* van Lith, 1965; *exaratus indicus* van Lith, 1968; *fuscinervis* (Cameron, 1899); *krombeini* van Lith, 1965; *nepalensis* van Lith, 1968; *nitidus* van Lith, 1959; *orientalis* Cameron, 1890; *refractus* Nurse, 1902; *rufiventris* Cameron, 1890; *rufoannulatus* Cameron, 1907 and *simlensis* van Lith, 1968. Only *fuscinervis* (Cameron) has been reported from Meghalaya.

31. *Psen fuscinervis* (Cameron)

1899. *Caenopsen fuscinervis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 4 : 55.

1976 *Caenopsen fuscinervis* Cameron : Bohart and Menke, *University calif. Press*, p. 166.

Diagnostic characters : Female : 10 mm long. Body largely black, covered with short to long, sparse to thick white hairs.

Antennae stout, about 2x the length of thorax, scape sparsely hairy. Head shiny. Frons and vertex strongly and closely punctate and hairy. Mesoscutum strongly and closely punctate, notauli short, confined to its base only. Scutellum weakly punctate. Propodeum with two transverse carinae, obliquely striated, also with three longitudinal carinae. Pro- and mesopleurum smooth, tubercle with white hairs. Mesopleural groove with deep and wide bend in the middle. Metapleurum depressed, with a narrow oblique groove below, apically irregularly reticulate. Mesopleurum smooth and shiny, median furrow shallow, wide, at base closely transversely striated. Abdomen smooth and shiny, the narrowed part of petiole longer the combined length of post-petiole and second segment. Second segment with a deep furrow at the base, side thickly covered with white hair; apices of third and 4th segments fringed with long hairs.

Material examined : Nil

Distribution : India : Meghalaya (East Khasi Hills).

4. Subfamily LARRINAE

The members of this subfamily are often dark in colour ranging from 2-30 mm. in length. Most species are fossorial and commonly term as "digger wasps". They prey upon the adults of spiders, orthoptera, Hemiptera, Diptera, Coleoptera, Hymenoptera and also larvae of Lepidoptera.

Diagnostic characters : Inner orbits usually converging above, parallel, rarely converging below; posterior ocelli usually normal. Antenna inserted low on face except near middle in some genera, sockets contiguous with frontoclypeal suture or separated. Female with 12 and male with 13 segmented antenna. Clypeus transverse except about as high as broad in some genera. Palpal formula 6-4 except 5-3 in some *Tachytes*. Pronotal lobe separated from tegula. Mesopleuron usually with an

episternal sulcus. Metapleuron consisting only of upper area, definitive pleuron tapering ventrad. Middle tibia with one apical spur; middle coxa usually separated, each with a dorsolateral carina or crest like elevation; claws simple except toothed in some females of Larrini. Propodeum short to long, dorsal enclosure present or absent. Forewing usually with 3 submarginal cells but sometimes none. Hindwing with jugal lobe varying from as long as anal area to very small or absent. Gaster usually sessile, but sometimes pedunculate or petiolate; tergum I and occasionally II with lateral carina; male with 7 visible terga; pygidial plate present or absent. Volsella in male simple without digitus, rarely absent; cerci absent.

This subfamily is represented by four tribes, viz., Larrini, Palarini, Miscophini and Trypoxylonini in India. Only three tribes are represented in the state of Meghalaya. These tribes can be distinguished by the following key (Bohart and Menke, 1976).

Key to the tribes of Larrinae

1. Hind ocelli reduced to flat, opaque scars of various shapes; jugal lobe of hindwing large, nearly as long as anal area. .LARRINI
 Hind ocellus with a convex or somewhat flattened, complete, transparent lens; jugal lobe of hind wing small or absent, never more than one-half length of anal area. 2
2. Inner orbits emarginate. .TRYPOXYLONINI
 Inner orbits straight, bowed or sinuate but not emarginate. 3
3. Clypeus divided into three parts by two vertical suturlike lines; antennal sockets separated from frontoclypeal suture by one-third or more of a socket diameter; hind ocelli usually flattened and elliptical [Not recorded from Meghalaya]. .PALARINI
- Clypeus not divided into three parts; antennal sockets essentially contiguous with frontoclypeal suture; hind ocelli round and convex (Hind femoral apex simple, femur thickest near middle, gradually tapering towards apex; inner orbits parallel or converging above. . MISCOPHINI

7. Tribe LARRINI

This tribe is represented by six genera, viz., *Larra* Fabricius, 1793; *Liris* Fabricius, 1804; *Tachytes* Panzer, 1806; *Parapiagetia* Kohl, 1896; *Tachysphex* Kohl, 1883 and *Prosopigastra* A costa 1867 in India. Only four genera have been reported from Meghalaya. A key to the genera is given below.

Key to the genera of Tribe Larrini

1. Frons below median ocellus with a transverse swelling extending between the eyes and joining a linear swelling along inner orbit to form a M or inverted U-shaped swelling. .. 2
- Frons variable and without swelling as above. . 3

2. **Female** : last tarsomere evenly arcuate in lateral view, sides diverging most of way to apex, ventral surface without hairmat; claws without an inner tooth; pronotal collar flat or slightly arcuate in front view; pygidial plate glabrous and shiny, no transverse row of setae apically. **Male** : propodeum densely punctate; apical half of outer surface of fore tibia usually with one or more erect bristles. *Larra* Fabricius
- **Female** : last tarsomere angled in lateral view, sides parallel on apical half; ventral surface usually with dense hair; claw prehensile, sometimes with an inner tooth; pronotal collar wedged shaped in front view; pygidial plate extensively setose and usually with a transverse row of apical setae. **Male** : propodeum dull and impunctate or if shiny then at most with sparse minute punctures; outer surface of fore tibia without bristles. . *Liris* Fabricius
3. Ocellar scars very long, distance between middle ocellus and of tail less than the length of scar; pygidial plate covered with dense setae which obscure integument. *Tachytes* Panzer
- Ocellar scars oval or oblong; distance between middle ocellus and lower end of scar equal to or greater than length of scar; pygidial plate bare in female, absent in male. Gasteral tergum II without a lateral carina, male fore femur with a basolateral notch or depression. *Tachysphex* Kohl

9. Genus *Larra* Fabricius

1793. *Larra* Fabricius, *Ent. System.*, 2:220.
Type-species : *Larra ichneumoniformis* Fabricius. Designated by Latreille, 1810.
1840. *Monomatium* Shuckard, In Swainson and Shuckard, Cabinet Cyclopaedia of Lardner, 129 : 181. No. species.
Type-species : *Larraxena princeps* Smith. Designated by Pate, 1935. First included species.
1843. *Tachytes* (*Lyrops*) Dahlbom, *Hym. Europaea*, 1:132.
Type-species : *Tachytes* (*Lyrops*) *pagana* Dahlbom. Monotypic.
1851. *Larraxena* Smith, *Ann. Mag. Nat. Hist.*, (2) 7:30.
Type-species : *Larraxena princeps* Smith. Monotypic.
1856. *Larrada* Smith, *Cat. Hym. Brit. Mus.*, 4:337.
Type-species : *Sphex anathema* Rossi. Original designated.

Eight species have been recognised under this genus from India, viz., *simillima* (Smith), 1856; *carbonaria* Smith, 1858; *erratica* Bingham, 1897; *femorate* (Cameron), 1900; *fuscinervis* Cameron, 1900; *apicepennis* Cameron, 1904; *bicolorata* Cameron, 1904 and *pygidialis* Cameron, 1904. Of these, only three species have been reported from Meghalaya. These can be distinguished by the following key:

Key to the species of *Larra*

1. Propodeum moderately long, about as long as the rest of the thorax, its dorsal surface reticulate. Head smooth. Body entirely black. *carbonaria* Smith

Propodeum long, about as long as head and rest of thorax united; dorsally striated or densely punctate, punctures running into transverse striae. Head finely and very closely punctate or smooth. Hind femora red. 2

2. Head finely and closely punctate. Face and clypeus smooth in female, with sparse silvery hairs in male. Propodeum dorsally densely punctate, punctures running into transverse striations.

.. *erratica* Bingham

Head smooth and shiny. Face and clypeus thickly covered with white hairs in both sexes. Propodeum dorsally transversely striated. *femorata* (Cameron)

32. *Larra carbonaria* (Smith)

1858. *Larrada carbonaria* Smith. *J. Proc. Linn. Soc. London. Zool.*, 2:102, Type : Female.

1873. *Larrada erebus* Smith. *Ann. Mag. Nat. Hist.*, (4) 12:193.

1976. *Larra sparsa* Rohwer : Bohart and Menke. *University Calif. Press*, p. 237.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Burma, Japan, Indonesia, Philippines, Singapore, Taiwan.

Remarks : This is the first record of this species from Meghalaya. This species is easily distinguished by its dorsal propodeum reticulate.

33. *Larra erratica* Bingham

1897. *Larra erratica* Bingham, *Fauna Brit. India, Hymenoptera*, 1:198.

Type : Female, male. Burma : Tenasserim; Sri Lanka.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 2 exs., 30.iv. 1979, and 3.v. 1979, coll. J.K. Jonathan and party; East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East and West Garo Hills), Andamans Is., Andhra Pradesh, Rajasthan. Elsewhere : Burma.

Remarks : This is the first record of this species from India including the state of Meghalaya. This species is mainly recognised by having dorsal propodeum densely punctate, punctures running into transverse striations.

34. *Larra femorata* (Cameron)

1900. *Cratolarra femorata* Cameron. *Ann. Mag. Nat. Hist.*, (7) 5:34. Type : Female. India : Meghalaya : Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. However, this species is easily recognised by having face, clypeus and thorax thickly covered with white hairs; propodeum dorsally transversely striated.

10. Genus *Liris* Fabricius

This is a large cosmopolitan genus with about 260 species in the world fauna. This genus is subdivided into 3 subgenera. A key to subgenera is given below (Bohart and Menke, 1976 : 241).

Key to subgenera of *Liris*

1. Mandible entire or with a small V-shaped notch on externoventral margin. *.Liris* Fabricius
- Mandible with a broad, deep, emargination on externoventral margin. 2
2. Apex of female pygidial plate with transverse rows of stout setae, surface usually at least partially covered with appressed setae or hairs; female with one or two mandibular teeth on inner margin near base; female tarsal claw usually simple but when toothed within, the pygidial plate is not completely glabrous; hind tibia often with a sharp polished carina. *. Leptolarra* Cameron
- Apex of female pygidial plate without transverse row of stout setae, surface glabrous or at most with a fine dustlike bloom; mandible of both sexes without inner teeth; inner margin of female tarsal claw with 2 teeth set side by side; hind tibiae without a sharp, polished carina (Not reported from Meghalaya). *Motes* Kohl

5. Subgenus *Liris* (*Leptolarra*) Cameron

1900. *Leptolarra* Cameron. *Ann. Mag. Nat. Hist.*, (7) 5:29.

Type-species : *Leptolarra reticulata* Cameron, 1900 (nec *Liris reticulata* (Saussure), 1892 [= *Leptolarra reticuloides* Richards, 1935, = *Liris nigricans* (Walker), 1871 subsp. *reticuloides* (Richards), 1935] designated by Richards, 1935:164.

1976. *Liris* (*Leptolarra*) Cameron : Bohart and Menke. *University Calif. Press*, p. 43. syn.

This is the only subgenus of *Liris* reported from the state of Meghalaya. There are about 35 species/subspecies of this subgenus known to occur in India (Bohart and Menke, 1976 : 243-248). Only 13 species are referable to this subgenus from Meghalaya. These can be distinguished by the following key :

Key to the species of *Liris* (*Leptolarra*)

1. Body covered with golden pubescence. 2
- Body covered with silvery white pubescence. 3

2. Pygidium with stiff black pile all over the surface; clypeus closely punctate. .
.appendiculata (Cameron)
- Pygidium with stiff reddish pile along the margin; clypeus sparsely punctate. . .
.aureosericea (Cameron)
3. Wings with apical margin dark brown or blue. .4
 Wings without dark apical margins. 6
4. Wings light fusco-hyaline with no tint of yellow; pygidium with stiff black pubescence.
laboriosa (Smith)
- Wings hyaline, iridescent or with yellowish tint, apex smoky or deep blue. . 5
5. Wings iridescent, apex deep blue, Pygidium with golden pubescence. . *fuscinerva* (Cameron)
 Wings with a yellowish tint, apex smoky. Pygidium with silvery white pubescence.
 . . *vivax* (Cameron)
6. Wings fusco-or fusco-hyaline. .7
 Wings fusco-violaceous. 9
7. Pygidium bare, without pubescence, its surface punctate. Body long and slender.
elegans (Bingham)
- Pygidium covered with silvery white pubescence. Body not long, normal in length. 8
8. Wings fusco-hyaline; antennal scape reddish; propodeum dorsally closely and finely
 trans-striated. . . *.testaceicornis* (Cameron)
 Wings flavo-hyaline; antennal scape black; propodeum dorsally reticulated. . *.tristis* (Smith)
9. Tibial and tarsal spines red. 10
 Tibial and tarsal spines black. 11
10. Clypeus punctate. Pygidium thickly covered with brownish pubescence. Frons and vertex also
 with brown hairs. *tegaris* (Cameron)
 Clypeus smooth and shiny. Pygidium thickly covered with yellowish pubescence. Frons and
 vertex with white silvery hairs. . . *.sulcifrons* (Cameron)
11. Body length 11 mm. (Clypeus smooth and shiny; thorax largely aciculate; frons and vertex
 alutaceous with fine punctures). *strenua* (Cameron)
 Body Length 9-10 mm. 12
12. Wings hyaline at base; mesoscutum aciculate; propodeum with a Ω -shaped area towards the
 apex. . *.aciculata* (Cameron)

- Wings not so hyaline at base; Mesoscutum closely punctate; propodeum with a Ω -shaped area towards the apex ... *.khasiana* (Cameron)

35. *Liris (Leptolarra) aciculata* (Cameron)

1905. *Notogonia aciculata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15:225. Type : Female.

1976. *Liris (Leptolarra) aciculata* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 244.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available from Meghalaya. However, this species can be distinguished by having fusco-violaceous wings, mesoscutum aciculate and wings hyaline at base.

36. *Liris (Leptolarra) appendiculata* (Cameron)

1901. *Chrysolarra appendiculata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 8:118.

1976. *Liris (Leptolarra) appendiculata* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 244.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Material of this species was available for study. This species is mainly recognised by having body covered with golden pubescence and pygidium with stiff black pile all over.

37. *Liris (Leptolarra) aureosericea* (Cameron)

1901. *Chrysolarra aureosericea* Cameron, *Ann. Mag. Nat. Hist.*, (7) 8:119-120.

1976. *Liris (Leptolarra) aureosericea* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 244.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is very close to *appendiculata* (Cameron), but readily distinguished by having pygidial covered with stiff reddish pile along the margin, and clypeus sparsely punctate.

38. *Liris (Leptolarra) elegans* (Bingham)

1897. *Larra elegans* Bingham, *Fauna British India, Hymenoptera*, 1:197.

1976. *Liris (Leptolarra) elegans* (Bingham) : Bohart and Menke, *University Calif. Press*, p. 245.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 2 exs., 30.v. 1979, coll. J.K. Jonathan and party; Songsak, 423m, 1 ex., 5-6. v. '979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Burma.

Remarks : This species is well recognised by having bare pygidium and body long and slender.

39. *Liris (Leptolarra) fuscinerva* (Cameron)

1905. *Notogonia fuscinerva* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 224. Type : Female.

1976. *Liris (Leptolarra) fuscinerva* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 245.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *laboriosa* (Smith) and *vivax* (Cameron) in having wings dark brown or blue at the apical margin. However, this species is readily distinguished by having wings iridescent, apices deep blue and pygidium with golden pubescence.

40. *Liris (Leptolarra) khasiana* (Cameron)

1905. *Notogonia khasiana* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 225. Type : Female.

1976. *Liris (Leptolarra) khasiana* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 246.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is mainly recognised by having tibial and tarsal spines black; wings not hyaline at base; mesoscutum closely punctate; propodeum without a U-shaped area toward the apex. No material of this species was available for study.

41. *Liris (Leptolarra) laboriosa* (Smith)

1856. *Larrada laboriosa* Smith, *Cat. Hym. Brit. Mus.*, 4 : 278. Type : Female.

1976. *Liris (Leptolarra) laboriosa* (Smith) : Bohart and Menke, *University Calif. Press*, p. 246.

Material examined : India : Meghalaya : East Garo Hills : Songsak, 1. ex., 22.ix. 1975, coll. N. Muralidharan and party.

Distribution : India : Meghalaya (East Garo Hills), West Bengal. Elsewhere : Burma, Hawaii, Marianas, Philippines, Taiwan.

Remarks : This species is distinguished by having fusco-hyaline wings and pygidium with stiff black pubescence.

42. *Liris (Leptolarra) strenua* (Cameron)

1905. *Natogonia strenua* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 228

1976. *Liris (Leptolarra) strenua* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 248

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species belongs to a group of species having tibial and tarsal spines black. However, it is recognised by having body about 12 mm long, clypeus smooth and shiny thorax aciculate.

43. *Liris (Leptolarra) sulcifrons* (Cameron)

1905. *Notogonia sulcifrons* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15: 229

1976. *Liris (Leptolarra) sucifrons* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 248.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *regularis* (Cameron) in having tibial and tarsal spines red. It differs from *regularis* in having clypeus smooth and shiny; pygidium thickly covered with yellow pubescence, and frons and vertex with white silvery pubescence.

44. *Liris (Leptolarra) testaceicornis* (Cameron)

1905. *Notogonia testaceicornis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 227. Type : Male.

1976. *Liris (Leptolarra) testaceicornis* (Cameron) : Bohart and Menke, *University Calif. press*, p. 248.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *tristis* (Smith) in having silvery white pubescence on pygidium. It is distinguished by having wings fusco-hyaline; antennal scape reddish and propodeum dorsally closely and finely trans-striated.

45. *Liris (Leptolarra) regularis* (Cameron)

1905. *Notogonia regularis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15: 226. Type : Female.

1976. *Liris (Leptolarra) regularis* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 248.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *sulcifrons* (Cameron) in having tibial and tarsal spines red, it differs from the same in having clypeus closely punctate; pygidium thickly covered with brownish pubescence; vertex and frons also with brown hairs.

46. *Liris (Leptolarra) tristis* (Smith)

1956. *Larrada tristis* Smith, *Cat. Hym. Brit. Mus.*, 4 : 277. Type : Female.

1976. *Liris (Leptolarra) tristis* (Smith) : Bohart and Menke, *University Calif. Press*, p. 248.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1412 m, 3 exs., 30.iv.- 2.v. 1979, coll. J.K. Jonathan and party. East Garo Hills : Dainadubi, 340 m, 2 exs., 8-13.v. 1979. coll. J.K. Jonathan and party and S.B. Roy and party; Darugiri, 400 m, 1 ex., 30.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East and West Garo Hills), Andhra pradesh, Gujrat. Elsewhere : Borneo.

Remarks : This species is close to *testaceicornis* (Cameron) in having pygidium covered with silvery white pubescence. It is distinguished by flavo-hyaline wings; antennal scape black and propodeum dorsally reticulated.

47. *Liris (Leptolarra) vivax* (Cameron)

1905. *Notogonia vivax* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 226.

1976. *Lris (Leptolarra) vivax* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 248.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is distinguished by having wing with yellowish tint pygidium with silvery pubescence.

11. Genus *Tachytes* Panzer

1806. *Tachytes* Panzer, *Krit. Rev. Insektenf. Deutschlands*, 2: 129.

Type-species : *Sphex tricolor* Fabricius. Monotypic

1976. *Tachytes* Panzer : Bohart and Menke, *University Calif. Press*, p. 43. Syn.

This is moderately a large genus, having about 23 species/subspecies in Indian region. They are black or black and red in colour, densely covered with golden or silvery pubescence. They nest in ground and store orthopteran larvae in their nests. The following species are referable to this genus from India : *assamensis* Cameron, 1904; *astutus* Nurse, 1909; *brevipennis* Cameron, 1900; *celsissimus* Turner, 1917; *hospes* Bingham, 1898; *fervidus* Smith, 1856; *flagellatus* Nurse, 1903; *fulvopilosus* Cameron, 1904; *indicus* Dalla Torre, 1897; *modestus* Smith, 1856; *monetarius* Smith, 1856; *nitidulus* (Fabricius), 1793; *pygmacus* Kohl, 1888; *repandus* (Fabricius), 1787; *rufipalpus* Cameron, 1904; *saundersii* Bingham, 1897; *sinensis* Smith, 1856; *taprobane* Cameron, 1900; *tarsalis* (Dalla Torre), 1897; *vestitus* (Smith), 1873; *vicinix* Cameron, 1889; *vischnu* Cameron, 1889 and *xenoferus* Rohwer, 1911.

A key to the species of this genus from Meghalaya is as follows:

Key to the species of *Tachytes*

1. Abdomen partly red and black, apical segments black and basal segments red; apical bands on abdominal segments of golden/silvery short dense pubescence. 2
 Abdomen entirely black. Apical bands on abdominal segments of silvery short dense pubescence. 3
2. Apical bands on abdominal segments of shiny silvery pubescence. Front with a median shallow furrow meeting a deep ^-shaped groove in front of ocelli. *tarsalis* (Dalla Torre)
 Apical bands on abdominal segments of shiny golden pubescence. Frons not furrowed as above. *fervidus* Smith
3. Pygidium with black stiff pubescence. Vertex with a deep ^-shaped groove behind ocelli *nitidulus* (Fabricius)
 Pygidium with short, soft, dense silvery or golden pubescence. .4

4. Apical 0.5 of femora, tibiae and tarsi reddish brown; pygidium with silvery pubescence in both sexes. *.modestus* Smith

Legs in general black; pygidium in female with golden hairs and in males with silvery pubescence. *saundersii* Bingham

48. *Tachytes fervidus* Smith

1856. *Tachytes fervidus* Smith, *Cat. Hym. Brit. Mus.*, 4 : 298. Type : Female.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 ex., 30.iv. 1979. coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills), West Bengal.

Remarks : This species is readily recognised from other species of Meghalaya, by apical abdominal band of golden hairs and abdomen apical half black and basal half red.

49. *Tachytes modestus* Smith

1856. *Tachytes modestus* Smith, *Cat. Hym. Brit. Mus.*, 4 : 299. Type : Female.

Material Examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party; East Khasi Hills : Barapani, 1 ex., 20.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Khasi and East Garo Hills), Kerala, Orissa, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Burma, China.

Remarks : This species is distinguished by having apical half of femora, tibiae and tarsi reddish-brown; stiff hairs on pygidium in both sexes silvery. This is the first record of this species from Meghalaya.

50. *Tachytes nitidulus* (Fabricius)

1775. *Crabro nitidulus* Fabricius, *Ent. Syst.*, 2 : 294.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills), Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Burma.

Remarks : This is a distinct species having pygidium with black stiff hairs and vertex behind ocellar triangle with a ^-shaped narrow groove. This is the first record of this species from Meghalaya.

51. *Tachytes saundersii* Bingham

1897. *Tachytes saundersii* Bingham, *Fauna Brit. India, Hymenoptera*, 1: 189. Type : Female, Male, Burma.

Material examined : Inida : Meghalaya : East Garo Hills : Darugiri, 1 ex., 14-20.v. 1979, coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Burma.

Remarks : This species is recognised by having legs black.

52. *Tachytes tarsalis* (Dalla Torre)

1856. *Tachytes tarsatus* Smith, *Cat. Hym.*, 4 : 297.

1897. *Tachysphex tarsalis* Dalla Torre, *Cat. Hym.*, 8 : New name for *tarsatus* Smith, 1856, p. 297, nec *Tachysphex tarsatus* (Say), 1823 (*Larra*), now in *Tachysphex*.

1976. *Tachytes tarsalis* (Dalla Torre) : Bohart and Menke, *University Calif. Press*, p. 267.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 1 ex., 8-13.v. 1979, coll. S.B. Roy and party.

Distributin : India : Meghalaya (East Garo Hills), West Bengal.

Remarks : This species is very close to *T. fervidus* Smith in having abdomen largely red in colour. However, it differs in the colour of legs as apical bands on abdominal segments.

12. Genus *Tachysphex* Kohl

1883. *Tachysphex* Kohl, *Deut. Ent. Ztschr.*, 27 : 166.

Type-species : *Tachysphex fillicournis* Kohl. Designated by Bingham, 1897.

1922. *Schistosphex* Arnold, *Ann. Trans. Mus.*, 9 : 137.

Type-species : *Schistosphex breijeri* Arnold. Original Designation.

1923. *Atelosphex* Arnold, *Ann. Trans. Mus.*, 9 : 177.

Type-species : *Atelosphex miscophoides* Arnold. Original designation.

1976. *Tachysphex* Kohl : Bohart and Menke, *University Calif. Press*, p. 44.

This is a moderately large genus, represented in India by 18 species/subspecies, viz., *albocinctus* (Lucas), 1848; *albocinctus peculator* Nurse, 1909; *auriceps* Cameron, 1889; *bengalensis* Cameron, 1889; *bituberculatus* Cameron, 1905; *conclusus* Nurse, 1903; *erythrophorus* Dalla Torre, 1897; *erythropus* (Spinole), 1838; *gujaraticus* Nurse, 1909; *instructus* Nurse, 1909; *minutus* Nurse, 1909; *novarae* (Saussure, 1867); *panzeri pulverosus* (Rodoszowski, 1886); *plicosus* (A. Costa, 1867); *pompiliformis* (Panzer, 1804); *puncticeps* Cameron, 1903; *schmiedeknechti* Kohl, 1883 and *tinctipennis* Cameron, 1904.

53. *Tachysphex bituberculatus* Cameron

1905. *Tachysphex bituberculata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 232. Type : Female.

1976. *Tachysphex bituberculatus* Cameron : Bohart and Menke, *University Calif. Press*, p. 272.

Diagnostic characters : Female : Body 11 mm long. Head and thorax densely punctate, covered with short silvery pile; apical margin of clypeus depressed. Scutellum shiny, sparsely punctate, mesoscutum closely reticulate; pronotum above closely rugosely punctate, below sparsely punctate; Mesopleurum closely punctate, behind the base with wide shallow furrow; furrow obscurely striated; upper part of metapleurum with irregular clearly separated keels, area striate. Legs pruinose. Abdomen with brown pruinose.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya.

8. Tribe MISCOPHINI

This tribe is represented by four genera, viz., *Lyroda* Say, 1837; *Paranysson* Guerin-Meneville, 1844; *Nitela* Latreille, 1809 and *Miscophus* Turine, 1807, in India. Only one genus has been reported from the state of Meghalaya.

13. Genus *Lyroda* Say

1837. *Lyrops* (*Lyroda*) Say, *Boston Jour. Nat. Hist.*, 1 : 372.

Type-species : *Lyrops* (*Lyroda*) *subita* Say. Designated by Patton, 1881.

1856. *Morphota* Smith, *Cat. Hym. Bri. Mus.*, 4 : 293.

Type-species : *Morphota fasciata* Smith. Designated by Pate, 1937.

1900. *Odontolarra* Cameron, *Ann. Mag. Nat. Hist.*, (7) 5 : 35.

Type-species : *Odontolarra rufiventris* Cameron. Monotypic.

1979. *Lyroda* Say : Krombein *et al.*, *Cat. Hym. America, North of Mexico, Washington*, 2 : 1633.

This genus is represented by three species in India, viz., *argenteofacialis* (Cameron, 1889), *formosa* (Smith, 1859) and *salai* Giner Mari, 1945. Only one species had been reported from Meghalaya, which is discussed below.

54. *Lyroda formosa* Smith

1858. *Morphota formosa* Smith. *J. Proc. Linn. Soc. London. Zool.*, 2 : 17. Type : Female.

Diagnostic characters : Body 9-11 mm long. Front with median impressed line from the anterior ocellus to base of antennae; mesoscutum anteriorly with a median depression; propodeum weakly rugose, with a median longitudinal carina.

Head and thorax densely pruinose. Abdominal tergites 1-4 also apically with pruinose bands. Body in general black, basal two abdominal segments, red. Clypeus, frons malar space, pronotum, mesoscutum at sides and propodeum densely silvery hairs, with a golden-yellow tint. Abdominal apical bands pure silvery. Wings hyaline, iridescent.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, West Bengal. Elsewhere : Burma, Philippines, Sulawesi, Solomon Is.

Remarks : No material of this species was available for study from Meghalaya. This species is readily distinguished by having dense velvety pruinose on body and basal two abdominal segments red.

9. Tribe TRYPOXYLONINI

This tribe is represented by two genera, viz., *Pison* Jurine, 1808 and *Trypoxylon* Latreille, 1796. Of these genera, only *Trypoxylon* has been reported from the state of Meghalaya. However, a key to both the Indian genera is given below for ready reference.

Key to genera of tribe Trypoxylonini

1. Fore wing with one submarginal cell; antennal sockets not contiguous with frontoclypeal suture. *Trypoxylon* Latreille
- Fore wing with two or three submarginal cells; antennal sockets contiguous with frontoclypeal suture. *Pison* Jurine

14. Genus *Trypoxylon* Latreille

1796. *Trypoxylon* Latreille, *Precis Caract. Gen. Ins.*, p. 127.
Type-species : *Sphex figulus* Linnaeus, 1758, designated by Latreille, 1802-1803
1806. *Apius* Panzer, *Krit. Revis. Fauna. Deutschl.*, p. 106.
Type-species : *Sphex figulus* of Panzer, 1801 (= *Sphex figulus* Linnaeus, 1758). Monotypic.
1959. *Asaconoton* Arnold, *Occ. Pap. Natl. Mus. So., Rhodesia*, 23 B : 322.
Type-Species : *Trypoxylon egregium* Arnold, 1959. Original designation.
1976. *Trypoxylon* : Bohart and Menke, *University Calif. Press.*, p. 45, 339. Syn. des.

This is a moderately large genus, represented in India by 20 species/subspecies, viz., *accumulator* Smith, 1875; *buddha* Cameron, 1889; *canaliculatum* Cameron, 1889; *fletcheri* Turner, 1918; *fulvocollare* Cameron, 1904; *geniculatum* Cameron, 1902; *gracilescens* Smith, 1860; *indicum* Menke, 1976; *khasiae* Cameron, 1904; *mandibulatum* Richards, 1933; *montanum* Schulz, 1906; *nodosicorne* Turner, 1917; *orientale* Cameron, 1904; *pileatum* Smith, 1856; *pygmaeum* Cameron, 1900; *rejector* Smith, 1870; *responsum* Nurse, 1903; *testaceicorne* Cameron, 1907; *tinctipenne* Cameron, 1889 and *trochanteratum* Cameron, 1902. In Meghalaya this genus is represented by four species, viz., *geniculatum* Cameron, *khasiae* Cameron, *pileatum* Smith and *trochanteratum* Cameron. Of these, the material and description of *pileatum* was available for study. A key to the species could not be provided due to non-availability of material and description of other species.

55. *Trypoxylon geniculatum* Cameron

1902. *Trypoxylon geniculatum* Cameron, *J. Bombay Nat. Hist. Soc.* 14 : 52.

1976. *Trypoxylon geniculatum* Cameron : Bohart and Menke, *University Calif. Press.* p. 346.

Distribution : India : Meghalaya, West Bengal.

Remarks : No material of this species was available for study.

56. *Trypoxylon khasiae* Cameron

1904. *Trypoxylon khasiae* Cameron, *Ann. Mag. Nat. Hist.*, 13 : 218.

1976. *Trypoxylon khasiae* Cameron : Bohart and Menke, *University Calif. Press.* p. 346.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study.

57. *Trypoxylon pileatum* Smith

1856. *Trypoxylon pileatum* Smith, *Cat. Hym. Brit. Mus.*, 4 : 377. Type : Female and male.

1976. *Trypoxylon pileatum* Smith : Bohart and Menke. *University Calif. Press.*, p. 347.

Material examined : India : Meghalaya : East Garo Hills: Darugiri, 400 m, 1 ex., 30.iv. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills), Himachal Pradesh, Tamil Nadu. Elsewhere : Burma, Sri Lanka.

Remarks : This species is distinguished by having clypeus densely hairy, front produced into a shield-shaped form; propodeum with an enclosed subtriangular space at base. Body with shiny silvery pile.

58. *Trypoxylon trochanteratum* Cameron

1902. *Trypoxylon trochanteratum* Cameron, *Entomologist*, 313.

1976. *Trypoxylon trochanteratum* Cameron : Bohart and Menke, *University Calif. Press.*, p. 348.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills).

5. Subfamily CRABRONINAE

This subfamily includes a great variety of forms. They are commonly known as Silver moth or mustache wasps, due to the presence of a transverse silvery clypeus which, together with the vertical pale stripes on the scapes, forms an inverted pi-mark(□). They prey most orders of insects, but Dipterans are favourite.

Diagnostic characters : Eyes moderately separated, converging below, ocelli normal. Antennal sockets close to frontoclypeal suture; male with 11-13 and female with 12 antennal segments. Mandible with externoventral notch. Pronotal lobe and Tegula separated. Notauli short and indistinct. Middle tibia with one spur, sometimes none in male, rarely none in females; middle coxae slightly to broadly separated, without dorsolateral carina; hind femoral apex sometimes thickened and truncate; claws simple; fore tarsus with or without a rake. Propodeum short, dorsal enclosure sometimes present; no propodeal sternite. Fore wing with one submarginal cell or this may be fused with first discoidal cell, third discoidal cell absent. Jugal lobe of hind wing small, shorter to longer than submedian cell, media diverging beyond cu-a; second anal vein and subcosta absent. Gaster sessile or pedunculate, tergite I with lateral carina; male with 7 visible tergites; pygidial plate always present in females and in some males. Volsella simple and cerci absent.

In India, this subfamily is represented by 13 genera under two tribes viz., Oxybelini and Crabronini. The following genera are referable to this subfamily : *Oxybelus* Latreille, 1796; *Encopognathus* Kohl, 1896; *Entomognathus* Dahlbom, 1844; *Lindenius* Lepeletier and Brullé, 1834; *Rhopalum* Stephens, 1829; *Isorhopalum* Leclercq, 1963; *Crossocerus* Lepeletier and Brullé, 1834; *Crabro* Fabricius, 1775; *Vechtia* Pate, 1944; *Hingstoniola* Turner and Waterston, 1926; *Dasyproctus* Lepeletier and Brullé, 1834; *Ectemnius* Dahlbom, 1845 and *Lestica* Billberg, 1820.

Key to the tribes of Crabroninae

1. Submarginal and discoidal cells fused. .Oxybelini
- Submarginal and discoidal cells separate, not fused. ..Crabronini.

10. Tribe OXYBELINI

This tribe is represented by a single genus in India, including the state of Meghalaya.

15. Genus *Oxybelus* Latreille

1805. *Oxybelus* Latreille, *Hist. Nat. Crust. Ins.* 13 : 307.

Type-species : *Crabro uniglumis* of Fabricius, 1775 [= *Vespa uniglumis* Linnaeus, 1758], designated by Latreille, 1802-1803 : 343. [For detailed synonymy refer Bohart and Menke, 1976 : 46]

This is moderately a large genus represented by 14 species in India. Only *O. lamellatus squamosus* Smith has been reported from Meghalaya. The following 14 species are referable to this genus from India : *agilis* Smith, 1856; *canescens* Cameron, 1890; *flavipes* Cameron, 1890; *fulvicandis* Cameron, 1908; *fulvopilosus* Cameron, 1890; *furcifer*, Turner, 1917; *latileneatus* Cameron, 1908; *lamellatus* Olivier, 1811; *lewisi* Cameron, 1890; *linguiferus* Turner, 1917; *nigritulus* Turner, 1917; *robustus* Cameron, 1890; *ruficornis* Smith, 1856; *transiense* Turner, 1917; *tridentatus* Smith, 1856 (Bohart and Menke, 1976 : 366-370).

59. *Oxybelus squamosus* Smith

1875. *Oxybelus squamosus* Smith, *Trans. Ent. Soc.*, : 38. Type : Female.

1976. *Oxybelus lamellatus* : Bohart and Menke, *University Calif. Press*, p. 368.

Diagnostic characters : Female : Body length 7 mm. Head and mesoscutum strongly punctate, tending to be striated; pronotum smooth; scutellum and postscutellum sparsely punctate, projecting laminae minute, median mucro leaf-like. Propodeum short, truncate at apex. Abdomen finely and closely punctate. Body black, except scape, a broad line on pronotum, tubercles, two lateral spots on scutellum, abdominal segments 1-4 with two marks on either side, yellow; fore tibiae, middle femora and tibiae, and hind femora reddish. Fore femora black with apices yellow, hind tibiae and all the tarsi reddish-brown. Wings clear hyaline.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 1 ex., 14-17.v. 1979, coll. S.B. Roy and party. Dianadubi, 340 m, 1 ex., 8-13.v. 1979 coll. S.B. Roy and party; 1 ex., 8-13.v. 1979, coll. J.K. Jonathan and party; West Garo Hills : Tura, 1412 m, 1 ex., 1.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East and West Garo Hills), West Bengal. Elsewhere : Sri Lanka.

Remarks : This is the first record of this species from Meghalaya.

11. Tribe CRABRONINI

This tribe is represented by 12 genera in India, as already listed above. Only two genera, *Ectemnius* Dahlbom, *Dasyproctus* Lepeletier and Brulle have been reported from the state of Meghalaya. These two genera can be distinguished by the following key:

Key to the genera of Crabronini

1. Integument largely dull and mat; verticulus weak, but unusually elongate; male antenna 13-segmented. Gaster nodose towards the apex . . . *Dasyproctus* Lepeletier and Brulle

Integument largely subpolished and coarsely sculptured; verticulus well-developed, L-shaped; male antenna 12-or rarely 13 segmented. Gaster not nodose towards the apex.

Ectemnius Dahlom

16. Genus *Dasyproctus* Lepeletier and Brulle

1834. *Dasyproctus* Lepeletier and Brulle, *Ann. Soc. Ent. France*, 3 : 801.

Type-species : *Dasyproctus bipunctatus* Lepeletier and Brulle, 1834. Monotypic.

1976. *Dasyproctus* : Bohart and Menke, *University Calif. Press*, p. 49, 419. University Syn, des.

This is small genus, known by four species, viz., *agilis* (Smith), 1858; *buddha* (Cameron), 1889; *oppidanus* Leclercq, 1972 and *pulveris* (Nurse), 1902 from India., Only one species had been reported from Meghalaya, which is detailed below :

60. *Dasyproctus agilis* (Smith)

1858. *Carbro agilis* Smith, *J. Proc. Linn. Soc. London, Zool.* 2 :

1890. *Crabro orientalis* Cameron, *Mem. Manch. Lit. Phil. Soc.*, 3(4) : 272.

1976. *Dasyproctus agilis* : Bohart and Menke, *University Calif. Press*, p. 420. syn.

Diagnostic characters : Female : Body 8-11 mm long, clypeus, frontal depression, malar space densely hairy. Head closely and finely punctate, punctures less dense on vertex. Thorax not so densely punctate; apical margin of mesoscutum, scutellum and pleural furrow striate. Propodeum obliquely rugoso-striate, with a Y-shaped furrow posteriorly. Abdomen dull, obscurely hairy; petiole swollen at apex; second segment also strongly constricted at base.

Body black. Hair on head silvery, on abdomen brownish and on thorax longish and gray-white. The mandible at base, scape, posterior margin of pronotum, scutellum transversely in the middle, a small spot on either side of petiole at apex, lateral oval spots on 2nd fourth and fifth segments of abdomen yellow, spots on fifth segments sometimes fusing and forming a broad transverse yellow band above. Legs with femora at apices all tibiae and tarsi, yellow. Wings light brownish hyaline.

Material examined : India : Meghalaya : East Garo Hills : Dainadubi, 340 m, 2 exs., 8-13.v. 1979, coll. S.B. Roy and party. Songsak, 423 m, 5-6.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills), Himachal Pradesh, Sikkim, Maharashtra, West Bengal. Elsewhere : Burma.

Remarks : This is the first record of this species from Meghalaya.

17. Genus *Ectemnius* Dahlbom

1845. *Crabro* (*Ectemnius*) Dahlbom, *Hym. Europaea*, 1 : 389.

Type-species : *Crabro guttatus* of Dahlbom. Designated by Ashmead, 1899.

1892. *Crabro* (*Mesocrabro*) Verhoeff, *Ent. Nachr.*, 18 : 70.

Type-species : *Crabro guttatus* van der Linden. Designated by Pate, 1937.

1976. *Ectemnius* Dahlbom : Bohart and Menke. *University Calif. Press*, p. 424.

This is a widely distributed genus. About 160 species in the world and 16 species have been described from India. Most species of *Crabro* from India belong to this genus (Bingham, 1897 : 321). The following species are referable to this genus from India : *agycus* (Cameron), 1904; *ammanitus* Leclercq, 1958; *asiaticus* Leclercq, 1950; *bogorensis* Leclercq, 1958; *chrysites* (Kohl) 1892; *corvidus* Laclercq, 1961; *fulvopilosellus* (Cameron), 1902; *fuscipennis* (Lepelletier and Brulle), 1834; *insignis* (Smith), 1856; *lysias* (Cameron), 1905; *melanotarsis* (Cameron) 1902; *menyllus* (Cameron), 1905; *palitans* (Bingham), 1896; *sodalis* (Bingham), 1897; *trichiosomus* (Cameron), 1904 and *violaceipennis* (Cameron), 1907. Only four species have been reported so far from the state of Meghalaya. These can be distinguished by the following key :

Key to the species of *Ectemnius*

1. Body in general covered with golden-yellow pubescence. Pygidium with a small yellow mark.
fulvopilosellus (Cameron)

Body in general covered with white silvery pubescence. Pygidium without a yellow mark. 2

2. Propodeum dorsally distinctly punctate, at sides with a few indistinct striae.
trichiosomus (Cameron)
- Propodeum largely transversely or obliquely striate. 3
3. Wings clear hyaline; pronotum without a yellow line above. Face not thickly covered with silvery pubescence. Body length 14 mm.
chrysites (Kohl)
- Wings fuscous; pronotum with a broad yellow line above. Face thickly covered with silvery pubescence. Body length 9 mm.
.melanotarsis (Cameron)

61. *Ectemnius chrysites* (Kohl)

1892. *Crabro chrysites* Kohl, *Ann. Naturhist. Hofmus Wien*, 8:

1897. *Crabro auricomus* Bingham, *Fauna Brit. India, Hymenoptera* 1 : 327. Type : Female.

1976. *Ectemnius chrysites* (Kohl): Bohart and Menke, *University Calif. Press*, p. 424.

Distribution : India : Meghalaya (East Khasi Hills), Assam. Elsewhere : Japan, Thailand, Korea, Philippines, U.S.S.R.

Remarks : No material of this species was available for study from Meghalaya. This is a large size species, about 14 mm long; mesoscutum anteriorly transversely and posteriorly obliquely striate; apical margin of first to fifth abdominal segments irregularly marked yellow.

62. *Ectemnius fulvopilosellus* (Cameron)

1902. *Crabro fulvopilosellus* Cameron, *Ann. Mag. Nat. Hist.* (7) 10 : 54. Type : Female.

1976. *Ectemnius fulvopilosellus* (Cameron) : Bohart and Menke, *University Calif. Press*, p. 426.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : No material of this species was available for study from Meghalaya. This species is readily distinguished by having golden yellow pubescence on the body.

63. *Ectemnius melanotarsis* (Cameron)

1902. *Crabro melanotarsis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 10 : 60.

1905. *Crabro elvinus* Cameron, *Entomologist*, 38 : 14.

1905. *Crabro monozonus* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 218.

1976. *Ectemnius melanotarsis* Cameron, Bohart and Menke, *University Calif. Press*, p. 427.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species can be identified by having a broad yellow line on pronotum; apical margin of second abdominal segment; fore femora broadly, yellow; wings brownish.

64. *Ectemnius trichiosomus* (Cameron)

1904. *Crabro trichiosomus* Cameron, *Entomologist*, **37** : 262.

1905. *Crabro himalayensis* Cameron, *Ann. Mag. Nat. Hist.*, (7) **15** : 218.

1976. *Ectemnius trichiosomus* Cameron, Bohart and Menke, *University Calif. Press*, p. 428.

Distribution : India : Meghalaya (East Khasi Hills), Assam.

Remarks : This species is distinguished by having propodeum dorsally distinctly punctate, at sides with a few indistinct striae.

6. Subfamily NYSSONINAE

The members of this subfamily is commonly known as "sand wasps". Most species nest in the ground and prefer sandy habitats. They prey up on variety of other insects, from grasshoppers to flies. This is fairly a large subfamily, there are more than 1400 known species (Bohart and Menke, 1976) under this subfamily.

Diagnostic characters : Eyes parallel or converging below, rarely above. mandible not notched nor toothed. Scutellum without complete notauli. Middle tibia with two apical spurs; claws simple. Propodeal sternite absent. Fore wing with two or three submarginal cells of which second cell usually receives at least one recurrent vein; three discoidal cells present. Jugal lobe in hind wing usually small, rarely absent, at most half as long as anal area. Gaster usually sessile, when pedunculate, made up of both tergite and sternite. Male genitalia usually with volsella differentiated into cuspis and digitus.

In India, this subfamily is represented by 12 genera under four tribes viz., Nyssonini, Gorytini, Stizini and Bembicini. The following genera are referable to this subfamily : *Nursea* Cameron, 1902; *Nysson* Latreille, 1802-1803; *Brachystegus* A. Costa, 1859; *Dienoplus* W. Fox, 1893; *Gorytus* Latreille, 1804; *Lestiphorus* Lepeletier, 1832; *Ammatomus* A. Costa, 1859; *Hoplisoides* Gribodo, 1884; *Stizus* Latreille, 1802-1803; *Stizoides* Guérin-Meneville, 1844; *Bembecinus* A. Costa, 1859 and *Bembix* Fabricius, 1775.

The state of Meghalaya is represented by 2 tribes, these can be distinguished by the following key (Bohart and Menke, 1976 : 445).

Key to the tribes of Nyssoninae

1. Labrum exerted and at least as long as broad, omanlus absent, hind ocelli deformed and often scar-like, only one midtibial spur, prestigmal length of submarginal cell I more than twice height of cell. .BEMBICINI
- Labrum, if exerted, not as long as broad; hind ocelli rarely deformed and if so, omanlus present. GORYTINI

12. Tribe GORYTINI

This tribe is represented by 5 genera, viz., *Dienoplus* W. Fox, 1893; *Gorytus* Latreille, 1804; *Lestiphorus* Lepeletier, 1832; *Ammatomus* A. Costa, 1859 and *Hoplisoides* Gribodo, 1884 in India. Of these only one genus, viz., *Ammatomus* has been recorded from Meghalaya.

18. Genus *Ammatomus* A. Costa

1859. *Ammatomus* A. Costa, *Fauna del Regno di Napoli. Specidea*, p. 36.

Type-species : *Gorytes coarctatus* Spinola, 1808. Monotypic.

1976. *Ammatomus* A. Costa : Bohart and Menke, *University Calif. Press*, p. 53, 512. Syn.

This genus is known to have 2 species, viz., *alipes* (Bingham, 1897) and *lenis* (Nurse, 1903). Of these only *alipes* has been reported from Meghalaya, which is discussed below.

65. *Ammatomus alipes* (Bingham)

1897. *Gorytes alipes* Bingham, *Fauna Brit. India, Hymenoptera*, 1 : 273. Type : Female, male, des. India : Maharashtra : Bombay. Burma.

1976. *Ammatomus alipes* : Bohart and Menke. *University Calif. Press*, p. 513.

Diagnostic characters : *Female and Male* : Body length 9-13 mm, obscurely covered with fine hairs. Eyes convergent below; clypeus triangular, its anterior margin transverse; frons with a vertical impressed groove; propodeum with a triangular area at the base, smooth and shiny. Abdomen with a stout petiole.

Black. The following are yellow : Clypeus, scape a line on the pronotum posteriorly a line on mesoscutum on the antero-lateral margin, post-scutellum, fore and middle femora, tibiae and tarsi, and also hind tibiae and tarsi, apical margins of basal four segments of abdomen. Middle femora and hind tibiae black above, transverse band on basal segment emarginate in the middle, and the bands on the remaining segments very wide laterally. Clypeus covered with dense silvery pile. Wings hyaline, nerves testaceous.

Material examined : India : Meghalaya : East Garo Hills : Songsak, 423 m, 2 exs., 5-6.v. 1979, coll. J.K. Jonathan and party.

Distribution : India : Meghalaya (East Garo Hills), Maharashtra, Sikkim. Elsewhere : Burma.

Remarks : This is a new record of the species from Meghalaya. This species can be recognised by having eyes convergent below; basal abdominal segment black and fore wing clear hyaline.

13. Tribe BEMBICINI

This tribe is represented by a single genus, viz., *Bembix* Fabricius, 1775 from India including Meghalaya.

19. Genus *Bembix* Fabricious

1775. *Bembix* Fabricius, *Systema Ent., Char. Gen.*, p.23

Type-species : *Bembix rostrate* of Fabricious. Designated by Latreille, 1810.

1976. *Bembix* Fabricius : Bohart and Menke, *University Calif. Press*, p. 54. Syn.

1979. *Bembix* Fabricius : Krombein *et al.*, *Cat. Hymn. Amer. North of Mexico*. 2 : 1708. Syn.

This Genus is represented by 21 species (Bohart and Menke, 1976 : 545-549) in India. Only one species has been recorded from the state of Meghalaya, which is discussed below.

66. *Bembix khasiana* Cameron, 1904

1904. *Bembix khasiana* Cameron. *Trans. Amer. Ent. Soc.*, 30 : 123.

1976. *Bembix khasiana* Cameron. Bohart : and Menke. *University Calif. Press*, p. 547.

Diagnostic characters : Female : Body 20 mm long, yellow, two oblique marks on clypeus above, vertex, front with two large lines on the upper half, a line on frontal carinae, prothorax, except for an irregular mark on the apex of pronotum, a line on the apex of scutellum, a short line on postscutellum, two oblique marks on the base of propodeum, an irregular mark on the sides on the top of the apical slope, the pleurae, an irregular broad line on the upper half of the metapleurae above, two marks on the centre of the mesosternum, black. First abdominal segment black, with a yellow mark; 2nd segment black on the extreme base, the band dilated backwards in the middle and having two broad large projecting marks united to it; the base of the third segment black, with two broad marks near the centre, its apex more broadly black and dilated backward in the middle; fourth and fifth segments similarly marked; the apical entirely black. Legs pale yellow : The coxae and femora broadly black above. Tarsal segments broadly dilated at apex, its spines long, rufus.

Distribution : India : Meghalaya (East Khasi Hills).

7. Subfamily PHILANTHINAE

This subfamily is considered to be one of the largest subfamilies of Sphecidae. There are about 1100 described species in the world fauna under this subfamily. Almost all the species are ground nesting, and the provisions are Hymenoptera or Coleoptera. They are commonly found on flowers and a considerable amount of pollen is found on their body (Bohart and Menke, 1976).

Diagnostic characters : Eyes rather widely separated, inner orbit emarginate or entire, converging above. Antennal sockets separated from fronto-clypeal suture; male with 13 and female with 12 antennae. Mandible without externoventral notch. Mesoscutum with notauli usually distinct; omaulus, sternaulus and acitabular carina absent. Middle tibia with one spur, claws simple. Propodeum short to moderately long dorsal enclosure present, without propodeal sternite. Forewing with 3 submarginal cells, II and III each usually receiving one recurrent vein; jugal lobe small to large; media in hind wing diverging before, at or after cu-a; second anal vein and subcosta absent. Gaster sessile, pedunculate, or occasionally petiolate, petiole clearly composed of tergite and sternite; male with 7 exposed terga; pygidial plate usually present. Volsella simple or with digitus and cuspis; cerci usually absent.

In India this subfamily is represented by 2 tribes viz., Philanthini and Cercirini. The tribe Philanthini contains only one genus *Philanthus* Fabricius from India. 11 species have been reported under genus *Philanthus*, but none belongs to the state of Meghalaya. The tribe Cercirini is represented by 2 genera viz., *Cerceris* Latreille, 1802-1803 and *Eucerceris* Cresson, 1865 in world fauna. The genus *Cerceris* contains a huge number of species in relation to other genera, and is the only genus known to occur in Meghalaya. There are about 46 species (Bohart and Menke, 1976 : 576-589) under the genus *Cerceris* from India.

14. Tribe CERCERINI

20. Genus *Cerceris* Latreille

1805. *Cerceris* Latreille, *Hist. Nat. Crust. Ins.*, 13 : 315.
Type-species : *Philanthus ornatus* Fabricius. Designated by Latreille, 1810 (= *Sphex rybyensis* Linnaeus).
1838. *Nectanebus* Spinola, *Ann. Soc. Ent. France*, 7 : 489.
Type-species : *Nectanebus fischeri* Spinola. Original designation.
1844. *Diamma* Dahlbom, *Hym. Europaea*, 1 : 225. Preoccupied.
Type-species : *Diamma spinolae* Dahlbom. Monotypic (= *Cerceris binodis* Spinola).
1845. *Didesmus* Dahlbom, *Hym. Europaea*, 1: 502, n. name.
1913. *Paracerceris* Brethes, *Ann. Mus. Nac. Hist. Nat. Buenos Aires*, 24 : 127.
Type-species : *Paracerceris tridentifera* Brethes. Monotypic.
1923. *Apiraptrix* Shestakov, *Sbornik Jaroslav Gosudarst. Universitet*:101.
Type-species : *Sphex rybyensis* Linnaeus. Original designation.
1934. *Bucerceris* Minkiewicz, *Polski Pismo Ent.*, 12 : 253.
Type-species : *Cerceris bupresticida* Dufour. Monotypic.

The following species are referable to this Genus from Meghalaya : *bimaculata* Cameron, 1905; *fortunata* Cameron, 1902; *instabilis* Smith, 1856; *kirbyi* Bingham, 1897; *latibalteata* Cameron, 1904; *lepcha* Cameron, 1905; *nebulosa* Cameron, 1890; *unifasciata* Smih, 1856; *violaceipennis* Cameron, 1904. These can be distinguished by the following key.

Key of the species of *Cerceris*

1. Second ventral segment with a raised area at the base. .2
Second ventral segment without a raised area at the base. 4
2. Clypeus with a free lamina arising from the base. .*violaceipennis* Cameron
Clypeus without a free lamina arising from the base or with the extreme apical margin only free. .3
3. Clypeus apically truncated. (Enclosed area at the base of propodeum longitudinally striated from base to apex). .*fortunata* Cameron

Clypeus more or less emarginate apically, produced into an obtuse tooth on each side.

instabilis Smith

4. Clypeus with a more or less free lamina; lamina truncate; apical margin of clypeus with two teeth on each side. *latibalteata* Cameron

Clypeus without a free lamina.

5

5. Clypeus with several teeth on apical margin. Propodeum at sides dirty yellow. (First abdominal segment about 2x as long as broad. *kirbyi* Bingham

Clypeus without teeth on apical margin. Propodeum immaculate, black

6

6. Second abdominal tergite with 2 yellow spots at its base; 3-5 tergites apically broadly, yellow. Female 10 mm long. *..unifasciata* Smith

Second abdominal tergite with a narrow yellow band at base; apical half of 3rd and extreme apex of 4th tergite reddish yellow. Female 15 mm long. *nebulosa* Cameron

[Note : *C. bimaculata* Cameron and *C. lepcha* Cameron could not be included in the key, because their females are unknown].

67. *Cerceris instabilis* Smith

1856. *Cerceris instabilis* Smith, *Cat. Hym. Brit. Mus.*, 4 : 452. Type : Female.

1875. *Cerceris velox* Smith, *Trans. Ent. Soc. London*, p. 41. Type : Male.

Material examined : India : Meghalaya : East Garo Hills : Songsak, 1 ex., 22.ix. 1975, coll. N. Muralidharan & Party.

Distribution : India : Meghalaya (East Garo Hills), Goa, Karnataka, Sikkim, Maharashtra, Tripura, Tamil Nadu, West Bengal. Elsewhere : Burma, Sri Lanka.

Remarks : This is the first record of this species from Meghalaya. This species is readily distinguished by having propodeum posteriorly red in colour, marked with yellow; enclosed area black and longitudinally striate.

68. *Cerceris bimaculata* Cameron

1905. *Cerceris bimaculata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 219. Type : Male.

1976. *Cerceris bimaculata* Cameron : Boliart and Menke, *University calif. Press*, p. 578.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is based on a single male specimen from Shillong in Khasi Hills. No material of the species was available for study. However, this species can be identified by having first abdominal segment half as long as broad; second ventral segment without a raised area at base. Head

and thorax including enclosed area at the base of propodeum finely and closely punctate. Body length 9 mm.

69. *Cerceris fortinata* Cameron

1902. *Cerceris fortinata* Cameron, *Ann. Mag. Nat. Hist.* (7) 10 : 57.

1905. *Cerceris aureobarba* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 221.

1976. *Cerceris fortinata* Cameron : Bohart and Menke, *University Calif. Press*, p. 581.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *instabilis* Smith, by having clypeus without a free lamina arising from the base. This species can be easily distinguished by having clypeus apically truncate; enclosed area at the base of propodeum longitudinally striated from base to apex.

70. *Cerceris kirbyi* Bingham

1897. *Cerceris kirbyi* Bingham, *Fauna Brit. India, Hymenoptera*, 1 : 313. Type : Female.

1976. *Cerceris kirbyi* Bingham : Bohart and Menke, *University Calif. Press*, p. 583.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 2 exs., 14-20.v. 1979. coll. S.B. Roy and party; Dainadubi, 340 m, 1 ex., 8-13.v. 1979. coll. S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills). Elsewhere : Burma.

Remarks : This is the first record of this species from Meghalaya. This species is readily distinguished by having clypeus with several teeth on apical margin; first abdominal segment about 2x as long as wide; enclosed space at the base of propodeum transversely striate.

71. *Cerceris latibalteata* Cameron

1904. *Cerceris latibalteata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 13 : 292, Type : Female.

1976. *Cerceris latibalteata* Cameron : Bohart and Menke, *University Calif. Press.*, 583.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya. This species is distinguished by having second ventral segment without a raised area at the base; clypeus with a more or less free lamina; lamina truncate; apical margin of clypeus with two teeth on each side.

72. *Cerceris lepcha* Cameron

1905. *Cerceris lepcha* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 222. Type : Male.

1976. *Cerceris lepcha* Cameron : Bohart and Menke, *University Calif. Press*, p. 583.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this available for study. This species is based on a single male specimen from Khasi Hills in Meghalaya. This species is distinguished by having clypeus specially truncated; first abdominal segment slender, about 3x as long as broad; pygidial area 2x broad at base than at apex; body largely coarsely to finely punctate. Body about 7 mm long. This species could not be included in the key, due to non-availability of female.

73. *Cerceris nebulosa* Cameron

1890. *Cerceris nebulosa* Cameron, *Mem. Manch. Lit. Phil. Soc.*, (4) 3 : 250, 265. Type : Female, Male.

1976. *Cerceris nebulosa* Cameron : Bohart and Menke, *University Calif. Press*, p. 584.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *unifasciata* Smith in having propodeum emaculate, black; clypeus without teeth on apical margin. However, it can be distinguished by its second tergite with narrow yellow band at base; apical half of 3rd and extreme apex of 4th tergite, reddish-yellow.

74. *Cerceris unifasciata* Smith

1856. *Cerceris unifasciata* Smith, *Cat. Hym. Brit. Mus.*, 4 : 456. Type : Male (nec. female).

1976. *Cerceris unifasciata* Smith : Bohart and Menke, *University Calif. Press*, p. 588.

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 400 m, 2 exs., 14-20.v. 1979, coll. S.B. Roy and party; Songsak, 423 m, 2 exs., 5-6.v. 1979, coll. J.K. Jonathan and party; Dainadubi, 340 m, 2 ex., 8-13.v. 1979, J.K. Jonathan and party and S.B. Roy and party; East Khasi Hills : Cherrapunjee, 1358 m, 1 ex., 23-26.iv. 1979, coll. J.K. Jonathan and party; Shillong, 3 exs., coll. La Touche.

Distribution : India : Meghalaya (East Garo and East Khasi Hills), Assam, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Burma, China.

Remarks : This species is close to *nebulosa* Cameron, but can be distinguished by having second abdominal tergite with 2 yellow spots at its base; 3-5 tergites apically broadly, yellow. Female 10 mm long.

75. *Cerceris violaceipennis* Cameron

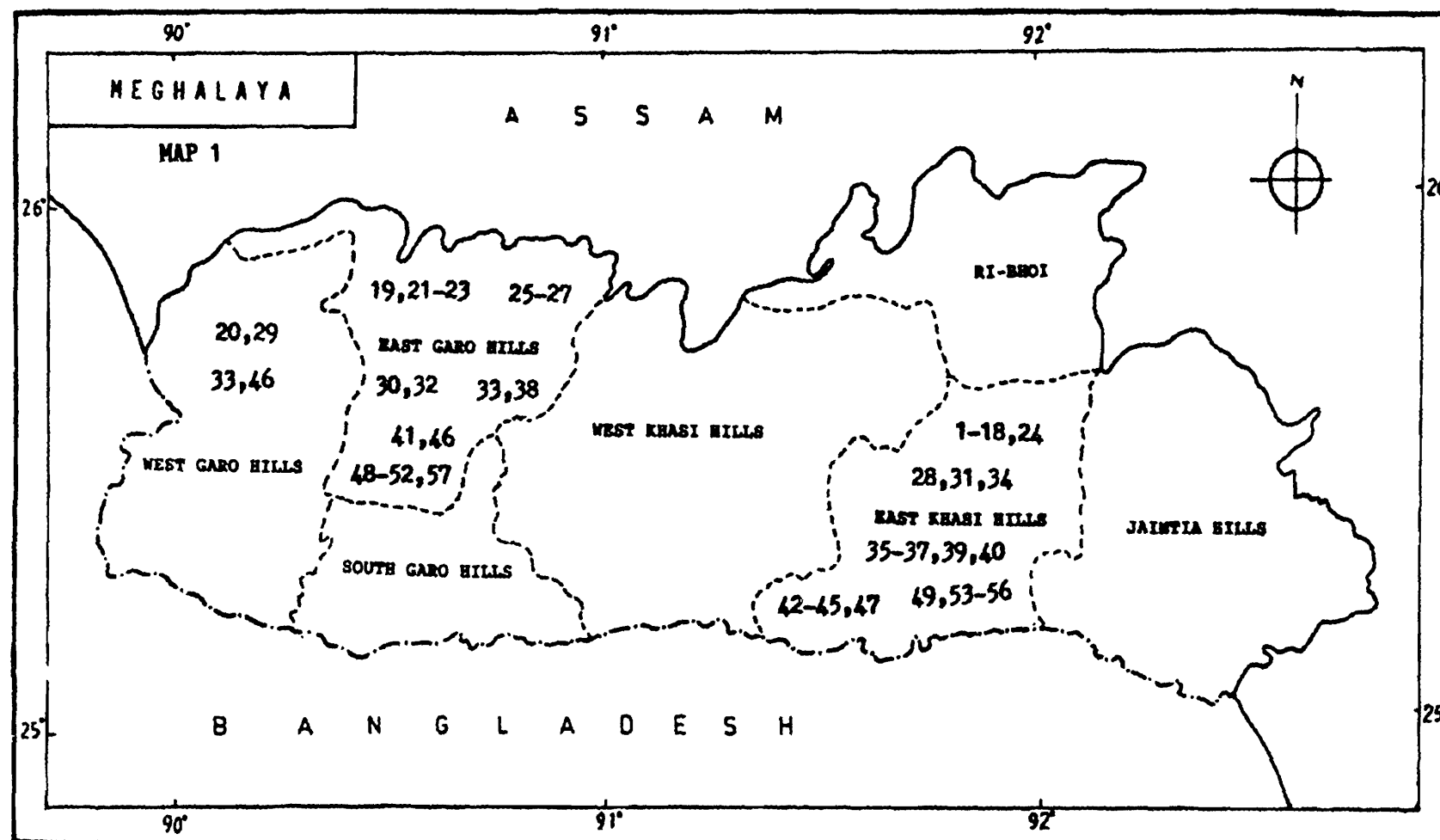
1904. *Cerceris violaceipennis* Cameron, *Ann. Mag. Nat. Hist.*, (7) 13 : 292.

1905. *Cerceris rufoplagiata* Cameron, *Ann. Mag. Nat. Hist.*, (7) 15 : 221.

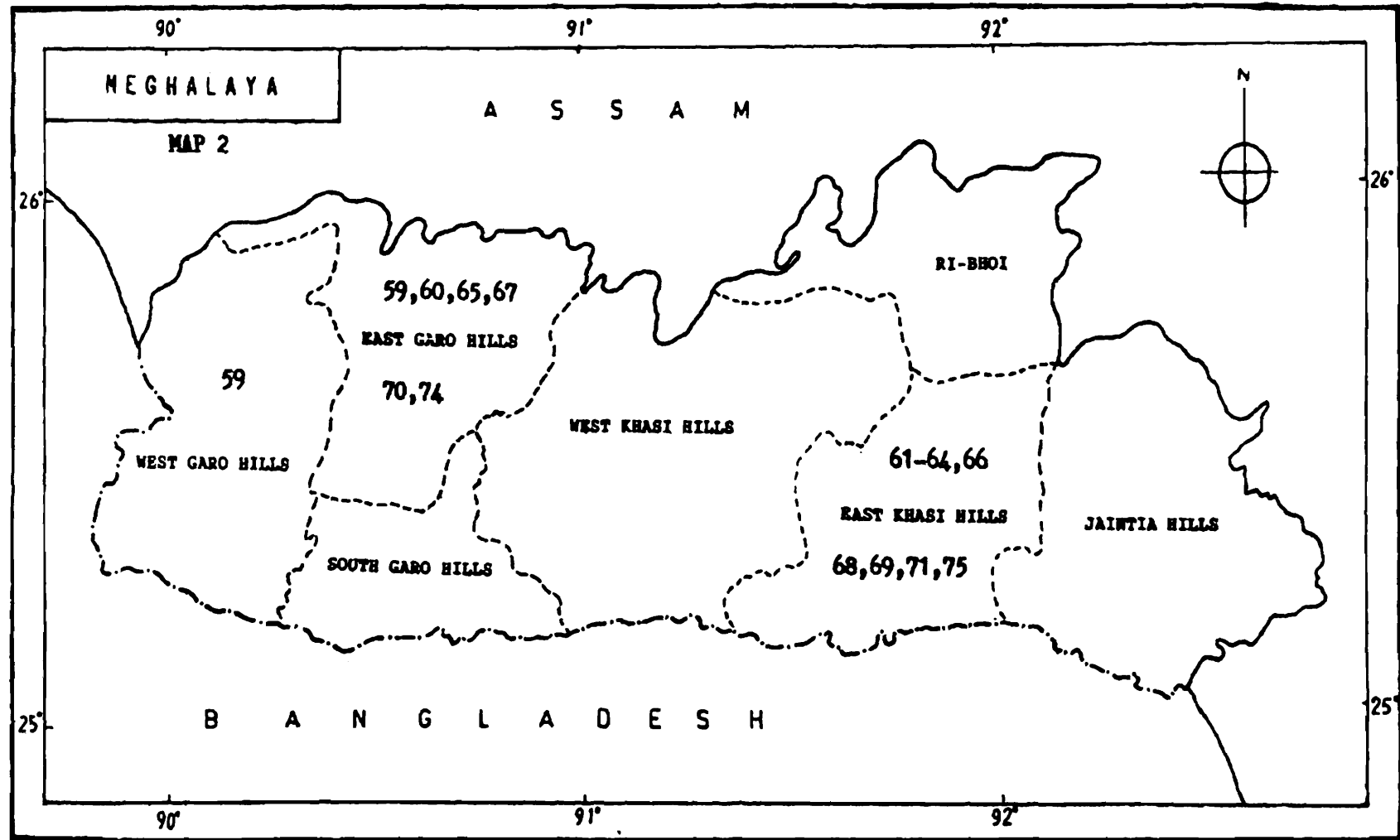
1976. *Cerceris violaceipennis* Cameron : Bohart and Menke. *University Calif. Press*, p. 589.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is recognised by having second ventral segment with a raised area at the base; clypeus with a free lamina arising from the base. This is a little known species, with no material available for study from the state of Meghalaya.



Map 1. Distribution of taxa of subfamilies : Ampulicinae, Sphecinae, Pemphredoninae and Larrinae in Meghalaya. Number indicates the name of the taxa as treated in the text.



Map 2 Distribution of taxa of subfamilies : Crabroninae, Nyssoninae and Philanthinae in Meghalaya. Number indicates the name of the taxa as treated in the text.

District-wise Distribution Of Taxa Of Family Sphecidae In Meghalaya

Sl. No.	Name Of Taxa	Distribution
	1. Subfamily Ampulicinae	
	1. Tribe Dolichurini	
	1. Genus <i>Dolichurus</i> Latreille, 1809	
1.	<i>taprobane</i> Smith, 1869	East Khasi Hills
2.	<i>bipunctatus</i> Bingham, 1896	East Khasi Hills
	2. Tribe ampulicini	
	2. Genus <i>Ampulex</i> Jurine, 1807	
3.	<i>aborensis</i> Nurse, 1914	East Khasi Hills
4.	<i>assamensis</i> Cameron, 1903	East Khasi Hills
5.	<i>carinifrons</i> Cameron, 1903	East Khasi Hills
6.	<i>compressa</i> (Fabricius), 1775	East Khasi Hills
7.	<i>crudelis</i> Bingham, 1897	East Khasi Hills
8.	<i>himalayensis</i> Cameron, 1903	East Khasi Hills
9.	<i>hospes cognata</i> Kohl, 1893	East Khasi Hills
10.	<i>interstitialis</i> Cameron, 1903	East Khasi Hills
11.	<i>hasiana</i> Cameron, 1903	East Khasi Hills
12.	<i>latifrons</i> Kohl, 1893	East Khasi Hills
13.	<i>longicollis</i> Cameron, 1903	East Khasi Hills
14.	<i>montana</i> Cameron, 1903	East Khasi Hills
15.	<i>nigricans</i> Cameron, 1899	East Khasi Hills
16.	<i>pilosa</i> Cameron, 1900	East Khasi Hills
17.	<i>rothneyi</i> Cameron, 1902	East Khasi Hills
18.	<i>ruficoxis</i> Cameron, 1902	East Khasi Hills

Sl. No.	Name Of Taxa	Distribution
	2. Subfamily Sphecinae	
	3. tribe Sceliphronini	
	3. Genus <i>Chlorion</i> Latreille, 1802	
19.	<i>lobatum</i> (Fabricius), 1775	East Garo Hills
	4. Genus <i>Chalybion</i> Dahlbom, 1843	
	1. Subgenus <i>Chalybion</i> (<i>chalybion</i>) s. str.	
20.	<i>spinolae</i> (Lepeletier), 1845	West Garo Hills
21.	<i>bengalense</i> Dahlbom, 1845	East Garo Hills
	5. Genus <i>Sceliphron</i> Klug	
	2. Subgenus <i>Sceliphron</i> (<i>Sceliphron</i>) s. str.	
22.	<i>madraspatanum madraspatanum</i> (Fabricius), 1781	East Garo Hills
	3. Subgenus <i>Sceliphron</i> (<i>Prosceliphron</i>) van der vecht, 1968	
23.	<i>formosum</i> (Smith), 1856	East Garo Hills
24.	<i>deforme tibiale</i> Cameron, 1899	East Khasi Hills
	4. Tribe Sphecini	
	6. Genus <i>Sphex</i> Linnaeus, 1758	
	4. Subgenus <i>Sphex</i> (<i>Sphex</i>) s. str.	
25.	<i>argentatus</i> Fabricius, 1787	East Garo Hills
26.	<i>sericeus fabricii</i> Dahlbom, 1793	East Garo Hills
27.	<i>subtruncatus</i> Dahlbom, 1843	East Garo Khasi Hills
	5. Tribe Ammophilini	
	7. Genus <i>Ammophila</i> Kirby, 1798	
28.	<i>basalis</i> Smith, 1889	East Khasi Hills
29.	<i>atripes</i> Smith, 1852	East & West Garo Hills
30.	<i>laevigata</i> Smith, 1856	East Garo Hills

Sl. No.	Name Of Taxa	Distribution
	3. Subfamily Pemphredoninae	
	6. Tribe Psenini	
	8. Genus <i>Psen</i> Latreille, 1796	
31.	<i>fuscinervis</i> (Cameron), 1899	East Khasi Hills
	4. Subfamily Larrinae	
	7. Tribe Larrini	
	9. Genus <i>larra</i> Fabricius, 1793	
32.	<i>carbonaria</i> (Smith), 1858	East Garo Hills
33.	<i>erratica</i> Bingham, 1897	East and West Garo Hills
34.	<i>femorata</i> (Cameron), 1900	East Khasi Hills
	10. Genus <i>Liris</i> Fabricius, 1804	
	5. Subgenus <i>Liris</i> (<i>Leptolarra</i>) Cameron, 1900	
35.	<i>aciculata</i> (Cameron), 1905	East Khasi Hills
36.	<i>appendiculata</i> (Cameron), 1901	East Khasi Hills
37.	<i>aureosericea</i> (Cameron), 1901	East Khasi Hills
38.	<i>elegans</i> (Bingham), 1897	East Garo Hills
39.	<i>fuscinerva</i> (Cameron), 1905	East Khasi Hills
40.	<i>khasiana</i> (Cameron), 1905	East Khasi Hills
41.	<i>laboriosa</i> (Smith), 1856	East Garo Hills
42.	<i>strenua</i> (Cameron), 1905	East Khasi Hills
43.	<i>sulcifrons</i> (Cameron), 1905	East Khasi Hills
44.	<i>testaceicornis</i> (Cameron), 1905	East Khasi Hills
45.	<i>tegularis</i> (Cameron), 1905	East Khasi Hills
46.	<i>tristis</i> (Smith), 1856	East and West Garo Hills
47.	<i>vivax</i> (Cameron), 1905	East Khasi Hills

Sl. No.	Name Of Taxa	Distribution
11. Genus <i>Tachytes</i> Panzer, 1806		
48.	<i>fervidus</i> Smith, 1856	East Garo Hills
49.	<i>modestus</i> Smith, 1856	East Khasi/ East Garo Hills
50.	<i>nitidulus</i> (Fabricius), 1775	East Garo Hills
51.	<i>saundersii</i> Bingham, 1897	East Garo Hills
52.	<i>tarsalis</i> (Dalla Torre), 1897	East Garo Hills
12. Genus <i>Tachysphex</i> Kohl, 1883		
53.	<i>bituberculatus</i> Cameron, 1905	East Khasi Hills
8. Tribe Miscophini		
13. Genus <i>Lyroda</i> Say, 1837		
54.	<i>formosa</i> (Smith), 1859	East Khasi Hills
9. Tribe Trypoxylonini		
14. Genus <i>Trypoxylon</i> Latreille, 1796		
55.	<i>geniculatum</i> Cameron, 1902	East Khasi Hills
56.	<i>khasiae</i> Cameron, 1904	East Khasi Hills
57.	<i>pileatum</i> Smith, 1856	East Garo Hills
58.	<i>trochanteratum</i> Cameron, 1902	East Khasi Hills
5. Subfamily Crabroninae		
10. Tribe Oxybelini		
15. Genus <i>Oxybelus</i> Latreille, 1805		
59.	<i>lamillatus squamosus</i> Smith, 1875	East and West Garo Hills
11. Tribe Crabronini		
16. Genus <i>Dasyproctus</i> Lepeletier and Brulle, 1834		
60.	<i>agilis</i> (Smith), 1858	East Garo Hills

Sl. No.	Name Of Taxa	Distribution
17. Genus <i>Ectemnius</i> Dahlbom, 1845		
61.	<i>chrysites</i> (Kohl), 1892	East Khasi Hills
62.	<i>flavopilosellus</i> (Cameron), 1902	East Khasi Hills
63.	<i>melonotarsis</i> (Cameron), 1902	East Khasi Hills
64.	<i>trichiosomus</i> (Cameron), 1904	East Khasi Hills
6. Subfamily Nyssoninae		
12. Tribe Gorytini		
18. Genus <i>Ammatomus</i> A. Costa, 1859		
65.	<i>alipes</i> (Bingham), 1897	East Garo Hills
13. tribe Bembicini		
19. Genus <i>Bembix</i> Fabricius, 1775		
66.	<i>hasiana</i> Cameron, 1904	East Khasi Hills
7. Subfamily Philanthinae		
14. Tribe Cercerini		
20. Genus <i>Cerceris</i> Latreille, 1802-03		
67.	<i>instabilis</i> Smith, 1856	East Garo Hills
68.	<i>bimaculata</i> Cameron, 1905	East Khasi Hills
69.	<i>fortinata</i> Cameron, 1902	East Khasi Hills
70.	<i>kirbyi</i> Bingham, 1897	East Garo Hills
71.	<i>latibalteata</i> Cameron, 1904	East Khasi Hills
72.	<i>lepcha</i> Cameron, 1905	East Khasi Hills
73.	<i>nebulosa</i> Cameron, 1890	East Khasi Hills
74.	<i>unifasciata</i> Smith, 1856	East Garo and East Khasi Hills
75.	<i>violaceipennis</i> Cameron, 1904	East Khasi Hills

SUMMARY

The present paper deals with the Sphecidae fauna of the state Meghalaya, India. In Meghalaya, family sphecidae is represented by 7 subfamilies. In India this family is represented by about 450 species/subspecies. Only 75 species / subspecies have been recorded from the state of Meghalaya under 20 genera.

The following 16 species/subspecies have been recorded for the first time from Meghalaya : *Dolichurus taprobane* Smith; *Chlorion lobatum* (Fabricius); *Chalybion* (*Chalybion*) *spinolae* (Lepeletier); *Sceliphron* (*Prosceliphron*) *formosum* (Smith); *Sphex* (*Sphex*) *argentatus* Fabricius; *Ammophila basalis* Smith; *A. atripes* Smith; *Larra carbonaria* (Smith); *L. erratica* Bingham; *Tachytis modestus* Smith; *T. nitidulus* (Fabricius); *Oxybelus lamellatus squamosus* Smith; *Dasyproctus agilis* (Smith); *Ammatomus alipes* (Bingham); *Cerceris instabilis* Smith and *C. kirbyi* Bingham.

The family sphecidae includes blue mud-dauber, black and yellow mud-dauber, digger or sand wasps. The sphecid wasps are mainly beneficial to man and cause no harm to him. The majority of the members of this family are predatory on a great variety of terrestrial insects; but some are cleptoparasitic. It may be possible to exploit some of them for the control of insect pests.

ACKNOWLEDGEMENT

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INSECTA : HYMENOPTERA : SCOLIIDAE

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INTRODUCTION

The family Scoliidae belongs to superfamily scolioidea, which includes one of the most attractive groups of wasps. The superfamily Sclioidea is one of the seven recently recognised superfamilies of aculeate hymenoptera. This superfamily has 4 families viz., Scoliidae, Tiphidae, Mutillidae and Sapygidae in India.

The members of the family Scoliidae are commonly known as hairy wasps, usually black in colour, marked with spots or bands of yellow, white or red. Their wings are usually dark with a metallic iridescence. The members of this family are world-wide in distribution and their larvae are ectoparasitic on the larvae of Scarabaeidae. Because of their parasitic habits, it may be possible to exploit them for biological control of insect pests.

Bingham (1897) made an attempt to provide an account of family Scoliidae. Betrem (1928) did a pioneering monographic work on the Indo-Australian genera and species of this family. Addition of more taxa, changes in the systematic position and classification in more natural groups were significant contributions made by several workers namely : Betrem and Bradley (1964); Bradley (1964-1974); Guiglia (1965); Krombein (1963-1978); Gupta and Jonathan (1991) and Jonathan and Gupta (1993).

The members of this family are distinguished quite readily from other wasps by having wing membrane beyond the cells closely striolate and meso- and metasternum form a flat plate overlying the bases of the middle and hind coxae.

This family is known by two subfamilies viz., Campsomerinae and Scoliinae in Indian subregion. In India, the family is represented by 13 genera, 70 species and 29 subspecies. In Meghalaya the family scoliidae is represented by 18 species/subspecies under 8 genera.

MATERIAL AND METHODS

The present study on the Scoliid fauna of the State of Meghalaya, India is based on a collection present at the Zoological Survey of India. This collection was brought by various survey parties of the

Survey. Some collection was also available from other institutions in India and abroad. The material was mainly received through mopping survey of Meghalaya by the following parties and individuals : N. Muraleedharn and party, 1979; A.P. Kapoor, 1958, 1959; M.K. Kamath, 1966; Fletcher, 1908, 1919, 1924, 1928; S. Kemp, 1914, 1917; Bose, 1924; R.B. Sewel, 1926; Saxena and Biswas, 1976; J.K. Jonathan, 1976; Puri, 1975; Kuldeep, 1976.

In the present study, an attempt has been made to provide keys to the subfamilies, genera, species/subspecies, for the identification of the various taxa recorded from Meghalaya. Illustrations of taxonomic terms used in present work, distributional tables and maps are given for ready reference.

TAXONOMIC TERMINOLOGY

The morphological terms followed by Betrem (1928) and Krombein (1978) are used in the present work. The morphological terms used in the text are illustrated in figures 1-4.

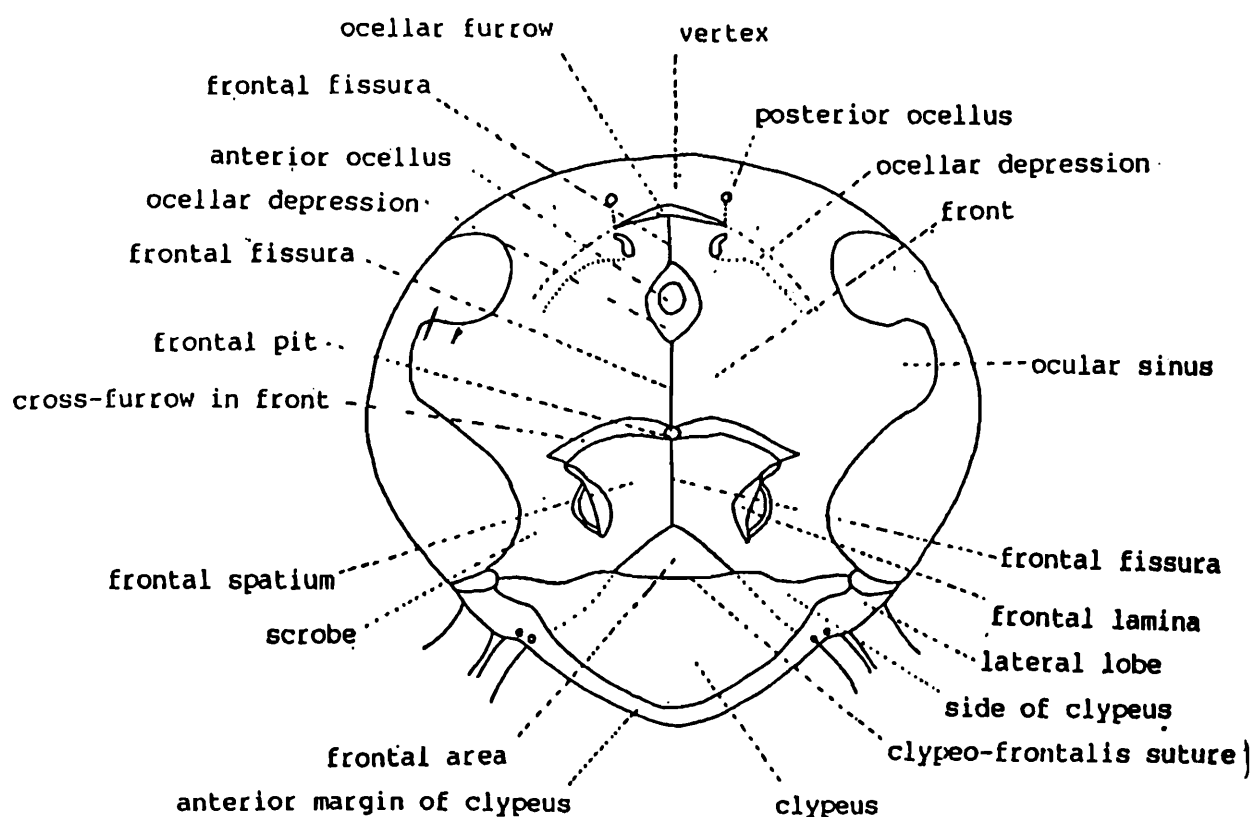


Fig. 1. Anterior view of head of a Scoliid.

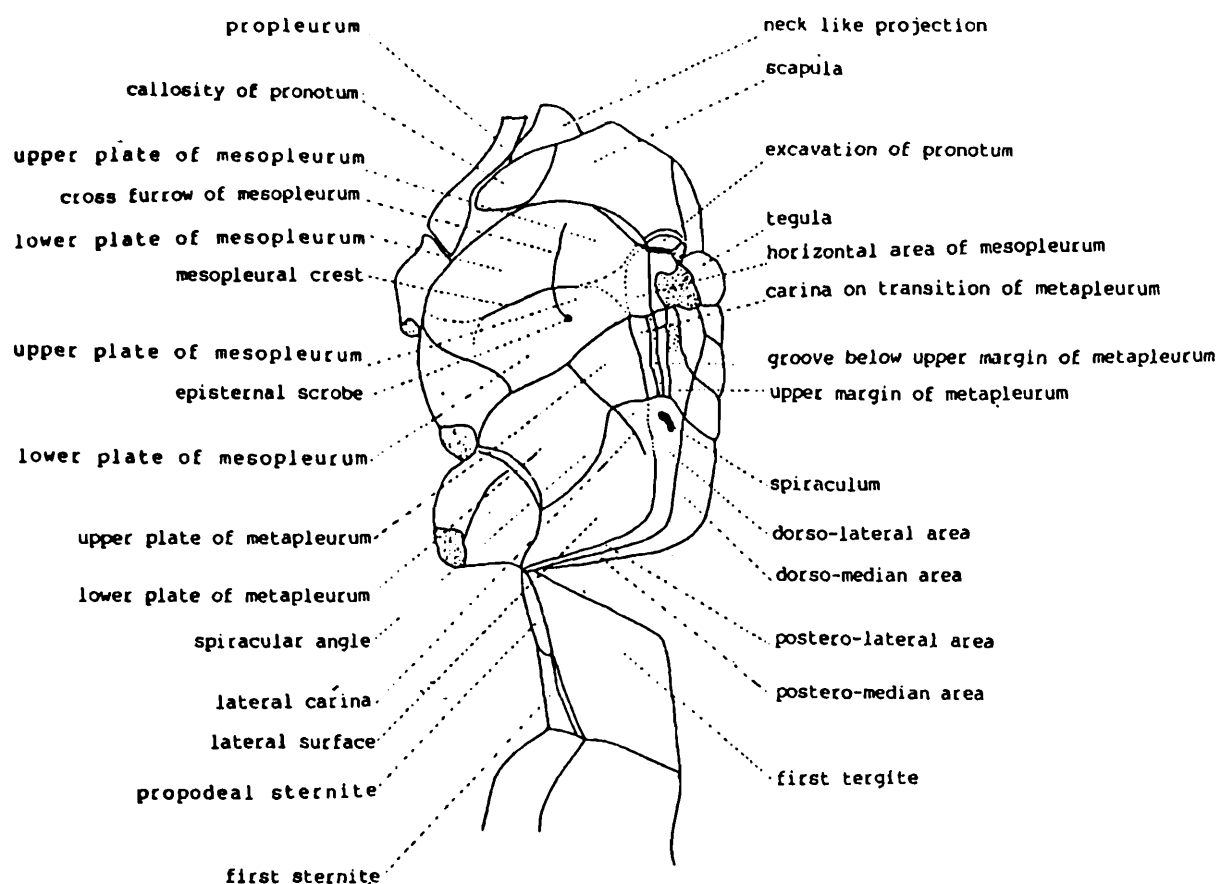


Fig. 2. Lateral view of Thorax of a Scoliid.

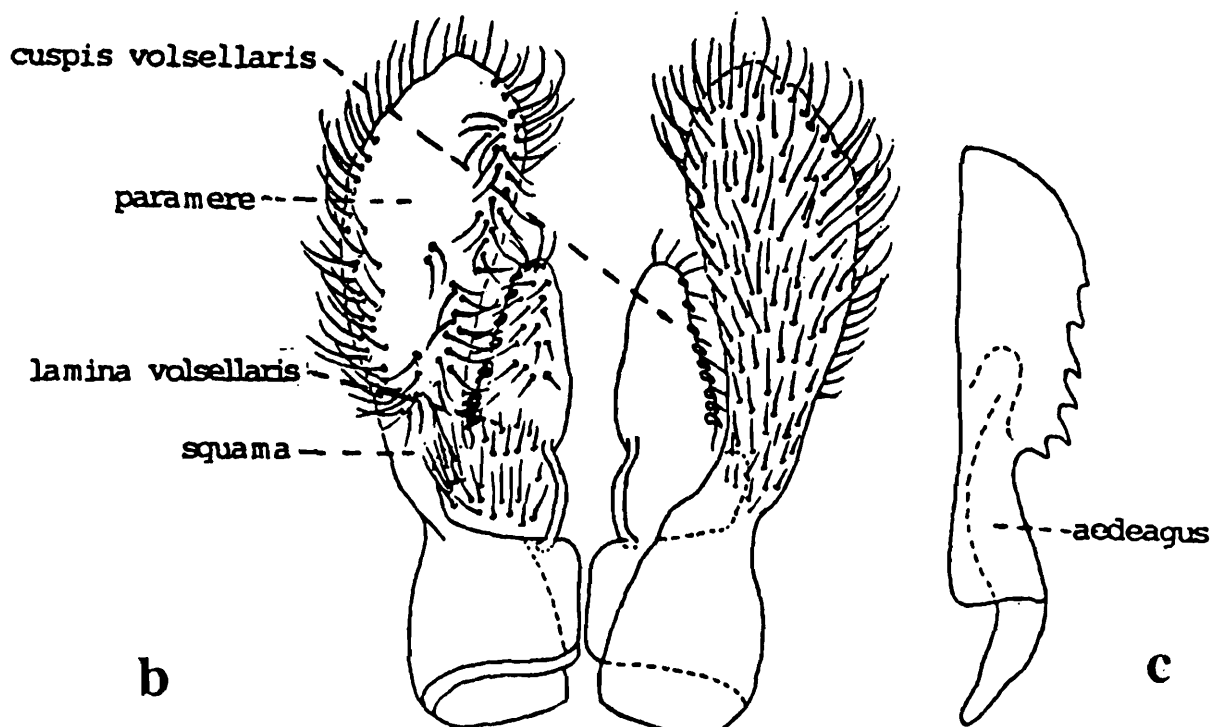
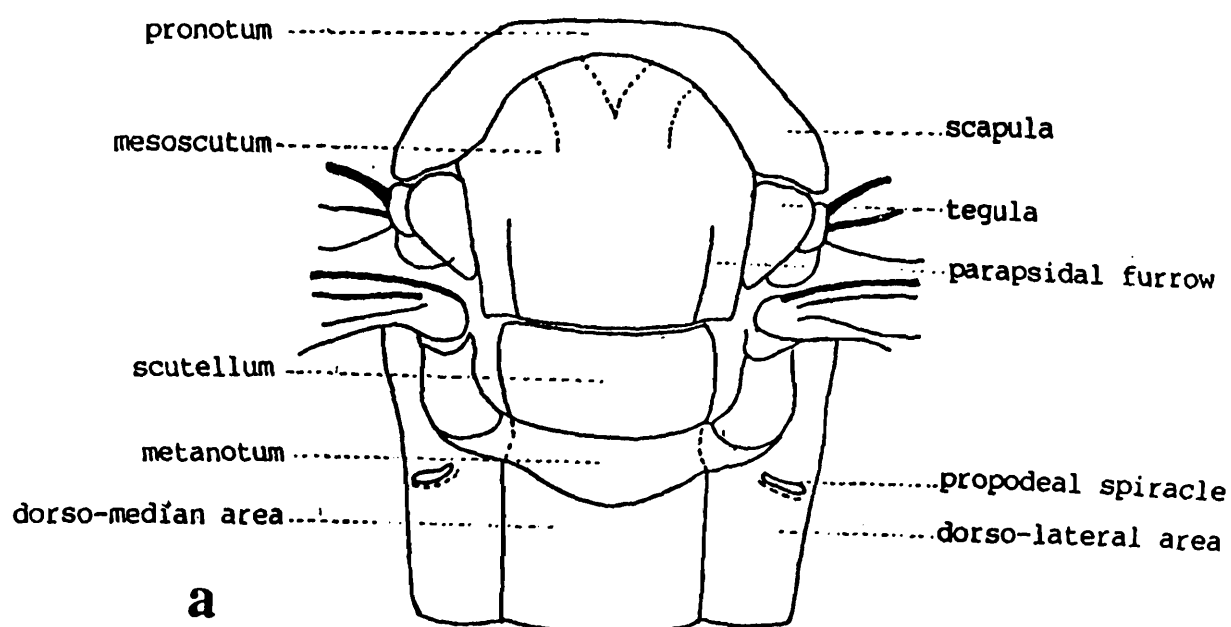


Fig. 3. a, Dorsal view of thorax of a Scoliid;
b, male genitalia, ventral aspect at left; dorsal aspect at right; c, aedeagus.

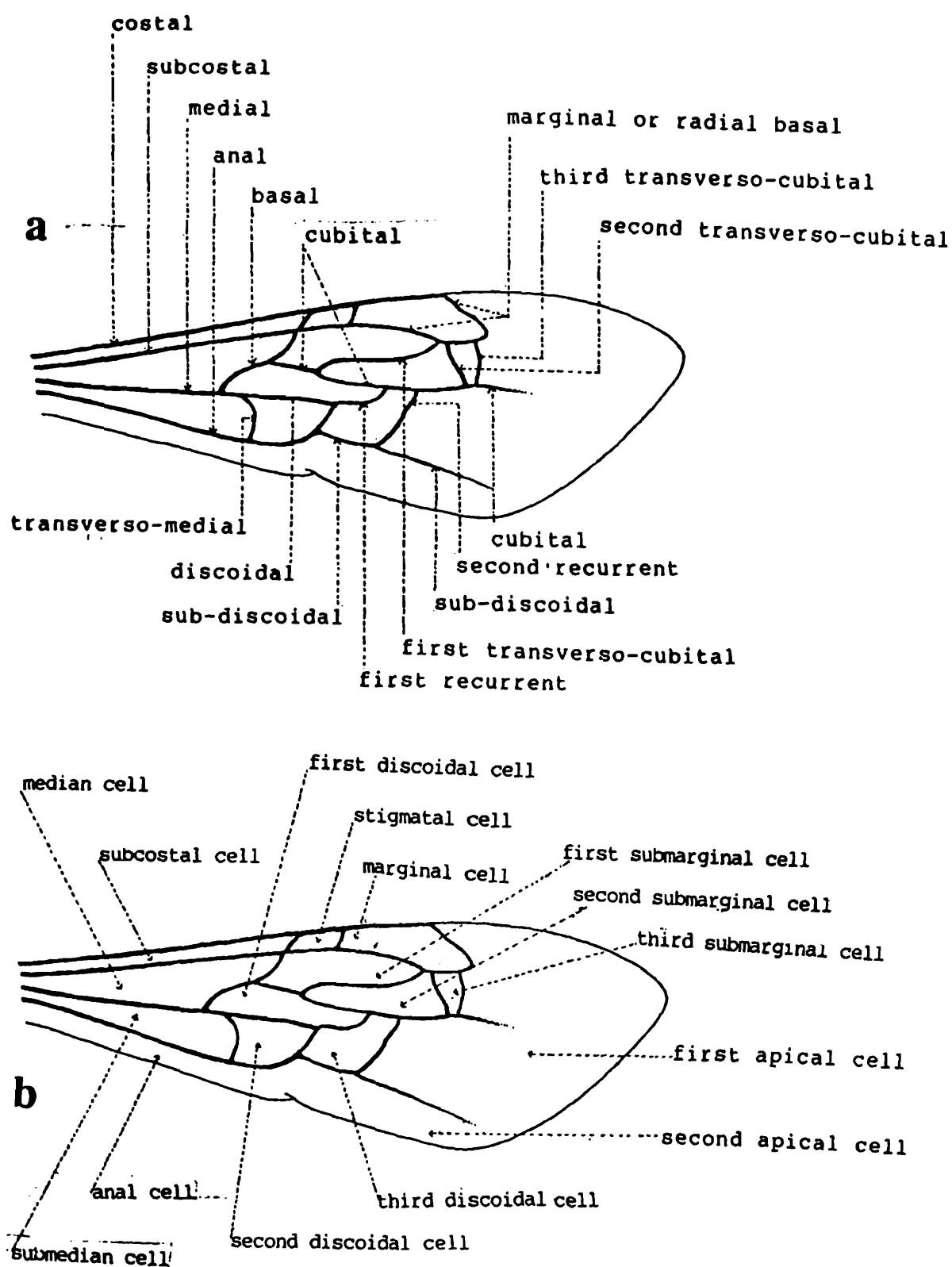


Fig. 4. Diagrammatic view of fore wing:
a, various veins; b, various cells.

SYSTEMATIC ACCOUNT

FAMILY SCOLIIDAE

I. Subfamily Campsomerinae

1. Genus *Phalerimeris* Betrem1. *Phalerimeris phalerata phalerata* (Saussure)2. Genus *Colpacampsomeris* Betrem2. *Colpacampsomeris indica indica* (Saussure)3. Genus *Sericocampsomeris* Betrem3. *Sericocampsomeris flavomaculata* Gupta and Jonathan4. Genus *Campsomeriella* Betrem1. Subgenus *Campsomeriella* Betrem4. *Campsomeriella* (C.) *collaris collaris* (Fabricius)2. Subgenus *Annulimeris* Betrem5. *Campsomeriella* (*Annulimeris*) *annulata* (Fabricius)5. Genus *Megacampsomeris* Betrem6. *M. asiatica himalayana* (Betrem)7. *M. binghami khasiensis* (Betrem)8. *M. prismatica* (Smith)9. *M. shillongensis* (Betrem)

II. Subfamily Scoliinae

6. Genus *Carinoscolia* Betrem10. *Carinoscolia bhamoensis* (Magretti)7. Genus *Megascolia* Betrem3. Subgenus *Regiscolia* Betrem & Bradley11. *M. (Regiscolia) azurea christiana* (Guiglia & Betrem)

8. Genus *Scolia* Fabricius4. Subgenus *Discolia* Saussure

- 12. *S. (Discolia) sikkimensis* Bingham
- 13. *S. (Discolia) rugifrons* Betrem
- 14. *S. (Discolia) affinis* Guérin
- 15. *S. (Discolia) quadripustulata* Fabricius
- 16. *S. (Discolia) felderi* Betrem
- 17. *S. (Discolia) superciliaris staudingeri* Betrem
- 18. *S. (Discolia) fichteli* Betrem

FAMILY SCOLIIDÆ

Key to the subfamilies of Scoliidæ

1. Second recurrent vein of fore wing not coalesced above with first recurrent vein, sometimes absent; sexual dimorphism well developed; males more slender, with various yellow markings; thorax with silvery or golden tomentose. Female : Upper mesopleural plate when viewed from above not conically produced, rarely with a distinct dorsal surface, the juncture of anterior and posterior surface of lower plate sharply crested; integument of abdomen black, except sometimes marked with yellow, Male : volsella divided in middle into apical and basal parts by a transverse suture; head, thorax, abdomen and legs with yellow markings.

.I. CAMPSOMERINAE

Second recurrent vein of fore wing frequently lacking, if present coalescing with first recurrent vein before latter reaches cubital vein; sexual dimorphism not so marked, males comparatively more stout than in campsomerinae, with various yellow markings; thoracic tomentum not silvery or golden. Female : Upper mesopleural plate conically produced and with a distinct dorsal surface, the juncture of anterior and posterior surface of lower plate rounded; abdominal integument black or with red spots. Male : volsella not divided by a suture, though often constricted in middle; head, thorax, abdomen and legs with yellow markings on some species, many species with red markings on abdomen, some entirely black.

II. SCOLIINAE

I. Subfamily CAMPSOMERINAE

Key to the genera of subfamily Campsomerinae

Females

1. Fore wing with single recurrent vein
- . 2. *Colpacampsomeris*

- Fore wing with two recurrent veins. .2
2. Upper plate of metapleurum entirely impunctate, transition between its dorsal and vertical areas either sharp and marked by a carina or the transition very gradual. .3
- Upper plate of metapleurum more or less punctate above, transition between its vertical and dorsal areas gradual to blunt, usually sharp anteriorly and gradual posteriorly. .4
3. Lateral carina of propodeum abbreviated or extended up to spiracles; head behind the ocelli impunctate; dorso-median area of propodeum triangularly protruded posteriorly; posterior surface of propodeum impunctate to finely and sparsely punctate; longer spur of hind tibia black, white or testaceous, usually blunt or acute but rarely slightly spatulate at the apex. Forewing yellowish hyaline to entirely fuscous, often basally hyaline and apically fuscous.

4. *Campsomeriella*

Lateral carina of propodeum extended beyond the spiracle; head behind the ocelli with scattered to close punctures; dorso-median area of propodeum not triangularly protruded posteriorly; posterior surface of propodeum closely punctate at least above; longer spur of hind tibia black or testaceous, usually blunt at the apex. Forewing usually dark brown.

.3. *Sericocampsomeris*

4. Front in front of anterior ocellus with a group of deep punctures; scapulae without shallow longitudinal grooves; lateral carina extended beyond the spiracles; carina along the outer margin of the dorsum of propodeum distinct but not high; longer spur of hind tibia straight, acute or somewhat blunt at the apex; first submarginal cell almost entirely setose; basal abdominal tergites usually with yellow or reddish-brown bands. .1. *Phalerimeris*

Front in front of anterior ocellus usually without any group of deep punctures; scapulae with shallow longitudinal grooves; carina along the outer margin of dorsum of propodeum very strong and high, and extended posteriorly up to the upper half of the postero-lateral area, with a deep groove along the inner side; dorso-median area of propodeum sometimes with a median tubercle posteriorly; second submarginal cell bare, setose only above. Integument usually entirely black, sometimes basal tergites with yellow apical bands; vestiture usually yellowish or yellowish-brown, rarely entirely black; thorax especially the dorsum of propodeum with long vestiture. Wings hyaline to dark brown.

.5. *Megacampsomeris*

1. Genus *Phalerimeris* Betrem

1967. *Campsomeris* subgenus *Phalerimeris* Betrem, *Bull. British Mus. (Nat. Hist.) Ent.*, 20 (7) : 294-295
Type-species : *Elis (Campsomeris) phalerata* Saussure, 1858.
1974. *Phalerimeris* Betrem : Bradley, *Revue Suisse Zool.*, 81 (20) : 460, (*Phalerimeris* raised to generic status).
Type-species : *Elis (Campsomeris) phalerata phalerata* Saussure, 1858. Original designation.

This genus is widely distributed in the Oriental Region and also occurs in New Guinea and adjacent Islands. The females of this genus can be easily distinguished from that of *Megacampsomeris* in having a group of deep punctures in front of anterior ocellus.

Of the three species known from Indian subregion, *P. phalerata* Saussure, *P. madurensis* Betrem and *P. lantschneri* (Dalla-Torre), only *P. phalerata* subspecies *phalerata* Saussure has been recorded from Maghalaya.

1. *Phalerimeris phalerata phalerata* Saussure

1858. *Elis (Campsomeris) phalerata* Saussure, *Ann. Soc. Ent. France*, (3) 6 : 233. Female (not male). (Copenhagen).
1897. *Elis iris* (Lepeletier) : Bingham, *Fauna of British India Hym.*, 1 : 94. Male, Female (Specimens from North India, Burma and Java only).
1911. *Campsomeris albopilosa* Rohwer, *Proc. U.S. Nat. Mus.*, 39 : 480. Male, Java. (Synonymised by Betrem, 1928 : 103).
1972. *Phalerimeris phalerata phalerata* (Saussure) : Bradley, *Revue Suisse Zool.*, 81 (20) : 460.

Diagnostic characters : Female : Length 12-18 mm. Black, antennae, tibiae and tarsi reddish; first three tergites with narrow apical orange bands, that on second narrowed toward sides. Erect vestiture reddish-golden, except black on the last abdominal segment and pygidium. Tomentum golden. Wings yellowish, apex of fore wing with large, dark well defined mark.

Male : Length 10-16 mm. Black, abdomen with faint blue reflection. The yellow marks are as follows : Clypeus (except for a small to large median triangular area), a line along lower inner eye orbit, scrobes, a long mark on gena, pronotum broadly along its posterior margin, a minute postero-lateral mark on mesoscutum, a narrow anterior band on scutellum small anterior spot on metanotum, fore coxa, apical mark on fore femur below, middle femur with narrow stripes above and below, outer surface of fore and middle tibiae, apical bands on first four tergites, band on first tergite usually covering apical half, band on third emarginate on sides, fourth band narrow and sometimes interrupted in the middle, rarely with postero-lateral spots on fifth tergites also; second, third and usually fourth sternites with narrow apical lateral spots, spots on second and third sternites sometimes united in the middle, that on fourth widely separated in the middle. Erect vestiture pale, except black on last three abdominal tergites. Wings slightly infumated; fore wing usually with a very light subapical mark.

Material examinaed : India : Meghalaya : East Garo Hills, Dainadubi, 1 female, 12 males, 8-13.v. 1979, J.K. Jonathan and party; West Garo Hills : Rongram, 1 Female, 26.ix. 1975, N. Muraleedharn; Songsak, 1 male, 8.ix. 1975, N. Muraleedharn; East Khasi Hills, Cherrapunjee. 1 female, 24.xii. 1958, A.P. Kapoor.

Distribution : India : Meghalaya (East and West Garo and East Khasi Hills), Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Sikkim, Tripura, Uttar Pradesh and West Bengal. Elsewhere : Myanmar, China, Nepal, Thailand, Taiwan, Sulawesi.

Remarks : This is a widely distributed sub-species in North India. This sub-species breeds throughout the year, attaining peak population during May-June.

2. Genus *Colpacampsomeris* Betrem

1941. *Campsomeris* subgenus *Colpacampsomeris* Betrem, *Notes Ent. Chionoise*, 8 (4) : 101-102.

Type-species : *Scolia indica* Saussure, 1855.

1974. *Colpacampsomeris* Betrem : Betrem in Bradley, *Revue Suisse Zool.*, 81(2) : 445. (*Colpacampsomeris* raised to generic rank).

Type-species : *Scolia indica* Saussure 1855 [= *Colpacampsomeris indica indica* (Saussure, 1855)], original designation.

This genus is widely distributed in the Oriental Region and is hitherto known only by its genotype viz., *Colpacampsomeris indica* (Saussure).

This genus can be separated from the members of its closely allied tribe Compsomerini by having a single recurrent vein in the forewing in both sexes and body size ranging from 22-35 mm.

2. *Colpacampsomeris indica indica* (Saussure)

1855. *Scolia (Lacosi) indica* Saussure, *Mem. Soc. Phys. Hist. nat. Geneve*, 14 : 46. Female, Indes Orientales; Lectotype designated by Bradley (1974). (Paris museum).

1855. *Scolia ignita* Smith, *Cat. Hym. British Mus.*, 3 : 101. Female (British museum).

1928. *Campsomeris (Trielis) assamensis* Betrem. *Treubia*, 9 (Suppl) : 111. Male, Khasi Hills (Syn. by Betrem in 1967).

Diagnostic characters : Female 25-35 mm. Integument entirely black. Vestiture black except apices of second to fifth abdominal segments with bright red or golden-red setae; pygidium also similarly clothed with red-golden setae. Wings dark brown with strong blue reflection.

Male : Length 22-28 mm. Integument black. Vestiture predominantly white mixed with black. Wings relatively light brown, anterior margin of fore wing darker with blue reflection. Longer spur of hind tibia spatulate; forewing with single recurrent vein.

Material examined : India : Meghalaya : East Garo Hills, Darugiri, 3 females, 155 males, 8-13.v. 1979, S.B. Roy and party; Khasi Hills, 1 female, no date, coll. Godwin Austin.

Distribution : India : Meghalaya (Khasi Hills and East Garo Hills), Arunachal Pradesh, Himachal Pradesh, Sikkim, West Bengal, S. India, Uttar Pradesh. Elsewhere : Bangladesh, Myanmar.

Remarks : This sub-species is widely distributed in the himalayan ranges of North India. Though uncommon, but it is abundantly occurring in certain localities.

3. Genus *Sericocampsomeris* Betrem

1941. *Campsomeris* Subgenus *Sericocampsomeris* Betrem, *Notes Ent. Chionoise*, 8 (4) : 91-92 des.

Type-species : *Scolia quadriguttulata* Burmeister, 1854.

1972. *Sericocampsomeris* Betrem, *Mon. Ned. ent. Ver.*, 6 : 12.

Type-species : *Scolia stygia* Illiger, 1802 (= *Scolia quadriguttulata* Burmeister)

This is a moderate sized genus, widely distributed in Oriental Region, and is also known from Southern China and Sulawesi. It is known by four species viz., *S. rubromaculata* (Smith), *S. bella* (Bingham), *S. stygia* (Illiger), *S. flavomaculata* Gupta and Jonathan from India. Only one species, *S. flavomaculata* Gupta and Jonathan is known from Meghalaya.

3. *Sericocampsomeris flavomaculata* Gupta & Jonathan

1989. *Sericocampsomeris flavomaculata* Gupta and Jonathan, *Ann. Entomol*, 7 (2) : 53-57. Type male. India : Meghalaya. (Z.S.I., Calcutta).

Diagnostic characters : Male : Length 20-23 mm. Black, the following are yellow : Scapulae broadly, apical bands on first five tergites and second to fourth sternite. The bands on first three tergites very broad covering almost entire surface, but mostly deeply and widely emarginate in the middle giving the appearance of broad lateral spots, the bands on fourth and fifth tergites are narrow and narrowly interrupted in the middle, bands on the sternites are narrow and interrupted in the middle but second and third sternites bear additional lateral spots in the middle. Vestiture erect white, tomentum silvery.

Material examined : India : Meghalaya : East Garo Hills, Dainadubi, 5 males (Holo-and paratypes) 8-13.v. 1979, S.B. Roy and party.

Distribution : India (Meghalaya : East Garo Hills). Elsewhere : Nepal.

Remarks : This species resembles *S. Stygia* (Illiger) in having yellow apical bands on the basal tergites, but can be differentiated by having clypeus, scutellum and metanotum black and the bands on first three tergites very broad, bands broadly and deeply emarginate in the middle. The band on the first tergite usually widely interrupted in the middle.

4. Genus *Campsomeriella* Betrem

1941. *Campsomeris* subgenus *Campsomeriella* Betrem, *Notes Ent. Chionoise*, 8 (4) : 86-87

Type-species : *Scolia thoracica* Fabricius.

1967. *Campsomeriella* Betrem. *Entom., Bericht*, 27 : 25-29.

Type-species : *Scolia thoracica* Fab. [= *Campsomeriella* (*Campsomeriella*) *thoracica* (Fab.)]. Original designation.

This genus is widely distributed in the African, Southern Palaearctic and Indo-Australian Regions, except Australia. This genus is divided into four subgenera viz., *Campsomeriella* Betrem, *Annulimeris* Betrem, *Rodriguimeris* Betrem and *Madonimeris* Betrem. Of these, *Campsomeriella* and *Annulimeris* are widely distributed in Indian subregion.

One subspecies and one species is known under these two subgenera. These can be distinguished by the following key.

Key to the subgenera and species and subspecies of *Campsomerilla*

Female

1. Basal portion of the lateral carina of propodeum not extending up to spiracles; impunctate areas behind the callosities usually large; spurs of middle and hind tibiae black or testaceous subgenus *Campsomeriella* Betrem Wings dark brown, abdominal vestiture black.

.collaris collaris

Basal portion of the lateral carina of propodeum extending somewhat beyond the spiracles; impunctate areas behind the callosities small to very small; spurs of middle and hind tibiae white .. subgenus *Annulimeris* .. Integument Black, abdominal vestiture white. Abdominal segments with apical white fringes *.annulata*

Male

1. Apical sternites with copulatory brushes .. subgenus *Campsomeriella* Pronotum, scutellum and metanotum with yellow marks; apical yellow bands on the basal tergites comparatively broad. *collaris collaris*

Apical sternites without copulatory brushes subgenus *Annulimeris* .. First to fifth abdominal tergites with broad to narrow apical bands. *.annulata*

4. *Campsomeriella* (*Campsomeriella*) *collaris collaris* (Fabricius)

1775. *Tiphia collaris* Fabricius, *Syst. Ent.*, P. 254. Type female. Malabar (Copenhagen Mus.)

1845. *Colpa parvula* Lepeletier, *Hist. nat. Ins. Hym.*, 3 : 548. Type male, Indes. (Type probably lost). Syn. by Betrem and Bradley, 1964.

1967. *Campsomeriella* (*Campsomeriella*) *collaris* : Betrem, *Entom. Bericht*, 27 : 29. (*Campsomeriella* raised to generic rank and *collaris* placed in subgenus *Campsomeriella*).

Material examined : India : Meghalaya : East Garo Hills, Dainadubi, 3 males. 8-13.v. 1979, J.K. Jonathan & Party. West Garo Hills: Rongram, 1 Female, 26.ix. 1975, N. Muraleedharan. Ri- Bhoi : Barapani, 1 male, 20.iv. 1979, J.K. Jonathan (Z.S.I., Calcutta). Jaintia Hills, Dawki, 1 male, 12.iv. 1966, M.K. Kamath.

Distribution : India : Meghalaya (East and West Garo and Jaintia Hills), Arunachal Pradesh, Andhra Pradesh, Assam, Bihar, Delhi, Goa, Gujarat, Haryana, Himachl Pradesh, Karnataka, Kerala, Medhya Pradesh, Maharashtra, Orissa, Rajasthan, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Myanmar, Nepal, Sri Lanka.

Remarks : This is the most abundant and widely distributed Indian scoliid, breeding throughout the year in all the ecosystems and areas of low to very heavy rainfall. This species can be easily recognised by having the integument of the female black, the wings dark fuscous with strong blue reflections and the occiput and pronotum with conspicuous erect white setae. Males have more extensive yellow marks on abdomen.

5. *Campsomeriella* (*Annulimeris*) *annulata* (Fabricius)

1793. *Tiphia annulata* Fabricius, *Ent. Syst.*, 2 : 225. Type female. China (Copenhagen Mus.).

1845. *Campsomeris servillei* Lapeletier, *Hist. nat. Ins. Hym.*, 3:501. Type female. Java (Torino Mus.).

1901. *Elis aglaea* Cameron. *Proc. Zool. Soc. London*, 2:19. Type male. Malaya.

1967. *Campsomeris* (*Annulimeris*) *annulata* (Fabricius) : Betrem, *Entom. Berich.*, 27:29 (*Campsomeriella* raised to generic rank; *annulata* placed under new subgenus *Annulimeris* Betrem).

Material examined : India : Meghalaya : East Khasi Hills, Shillong, 3 females, vi-vii. 1908, Fletcher (I.A.R.I. New Delhi): East Garo Hills, Dainadubi, 1 female, 1 male, 8-13.v.I 1979 S.B. Roy and party; Darugiri, 1 male, 144-20.v. 1979, S.B. Roy and party. Songsok, 1 female, 19.ix. 1975, N. Muraleedharan.

Distribution : India : Meghalaya (East Garo and East Khasi Hills), Arunachal Pradesh, Assam, Bihar, Delhi, Himachal pradesh, Kashmir, Sikkim, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Myanmar, China, Indonesia, Korea, Malaysia, Nepal, Taiwan.

Remarks : This is the only species under the subgenus *Annulimeris* Betrem. This species is widely distributed in North India and also distributed from Bangladesh to Japan.

5. Genus *Megacampsomeris* Betrem

1928. *Campsomeris* subgenus *Megacampsomeris* Betrem, *Treubia*, 9 (suppl.) : 138.
Type-species : *Tiphia grossa* Fabricius, 1804.

1972. *Megacampsomeris* Betrem : Betrem in Betrem and Bradley, *Mon. Ned. Ent. Ver.*, No. 6:167.
(*Megacampsomeris* (raised to generic status). Type-species : *Tiphia grossa* Fabricius, 1804.
[=*Megacampsomeris grossa* (Fab., 1804)]. Original designation.

This is a moderately large genus, represented by 7 species and 2 subspecies from India. The following species are referable to this genus from the state of Meghalaya : *M. prismatica* (Smith); *M. asiatica himalayana* (Betrem); *M. binghami khasiensis* (Betrem) and *M. shillongensis* (Betrem). These can be distinguished by the following key.

Key to the species of *Megacampsomeris*

Female

1. Basal abdominal tergites with white apical fringes. Forewing light brown; subspecies distributed in north India *.asiatica himalayana*
- Basal abdominal tergites without white fringes. .2
2. Basal tergites with yellow or reddish-yellow apical bands; vestiture on the abdomen golden, except on fifth and following segments black. *.shillongensis*
- Basal tergites without such bands; vestiture on the abdomen black or golden. 3
3. Mesoscutum with a large impunctate area in the middle. Vestiture on the abdomen predominantly golden. *.prismatica*
- Mesoscutum punctate, without an impunctate area in the middle. vestiture on the abdomen predominantly black. *binghami khasiensis*

6. *Megacampsomeris asiatica himalayana* (Betrem)

1928. *Campsomeris* (*Megacampsomeris*) *asiatica himalayana* Betrem., *Treubia*, 9 (suppl.) : 141, Female in Leiden museum; allotype and paratypes in F.R.I. Dehra Dun.
1972. *Megacampsomeris asiatica himalayana* (Betrem) : Betrem in Betrem and Bradley, *Mon. Ned. Ent. Ver.*, No. 6 : 164. *Magacampsomeris* raised to generic rank.

Material examined : India : Meghalaya : East Khasi Hills, Shillong, Lalit Kor Peak, 1 female, 12.x. 1975, Mohan.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Uttar Pradesh, Himachal Pradesh. Elsewhere : Nepal, Bhutan.

Remarks : This subspecies is widely distributed in the himalayan region of India, Bhutan and Nepal.

7. *Megacampsomeris binghami khasiensis* (Betrem)

1928. *Campsomeris* (*Megacampsomeris*) *binghami khasiensis* Betrem, *Treubia*, 9 (suppl.) : 143. Female, Shillong, Khasi Hills. Holotype in I.A.R.I. New Delhi (probably lost).

1972. *Megacampsomeris binghami khasiensis* Betrem : Betrem and Bradley, *Mon. Ned. Ent. Ver.*, No. 67:165.
Megacampsomeris raised to generic rank.

Material examined : India : Meghalaya : East Khasi Hills, Shillong, 1465 m, 2 females, 13.x. 1975, coll - Puri; 1 female, 6.x. 1976, Kuldip; Lalit Kor peak, 2 Females, 12.x. 1975, J.K. Jonathan; Laitting Kole, 1 female, 26.ix. 1926, R.B.S. Sewel.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This subspecies is restricted to Khasi Hills in Meghalaya. It is mainly distinguished by having vestiture on abdomen predominantly black.

8. *Megacampsomeris prismatica* (Smith)

1855. *Scolia prismatica* Smith, *Cat. Hym. British Mus.*, 3 : 102 Female, China : Shanghai; Holotype in British Museum.
1928. *Campsomeris* (*Megacampsomeris*) *prismatica* (Smith) : Betrem, *Treubia*, 9 (suppl.) 152-153. Female, male, Java, Sumatra, Borneo, Celebes, Malakka; North India, Taiwan and Japan.
1972. *Megacampsomeris prismatica* (Smith) : Betrem in Betrem and Bradley, *Mon. Ned. ent. ver.*, No. 6:164.
(Megacampsomeris raised to generic level).

Material examined : India : Meghalaya : East Khasi Hills, Shillong, Lalit Kor Peak, 1 female, 12.x. 1975, Puri.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Himachal Pradesh, Kashmir, Manipur, Orissa, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Myanmar, China, Honshu, Indonesia, Japan, Korea, Malaysia, Nepal, Philippines, Taiwan.

Remarks : This is a widely distributed species, easily recognised by having vestiture on the abdomen predomenantly golden, fore wing without any well defined apical spot and mesoscutum with a large impunctate area in the middle.

9. *Megacampsomeris shillongensis* (Betrem)

1928. *Campsomeris* (*Megacampsomeris*) *shillongensis* Betrem, *Treubia*, 9 (suppl.) : 155. Type female. India : Shillong. (Lost).
1972. *Megacampsomeris shillongensis* Betrem : Betrem and Bradley, *Mon. Ned. ent. Ver.*, No. 6:165
(Megacampsomeris raised to generic status).

Material examined : India : Meghalaya : West Garo Hills, Tura, 1412 m, 19 males, 2.v. 1979, J.K. Jonathan and party, East Khasi Hills, Shillong, 1 female, viii-x. 1919, Fletcher colln, Leiden Museum; 1 male, 10-12.x. 1914, S.W. Kemp; Malki Hills, 1500 m, 3 males, 13.x. 1976, K. Saxena and S. Biswas.

Distribution : India : Meghalaya (West Garo and East Khasi Hills), Manipur, Sikkim, West Bengal. elsewhere : Myanmar, Nepal.

Remarks : This species is characterised by having basal tergites in female with yellow apical bands.

II. Subfamily SCOLIINAE

Key to the Genera of Subfamily Scoliinae

1. Fore wing with two sub-marginal cells and always with one recurrent vein. 8. *Scolia*
Fore wing with three submarginal cells [(sometimes two submarginal cells) as in *Megascolia fulvifrons* (Saussure) and *carinoscolia bhamoensis* (Magretti)]; and always with one recurrent vein 2
2. Front with a transverse carina; first abdominal tergite without any antero-median tubercle. Small to large species about 15-33 mm long .6. *Carinoscolia*
Front without a transverse carina; first abdominal tergite with a strong antero-median tubercle. Large species, about 27-33 mm long. 7. *Megascolia*

6. Genus *Carinoscolia* Betrem

1927. *Scolia* subgenus *Carinoscolia* Betrem, *Tijdschr. ent.*, 70 (verslag) : xcvi.
Type-species *Scolia opalina* Smith, 1858.
1967. *Carinoscolia* Betrem : Betrem in Bradley and Betrem, *Bull. British Mus. (Nat. Hist.) Ent.*, 20(7) : 293.
(*Carinoscolia* raised to generic status). Type-species : *Scolia opalina* Smith, 1858. Original designation.

This is a moderate sized genus, widely distributed in the Indo- Australian Region and also recorded from Eastern Palaearctic Region. This genus is known in India by two species viz., *C. opalina* (Smith) and *C. bhamoensis* (Magretti). Only *C. bhamoensis* has been recorded from Meghalaya.

10. *Carinoscolia bhamoensis* (Magretti)

1892. *Scolia* (*Discolia*) *bhamoensis* (Magretti). *Ann. Mus. Civico Storia Nat. Genova*, 32 : 239-241. Female.
Burma : Bhmo, holotype in Genova Museum. Bingham, 1897. *Fauna British India Hymn.*, 1:80 Female,
Burma : Bhmo.
1928. *Scolia* (*Carinoscolia*) *bhamoensis* (Magretti) : Betrem, *Treubia*, 9 (suppl.) : 184-185. Female, male. India : Sikkim; Meghalaya: Garo Hills, Tura.
1967. *Carinoscolia bhamoensis* (Magretti) Bradley and Betrem., *Bull. British Mus. (Nat. Hist.) Ent.*, 20(7):293. .
(*Carinoscolia* raised to generic status).

Diagnostic characters : Female : Length 21-23 mm. Integument black. The following are reddish-yellow: Head (except anterior margin of clypeus, antennae, frontal laminae in part, ocellar

triangle) and scapulae. Vestiture black except on the coloured integumental parts, reddish-yellow. Wings brownish with coppery reflection, fore wing darker anteriorly.

Male : Length 18 mm. Integument black. The following are reddish-yellow : Head (except mandibles, anterior rim of clypeus, frontal laminae narrowly, ocellar triangle) and pronotum. Vestiture black except reddish-yellow on coloured integumental parts. Wings medium brown with coppery reflections.

Material examined : India : Meghalaya : West Garo Hills, Tura, 1 male, 15.vii-30.viii. 1917, S. Kemp (det. Betrem).

Distribution : India : Meghalaya (West Garo Hills), Sikkim. Elsewhere : Myanmar.

Remarks : The distribution of this species is restricted to the hilly areas of Myanmar and North east India. It can easily be distinguished from *C. opalina* Smith, the only other species known from India, by having head and pronotum largely reddish-yellow.

7. Genus *Megascolia* Betrem

1928. *Scolia* subgenus *Triscolia* Saussure : Betrem, *Treubia*, 9 (suppl.) : 224.

Type-species : *Scolia flavifrons* Fabricius, 1775.

1928. *Scolia* subgenus *Triscolia* section *Megascolia* Betrem, *Treubia*, 9 (suppl.) : 239.

Type-species : *Scolia procer* Illiger, 1802.

1964. *Megascolia* Betrem : Betrem and Bradley, *Zool. Meded*, 39 : 437 (*Megascolia* raised to generic status).

Type-species : *Scolia procer* Illiger, 1802 [= *Megascolia procer procer* Illiger, 1802]. Original designation.

This genus is widely distributed in the Oriental Region and is also known from southern Palaearctic and Mediterranean regions. The genus is subdivided into two subgenera viz., *Megascolia* s.str. and *Regiscolia* Betrem and Bradley.

These two subgenera can be distinguished by the following key:

Key to the subgenera of *Megascolia*

Female

1. Clypeus very broad, its anterior rim comparatively narrow with its median portion comparatively narrow and not widely truncate or subtruncate; disc of clypeus strongly raised and punctate (neither smooth nor rugulose); scapula usually with a strong tubercle in front of tegula, however, sometimes this tubercle may be small or indistinct. (not known from Meghalaya).
Subgenus *Megascolia*

Clypeus relatively small and narrow, its anterior rim broad and in the middle broadly truncate or subtruncate; disc of the clypeus flat usually rugulose, scapula without any tubercle in front of tegula.
Subgenus *Regiscolia*

3. Subgenus *Regiscolia* Betrem and Bradley

1928. *Scolia* subgenus *Triscolia* section *Triscolia* Saussure : Betrem, *Treubia*, 9 (suppl.) : 228.
Type-species : *Scolia flavifrons* Fabricius, 1775.
1964. *Megascolia* subgenus *Regiscolia* Betrem and Bradley, *Zool. Meded.*, 39 : 441 (erected a new subgenus).
Type-species : *Scolia flavifrons* Fab., 1775 [= *Megascolia (Regiscolia) flavifrons flavifrons* (Fab), 1775)], subsequent designation.

This subgenus is widely distributed in the Oriental Region and is also known from Mediterranean and southern Palaearctic regions.

This subgenus is known by three species viz., *M. (R.) rubida* (Gribodo), *M. (R.) azurea* (Christ), *M. (R.) flavifrons* (Saussure) and one undescribed species from India. *M. (R.) azurea* subspecies *christiana* (Guiglia and Betrem) is the only taxon known from Meghalaya.

11. *Megascolia (Regiscolia) azurea christiana* Guiglia and Betrem

1892. *Scolia (Triscolia) rubiginosa* Fabricius : Magretti, *Ann. Mus. Civico St. Nat. Geneva*, 32:236. Male, female, Myanmar.
1897. *Scolia (Triscolia) rubiginosa* : Bingham, *Fauna of British India Hymn.*, 1 : 76-77 Male & Female from Myanmar and India only.
1928. *Scolia (triscolia) azurea rubiginosa* Fabricius : Betrem, *Treubia*, 9 (suppl.) : 231. (specimens from Burma and India only).
1958. *Scolia (Triscolia) azurea christiana* Guiglia and Betrem, *Ann. Mus. Civico St. Nat. Geneva*, 70:96. New name.
1964. *Megascolia (Regiscolia) azurea christiana* (Guiglia and Betrem): Betrem and Bradley, *Zool. Meded*, 39:444 (new combination).

Diagnostic characters : Female : Length 30-42 mm. Black. The following are red or yellowish-red: frontal spatium along its upper margin; frons and vertex entirely including ocular sinuses, large oval paired spots on third tergite, fourth and following tergites usually with reddish tinge. Vestiture black, except on third and following tergites and all sternites including pygidium yellowish-red or reddish-brown. Wings dark brown with violaceous effulgence.

Male : Length 20-30 mm. Black, the following are reddish yellow : ocular sinus partly or wholly, paired large oval spots on third tergite, the following tergites almost entirely. Vestiture black except reddish-yellow on third and the following tergites and sternites. Wings dark brown.

Material examined : India : Meghalaya : East Khasi Hills, Shillong, 1 male, 9.v. 1959, A.P. Kapoor, 1 male, 19-21.iv. 1979. J.K. Jonathan & Party.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Assam, Himachal Pradesh, Manipur, Uttar Pradesh, West Bengal. elsewhere : Bangladesh, Myanmar, Nepal.

Remarks : It is a widely distributed species in Northern India, breeding throughout the year and attaining peak population during March-May.

8. Genus *Scolia* Fabricius

This genus is represented by two subgenera viz., *Scolia* Fabricius and *Discolia* Saussure. In the state of Meghalaya this genus is represented by 5 species under subgenus *Discolia* Saussure.

4. Subgenus *Discolia* Saussure

1863. *Scolia* subgenus *Discolia* Saussure, *Soc. ent. France, Ann.* (4)3:18.

Type-species : *Scolia nobilitata* Fab. Designated by Betrem and Bradley 1964.

This subgenus is widely distributed in most geographical regions of the world. About 40 species/subspecies are known under this subgenus from India. Only 5 species are reported under this subgenus from Meghalaya. These can be identified by the following key.

Key to the species of *Scolia* (*Discolia*)

1. Abdominal integument entirely black. .2
 Abdominal integument variously marked with white, yellow or red spots or bands. .5
2. Propodeal dorsum at its median area with minute to small, shallow, sparse to scattered punctures. .3
 Propodeal dorsum at its median area with small to large, sparse to subcontiguous punctures. 4
3. Antennal flagellum entirely reddish-yellow, rest of body integument black; metanotum impunctate and propodeal dorsum with minute scattered punctures. .*affinis* Gurein
 Antennal flagellum and head almost entirely reddish-yellow, except clypeus black; metanotum with small sparse punctures; propodeal dorsum at its median area with small, shallow and sparse puncture. .*superciliaris staudinger* Betrem
4. Clypeus entirely black, rest of the head and antennae entirely red; vestiture largely black; median tubercle at the base of first tergite not developed. .*rugifrons* Betrem
 Clypeus not entirely black, more or less reddish-yellow, except along the anterior margin, black; vestiture black, except on head predominantly reddish-brown; median tubercle at the base of first tergite weakly developed. .*felderi* Betrem
5. Head and /or thorax more or less maculated with yellow or red. (Third and fourth tergites with large paired yellow spots; legs reddish-brown; vestiture also reddish-brown; wings with golden effulgence). .*sikkimensis* Bingham

Head and thorax entirely black, except sometimes antennae partly or wholly reddish-yellow. .6

6. Upper plate of metapleurum with mostly subcontiguous punctures at its upper 0.6; second tergite with paired large red spots; vestiture in general black. Wings with blue effluence.

.*quadripustulata* Fabricius

Upper plate of metapleurum largely impunctate, except for a few close punctures along upper margin; second tergite without paired spots; vestiture black, except on occiput with mostly white and yellowish pubescence on coloured abdominal area. Wings dark brown, with blue effluence.

.*fichteli* Betrem

12. *Scolia (Discolia) sikkimensis* Bingham

1896. *Scolia sikkimensis* Bingham, *J. Linn. soc. Zool.*, **25**:423. Female, male. India : Sikkim; Type in British Museum.

1897. *Scolia (Discolia) sikkimensis* Bingham : Bingham, *Fauna British India Hym*, 1:85-86. Female, male. India : Sikkim, Bengal.

1964. *Scolia (Discolia) sikkimensis* Bingham: Betrem and Bradley, *Zool. Meded.*, **40**:94 (subgeneric assignment).

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1500 m, 1 female, 1 male, 17.v.-6.vi. 1924. 1924; 1 female, 26.vi. 1928, Fletcher; 1 male, 11.vi. 1924, Bose.

Distribution : India : Meghalaya (east Khasi Hills), Sikkim, West Bengal. Elsewhere : Nepal, Bhutan.

Remarks : This species is mainly distributed in the North-Eastern himalayan region. This species is easily recognised by having reddish-brown legs, wings with golden effluence and vestiture in general reddish-brown.

13. *Scolia (Discolia) rugifrons* Betrem

1928. *Scolia (Scolia) rugifrons* Betrem, *Treubia*, **9** (suppl.) : 273. Female. Burma; India; Khasi Hills. Types in British Museum.

1964. *Scolia (Discolia) rugifrons* Betrem : Betrem and Bradley, *Zool. Meded.*, **40** : 89-96 (new subgeneric assignment).

Material examined : No material of this species was available for study.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is recognised by having abdomen entirely black; frontal spatium, front and vertex, red. Median tubercle on first tergite not developed.

14. *Scolia (Discolia) affinis* Guérin

1838. *Scolia affinis* Guérin, Voy. Cog. : 254. Female, male, Senegal. Types in Paris Museum. Female Lectotype designation by Bradley.
1855. *Scolia (Lacosi) jurinei* Saussure, *Mem. Soc. Phys. Hist. Nat. Geneva*, 14 : 45 Female, male, "Indes Orientalis" lectotype in Geneva Museum, designated by Bradley.
1855. *Scolia instabilis* Smith. *Cat. Hym. British Mus.*, 3:88, Female, male "India" Type female in British Museum (syn. by Betrem in Bradley and Betrem 1967 under *S. jurinei*).
1864. *Scolia (Discolia) aureipennis* Lefebvre : Saussure and Sichel. *Cat. Spec. Gen. Scolia* : 109. (misidentification of *aureipennis*).
1978. *Scolia (Discolia) affinis* Guérin: Krombein. *Smithsonian Contr. Zool.*, 283 : 31-33. Female, male (localities from Sri Lanka).

Material examined : India : Meghalaya : Jaintia Hills, Dawki, 4 females, 2 males, 12.iv. 1966, M.K. Kamath. East Garo Hills: Dainadubi, 1 female, 22 males, 8-13.v. 1979, S.B. Roy and party; Darugiri, 1 female, 8 males, 14-20.v. 1979, S.B. Roy and party.

Distribution : India : Meghalaya (Jaintia and East Garo Hills), Assam, Bihar, Delhi, Himachal Pradesh, Karnataka, Kashmir, Kerala, Madhya Pradesh, Maharashtra, Nagaland, Orissa, Pondicherry, Punjab, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh, West Bengal. Elsewhere : Myanmar, Nepal, Sri Lanka.

Remarks : This is one of the most common and widely distributed Indian scoliids. Widely occurring in Indian subcontinent. The female can be easily distinguished by having orange-red antennal flagellum and rest of the integument and vestiture entirely black.

15. *Scolia (Discolia) quadripustulata* Fabricius

1782. *Scolia 4-pustulata* Fabricius, *Spec. Ins.*, 1:453. Type male India; type in British Museum.
1928. *Scolia (Scolia) obscuripunctata* Betrem, *Treubia*, 9 (suppl.):308-309. Type female (Holotype in Leiden Museum, paratypes Artis and Z.S.I. Calcutta). Syn. by Betrem, 1973.
1928. *Scolia (Scolia) kumaoensis* Betrem, *Treubia*, 9 (suppl.) : 309, India. (Z.S.I. Calcutta Museum).
1978. *Scolia (Discolia) quadripustulata* : Krombein, *Smithsonian Contr. Zool.*, 283 : 38.

Material examined : India : Meghalaya : East Garo Hills, Dainadubi, 1 female, 8-13.v. 1979, S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Karnataka, Madhya Pradesh, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Sri Lanka.

Remarks : This species is widely distributed in India and Sri Lanka. The female is readily recognised by having red spots on the black abdomen, median portion of the anterior lobe of the clypeus truncate.

16. *Scolia (Discolia) felderi* Betrem

1897. *Scolia (Discolia) erratica* Smith : Bingham, *Fauna British India Hym.*, 1:77. Female, male. Myanmmar; Sikkim (misdet).
1928. *Scolia (Scolia) felderi* Betrem, *Treubia*, 9 (suppl.) : 274- 275. Female, male, Myanmar: India:Sikkim, Naga Hills. (Holotype female from Sikkim in British Museum, allotype in Vienna Museum and paratypes in Z.S.I. Calcutta).
1964. *Scolia (Discolia) felderi* Betrem : Betrem and Bradley, *Zool. Meded.*, 40:93 (subgeneric assignment).

Material examined : India : Meghalaya : East Garo Hills, Darugiri, 400 m, 2 females, 14-20.v. 1979, S.B. Roy and party.

Distribution : India : Meghalaya (East Garo Hills), Assam, Karnataka, Kerala, Nagaland, Sikkim, West Bengal. Elsewhere: Myanmar.

Remarks : This species is known from Myanmar, Northeast and South India. The female of this species is easily recognised by having head and antennae red, vestiture black except head predominantly with reddish-brown hairs, and wings brown with purplish effulgence.

17. *Scolia (Discolia) superciliaris staudingeri* Betrem

1928. *Scolia (Scolia) sauteri staudingeri* Betrem, *Treubia*, 9 (suppl.) : 278. M; India : Meghalaya (formerly Assam) : Khasi Hills; Indo-China : Annam (holotype in Betrem Colln., Leiden Museum).
1941. *Scolia (Scolia) superciliaris staudingeri* Betrem : Betrem, *Notes Ent. Chinoise*, 8(4) : 135 (New combination).
1964. *Scolia (Discolia) superciliaris staudingeri* Betrem : Betrem & Bradley, *Zool. Meded.*, 40 : 92 (new subgeneric assignment).

Material examined : India : Meghalaya (formerly Assam) : Khasi Hills, Male (hlotype), no other data (Leiden Museum).

Distribution : India : Assam, Meghalaya and Uttar Pradesh. *Elsewhere* : China, Myanmar, Nepal, Taiwan and Vietnam.

18. *Scolia (Discolia) fichteli* Betrem

1928. *Scolia (Scolia) fichteli* Betrem, *Treubia*, 9 (suppl.) : 257, 258, 313, 314. F, M.; India, Malabar (type in Vienna Museum).
1964. *Scolia (Discolia) fichteli* Betrem : Betrem & Bradley, *Zool. Meded.*, 40 : 93 (new subgeneric assignment).

Material examined : India : Meghalaya : East Garo Hills : Darugiri, 2 F, 113 M, 14-20.v.1979, S.B. Roy & party.

Distribution : India : Meghalaya (East Garo Hills), Arunachal Pradesh, Andhra Pradesh, Bihar, Delhi, Kerala, Pondicherry, Punjab and West Bengal.

Remarks : This species is recorded from India only. It can be recognised by having vestiture black; second tergite without paired spots and wings dark brown with blue effulgence.

SUMMARY

This paper deals with the Scoliidae fauna of Meghalaya. Altogether 16 species/subspecies under 8 genera and two subfamilies are treated in the text. The keys for the identification of subfamilies, genera and species are provided. Distributional maps and illustrations of morphological characters are included for ready reference.

The Scoliid wasps are ectoparasites of Scarabaeidae found in the soil or in the decaying wood. Many of these may be economically exploited for the biological control of insect pests.

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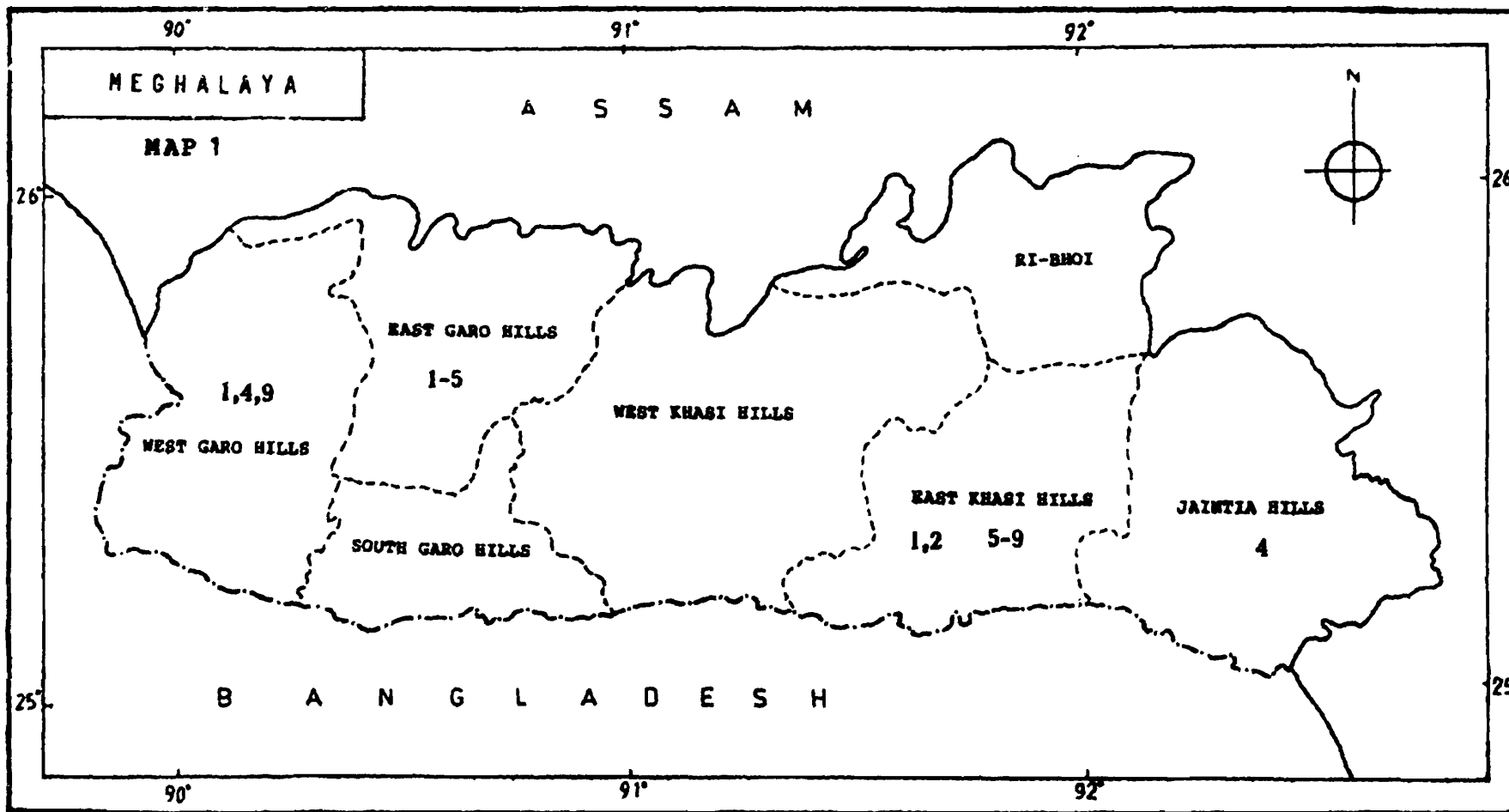
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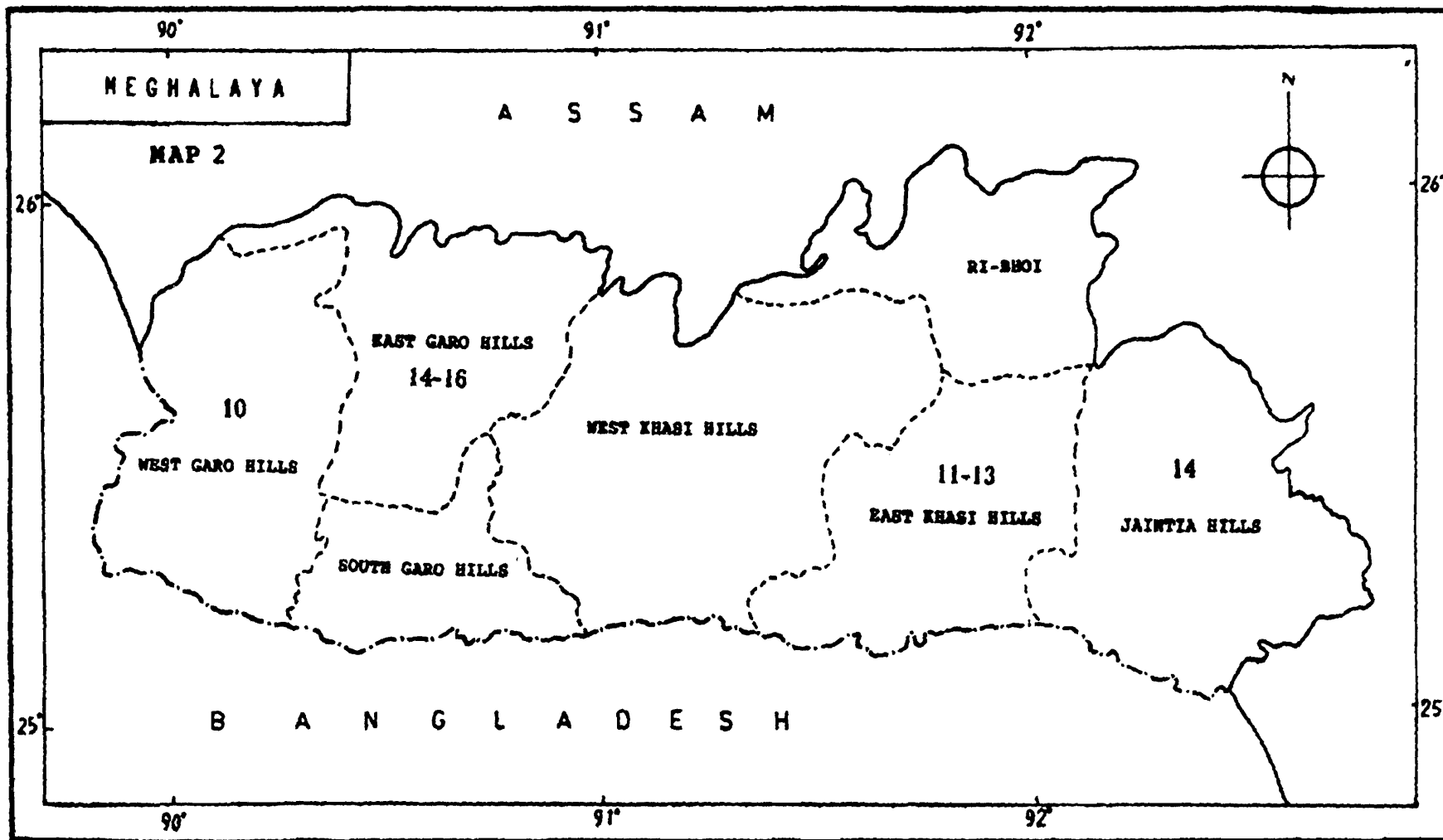
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Table showing distribution of species/subspecies of family Scoliidae in Meghalaya

Name of the taxa	East Khasi Hills	West Khasi Hills	Jaintia Hills	Ri-Bhoi Hills	East Garo Hills	West Garo Hills	South Garo Hills
I. Subfamily Campsomerinae							
1. Genus <i>Phalerimeris</i> Betrem							
1. <i>phalerata phalerata</i> (saussure)	+				+	+	
2. Genus <i>Colpacampsomeris</i> Betrem							
2. <i>indica indica</i> (Saussure)	+				+		
3. Genus <i>Sericocampsomeris</i> Betrem							
3. <i>flavomaculata</i> Gupta & Jonathan					+		
4. Genus <i>campsomeriella</i> Betrem							
Subgenus <i>Campsomeriella</i> Betrem							
4. <i>collaris collaris</i> (Rabricius)			+		+	+	
Subgenus <i>Annulimeris</i> Betrem							
5. <i>annulata</i> (Fabricius)	+				+		
5. Genus <i>Megacampsomeris</i> Betrem							
6. <i>prismatica</i> (Smith)	+						
7. <i>asiatica himalayana</i> (Betrem)	+						
8. <i>binghami khasiensis</i> (Betrem)	+						
9. <i>shillongensis</i> (Betrem)	+					+	
II. Subfamily Scoliinae							
6. Genus <i>Carinoscolia</i> Betrem							
10. <i>bhamoensis</i> (Magretti)						+	
7. Genus <i>Megascolia</i> Betrem							
Subgenus <i>Regiscolia</i> Betrem & Bradley							
11. <i>azurea christiana</i> (Guiglia & Betrem)	+						
8. Genus <i>Scolia</i> Fabricius							
Subgenus <i>Discolia</i> Betrem & Bradley							
12. <i>sikkimensis</i> Bingham	+						
13. <i>rugifrons</i> Betrem	+						
14. <i>affinis</i> Guerin			+		+		
15. <i>quadripustulata</i> Fabricius					+		
16. <i>felderi</i> Betrem					+		
17. <i>superciliaris staudingeri</i> Betrem	+						
18. <i>fichteli</i> Betrem					+		



Map. 1. Distribution of taxa of subfamily Campsomerinae in Meghalaya.
Number indicates the name of the taxa as treated in the text.



Map 2. Distribution of taxa of subfamily Scoliinae in Meghalaya. Number indicates the name of the taxa as treated in the text.

INSECTA : HYMENOPTERA : FORMICIDAE

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INTRODUCTION

Ants are one of the world's truly spectacular animal families. They form a single large family the Formicidae of the Aculeate Hymenoptera. They occupy a place close to the tiphiid wasps. Originally of the tropics, ants have spread to various ecological niches and can survive very extreme climatic conditions. Ants by their very nature, are preadapted to life in a wide variety of environments, including some of the harshest on earth. They make up 10-15% of total animal biomass in most terrestrial environs, turn more soil than earthworms and play leading role in ecology as predators and scavengers. All true-ants are social and live in groups, normally representing the offspring of one or two queens or sexually developed females.

The study of ants has produced many basic insights into the origins of altruistic behaviour, the use of chemicals (pheromones) in communication, the functioning of caste system and division of labour, and other important phenomena of social organisation (Holldobler and Wilson, 1990).

Polymorphism attains its highest expression among ants and large number of types have been recognised. Normally there are males, queens and workers. The male is the least variable of the three castes and retains many scolioid features. However, the males of Dorylinae are characterized by its large, peculiar mandibles, long cylindrical abdomen and the specialized genitalia. The queen is a female, characterized by her large stature and well developed reproductive organs. Worker is a female, characterized by the absence of wings, reduced thorax and small gaster. Workers are variable in size, colour and structure. When they are dimorphic without inter-mediate, the larger type with large head and mandibles is termed a soldier. These are often adapted to particular functions such as fighting, guarding the nest, crushing seeds and other food particles etc. The cooperation of many individuals is advantageous in foraging, nest construction, defence and care of the young.

Ants nests are quite varied, often they are excavations in the soil. In the most primitive forms, they consist of chambers and passages in the ground. Some species, nest in soft wood of rotting trunks, hollow branches and even in fallen leaves. Yet some others make silken nests on leaves. There are others which chew up plant material, the resulting pulp is glued into elaborate nest of cardboard. These

nests require no biologically expensive materials and are completely flexible as to plan and extremely efficient in that, they afford a wide range of temperature and moisture conditions from which the ants can choose and benefit. However, they are as plastic in their nest building as in other aspects of their behaviour. They can readily alter the typical plan to fit anything unusual in their nesting sites. They may normally use typical material, but can change readily to some other, if the supply is inconvenient, inadequate or even entirely lacking. A species may occupy the nest abandoned by another or even a colony can be evicted by another. thus, it may not be always easy to correctly identify a species from the nest it occupies.

Majority of ants are omnivorous. Primitive species are predators. Many have become more versatile and in addition to animal food, gather plant juices, fruits or seeds. Honeydew obtained from Homopterans is an important component in the ants' diet.

Ants are of great importance in the ecosystem, considering their diversity and abundance in the tropics. They play a major role in aerating the soil. Certain species help in the pollination of plants, the predator species play an important role in biological control of pests. However, some of them are directly or indirectly harmful as agricultural pests. Some species are house-hold pests.

Analysing the phylogeny of aculeate superfamilies of Hymenoptera, it is found that family Formicidae has originated from superfamily Bethyloidea, passing through Vespoidea (Brothers, 1975). Until recently the search for the ancestry of ants, always ended in frustration. Wilson et al. (1967a,b) obtained the first ant remains of Cretaceous age, in the fossil form of *Sphecomyra freyi*. Jell and Duncan (1986) described *Cretacoformica explicita* from lower cretaceous bed in victoria, Australia.

George Alexander James Rothneyi (1889) worked on Indian ants and later on A. Forel (1900a,b,c) published a comprehensive work on the Formicidae of India and Ceylon. Bingham (1903) published his valuable work on ants fauna of British India including Burma and Ceylon and gave details about the distribution of the species.

Successive workers like Jerdon (1851), Mukherjee (1927), Karwajew (1926, '27, '28), Menozzi (1935), Donisthorpe 1942a, b), Smith (1948) Chapman and Capco (1951), Brown Jr. (1954, '57, '59a), Wilson (1964), Taylor (1965, '66, '68), Collingwood (1970), Baroni Urbani (1977a, b), Bolton (1977), Tiwari et al. (1977a, b, c, '86a, b '94, a,b,'96,'97,'98) and Imai et al. (1984) have made valuable contribution on Indian fauna of Formicidae. Aphidocolous ants of North-East India are studied by Datta et al. (1983) and Devi and Singh (1987). The present work is based on the material collected and deposited at the Zoological Survey of India, Eastern Regional Station, Shillong, and the Headquarters at Calcutta.

Meghalaya comprises of an area of 22,549 sq. km. and is bounded by Bangladesh on the south and west and by Assam on the north and east. Originally it consisted of Garo hills, Khasi hills and Jaintia hills, which have been further divided into seven districts viz. West Garo-Hills, East Garo-Hills, South Garo Hills, West Khasi Hills, East Khasi Hills, Ri-Bhoi and Jaintia Hills.

The state merges almost to the sea-level in the plains of Bangladesh and Assam on all sides, except in the east, where it extends to the main ranges of the eastern Himalayas by a continuous hill

range through Mikir Hills, North Kachar Hills and Nagaland. Jaintia-Hills on its eastern border merges into Brail range, its central part comparatively flat and valley form. The southern part of Khasi and Jaintia Hills is mostly formed by gentle slopes. The central and northern part of Khasi and Garo Hills are hilly.

The state is watered with innumerable rivulets and streams. Besides this, there are number of lakes, ponds and rivers. The rivers are torrential and follow the directions of ranges. The Shillong peak and Nokrek peak, form the main watersheds of the rivers.

The climate of Meghalaya varies from sub-tropical in foot hills to temperate at higher elevations. In general, Khasi and Jaintia hills districts have warm summer and cold winter, while Garo-hills districts appear slightly warmer. South eastern monsoon from June to September accounts for 75% of the total rainfall. The north eastern monsoon lasting from December to January, accounts for minor percentage of rainfall.

The state shows different vegetative zones from tropical to temperate. Tropical evergreen vegetation with luxurious growth is met at lower altitudes. Topical forest is gradually replaced by subtropical forest. Trees are heavily loaded with epiphytes mostly orchids.

Southern part of Khasi hills districts, due to heavy rainfall and soil erosion has scanty vegetation. There are number of Reserve forests in the state, specially in the southern part of Khasi and Garo Hills where artificial plantation of economically important timber producing plants are present.

For details of the topography of Meghalaya, Alfred (1995) may be referred to.

SYSTEMATICS

The known living ants comprise of 11 living subfamilies, viz. Ponerinae, Nothomyrmecinae, Myrmecinae, Dorylinae, Ecitoninae, Leptanillinae, Pseudomyrmecinae, Myrmicinae, Dolichoderinae, Formicinae and Aneuretinae, spread over 297 genera with approximately 8,800 species from the world. (Wilson et al., 1990)

Turning to the entire fauna of ants, it is estimated and is quite possible that 20,000 or more species of ants, constituting as many as 350 genera exist in the world. (Holldobler and Wilson, 1990). A total of 163 species (including a few upto genera only) are reported in this paper.

COLLECTION, PRESERVATION AND IDENTIFICATION

Ants can be collected by hand picking with fine forceps or with the help of an aspirator. They are also taken in an insect net by sweeping the foliage or by extraction through a Berlese funnel. Baiting is another method. Storage is possible in 70 to 80 percent alcohol. Large specimens can be pinned directly through the body and smaller ones mounted on paper-tips. Identification is mainly based on worker caste (Fig.1). In species where modified worker caste occur, characters studied are mainly that of worker major or soldier forms.

In the pages that follow key characters and descriptions of species are based on worker or soldier forms whichever may be relevant. In text, abbreviations used to differentiate different forms of ants, are : M-Male; F-Female; W-Workers; S-Soldiers. While describing the species, the following abbreviations are used : TL Total length of the specimen; HL - Length of head measured from the anterior border of clypeus; HW Width of head measured excluding the eyes; CI - Cephalic Index; SL Length of antennal scape; SI Scape Index; PW Width of pronotum and Th L Diagonal length of thorax measured in lateral view, DE Diameter of eye. All measurements are in millimeters and magnification of drawings, wherever given, is mentioned in parenthesis.

Method of Study : It is necessary to relax the specimen fully before its study at high magnification. The method applied here for study is reasonably rapid and does not cause excessive damage or discolouration to the specimen.

Equipment and chemicals required are (1) saturated ammonia solution, (2) glycerine, (3) Barber's or Ward's fluid and (4) dissecting equipments.

The specimen is removed from the pin and placed in ammonia in a rubber stoppered vial of suitable size. Depending on the size of the specimen, it will be flexible and workable in 3-30 minutes. The specimen is removed to Barber's or Ward's fluid and examined at suitable magnification; the head is grasped with forceps and the mandible well separated; the labio-maxillary complex can now be removed and finally the labrum is removed; one antenna is dissected off and all the parts except mandible are removed to glycerine in a cavity slide. One mandible is air dried and mounted in the point with the specimen; the mandible is mounted with "trulleum" in an exposed position. The parts in glycerine are stored after examination in a genitalia vial in the absolute minimum of glycerine. The vial is mounted on the same pin through the cork end of vial - at an angle of 45°, to prevent the glycerine running upto the cork. Wings of male and female if any, are mounted in canada balsum on slides under coverslips. If the wings of dried specimen are undistorted, they may be wetted with xylene and mounted immediately. The distorted wings are relaxed, dried and then mounted (Ettershank, 1966). Morphological characters are illustrated in figs. 1-5

TAXA INCORPORATED IN THE TEXT

FAMILY : FORMICIDAE

I. Subfamily : DORYLINAE Forel

1. Genus *Aenictus* Schuckard

1. *Aenictus binghami* Forel, 1901
2. *Aenictus brevicornis* (Mayr, 1878)
3. *Aenictus fergusonii* Forel, 1900
4. *Aenictus laeviceps* Smith, 1856
5. *Aenictus longi* Forel, 1901

6. *Aenictus shillongensis* sp. nov.

2. Genus *Dorylus* Fabricius.

7. *Dorylus orientalis* Westwood, 1835

II. Subfamily CERAPACHYINAE Forel

3. Genus. *Lioponera* Mayr

8. *Lioponera Longitarsus* Mayr, 1878

9. *Lioponera parva* Forel, 1900

4. Genus *Cerapachys*

10. *Cerapachys risii* Forel, 1892

11. *Cerapachys aitkeni* Forel,

III. Subfamily PONERINAE Lapeletier

5. Genus *Gnamptogenys* Roger

12. *Gnamptogenys bicolor* Emery, 1892

6. Genus *Proceratium* Roger

13. *Proceratium williamsi* sp.nov.

7. Genus *Diacamma* Mayr

14. *Diacamma rugosum* (Le Guillou, 1841)

15. *Diacamma scalpratum* (Fred Smith, 1858)

8. Genus *Harpegnathos*

16. *Harpegnathos venator* (Fred Smith)

9. Genus *Leptogenys* Roger

17. *Leptogenys assamensis* Forel, 1900

18. *Leptogenys birmana* Forel, 1900

19. *Leptogenys binghami* Forel, 1900

20. *Leptogenys diminuta* (Fred Smith, 1857)

21. *Leptogenys kitteli* Mayr, 1870

22. *Leptogenys peuqueti* Er. André, 1887

23. *Leptogenys ocellifera* (Roger, 1861)

24. *Leptogenys punctiventris* Mayr, 1878

25. *Leptogenys jeanettei* sp.nov.

10. Genus *Odontoponera* Mayr

26. *Odontoponera transversa* (Fred. Smith), 1875

11. Genus *Pachycondyla* Fred Smith

27. *Pachycondyla amblyops* (Emery)

12. Genus *Ectomomyrmex* Mayr

28. *Ectomomyrmex astuta* (Fred. Smith), 1858

29. *Ectomomyrmex javana materna* (Forel), 1901

30. *Ectomomyrmex leeuwenhoekii* (Forel), 1886

13. Genus *Brachyponera* Emery

31. *Brachyponera luteipes* (Mayr, 1862)

32. *Brachyponera nigrata* (Emery, 1894)

14. Genus *Bothroponera* Mayr

33. *Bothroponera rufipes* (Jerdon, 1851)

15 Genus *Odontomachus* Latreille

34. *Odontomachus haematodus* (Linnaeus, 1738)

35. *Odontomachus monticola* Emery, 1891

36. *Odontomachus punctulatus* Forel, 1900

37. *Odontomachus rixosus* Fred. Smith, 1857

16. Genus *Anochetus* Mayr

38. *Anochetus myops* (Emery, 1893)

39. *Anochetus punctiventris* Mayr, 1878

IV. Subfamily : PSEUDOMYRMECINAE Emery

17. Genus *Tetraponera* Smith

- 40. *Tetraponera aitkeni* (Forel), 1902
- 41. *Tetraponera allaborans* (Walker, 1859)
- 42. *Tetraponera nigra* (Jerdon, 1851)
- 43. *Tetraponera rufonigra* (Jerdon, 1851)

V. Subfamily MYRMICINAE Lepeletier

18. Genus *Rhoptromyrmex* Mayr

- 44. *Rhoptromyrmex wroughtonii* Forel, 1902

19. Genus *Triglyphothrix* Forel

- 45. *Triglyphothrix lanuginosa* (Mayr), 1870
- 46. *Triglyphothrix walshi* Forel, 1890

20. Genus *Myrmica* Latreille

- 47. *Myrmica margaritae* Emery, 1889

21. Genus *Aphaenogaster* Mayr

- 48. *Aphaenogaster rothneyi* (Forel, 1902)
- 49. *Aphaenogaster sagei* (Forel), 1902
- 50. *Aphaenogaster schurri* (Forel, 1902)
- 51. *Aphaenogaster smythiesi* (Forel), 1902

22. Genus *Monomirium* Mayr

- 52. *Monomirium aberrans* Forel, 1902
- 53. *Monomirium floricola* (Jerdon, 1851)
- 54. *Monomirium longi* Forel, 1902
- 55. *Monomirium minutum* Mayr, 1855
- 56. *Monomirium pharaonis* (Linnaeus, 1758)
- 57. *Monomirium schurri* Forel, 1902

23. Genus *Cardiocondyla* Emery

58. *Cardiocondyla nuda* (Mayr), 1866

24. Genus *Tetramorium* Mayr

59. *Tetramorium barryi* Mathew, 1980

60. *Tetramorium bicarinatum* (Nylander), 1846

61. *Tetramorium browni* sp.nov.

62. *Tetramorium christiei* Forel, 1902

63. *Tetramorium mixtum* Forel, 1902

64. *Tetromorium simillimum* (Fred. Smith), 1851

65. *Tetramorium Smithi* Mayr, 1878

66. *Tetramorium* sp.

25. Genus *Xiphomyrmex* Forel

67. *Xiphomyrmex tortuosum* (Roger), 1863

26. Genus *Pheidole* Westwood

68. *Pheidole allani* Bingham, 1903

69. *Pheidole bhavanae* Bingham, 1903

70. *Pheidole capellinii* Emery, 1887

71. *Pheidole constanciae* Forel, 1902

72. *Pheidole feae* Emery, 1894

73. *Pheidole jucunda* Forel, 1885

74. *Pheidole lamellinoda* Forel, 1902

75. *Pheidole malinsii* Forel, 1902

76. *Pheidole mus* Forel, 1902

77. *Pheidole parva* Mayr, 1865

78. *Pheidole pronotales* Forel, 1902

79. *Pheidole roberti* Forel, 1902

- 80. *Pheidole sagei* Forel, 1902
- 81. *Pheidole smythiesi* Forel, 1902
- 82. *Pheidole striativentris* Mayr, 1878
- 83. *Pheidole watsoni* Forel, 1902
- 84. *Pheidole wood-masoni* Forel, 1885
- 85. *Pheidole* sp.

27. Genus *Trigonogaster* Forel

- 86. *Trigonogaster recurvispinosa* Forel, 1890

28. Genus *Cataulacus* Fred. Smith

- 87. *Cataulacus taprobanae* Fred. Smith, 1853
- 88. *Cataulacus simoni* Emery, 1893

29. Genus *Crematogaster* Lund

- 89. *Crematogaster anthracina* Fred. Smith, 1857
- 90. *Crematogaster artifex* Mayr, 1878
- 91. *Crematogaster biroi* Mayr, 1892
- 92. *Crematogaster flava* Forel, 1887
- 93. *Crematogaster hodgsoni* Forel, 1911
- 94. *Crematogaster politula* Forel, 1902
- 95. *Crematogaster dohrni rogenhoferi* Mayr, 1878
- 96. *Crematogaster rothneyi* Mayr, 1902
- 97. *Crematogaster travancorensis* Forel, 1902
- 98. *Crematogaster walhi* Forel, 1902
- 99. *Crematogaster* sp.

30. Genus *Lophomyrmex* Emery.

- 100. *Lophomyrmex bedoti* Emery, 1893
- 101. *Lophomyrmex burmanus* Emery, 1893

102. *Lophomyrmex quadrispinosus* (Jerdon), 1851

31. Genus *Pheidologeton* Mayr

103. *Pheidologeton affinis* (Jerdon, 1851)

32. Genus *Myrmecina* Curtis

104. *Myrmecina striate* Emery, 1889

33. Genus *Meranoplus* Smith

105. *Meranoplus bicolor* (Guerin, 1838)

106. *Meranoplus rothneyi* Forel, 1902

107. *Meranoplus laeviventris* Emery, 1889

34. Genus *Carebara* Westwood

108. *Carebara lignata* Westwood, 1841

35. Genus *Strumigenys* Fred Smith

109. *Strumigenys godeffroyi* Mayr, 1866

36. Genus *Myrmicaria* Saunders

110. *Myrmicaria brunnaea* Saunders, 1841

37. Genus *Vollenhovia* Mayr

111. *Vollenhovia* sp.

VI. Subfamily DOLICHODERINAE Forel

38. Genus *Liometopum* Mayr

112. *Liometopum lindgreeni* Forel, 1902

39. Genus *Bothriomyrmex* Emery

113. *Bothriomyrmex myops* Forel, 1895

40. Genus *Iridomyrmex* Mayr

114. *Iridomyrmex anceps* (Roger, 1863)

41. Genus *Dolichoderus* Lund

- 115. *Dolichoderus affinis* Emery, 1889
- 116. *Dolichoderus bituberculatus* Mayr, 1862
- 117. *Dolichoderus fuscus* Emery, 1895
- 118. *Dolichoderus sundari* sp. nov.
- 119. *Dolichoderus taprobanae* (Fred. Smith, 1858)
- 120. *Dolichoderus* sp.

42. Genus *Tapinoma* Foerster

- 121. *Tapinoma indicum* Forel, 1895
- 122. *Tapinoma melanocephalum* (Fabricius, 1793)

43. Genus *Technomyrmex* Mayr

- 123. *Technomyrmex* sp.

VII. Subfamily FORMICINAE Lepeletier

44. Genus *Oecophylla* Fred Smith

- 124. *Oecophylla smargdina* (Fabricius, 1775)

45. Genus *Pseudolasius* Emery

- 125. *Pseudolasius familiaris* (Fred. Smith, 1860)

46. Genus *Myrmecocystus* Wesmael

- 126. *Myrmecocystus setipes* Forel, 1894

47. Genus *Acantholepis* Mayr

- 127. *Acantholepis capensis* Mayr, 1862
- 128. *Acantholepis frauenfeldi* Mayr, 1855
- 129. *Acantholepis capensis simplex* Forel, 1892

48. Genus *Anoplolepis* Santschi

- 130. *Anoplolepis longipes* (Jerdon, 1851)

49. Genus *Plagiolepis* Mayr

131. *Plagiolepis dichroa* Forel, 1902

50. Genus *Paratrechina* Motschoulsky

132. *Paratrechina longicornis* Latreille, 1802

51. Genus *Camponotus* Mayr

133. *Camponotus cotesii* (Forel, 1893)

134. *Camponotus pubescens* (Mayr, 1862)

135. *Camponotus strictus* (Jerdon, 1851)

136. *Camponotus angusticollis* (Jerdon, 1851)

137. *Camponotus camelinus* (Fred Smith)

138. *Camponotus compressus* (Fabricius, 1787)

139. *Camponotus holosericeus* Emery, 1889

140. *Camponotus paria* Emery, 1889

141. *Camponotus rufoglaucus* (Jerdon, 1851)

142. *Camponotus selene* (Emery, 1889)

143. *Camponotus sericeus* (Fabricius, 1778)

144. *Camponotus wasmanni* Emery, 1893

52. Genus *Polyrhachis* Fred Smith

145. *Polyrhachis abdominalis* Fred. Smith, 1858

146. *Polyrhachis affinis* Smith, 1858

147. *Polyrhachis armata* (La Guillou, 1841)

148. *Polyrhachis bicolor* Fred Smith, 1858

149. *Polyrhachis ceylonensis* emery

150. *Polyrhachis convexa* Roger, 1863

151. *Polyrhachis dives* Fred Smith, 1858

152. *Polyrhachis furcata* Fred Smith, 1858

153. *Polyrhachis illaudata* Walker, 1859
154. *Polyrhachis intermedia* Forel, 1886
155. *Polyrhachis laevissima* Fred. Smith, 1858
156. *Polyrhachis mayri* Roger, 1863
157. *Polyrhachis mutata* Fred Smith, 1858
158. *Polyrhachis proxima* Roger, 1863
159. *Polyrhachis punctillata* Roger, 1863
160. *Polyrhachis rastellata* Latreille, 1802
161. *Polyrhachis striata* Mayr, 1862
162. *Polyrhachis tibialis* Fred. Smith, 1858
163. *Polyrhachis* sp.

SYSTEMATIC ACCOUNT

Key to the Subfamilies of Formicidae

Based on Workers

1. Eyes absent or vestigial; pedicel with one or two segments (one in female and male); clypeus short; frontal carinae short and vertical, not covering the antennal insertions; antennae usually short; epinotum usually unarmed; pro-mesonotal suture weak or absent .Dorylinae
Without this combination of characters 2
2. Pedicel of one segment 3
- Pedicel of two segments. 4
3. With a conspicuous constriction between 1st and 2nd gastric segments. .5
Without a constriction between 1st and 2nd gastric segments 6
4. Elongate, often slender, eyes very large and elongate; clypeus with a rounded upper margin, not produced between the frontal carinae, frontal carinae usually close together, usually narrow and not expanded laterally to cover the antennal insertions; antennae short .Pseudomyrmecinae
- Frontal carinae usually large, nearly always well separated and covering the antennal insertions .Myrmicinae

5. Elongate, slender and subcylindrical; scape usually short and stout; antennal fossa more or less encircled by a lateral carina on the cheek; posterior surface of head usually with a distinct carina running ventrally from each dorsolateral corner; dorsal surface of thorax with sutures indistinct or absent Cerapachyinae

Without this combination of characters Ponerinae

6. Mandibles articulated near the middle of the ventral border of the head; when closed, parallel to each other; when fully open, they form together a straight line parallel to the ventral border of the head. Ponerinae

- Mandibles articulated on the corners of the head. .7

7. Opening at posterior end of gaster terminal, circular and usually surrounded by a fringe of hairs; sting vestigial; node of pedicel usually scale like . . .Formicinae

Opening at posterior end of gaster slit-like; sting vestigial; node of pedicel scale like Dolichoderinae

I. SubFamily DORYLINAe

Sub-family Dorylinae comprises the renowned army ants of the tropics. They exhibit great difference in size between the worker caste and alate sexual forms. This sub-family is represented by two genera *Dorylus* and *Aenictus*. Their colonies may run into thousands of individuals.

Key to the genera of Dorylinae

1. Pedicel with one segment *Dorylus*
 Pedicel with two segments *Aenictus*

1. Genus *Aenictus* Shuckard, 1840

Aenictus Shuckard 1840, *Ann. Mag. Nat. Hist.*, 5 : 266.

Aenictus, Brown, 1973, *Tropical forest ecosystems in Africa and South America* : 161-185.

Workers of this genus are blind; antennae with 10 segments; males are wasp like insects and resemble the males of *Dorylus*. Pedicel in workers 2-jointed.

Key to the species of *Aenictus* Shuckard

1. Head with yellowish or reddish white spot on each side 2
 Head without yellowish or reddish white spot on each side 4
2. Posterior margin of head transverse, as wide as in front . *fergusoni*
 Posterior margin of head not transverse, narrower than in front 3

- 3. First joint of pedicel finely sculptured *laeviceps*
- First joint of pedicel coarsely sculptured, rugose *binghami*
- 4. Scape of antennae very short; pronotum smooth, polished and shining, rest of the thorax sculptured. *brevicornis*
- Scape of antennae longer; entire thorax sculptured, not polished and shining *shillongensis* Sp.nov

Note : The above key is based on workers and hence does not contain *Aenictus longi* which is represented by male only.

1. *Aenictus binghami* Forel (Fig. 5)

Aenictus binghami Forel, 1901, *J. Bombay nat. Hist. Soc.*, 13 : 465.

Aenictus binghami, Chapman and Capco, 1951, *Check list of ants of Asia*, 1 : 12.

Aenictus binghami; Wilson, 1964, *Pacific Insects*, 6 (3) : 450.

Material examined : 15 ex: 5 ex, India, Meghalaya, Garo hills, Songsak, 12.xi.78, Coll. K.P. Singh; 7 ex, East Khasi hills, Nongpoh, Nongkhyllem Reserve Forest, 19.x.82, Coll. R. Mathew; 3 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C Radhakrishnan.

Diagnostic characters : Worker. Black, head highly polished, smooth and shining; pronotum convex, delicately transversely sculptured and shining; metanotum compressed, longitudinally striate; 1st node of pedicel rugose and opaque, 2nd node smooth and shining; abdomen oval, narrow at base.

Length : W 4-5 mm.

Distribution : INDIA : (East and West Khasi hills, West Garo hills), Meghalaya, Assam. Elsewhere : Myanmar, Tenasserim.

2. *Aenictus brevicornis* (Mayr) (Fig. 6)

Typhlatta brevicornis Mayr, 1878, *Verh. zool-bot. Ges. Wien*, 28 : 668.

Aenictus brevicornis, Wilson, 1964, *Pacific Insects*, 6 (3) : 451.

Material examined : 27 ex: 14 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 12.vii.76, Coll. R. Mathew; 13 ex, East Khasi hills, Shillong, Risa Colony, 16.viii.78, Coll. R. Mathew.

Diagnostic characters : Worker. Reddish yellow; head rectangular, very broad posteriorly, smooth and shining; mandibles with three distinct teeth; pronotum convex, smooth and shining, mesonotum posteriorly and metanotum densely and very finely rugulose; nodes of pedicel round, shining, 1st node slightly rugulose in front; abdomen elongate oval.

Length : W 2.5-3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam; West Bengal; Karnataka; Kerala.

3. *Aenictus fergusonii* Forel (Fig. 7)

Aenictus fergusonii Forel, 1900, *J. Bombay nat. Hist. Soc.*, 13 : 473.

Aenictus Fergusonii, Wilson, 1964, *Pacific Insects*, 6(3) : 462.

Material examined : 6 ex: 2 ex, India, Meghalaya, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 4 ex, East Khasi hills, Nayabunglow, Raithwang forest, 10.ii.82, Coll. J. P. Sati.

Diagnostic characters : Worker Reddish brown; yellow spots on the head placed high up, head smooth and shining; mandibles broad, armed with minute teeth; thorax convex, pronotum smooth and shining; metanotum delicately rugulose, apical portion vertical, bordered by a carina above and on the sides; nodes of pedicel smooth and shining; abdomen oval, narrowed anteriorly.

Length : W 3.5-4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Sikkim, Southern and Western India.

4. *Aenictus laeviceps* (Smith) (Fig. 8)

Typhlatta Laeviceps Fr. Smith, 1858 *J. Proc. Linn. Soc. Lond. Zool.*, 2 : 79.

Aenictus laeviceps, Wheeler & Wheeler, 1974, *J. Kansas. Ent. Soc.*, 47(2) : 166-172.

Material examined : 16 ex: 9 ex, India, Meghalaya, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew, '7 ex, India, Meghalaya, West Garo hills, Selbalgiri, Alt. 2000', 19.iii.88, Coll. V.T. Darlong.

Diagnostic characters : W. Dark castaneous brown, head oval, highly polished, smooth and shining, with lateral yellowish-white spots lower down on the sides of the head; mandibles finely striate at base; pronotum highly polished, smooth and shining; meso and metanotum and 1st node of pedicel punctate reticulate; abdomen and 2nd node of pedicel highly polished and shining.

Length : Worker 3.5-3.8 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills), Meghalaya, Assam. Elsewhere : Borneo; Myanmar.

5. *Aenictus longi* Forel

Aenictus longi Forel, 1901 *J. Bombay nat. Hist. Soc.*, 13 : 467, 470, ♂

Aenictus longi, Wilson, 1964, *Pacific Insects*, 6(3) : 483

Material examined : Nil.

Diagnostic characters : Male. Head, thorax and abdomen densely pubescent; thorax and abdomen more distantly punctured. Head without the eyes about as long as broad; mandibles long and somewhat obtuse at apex; the joints 2-9 of the flagellum of antennae thicker than long. Pedicel concave above with raised sides, tuberculate beneath. Pygidium smooth and shining, with a longitudinal impression and its posterior border medially emarginate.

Length : M. 7 mm.

Distribution : INDIA : Meghalaya (Garro Hills). Elsewhere : Burma, Pegu.

Remarks : Bingham (1903) reported this species from 'Garro Hills'

6. *Aenictus shillongensis* sp. nov. (fig. 9)

Holotype worker : TL 2.92; HL 0.68; HW 0.55; CI 81; SL 0.58; SI 105; ThL 0.89.

Head smooth, polished and shining, broader anteriorly; mandibles triangular, masticatory margin with five indistinct denticles; pilosity fairly abundant, long, recumbent; antennae stout; thorax punctate-rugose, densely sculptured on the meso and metanotum; apical portion of metanotum concave, bordered by a carina; anterior node of pedicel viewed from above cylindrical, punctate, with an appendix beneath; abdomen smooth, polished and shining; legs stout. Colour reddish brown.

Paratype workers : TL 2.82-3.00; HL 0.66-0.68; HW 0.55-0.58; CI 81-85; SL 0.55-0.61; SI 100-105; ThL 0.89-0.92.

Similar to holotype.

Holotype worker : INDIA : Meghalaya, (East Khasi hills), Shillong, Risa Colony, 25.vii.75, Coll. R. Mathew.

Paratype workers : 6 exs, with the same collection data as the holotype.

Aenictus shillongensis comes closer to *punensis*, but can be differentiated by its mandibular construction and the sculpture of the thorax and that of the nodes of pedicel.

2. Genus *Dorylus* Fabricius 1793

Dorylus Fabricius, 1793, *Ent. Syst.* 2 : 365.

Dorylus, Brown, 1973, in *Tropical forest ecosystems in Africa and South America* 161-185.

Males, females and workers of this genus exhibit great variation in appearance and were for a long time classed in different genera. Males are wasp like insects which are attracted towards light and

are encountered inside houses at night during rainy season. Workers are without eyes and ocelli; pedicel is with a single joint.

7. *Dorylus orientalis* Westwood (Fig. 10)

Dorylus (Alaopone) orientalis Westwood, 1835, *Proc. Zool. Soc. Lond.*, 3 : 72.

Dorylus orientalis, Mathew, 1983, *Bull. zool. Surv. India*, 5(1) : 125-127.

Material examined : 121 ex: 25 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 5.vii.75, Coll. R. Mathew; 25 ex, Risa Colony, 14.vii.75, R. Mathew; 15 ex, East Khasi hills, Mawphlang; 1 ex, Shillong, 3.x.76, Coll. M. S. Jyrwa; 5 ex, Shillong, Risa Colony, 17.vi.75, Coll. R. Mathew; 1 ex, Risa Colony, 6.vi.75, Coll. R. Mathew; 2 ex, Risa Colony, 20.vi.75, Coll. R. Mathew; 5 ex, Risa Colony, 25.vi.75, Coll. R. Mathew; 3 ex, Risa Colony, 14.vi.75, Coll. R. Mathew; 2 ex, Risa Colony, 22.vi.75, Coll. R. Mathew; 1 ex, Risa Colony, 18.vi.75, Coll. R. Mathew; 16 ex, Risa Colony, 17.vi.76, Coll. R. Mathew; 11 ex, East Khasi hills, Shillong, Lumparing, 25.ix.75, Coll. R. Mathew; 4 ex, East Khasi hills, Upper Shillong, 25.vi.75, Coll. M.S. Jyrwa.; 4 exs, Jaintia Hills, Garampani, 22.v.90, Coll. M.S. Shishodia and party.

Diagnostic characters : Worker. Reddish brown; head and thorax densely and abdomen lightly punctured; head rectangular, broader anteriorly than posteriorly; occiput deeply emerginate, a deeply impressed median line or furrow down the front; thorax depressed and flat above; node of pedicel broader than long, transverse; abdomen depressed above.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills & Jaintia hills), Meghalaya; whole of India. Elsewhere : Myanmar; Sri Lanka; Malay Peninsula; Borneo; Sumatra And Java.

II. Sub-family CERAPACHYINAE

Primarily tropicopolitan sub-family Cerapachyinae is intermediate between Dorylinae and Ponerinae. Elongate, slender and sub- cylindrical forms. Posterior surface of head usually with a distinct carina running ventrally from each dorsolateral corner. Pedicel of one segment. Sting developed.

Key to the genera of Cerapachyinae

1. Eyes remarkably large, lateral, placed below middle of head	<i>Lioponera</i>
Eyes small, lateral, placed about or above middle of head	<i>Cerapachys</i>

3. Genus *Lioponera* Mayr, 1878

Lioponera Mayr, 1878, *Verh. zool.-bot. Ges. Wien*, 28 : 666.

Lioponera, Chapman and Capco, 1951, *Check list of ants of Asia*, 1.

Diagnostic characters : Worker. Head ovato-rectangular; mandibles triangular, obsoletely dentate; antennal carinae short, prominent, close together, 12 jointed antennae, eye large, placed anteriorly close to the mandibles ; thorax transverse in front, truncate posteriorly, thoracic Suture obsolete; node of pedicel square, transverse posteriorly ; abdomen long, constriction between the basal two segments very deep.

Key to the Species of *Lioponera* Mayr

1. Black, Shining; length 4 mm. *longitarsus*
 Brownish red, smaller length 2.5-3 mm. *parva*

8. *Lioponera longitarsus* Mayr

Lioponera longitarsus Mayr, 1878, *Verh. zool.-bot. Ges. Wien*, **28** : 667.

Lioponera longitarsus; Chapman and Capco, 1951, *Check list of ants of Asia*. **1** : 327.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Old Barapani, 6.ix.79, Coll. R. Mathew.

Diagnostic characters : Worker. Black, shining; antennae, mandibles, thorax, pedicel and legs reddish brown; head thorax and abdomen with scattered punctures; thorax short, rectangular, pilosity sparse, short, erect and black.

Length : W. 4 mm.

Distribution : INDIA : (East Khasi Hills), Meghalaya; Western and Southern India; West Bengal.

9. *Lioponera parva* Forel

1900. *Lioponera longitarsus* var. *parva* Forel, *J. Bombay Nat. Hist. Soc.*, **13** : 330. W, M

1903. *Lioponera parva*, Bingham, *Fauna Brit. India, Hym.*, **2** : 27, W,M.

1993. *Lioponera parva*, Tiwari *et al.*, *State Fauna Series 3 : Fauna of West Bengal*, Part 8 : 234.

Material examined : India : Meghalaya : East Khasi Hills, Shillong, Beshope's fall, 12 W, 29.iii. 1959, Coll. A.P. Kapur.

Diagnostic characters : Worker. Head, thorax and basal abdominal segment brownish red; rest of abdomen blackish; mandibles, antennae and legs testaceous. Head ovato-rectangular; mandibles triangular, comparatively large, masticatory margin broad; antennae 12-jointed; eyes round, proportionately very large. Thorax short, rectangular, transverse in front, truncate posteriorly, sides flat; legs short, elongate, tarsi especially so. Pedicel one-jointed, with node nearly square, broader than long. Abdomen comparatively long, constriction between the basal two segments very deep.

Length : W. 2.5-3mm.

Distribution : INDIA : (East Khasi Hills), Meghalaya, Tamil Nadu, Uttar Pradesh and West Bengal.

4. Genus *Cerapachys* Fred. Smith 1857

Carapachys Smith, 1858, *J. Proc. Linn. Soc. Lond. Zool.*, **2** : 74.

Cerapachys Brown, 1973, in *Tropical forest ecosystems in Africa and South America* 161-185.

Diagnostic characters : Elongate and narrow; antennae 11 or 12 jointed; thorax short, compressed; thoracic sutures indistinct; node of pedicel free; abdomen elongate, constriction between the basal two segments deep.

Key to the species of *Cerapachys* Fr. Smith.

1. Head, throx, and abdomen black, longer than 5 mm *risii*
- Head in part, thorax and abdomen reddish brown, smaller species, less than 5 mm *aütkeni*

10. *Cerapachys risii* Forel (Fig. 12)

Cerapachys risii Forel, 1892, *Grandidier, Hist. Nat. Phy. Madagascar*, **20** : 244.

Cerapachys (Cerapachys) risi; Chapman and Capco, 1951, *Checklist of ants of Asia*, **1** : 19.

Material examined : 13 ex; India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : Worker. Black, almost smooth and shining; head and thorax sparsely but coarsely punctured, the pedicel more densely punctured and longitudinally coarsely furrowed or wrinkled; the whole insect covered with fine long erect yellowish hairs; posterior lateral angles of head acute; antennae 12 jointed; thorax strongly rounded and convex above, submargined anteriorly; posterior face of metanotum flat, bordered above and on the sides by a shining carina; apex of abdomen acute.

Length : W. 5.5-6.5 mm.

Distribution : INDIA : (East Khasi hills) : Meghalaya : Sikkim. Elsewhere : Myanmar; Malay Peninsula.

11. *Cerapachys aütkeni* Forel (Fig. 11)

Cerapachys aütkeni Forel, *J. Bombay Nat. Hist. Soc.*, **13** : 331 & 332.

Cerapachys aütkeni, Chapman and Capco, 1951 *Checklist of ants of Asia*, **1** : 327.

Material examined : 9 ex: India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 25.iv.84, Coll. C. Radhakrishnan.

Diagnostic characters : Worker. Reddish brown, shining; antennae, clypeus, mandibles, legs and the apex of abdomen reddish; head, thorax and abdomen covered with abundant short, erect, thick, yellowish hairs; head closely and somewhat irregularly cribrate; thorax with sparsely scattered shallow, punctures; node of pedicel and basal abdominal segment punctate shining; abdomen almost smooth and shining; posterior lateral angles of head acute; thorax convex and arched above, anteriorly submargined, posteriorly the basal portion of metanotum separated from the apical portion by a semicircular carina.

Length : W. 4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya : Karnataka : Western India.

III. SubFamily PONERINAE

Ponerinae comprises of a primitive but heterogeneous group. They are entomophagous. Colony size is small. Nests are in the soil or old logs, small and inconspicuous. The economic importance of the Ponerinae in the tropics can hardly be overestimated, since an estimated 80% of their food is termites (Wheeler & Wheeler, 1972).

Key to the genera of Ponerinae

1. Claws pectinate; mandibles linear or triangular, with or without teeth; clypeus unarmed or with a carina. *Leptogenys*
Claws simple 2
2. Mandibles articulated in the middle of the anterior margin of the head, when closed placed parallel to each other in front of the clypeus, when opened they lie in a straight line parallel to the anterior margin of the head. *Odontomachus*
Mandibles articulated differently 3
3. Mandibles very long, narrow, converging near the base where they are provided with a strong tooth beneath; eyes very large, placed near the base of mandibles. *Harpegnathos*
Mandibles differently shaped 4
4. Pronotum armed with two spines, anterior margin of clypeus arcuate, with numerous denticulations. *Odontoponera*
Pronotum unarmed, clypeal margin without denticulations 5
5. Posterior coxae armed with a spine; pro-mesonotal suture obsolete; antennal fossae short; antennae not ending in a club. *Gnamptogenys*

	Posterior coxae unarmed	6
6.	Node of pedicel with a pair of backwardly directed spines	<i>Diacamma</i>
	Node of pedicel unarmed	7
7.	Thoracic sutures distinct; pronotum more or less marginate	<i>Pachycondyla</i>
	Thoracic sutures indistinct; anterior clypeal margin produced in the middle; abdomen curved inward.	<i>Proceratium</i>

5. Genus *Gnamptogenys* Roger, 1863

Gnamptogenys Roger, 1863, *Berl. ent. Z.* 7 : 131-214.

Gnamptogenys, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : Worker. Antennae 12-jointed; head oval, mandibles triangular, masticatory margin broad, head posteriorly emarginate, the posterior lateral angles acutely produced; thorax short, broad, thoracic sutures indistinct; posterior coxae armed with a spine; node of pedicel single, constricted anteriorly and posteriorly; dentate beneath; head, thorax and base of abdomen always coarsely rugose-punctate, punctures forming longitudinal ridges. A single species reported from Meghalaya.

12. *Gnamptogenys bicolor* (Emery) (Fig. 13)

Ectatomma bicolor, 1889, *Ann. Mus. Civ. Gen.* 27 : 403.

Stictoponera menadensis bicolor, Chapman and Capco, 1951, *Checklist of ants of Asia*, 327.

Material examined : 11 ex; 1 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 5 ex, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, Nongkhylllem Reserve forest, Lai-lad, 23.i.82, Coll. C. Radhakrishnan; 2 ex, Nongkhylllem Reserve Forest, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, Nongkhylllem Reserve Forest, Nongpoh, 28.x.82, Coll. R. Mathew; 1 ex, Nongkhylllem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : Worker. Head, thorax, legs, pedicel and apex of abdominal segments ferruginous red; abdomen black; eyes of moderate size, placed laterally; 1st joint of flagellum longer than 2nd; mandibles obscurely and finely longitudinally striate; apical face of metanotum feebly denticulate; abdomen curved.

Length : W. 5.5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam: Elsewhere; Myanmar; China And Malay Peninsula.

6. Genus *Proceratium* Roger, 1863

Proceratium Roger, 1863, *Berl. ent. Z.*, 7 : 131-214,

Proceratium, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : Worker. Antennae 12-jointed; anterior margin of clypeus with or without projection in the middle; thorax without dorsal sutures; abdomen curved inward; females winged.

13. *Proceratium williamsi* sp. nov. (Figs. 14, 15)

Holotype worker : TL 2.92; HL 0.68; HW 0.68; CI 100; SL 0.42; SI 62; PW 0.47; ThL 0.79.

Head as long as broad, occipital margin round; the median clypeal margin produced in the middle, mandibles tridentate; eyes very minute, placed about the middle of the head laterally; antennae stout; thorax round, thoracic sutures not distinct; apical portion of metanotum concave, bordered on either side by a carina; node of pedicel broad, broader than long, briefly petiolate in front, with a short appendix beneath; abdomen stout, convex; legs moderate; the whole insect densely punctate and with a silky gloss; hairs on body sparse, few on the mandibles at the base of the masticatory region; pubescence dense, golden yellow, almost covering the sculpture.

Colour : Reddish brown.

Female : TL 4.13-4.34; HL 0.92; HW 0.76; CI 83; SL 0.74; SI 97; PW 0.68; ThL 1.32; DE 0.16.

Head longer than broad; eyes prominent, placed about the middle of the head laterally; ocelli prominent; clypeal margin anteriorly not produced in the middle; mandibles with few longitudinal striae; masticatory margin broad, armed with ten to eleven small teeth, apical two prominent; sides of head straight, posterior margin round, frontal carinae raised, spatulate; clypeal region concave; clypeal concavity on either side with transverse striae, striae bent towards the mandibular base; erect to suberect hairs on body numerous; densely pubescent; the whole insect densely punctured.

Paratype workers : TL 2.87-2.89; HL 0.63-0.71; HW 0.68; CI 96- 108; SL 0.45; SI 66; PW 0.45-0.47; ThL 0.82. Similar to holotype.

Holotype worker : India : Meghalaya; East Khasi hills, Shillong, Risa Colony, 14.v.76, Coll. R. Mathew. Paratypes : 2 workers and 3 females with the same collection data as that of the holotype.

Remark : *Proceratium* is recorded for the first time from India. Chapman and Capco (1951) reported four species from Asia.

7. Genus *Diacamma* Mayr, 1862

Diacamma Mayr, 1862, *Verh. Zool. bot. Ges. Wien*, **12** : 718.

Diacamma, Brown, 1973, *In Tropical forest ecosystem in Africa and South America*. : 161-185.

Diagnostic characters : Worker. Antennae 12 jointed; mandibles broad, triangular, masticatory margin strongly toothed; thorax rounded; pedicel one-jointed, node of pedicel arched and convex in front, flat or concave posteriorly, armed with a pair of spines.

Key to the species of *Diacamma* Mayr

1. First abdominal segment striate, the striae in concentric arches from back to front; nodal spines thick at base, pointing backwards in continuation of the upper surface of the node. *rugosum*
- First abdominal segment not striate; node of pedicel very strongly laterally compressed, longer than broad. *scalpratum*

14. *Diacamma rugosum* (Le Guillou) (Fig. 16)

Ponexa rugosum Le Guillou, 1841, *Ann. Soc. Ent. France*, **10** : 318.

Diacamma rugosum, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1** : 55.

Material examined : 60 ex: 11 ex, India, Meghalaya, East Khasi hills, Barapani, 21.vi.73, Coll. A. K. Ghosh; 8 ex, East Khasi hills, Old Barapani, 14.v.76, Coll. R. Mathew; 9 ex, East Khasi hills, Barapani, 24.vii.67, Coll. R.K. Varshney; 1 ex, East Khasi hills, Umshing, 23.viii.63, Coll. M.R. Rynth; 16 ex, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 2 ex, East Khasi hills, Shillong, 27.v.72, Coll. G.M. Yazdani; 4 ex, East Khasi hills, Shillong, Bishnupur, 24.v.81, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 1 ex East Khasi hills, Old Barapani, 6.ix.79, Coll. R. Mathew; 3 ex, Old Barapani 30.xii.81, Coll. C. Radhakrishnan; 2 ex, West Khasi hills, Ranikor, 9.ii.87, Coll. V.T. Darlong; 2 ex, East Khasi hills, Lai-lad, 27.v.89, Coll. A. K. Karnakar. 16 exs., East Khasi Hills, Adi Basti, 2.ix.88, Coll. A. K. Hazra and Party; 16 exs., West Khasi Hills, Mongpahi Circuit House Compound, 28.ix.88, Coll. A.K. Hazra and Party.

Diagnostic characters : Worker. Bronzy-brown; head oval; mandibles punctured, dentate, clypeus tectiform; head above the antennae deeply and regularly striate, the striae oblique on the sides; pronotum with one to four transverse striae, surrounded by concentric striae; mentanotum striate; node of pedicel concentrically striate; abdomen elongate.

Length : W. 8-10 mm.

Distribution : INDIA : (East and West Khasi hills); Meghalaya; Assam; Karnataka; Maharashtra; Orissa; West Bengal. Elsewhere : Myanmar; Sri Lanka.

15. *Diacamma scalpratum* (Fred. Smith) (Fig. 17)

Ponera scalpratum Fred. Smith, 1858, *Cat. Hym. Brit. Mus.*, 6 : 84, pl. 6, figs. 21-22.

Diacamma scalpratum, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1 : 327.

Material examined : 25 ex, 2 ex, India, Meghalaya, East Khasi hills, Umrang, 14.v.70, Coll. S. Biswas; 2 ex, Garo hills, Songsak, around district council IB, 17.xi.73, Coll. S. Biswas; 2 ex, East Khasi hills, Nongpoh, 27.v.72, Coll. G.M. Yazdani; 1 ex, Garo hills, Charikutty, 11 km. from Bajengdoba, 4.xi.73, Coll. S. Biswas; 1 ex, East Khasi hills, Shillong, Risa Colony, 6.vii.75, Coll. R. Mathew; 2 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 2 ex, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, East Khasi hills, Nongpoh, 28.x.83, Coll. R. Mathew; 2 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., (collected the day after burning jhum), 19.iii.88, Coll. V.T. Darlong; 2 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., 28.iv.88, Coll. V.T. Darlong; 3 ex, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong; 4 ex, West Garo hills, Selbalgiri, 14.v.88, Coll. V.T. Darlong.

Diagnostic characters : Worker. Black, head rectangular, longitudinally striate, posterior lateral angles rounded; mandibles with 7 or 8 large teeth, with smaller teeth in between them; 2nd joint of flagellum of antennae longer than 1st; pronotum constricted anteriorly into a collar, the disc of pronotum with one or two transverse striae surrounded by concentric striae; mesonotum not striate; metanotum compressed, with concentric striae on the basal portion above, oblique striae on the sides; apical portion of metanotum margined and transversely striate.

Length : W. 15-18 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills), Meghalaya : Assam : Sikkim. Elsewhere : myanmar; tenasserim.

8. Genus *Harpegnathos* Jerdon, 1851

Harpegnathus, Jerdon, 1851, *Madras. Jour. Lit. & Sci.*, 18 : 116.

Harpegnathos, Brown, 1973, *In Tropical forest ecosystems in Africa and South America*. : 161-185.

Diagnostic characters : Worker. Head rectangular, mandibles longer than head, sickle-shaped; antennae 12 jointed; eyes large; thorax slightly laterally compressed; pro-mesonotal suture remarkably broad and shallow; mesometanotal suture obsolete; abdomen cylindrical, constriction between the basal two segments distinct, sting exerted.

16. *Harpegnathos venator* (Fred. Smith) (Figs. 18, 19)

Drepanognathus venator Fred. Smith, 1858, *Cat. Hym. Brit. Mus.*, 6 : 82.

Harpegnathos venator, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1 : 67.

Material examined : 2 ex, India; Meghalaya, East Khasi hills, Old Barapani, 14.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Black; head and thorax closely coarsely cribrate punctate; abdomen finely densely reticulate punctate and with few shallow punctures; pilosity pale, sparse, short and erect.

Lenght : W. 16-18 mm.

Distribution : INDIA : (East Khasi hills); Meghalaya; Assam; Uttar Pradesh; Sikkim. Elsewhere : Myanmar.

Remark : When startled or disturbed, this species leap about in a characteristic manner.

9. Genus *Leptogenys* Roger, 1861

Leptogenys Roger, 1861, *Berl. ent. Zeit.*, 5 : 41.

Leptogenys, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : Worker. Head longer than broad; clypeus narrow, transverse, triangularly produced in the middle; eyes placed above the middle of the head; pedicel with a single joint, node squamiform or cubical; claws pectinate.

Subgenus *Lobopelta* Mayr

Lobopelta Mayr, 1862, *Verb. zool.-bot. Ges. Wien*, 12 : 733.

Key to the species of *Leptogenys* (*Lobopelta*) Roger

1.	Node of pedicel compressed longitudinally, its upper margin marrow, obtuse	2
	Node of pedicel not compressed longitudinally, broader above, sub-cubical with anterior and posterior margins.	3
2.	Medial joints of flagellum of antennae distinctly longer than broad	<i>processionalis</i>
	Medial joints of flagellum of antennae not longer than broad	<i>birmana</i>
3.	Head more or less striate	4
	Head either punctured or smooth and shining, never striate	5
4.	Clypeus not carinate	<i>kitteli</i>
	Clypeus more or less distinctly carinate or subcarinate	<i>diminuta</i>
5.	Basal abdominal segment punctured	6

	Basal abdominal segment not punctured, smooth	8
6.	Length over 9 mm	<i>binghami</i>
	Length 4-6 mm	7
7.	Abdomen densely punctured	<i>punctiventris</i>
	Abdomen polished with few shallow punctures	<i>geanettei</i> sp. nov.
8.	Antennae remarkably long, 2nd joint of flagellum much longer than 3rd	<i>assamensis</i>
	Antennae comparatively short; 2nd and 3rd joints of flagellum subequal	<i>peuqueti</i>

17. *Leptogenys (Lobopelta) assamensis* Forel (Fig. 20)

Lobopelta assamensis Forel, 1901, *J. Bombay Nat. Hist. Soc.*, 13 : 318.

Leptogenys (Lobopelta) assamensis, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1 : 32.

Material examined : 18 ex : 1 ex, India, Meghalaya, East Khasi hills, Shillong, 3.vii.75, Coll. M. S. Jyrwa; 1 ex, Shillong, 7.vi.75, Coll. R. Mathew; 1 ex, Shillong, 24.vii.75, Coll. R. Mathew; 1 ex, Shillong, 26.vii.75, Coll. R. Mathew; 1 ex, Shillong, 10.ix.75, Coll. R. Mathew; 2 ex, Shillong, 26.ix.75, Coll. R. Mathew; 5 ex, Shillong, 27.vii.75, Coll. R. Mathew; 2 ex, Shillong, 17.vi.76, Coll. R. Mathew; 1 ex, East Khasi hills, Upper Shillong, 20.v.78, Coll. R. Mathew; 1 ex, Shillong, 26.vii.75, Coll. R. Mathew.

Diagnostic characters : Worker. Castaneous red, smooth and shining, the mandibles, flagellum of antennae and legs pale red; hairs on body soft, erect, abundant, pale reddish in colour; head elongate, as broad posteriorly as in front; mandibles not dentate, but with an acute curved point; antennal scape extending beyond the top of the head; 2nd joint of flagellum very long, nearly three times as long as the first; eyes large; node of pedicel strongly compressed; abdomen long and massive.

Length : W. 6.5-7 mm.

Distribution : INDIA : Meghalaya East Khasi hills

18. *Leptogenys (Lobopelta) birmana* Forel

Lobopelta birmana Forel, 1901, *J. Bombay Nat. Hist. Soc.*, 13 : 305, 310.

Leptogenys (Lobopelta) birmana, Tiwari et al., 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part 8 : 242.

Material examined : India : Meghalaya : Jaintia Hills, Garampani, Safai Basti, 12 ex, 3.x. 1988, coll. V.D. Srivastava and party.

Diagnostic characters : worker. Castaneous brown. Head short, massive, nearly square; mandibles robust, armed with four unequal teeth at apex and denticulate along inner margins; antennae short, scape not, or only slightly passing beyond the top of head, medial joints of flagellum not longer than broad. Pro-meso and meso- metanotal sutures of thorax deeply marked. Node of pedicel convex in front, flat posteriorly, upper margin narrow, rounded. Abdomen massive, constriction between basal two segment very prominent and broad.

Length : W. 7-8 mm; o 9 mm.

Distribution : INDIA : Meghalaya (Jaintia Hills), Assam, West Bengal. Elsewhere : Myanmar.

19. *Leptogenys binghami* Forel

Lobopelta binghami Forel, 1901, *J. Bombay Nat. Hist. Soc.* 13 : 310.

Leptogenys (Lobopelta) binghami, Chapman and Capco, 1951, *Checklist of the ants of Aisa*, 1 : 32.

Material examined : 3 ex : India, Meghalaya, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth.

Diagnostic characters : Worker. Black; head, thorax and basal segment of abdomen opaque, very finely and densely punctured, punctures coarser on the basal portion of metanotum and on the node of the pedicel; mandibles long, not dentate; clypeus medially carinate, its median lobe produced anteriorly; the apex truncate; 2nd joint of flagellum of antennae twice as long as first; thoracic sutures distinct, node of pedicel cubical; abdomen massive; pilosity abundant, short, erect and black.

Length : W. 9-10 mm.

Distribution : INDIA : (West Khasi hills); Meghalaya; Karnataka. Elsewhere : Myanmar; Tenasserim.

20. *Leptogenys (Lobopelta) diminuta* (Fred. Smith) (Fig. 21)

Ponera diminuta Fred. Smith, 1858; *Proc. Linn. Soc. Lond. Zool.* 2 : 69.

Leptogenys diminuta, Wilson, 1958, *Evolution.*, 12 : 24-36.

Leptogenys (Lobopelta) diminuta, Tiwari *et al.*, 1994, *State Fauna Series 3 : Fauna of West Bengal*, part 8.

Material examined : 7 ex: 3 ex, India, Meghalaya, East Khasi hills, Mawsmmai, 9.v.76, Coll. S. Khera; 1 ex, East Khasi hills, Shillong, 13.vii.78, Coll. R. Mathew; 3 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : Worker. Black; head finely and closely striate, the striae longitudinal on the anterior portion, transverse on the front and forehead; thorax rugose, pronotum longitudinally

and rather coarsely striate on the disc, transversely striate anteriorly, node of pedicel and abdomen smooth and shining; mandibles finely longitudinally striate, ending in an acute curved point; clypeus triangular, medially vertically carinate; thorax constricted anteriorly into a neck; node of pedicel slightly broader posteriorly, truncate in front and behind.

Length : W. 6.5-7.5 mm.

Distribution : INDIA : (East Khasi hills); Meghalaya; throughout India, except the drier parts of Punjab and Central India.

21. *Leptogenys (Lobopelta) kitteli* Mayr (Fig. 22)

Lobopelta kitteli Mayr, 1870, *Verh. zool-bot. Ges. Wien*, 20 : 966.

Leptogenys kitteli, Mathew, 1984, *Bull. zool. Surv. India*, 6 (1-3) : 307-308.

Leptogenys (Lobopelta) kitteli, Tiwari et al., 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part 8.

Material examined : 364 ex : 7 ex India, Meghalaya, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew; 2 ex, East Khasi hills, Shillong, Motinagar, 3.ix.76, Coll. R. Mathew; 25 ex, Shillong, 25.vii.75, Coll. R. Mathew; 15 ex, Shillong, Mawlai, 2.x.76, Coll. R. Mathew; 20 ex, East Khasi hills, Barapani, 24.vii.67, Coll. R. K. Varshney; 10 ex, Shillong, 23.vi.75, Coll. R. Mathew; 16 ex, Shillong, 12.iv.75, Coll. K. Deb; 25 ex, Shillong, Malki forest, 29.vii.75, Coll. R. S. Giri; 19 ex, Shillong, Nongthymmai, 4.viii.75, Coll. M. S. Jyrwa; 1 ex, East Khasi hills, Old Barapani, 14.v.76, Coll. R. Mathew; 5 ex, Shillong, Nongthymmai, 4.vii.72, Coll. R.S. Giri, 19 ex, Motinagar, 7.vii.72, Coll. R. S. Giri, 2 ex, Shillong, 17.v.75, Coll. R. Mathew; 1 ex, Shillong, 18.viii.75, Coll. R. Mathew; 14 ex, Shillong, 27.vii.75, Coll. R. Mathew; 14 ex, Shillong, 17.vii.75, Coll. R. Mathew; 47 ex, Shillong, 17.v.75, Coll. R. Mathew; 38 ex, Shillong, Lumparing, 29.vii.75, Coll. M. S. Jyrwa; 6 ex, Shillong, Mawlai, 2.x.75, Coll. R. Mathew; 5 ex, Shillong, 26.vii.75, Coll. R. Mathew; 6 ex, Shillong, 20.v.75, Coll. P. B. Thapa; 2 ex, Shillong, 24.vii.75, Coll. R. Mathew; 2 ex, East Khasi hills, Nongpoh, 19.x.82, Coll. R. Mathew; 2 ex, Nongpoh, 28.x.83, Coll. R. Mathew; 1 ex, East Khasi hills, Nongkhylllem Reserve forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan; 3 ex, Shillong, 20.v.77, Coll. P. B. Thapa; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 24 ex, West Khasi hills, Kyllang Rock base, 18.xi.86, Coll. C. Radhakrishnan; 2 ex, Jaintia hills, Nartiang, 7.v.87, Coll. C. Radhakrishnan; 7 ex, West Garo hills, Selbalgiri, Alt. 2000 ft. (collected the day after the burning of jhum), 19.iii.88, Coll. V.T. Darlong; 1 ex, Jaintia hills, 24 km before Garampani, 9.iii.88, Coll. K. P. Singh; 22 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., 28.iv.88, Coll. V.T. Darlong; 6 ex, West Garo hills, Tura, 30.iv.-5.v.79, Coll. J. K. Jonathan and party.

Diagnostic characters : Worker. Black; head and thorax finely longitudinally striate; mandibles linear, longitudinally striate; clypeus convex; thorax elongate, sutures distinct; node of pedicel rugose, abdomen smooth, shining and polished, sting exerted.

Length : W. 7-8.5 mm.

Distribution : INDIA : (East & West Khasi hills, West Garo hills, and Jaintia hills), Meghalaya; Assam; West Bengal; Along the foothills of Himalayas from Simla to Sikkim; Elsewhere : Myanmar; Tenasserim.

Remarks : *Leptogenys kitteli* forages in groups. They are seen shifting their nest sites often. They also carry nest mates, in a ventroventral position, on such occasions.

22. *Leptogenys (Lobopelta) peuqueti* Er. André

Lobopelta peuqueti André, 1887, *Rev. Ent.*, **6** : 292.

Leptogenys (Lobopelta) peuqueti, Chapman and Capco, 1951, *Checklist of the ants of Asia*, **1** : 38.

Material examined : 2 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 22.x.76, Coll. R. Mathew; 1 ex, Shillong, Golflinks, 6.ix.79, Coll. K. Deb.

Diagnostic characters : Worker. Black, smooth and shining; head oval, narrower posteriorly than in front; mandibles linear, not dentate; clypeus triangular, the median lobe strongly carinate; antennae long, scapa extending beyond the top of the head; head anteriorly with few punctures; 2nd joint of flagellum much longer than 1st; thorax narrow; metanotum compressed; node of pedicel strongly compressed, curved to the anterior end, posteriorly vertically truncate; abdomen elongate.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Elsewhere : Annam; Myanmar; Sri Lanka.

23. *Leptogenys (Lobopelta) ocellifera* (Roger) (Fig. 23)

Ponera ocellifera Roger, 1861, *Berl. Ent. Zeit.*, **5** : 13.

Leptogenys (Lobopelta) processionalis, Tiwari *et al.*, 1993, *State Fauna Series 3 : Fauna of West Bengal*, part **8** : 29. (Syns.)

Material examined : 3 ex. India, Meghalaya, East Khasi hills, Lalsharai, 1.iv.82, Coll. S. Khongsit.

Diagnostic characters : Worker. Reddish brown; the whole insect smooth, polished and shining and with a few punctures; pilosity fairly abundant; head broader anteriorly; head anteriorly with few fine longitudinal striae; mandibles finely longitudinally striate, armed with four unequal teeth; clypeus sub-carinate; thoracic sutures well marked; metanotum broader posteriorly, apical portion truncate, smooth; node of pedicel convex in front, flat posteriorly; abdomen oval.

Length : W. 8-9 mm.

Distribution : INDIA : (East Khasi hills); Meghalaya; Kerala; Tamil Nadu.

24. *Leptogenys (Lobopelta) punctiventris* Mayr (Fig. 24)

Lobopelta punctiventris Mayr, *Verh. zool-bot. Ges. Wien* **28** : 666.

Leptogenys (Lobopelta) punctiventris, Tiwari *et al.*, 1993, *State Fauna Series 3 : Fauna of West Bengal*, part **8** : 30.

Material examined : 2 ex : 1 ex, India, Meghalaya, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong; 1 ex, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew.

Diagnostic characters : Worker. Black; head, thorax and abdomen densely punctured; mandibles linear, not dentate, thorax stout, meso-metanotal suture obsolete; node of pedicel cubical, seen from above longer than broad; abdomen massive.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills); Meghalaya; Sikkim; West Bengal.

25. *Leptogenys jeanettei* sp. nov. (Figs. 25, 26, 27)

Holotype worker : TL 6.00; HL 1.47; HW 1.05; CI 71; SL 1.39; SI 132; ThL 2.16.

Head densely punctured, giving it a striate appearance, glossy; antennae long, with few suberect hairs and abundant pubescence, scape reaching beyond the top of the head; clypeus anteriorly angularly produced, convex, strongly carinate in the middle; mandibles feebly triangular, masticatory margin without teeth, with few punctures; head longer than broad; hairs fairly abundant on head; eyes moderate, placed below the middle of the head; thorax densely punctate; pro-mesonotal suture wide; meso- metanotal suture marked by short, closely arranged, longitudinal striae; metanotum coarsely sculptured, sides with few longitudinal striae, apical portion of metanotum truncate, transversely striate; node of pedicel broader than long, less coarsely punctured; abdomen highly polished and shining, basal abdominal segments with few shallow punctures; the suture between the basal two abdominal segments marked by short, longitudinal striae; pilosity pale, fairly abundant on body, hairs on body erect to suberect, both long and short; legs moderate, pubescent; abdomen oval, sting exerted.

Colour : Black, the appendages reddish brown; the whole insect glossy.

Paratype workers : TL 6.00; HL 1.43-1.47; HW 1.00-1.05; CI 69-71; SL 0.79; SI 132-139; TH L 1.97-2.11.

Holotype worker : INDIA, Meghalaya, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth (Regd. No. A1/9711).

Paratype workers : 1 ex, with the same collection data as the holotype (Regd. No. A1/9712); 1 ex, India, Meghalaya, East Khasi hills, Lai-lad, 12.iii.87, Coll. V.T. Darlong (Regd. No. A1/10011).

Leptogenys jeanettei comes closer to *punctiventris*, but can be differentiated by its smooth abdomen and broader than long petiolar node.

10. Genus *Odontoponera* Mayr, 1862

Odontoponera Mayr, 1862, *Verh. zool-bot. Ges. Wien*, **12** : 717.

Odontoponera, Brown, 1973, *In Tropical forest ecosystems in Africa and south America*,: 161-185.

Diagnostic characters : worker. Head quadrate, occiput emarginate, head, thorax and node of pedicel striate; posterior lateral angles rounded; mandibles powerful, strongly dentate; clypeus narrow, transverse anteriorly, posteriorly produced between the antennal carinae; antennae 12 jointed; eyes placed below middle of head; thorax massive, pronotum convex, anteriorly narrowed into a collar, anterior lateral angles dentate; thoracic sutures distinct; apical portion of metanotum broad, flat, denticulate on sides; legs robust; pedicel one-jointed, node of pedicel cuneiform, emarginate above, flattened anteriorly and posteriorly; abdomen short. A single species.

26. *Odontoponera transversa* (Fred. Smith) (Fig. 28)

Ponera transversa Fred. Smith, 1857, *J. Proc. Linn. Soc. Lond. Zool.* **2** : 86.

Odontoponera transversa, Mathew, 1984, *Bull. zool. Surv. India* **6** (1-3) : 307-308.

Material examined : 55 ex: 10 ex, India, Meghalaya, East Khasi hills, Old Barapani, 14.v.76, Coll. R. Mathew; 3 ex, East Khasi hills, Shillong, 2.x.75, Coll. R. Mathew; 1 ex, East Khasi hills, Umtham, 25.iv.67, Coll. R. K. Varshney; 1 ex, East Khasi hills, Umsning, 23.viii.63, Coll. M.R. Rynth; 2 ex, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 2 ex, Jaintia hills, Garampani, 12.xii.75, Coll. S. K. Chanda; 1 ex, East Khasi hills, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Old Barapani, 30.xii.81, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K. P. Singh; 1 ex, East Khasi hills, Nongpoh, 19.x.82, Coll. R. Mathew; 2 ex, Nongkhylllem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan; 1 ex, West Khasi hills, 10 km. away from Mairang on Nongstoin road; 22.vii.86, Coll. R. Mathew; 1 ex, West Khasi hills, Balat, 9.ix.86, Coll. M. R. Rynth; 1 ex, East Khasi hills, Cherra-shella Road, 3.ix.86, Coll. K. P. Singh; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 1 ex, Jaintia hills, 2 km. from Raliang towards Garampani, 20.x.87, Coll. V.T. Darlong; 1 ex, Jaintia hills, 17 km. from Jowai near Mynso village, alt. 4300 ft., 5.i.88, Coll. A.K. Karmakar; 6 ex, West Garo hills, Selbalgiri, 2000 ft. (collected the day after burning the jhum), 19.iii.88, Coll. V.T. Darlong; 2 ex, East Khasi hills, 4 km. away from Lai-lad on the forest road to Patharkhma, 24 km. from Umling, 22.iv.88, Coll. A.K. Karmakar; 7 ex, West Garo hills, Selbalgiri, Alt, 2000 ft., 28.iv.88, Coll. V.T. Darlong; 2 exs Ri-Bhoi, 2.ix.'88, Coll. A. R. Lahiri & Party; 1 ex. East Khasi Hills, Holls of Umwai, 15.ix.88, Coll. A. R. Lahiri & party.

Diagnostic Characters : worker. Same as that mentioned under the Genus.

Length : W. 9-12 mm.

Distribution : INDIA : (East and West Khasi hills, West Garo hills); Jaintia hills & R. Bhoi; Meghalaya; the whole of India.

11. Genus *Pachycondyla* Fred Smith, 1858

Pachycondyla Smith, 1858, Cat. Hym. Brit. Mus. 5 : 107.

Pachycondyla, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185

Diagnostic characters: worker. Head rectangular, depressed, mandibles broad, strongly dentate; antennae 12 jointed; clypeus narrow, produced backwards in the middle to between the base of the antennae; thorax convex and rounded anteriorly, slightly or deeply compressed posteriorly; node of pedicel one-jointed; abdomen massive.

27. *Pachycondyla amblyops* (Emery)

Ponera amblyops Emery, 1887, *Ann. Mus. Civ. Stor. Nat. Genova* 25 : 434.

Pachycondyla (*Pseudoponera*) *amblyops* Emery, 1901, *Ann. Soc. Ent. Belg.*, 45:42

Pseudoponera amblyops, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:74.

Material examined : 22 ex: 4 ex, India, Meghalaya, East Khasi hills, Old Barapani, 14.v.76, Coll. R. Mathew; 13 ex, Old Barapani, 23.iv.77, Coll. R. Mathew; 1 ex, East Khasi hills, Mawpat, 19.v.79, Coll. R. Mathew; 1 ex, East Khasi hills, Cherra- Shella road, Alt. 2000 ft., 3.ix.86, Coll. K.P. Singh; 1 ex, West Khasi hills, 25 km. South West of Nongstoin on Syrkon road, 29.i.89, Coll. K.P. Singh; 2 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan.

Diagnostic characters: worker. Brownish yellow with a silky texture, covered with a fine golden pubescence; pilosity fairly abundant; head and thorax finely and densely punctured, opaque; head rectangular, mandibles longitudinally striate with 4 or 5 teeth; eyes small, concolorous with the surface of the head, placed below the middle of the head; clypeus narrow with a slightly produced median lobe; thorax broad and convex anteriorly, compressed posteriorly; basal portion of metanotum obliquely truncate, node of pedicel convex in front, concave posteriorly, thick at base and dentate beneath; abdomen cylindrical.

Length: W. 6 mm.

Distribution : INDIA : (East and West Khasi hills); Meghalaya; Assam; Sikkim; Elsewhere : Myanmar; Tenasserim; Malay Peninsula.

Remarks : Very few individuals are observed in their nests.

12. Genus *Ectomomyrmex* Mayr, 1867

Ectomomyrmex Mayr, 1867, *Tijdschr. v. Ent.*, 10 : 84, pls., fig., W.

Diagnostic Characters : worker. Head depressed, emarginate posteriorly, with the outline of the sides of the head from front arched; mandibles broadly triangular, masticatory margin dentate, apical tooth long acute and slightly curved; narrow clypeus acutely produced upwards in the middle to between the base of antennae; antennae 12-jointed, long, cylindrical. Thorax Short rounded and convex above; pro-mesonotal suture well-marked; a wide distinct suture between epimeron and episternum of mesothorax; meso-metanotal suture barely indicated above. Node of pedicel high, on a level with thorax, very convex and rounded in front. Abdomen massive, elongate.

Key to the species of *Ectomomyrmex* Mayr

1. Node of pedicel convex in front; upper portion of the posterior face bevelled off towards the front. 2
Node of pedicel not bevelled, flat and truncate anteriorly and posteriorly. *leeuwenhoekei*
2. Abdomen finely and closely punctured, opaque, not shining. *astuta*
Abdomen smooth, highly polished and shining *javana materna*

28. *Ecotomomyrmex astuta* (Fred. Smith)

Pachycondyla astutus Fred. Smith, 1858, *Cat. Hym. Brit. Mus.*, 6 : 107

Ecotomomyrmex sundaicus, Mayr, 1867, *Tijds. v. Ent.*, 10 : 85.

Ecotomomyrmex astutus, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1 : 61.

Material examined : 46 ex: 4 ex, India, Meghalaya, east Khasi hills, Shillong, Botanical garden, 14.vi.74, Coll. M.S. Jyrwa; 3 ex, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew; 1 ex, East Khasi hills, Mawlai, 2.x.75, Coll. R. Mathew; 1 ex, East Khasi hills, Shillong 4.xii.76, Coll. M.S. Jyrwa; 1 ex, East Khasi hills, Shillong, Nongthynmai, 9.vii.75, Coll. M.S. Jyrwa; 3 ex, Upper shillong, 1.viii.76, Coll. R. Mathew; 1 ex, Shillong, fruit Garden 18.vi.75, Coll. R. Mathew; 1 ex, Shillong Peak, 1.i.77, Coll. R. Mathew; 4 ex, Shillong, Sericulture garden, 25.ix.75, Coll. R. Mathew 1 ex, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 1 ex, Shillong, 3.xii.74, Coll. M.S. Jyrwa; 3 ex, Shillong 7.viii.76, Coll. M.S. Jyrwa; 3 ex, East Khasi hills, Mawpat, 19.iv.79, Coll. R. Mathew; 2 ex, Shillong, 30.x.75, Coll. M.S. Jyrwa; 2 ex, East Khasi hills, Pynursla, 17.viii.81, Coll. C. Radhakrishnan; 4 ex, East Khasi hills, Laitkor, 10.vii.74, Coll. R.S. Giri; 2 ex, Jaintia hills, Shangpung, 6.xii.75, Coll. S.K. Chanda; 2 ex, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 1 ex, Shillong, 17.v.77, Coll. R. Mathew 2 ex, East Khasi hills, Nongkhylliem Reserve forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan, 2 ex, West Khasi hills, 25 km. South of Nongstoin on Syrkon Road, 29.i.87, Coll. K.P. Singh.

Diagnostic characters: worker. Black, mandibles, tibiae and tarsi of legs reddish; head finely and closely striate, the striae diverging posteriorly from a medial line; head emarginate, occiput smooth and shining; thorax convex, pronotum narrowed anteriorly to form a neck, with concentric

striae; meso and metanotum closely longitudinally striate; node of pedicel striate in front, rugose above; abdomen finely and closely punctured.

Length: W. 12.5- 13 mm.

Distribution : INDIA : (East and West Khasi hills); Jaintia hills; Meghalaya; Assam; Elsewhere: Myanmar; Tenasserim; China; Malaya.

29. *Ectomomyrmex javana materna* Forel

Ectomomyrmex javana maternus Forel, 1901, *J. Bombay nat. Hist. Soc.*, **13** : 321, W.

Ectomomyrmex javana materna, Tiwari et al., 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part 8:240 (Syns.).

Material examined : INDIA : Meghalaya : East Garo hills, Williamnagar, 1 W, 27.v. 1990, coll. M.S. Shishodia and party.

Diagnostic characters: worker. Black; mandibles, antennae and legs reddish brown. Head very finely and closely striate; mandibles with 7 teeth. Thorax with the pronotum striate concentrically. Node of pedicel convex in front, transversely striate in the middle. Abdomen shining

Length: W. 8.5 - 9 mm.

Distribution : INDIA : Meghalaya (East Garo Hills), Assam, West Bengal. Elsewhere : Burma, China, Hong Kong, Maymyo.

30. *Ectomomyrme leeuwenhoekii* (Forel) (Fig. 29)

Ponera leeuwenhoekii Forel, 1886, *J. Asiat. Soc. Bengal*, **55** : 244.

Ectomomyrmex leeuwenhoekii, Chapman and Capco, 1951, *Check List of Ants of Asia*, **1** : 62.

Pachycondyla leeuwenhoekii, Mathew, 1984, *Bull. zool. Surv. India*, **6** (1-3) : 307.

Material examined : 15 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, 23.viii.75, Coll. R. Mathew; 2 ex, Shillong, 7.v.75, Coll. R. Mathew; 3 ex, West Garo hills, Tura Peak, 27.ii.65, Coll. A.S. Rajagopal; 1 ex, Shillong, 12.v.77, Coll. R. Mathew; 1 ex, East Khasi hills, Mawphlang, 2.v.86, Coll. V.T. Darlong; 2 ex, West Garo hills, Balphakram National Park, 12.ii.87, Coll. V.T. Darlong; 1 ex, East Khasi hills, Lai-lad Forest, 12.iii.87, coll. V.T. Xaviong; 1 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., (Collected the day after burning the jhum), 19.iii.88, Coll. V.T. Darlong; 3 ex, East Khasi hills, Umtru, Alt. 900 ft., 26.iv.88, Coll. A.K. Karmakar; 1 ex, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong.

Diagnostic characters: worker. Black, antennae, femora, tibia and tarsi of legs brownish-red; head coarsely longitudinally striate; thorax coarsely striate, the striae on pronotum concentric; apical portion of metanotum concave, transversely striate; node of pedicel coarsely punctured and rugose,

posteriorly with a few transverse striae; basal abdominal segment coarsely and finely punctured, the remaining segments shining.

Length : W. 7-8 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills); Meghalaya; Assam; Kerala; West Bengal. Elsewhere : Myanmar; Tenasserim.

13. Genus *Brachyponera* Emery, 1901

Euponera, Subg. *Brachyponera* Emery, 1901, *Ann. Soc. Ent. Belg.*, **45** : 43

Brachyponera, Bingham, 1903, *Fauna Brit India*, Hym., **2** : 101; Wilson, 1958, *Bull. Mus. Comp. Zool. Harvard, Cambridge, Mass.* **119** : 347 (Syns.)

Diagnostic characters : worker. Head without mandibles broadly oral, broader posteriorly than in front, the sides flattened; mandibles triangular; clypeus narrow, produced posteriorly into an angle between the antennal carinae; eyes large. Thorax narrower than head; mesonotum gibbous; metanotum strongly compressed and emarginate at mesometanotal suture, from there broadening to the apex, apical face very broad and shaped to allow the anterior face of node of pedicel closing over it. Pedicel one-jointed; node somewhat thick, rounded above. Abdomen massive.

Key to the Species of *Brachyponera* Emery

1.	Node of pedicel armed with a number of blunt processes on its posterior margin	<i>rufipes</i>
	Node of pedicel unarmed	2
2.	Joints of flagellum of antennae distinctly longer than broad; length over 5 mm.	<i>nigrita</i>
	Joints of flagellum of antennae, basal and apical excepted, as broad as or broader than long; length under 4 mm.	... <i>.luteipes</i>

31. *Brachyponera luteipes* (Mayr) (Fig. 30)

Ponera luteipes Mayr, 1862, *Verh. zool.-bot. Ges. Wein*, **12** : 72.

Euponera (Brachyponera) luteipes, Chapman and Capco, 1951, *Check List of Ants of Asia*, **1** : 63.

Pachycondyla luteipes (Mayr), Mathew, 1983, *Bull. zool. Surv. India*, **5** (1) : 125-127.

Brachyponera luteipes, Tiwari *et al*, 1994, *State Fauna Series 3 : Fauna of West Bengal, Part 8* : 26 (Syns).

Material examined : 48 ex: 4 ex, India, Meghalaya, East Khasi hills, Shillong, 12.iii.76, Coll. R.S.Giri; 2 ex, East Khasi hills, Mawsmi, 9.v.76, Coll. S. Khera; 1 ex, East Khasi hills, Shillong, 19.v.75, Coll. R. Mathew; 10 ex, East Khasi hills, Upper Shillong, 3.xi.75, Coll. R. Mathew; 3 ex, Shillong, 5.xii.79, Coll. R. Mathew; 3 ex, West Khasi hills, Shella, 25.ix.81, Coll. C. Radhakrishnan; 4

ex, Shillong, 10.v.75, Coll. R. Mathew; 6 ex, East Khasi hills, Nongkhyllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 5 ex, East Khasi hills, Mawpat, 16.iv.79, Coll. S.G. Patil; 1 ex, East Khasi hills, Pynursla, 6.viii.81, Coll. C. Radhakrishnan; 6 ex, West Khasi hills, 10 km. north of Nongkhlaw near Mawiang village, 20.ii.87, Coll. A.K. Karmakar; 3 ex, Jaintia hills, 2 km. from Raliang towards garampani, 20.x.81, Coll. V.T. Darlong.

Diagnostic characters: worker. Black, shining; mandibles, flagellum of antennae, legs and apex of abdomen testaceous brown; head, thorax and abdomen finely reticulate punctate, covered with a fine silky whitish pubescence; eyes small, placed below the middle of the head; mandibles finely punctured; clypeus with anteriorly produced medial lobe; thorax massive; metanotum truncate; node of pedicel flat anteriorly and posteriorly; abdomen massive.

Length: W. 3.5-4 mm.

Distribution : INDIA : (East and West Khasi hills, Jaintia hills), Meghalaya; throughout India, Elsewhere Myanmar; Sri Lanka; Malaya.

32. *Brachyponera nigrata* (Emery)

Ponera nigrata Emery, 1894, *Ann. Mus. Civ. Stor. Nat.* **24** : 459.

Brachyponera nigrata Bingham, 1903, *Fauna Brit. India, Hymenoptera*, **2** : 102.

Euponera (Brachyponera) nigrata, Chapman and Capco, 1951, *Check List of Ants of Asia*, **1**:64.

Material examined: 10 ex, India, Meghalaya, East Khasi hills, Shillong, 22.vii.63, Coll. S.N. Prasad.

Diagnostic characters: worker. Black, shining; the mandibles, flagellum of antennae and legs reddish brown; head nearly square, mandibles finely punctured; eyes not very small, placed above the middle of head on the sides; thorax broad, pronotum convex, mesonotum gibbous; abdomen massive.

Length: W. 5.5 - 6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Sikkim; Elsewhere : Myanmar; Tenasserim.

14. Genus *Bothroponera* Mayr, 1862

Bothroponera Mayr, 1862, *Verh. zool-bot. Ges. Wien*, **12** : 717

Diagnostic characters : worker. Head without mandibles quadrangular; mandibles broad, triangular, masticatory margin armed with 7 or 8 teeth; clypeus transverse, arched anteriorly; antennae 12-jointed, flagellum gradually thickening towards apex. Thorax comparatively broad, rounded above, metanotum obliquely truncate at apex, pro-mesonotal suture well-marked. Node of pedicel seen from the front oval or rounded. Abdomen massive; sting powerful, exerted.

33. *Bothroponera rufipes* (Jerdon) (Fig. 31)

Ponera rufipes Jerdon, 1851, *Madras Jour. Lit. Sc.* **17** : 102.

Pachycondyla (Bothroponera) rufipes, Emery, 1911, *Genera Insect.*, **118** : 76.

Bothroponera rufipes, Chapman and Capco, 1951, *Check List of Ants of Asia*, **1**: 50.

Pachycondyla rufipes; Mathew, 1984, *Bull. Zool. Surv. India*, **6** (1-3) : 307-308.

Bothroponera rufipes, Tiwari *et al*, 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part **8** : 21.

Material examined : 20 ex: 1 ex, India, Meghalaya, East Khasi hills, Laitkor, 10.vii.74, Coll. R.S. Giri; 1 ex, East Khasi hills, Shillong, 1.viii. 76, Coll. R. Mathew; 4 ex, Jaintia hills, Garampani, Kupli river bed, 3.vi.75, Coll. B. Rani; 1 ex, Jaintia hills, 3 km. West of Garampani IB, 12.xii.75, Coll. S.K. Chanda; 1 ex, East Khasi hills, Mawpat, 16.vii.71, Coll. R.S. Pillai; 1 ex, Shillong, 0.5 km. from Band stand towards Happy Valley, 18.ix.75, Coll. M. Vasanth; 4 ex, Shillong, 3.v.68, Coll R.K. Varshney; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, East Khasi hills, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, Nongpoh, 28.x.83, Coll. R. Mathew; 1 ex, Jaintia hills, 90 km. away from Shillong towards Khanduli, 7.v.87, Coll. C. Radhakrishnan; 1 ex, West Garo hills, Balphakram National Park, 12.v.88. Coll. V.T. Darlong; 1 ex, West Garo hills, Selbalgiri, 14.v.88. Coll. V.T. Darlong.

Diagnostic characters: worker. Black, the mandibles, antennae, legs and apical abdominal segments castaneous red; head, thorax and node of pedicel coarsely punctured, cribrate; basal two abdominal segments rugose with longitudinal ridges, the apical segments finely punctured; mandibles longitudinally striate and with some shallow punctures, dentition often worn and obsolete; eyes small; thorax broad, convex, apical face of metanotum concave, smooth and shining, margined on the sides and above, node of pedicel convex and rounded above, posteriorly concave, smooth and shining, spinous processes on the posterior margin above irregular; abdomen massive, constriction between the basal two segments distinct; pilosity reddish-yellow, abundant.

Length: W. 13 15 mm.

Distribution : INDIA : (East and West Khasi hills, West Garo hills), Jaintia hills, Meghalaya; Assam; Southern and Western India; West Bengal; Elsewhere Myanmar; Sri Lanka; Tenaserim.

15. Genus *Odontomachus* Latreille

Odontomachus Latr. 1804, *Nouv. Dict. Hist. Nat.* **24** : 179.

Odontomachus, Brown, 1973, *In Topical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Head rectangular, long, massive and emarginate; mandibles long, linear and straight, usually with three teeth at the terminal end; articulated in the middle anterior

margin of the head; antennae 12-jointed; eyes small, placed laterally below the middle of the head; pedicel one-jointed, the node conical and terminating in a spine above; abdomen oval, sting exserted.

Key to the species of *Odontomachus* Latreille

1.	Small species, size less than 5 mm	2
-	Large species, size more than 5 mm	3
2.	Metanotum bidentate	<i>myops</i>
	Metanotum not bidentate	<i>punctiventris</i>
3.	The whole head finely and delicately striate.	<i>haematodus</i>
-	The whole of the head not striate	4
4.	Innermost of the three apical teeth on the mandibles narrow, twice as long as broad	<i>rixosus</i>
	Innermost of the three apical teeth on the mandible broad, as broad as long	5
5.	Head posteriorly deeply emarginate, almost bilobed	<i>punctulatus</i>
-	Head posteriorly slightly emarginate, not bilobed	<i>monticola</i>

34. *Odontomachus haematodus* (Linnaeus)

Formica haematodes Linne, 1758, Syst. Nat. Ed. 10 i: 582.

Odontomachus haematodus, Brown, 1976, *Studia Ent.* 19 (1-4) : 67-171.

Material examined : 7 ex, India, Meghalaya, East Khasi hills, Shillong, 16.vi.79, Coll. R. Mathew.

Diagnostic characters : worker. Dark brown, with a silky gloss; head, thorax and node of pedicel finely striate, abdomen smooth and shining; head broad, dentition obsolete, the inner most of the apical teeth broad, very short, emarginate, Occiput smooth and polished; thorax anteriorly produced into a neck, striae on pronotum concentric, that on the metanotum transverse; node of pedicel convex anteriorly, flat posteriorly; abdomen with few punctures.

Length: W. 9 11 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam; Kerala; Tamil Nadu; Sikkim. Elsewhere : Sri Lanka.

35. *Odontomachus monticola* Emery (Figs. 32, 33)

Odontomachus monticola Emery, 1891, *Ann. Soc. Ent. Fr.* 60 : 560.

Odontomachus monticola, Mathew, 1983, *Bull. zool. Surv. India*, **5** (1) : 125-127.

Odontomachus monticola, Tiwari *et al.*, 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part 8 : 30.

Material examined : 12 ex, India, Meghalaya, East Khasi hills, Shillong, 17.vii.76, Coll. R. Mathew.

Diagnostic characters : worker. Dark or reddish brown; head broader anteriorly; mandibles robust, apical teeth large, the inner margins of the mandibles with 7 or 8 small teeth; thorax with concentric striae on pronotum; meso and metanotum with transverse striae.

Length : W. 11 - 13 mm.

Distribution : INDIA : (East Khasi hills and Garo hills), Meghalaya. Elsewhere : Myanmar; Siam.

36. *Odontomachus Punctulatus* Forel

Odontomachus punctulatus Forel, 1900, *J. Bombay Nat. Hist. Soc.*, **12** : 58.

Odontomachus punctulatus, Brown, 1976, *Studia Ent.* **19** (1-4) : 67-171

Material examined : 42 ex : 4 ex, India, Meghalaya, East Khasi hills, Shillong, 1.v.76, Coll. M. Vasanth; 3 ex, Shillong, 3.viii.75, Coll. R. Mathew; 1 ex, Shillong, 17.viii.75, Coll. M. Vasanth; 2 ex, Shillong, 6.ix.75, Coll. M. Vasanth; 2 ex, Shillong, 5.viii.75, Coll. R. Mathew; 6 ex, Shillong, 18.vii.75, Coll. R. Mathew; 1 ex, Jaintia hills, Shangpung, 7.xii.75, coll. S.K. Chanda; 2 ex, Shillong, 7.viii.75, coll. R. Mathew; 4 ex, Shillong, 9.viii.75, coll. R. Mathew; 1 ex, Shillong, 5.viii.75, coll. R. Mathew; 2 ex, Shillong, 13.viii.77, coll. Auarius; 1 ex, Jaintia hills, Caraspani, Kopili Damside, 14.iii.70, coll. S.K. Talukdar; 2 ex, Shillong, 17.vii.75, coll. R. Mathew; 2 ex, West Garo hills, Arbela IB compound, 7.iii.75, coll. S. Biswas; 1 ex, Shillong, 6.vii.75, coll. R. Mathew; 1 ex, Shillong, 20.ix.75, coll. R. Mathew; 1 ex, Shillong, 8.vii.75, coll. R. Mathew; 1 ex, Shillong, 2.vii.75, coll. R. Mathew; 1 ex, Shillong, 17.vii.75, coll. R. Mathew; 1 ex, Shillong, 10.x.75, coll. R. Mathew; 3 ex, Jaintia hills, 90 Kms. away from Shillong towards Khanduli, 7.v.87, coll. C. Radharishnan.

Diagnostic character : Worker. Dark brown; head deeply emarginate, broader anteriorly; mandibles robust, the apical tooth long, curved; eyes placed below the middle of the head, laterally; thorax coarsely striate.

Length : W. 12-13. mm.

Distribution : INDIA : East Khasi hills, West Garo hills, Jaintia hills, Meghalaya; Assam; Sikkim. Elsewhere Myanmar.

37. *Odontomachus rixosus* Fred. Smith (Figs. 34, 35)

Odontomachus rixosus Fred. Smith, 1857, *J. Proc. Linn. Soc. Lond. Zool.*, **2** : 67.

Odontomachus rixosus, Brown, 1976, *Studia Ent.*, **19** (1-4) : 67-171.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Shillong, 7.vi.77, Coll. R. Mathew.

Diagnostic characters : worker. Light brown : head narrower posteriorly, striae on the posterior region effaced; without the silky gloss; node of pedicel convex anteriorly, smooth; abdomen smooth and shining.

Length: W. 10-11.5 mm.

Distribution : INDIA : (East khasi hills), Meghalaya; Assam: Elsewhere : Myanmar.

16. Genus *Anochetus* Mayr, 1861

Anochetus Mayr, 1861, *Europ. Formicid.* : 53.

38. *Anochetus myops* Emery

Anochetus myops Emery, 1893, *Rev. Suisse Zool.*, **1** : 201.

Anochetus myops, Chapman and Capco, 1951, *Checklist of the ants of Asia, Manila*, **1** : 40

Material examined : 2 ex, India, Meghalaya, East Khasi hills, Old Barapani road, 14.v.76, Coll. R. Mathew,

Diagnostic characters : worker. Brownish yellow; head very broad and short, widely emarginate posteriorly, anteriorly striate, rest of the head with minute punctures; mandibles short, broadening towards the apex where it is furnished with three, long, acute teeth, eyes very small; thorax punctured, shining, metanotum truncate at apex; node of pedicel conical, smooth, shining and rounded above; abdomen smooth, polished and shining.

Length : W. 4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar.

39. *Anochetus punctiventris* Mayr

Anochetus punctiventris Mayr, 1878, *Verh. zool.-bot. Ges. Wien*, **28** : 659.

Anochetus punctiventris, Chapman and Capco, 1951, *Checklist of the ants of Asia*, **1** : 41. *Manila*.

Anochetus punctiventris; Tiwari et. al. 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part **8** : 21.

Material examined : 2 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew.

Diagnostic characters : worker. Brownish, abdomen darker; head convex in front, closely and regularly punctured, the punctures finer and more sparse on the mandibles; the preapical inner margin of the mandibles minutely serrate; thorax densely punctured, obliquely truncate posteriorly; apical portion of metanotum margined at the sides; node of pedicel smooth; basal abdominal segment densely punctate in front.

Length : W. 3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Western and Southern India; Sikkim and West Bengal.

IV. SUBFAMILY PSEUDOMYRMECINAE

This is a small subfamily primarily of tropics. Exclusively arboreal in habitat these nest in plant cavities. Only one genus in the Oriental region.

17. Genus *Tetraponera* Fred. Smith, 1852

Eciton, Jerdon, 1857, *Madras Jour. L. S.*, 17 : 111.

Tetraponera, Brown, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : Worker. Elongate, head more or less rectangular, truncate anteriorly; clypeus narrow, bent vertically downwards; antennae 12-jointed; eyes large, placed a little to the front of the head; thorax elongate, constricted in the middle, thoracic sutures distinct; pedicel elongate, with two nodes, petiolate; abdomen narrow, attenuate at apex; sting exerted. 7.xii.75, Coll. S.K. Chanda; 2 ex, Shillong, 7.viii.75, Coll. R. Mathew; 4 ex, Shillong, 9.viii.75, Coll. R. Mathew; 1 ex, Shillong, 5.viii.75, Coll. R. Mathew; 2 ex, Shillong, 13.viii.77, Coll. Aquarius; 1 ex, Jaintia hills, Garampani, Kopili Damside, 14.iii.70, Coll. S.K. Talukdar; 2 ex, Shillong, 17.vii.75, Coll. R. Mathew; 2 ex, West Garo hills, Arbela IB compound, 7.iii.75, Coll. S. Biswas; 1 ex, Shillong, 6.vii.75, Coll. R. Mathew; 1 ex, Shillong, 30.ix.75, Coll. R. Mathew; 1 ex, Shillong, 8.vii.75, Coll. R. Mathew; 1 ex, Shillong, 2.vii.75, Coll. R. Mathew; 1 ex, Shillong, 17.vii.75, Coll. R. Mathew; 1 ex, Shillong, 10.x.75, Coll. R. Mathew; 3 ex, Jaintia hills, 90 kms. away from Shillong towards Khanduli, 7.v.87, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Dark brown; head deeply emarginate, broader anteriorly; mandibles robust, the apical tooth long, curved; eyes placed below the middle of the head, laterally; thorax coarsely striate.

Length : W. 12 13.5 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills, Jaintia hills), Meghalaya; Assam; Sikkim. Elsewhere : Myanmar.

Key to the species of *Tetraponera* Fred. Smith

1.	Ocelli present	<i>rufonigra</i>
	Ocelli absent	2
2.	1st node of pedicel longer than its preceding petiole	3
-	1st node of pedicel as long as its preceding petiole; much narrower than 2nd node	<i>nigra</i>
3.	In profile metanotum distinctly very much higher than pro- mesonotum	<i>aitkeni</i>
-	In profile metanotum not higher than pro-mesonotum	<i>allaborans</i>

40. *Tetraponera aitkeni* (Forel) (Fig. 36)

Sima aitkeni Forel, 1902, *Rev. Suisse Zool.*, 10 : 245

Tetraponera (Tetraponera) aitkeni, Chapman and Capco; 1951, *Checklist of the ants of Asia*, 1 : 78

Material examined : 5 ex: 2 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 2 ex, East Khasi hills, Kyrדם Kulai, 25.ix.84, Coll. J.P. Sati.

Diagnostic characters: worker. Black, smooth and shining, and with few punctures; mandibles, antennae, anterior node of pedicel and margins of abdominal segments reddish yellow; head rectangular; mandibles with few striae, smooth, shining; eyes large, occupying nearly one third the length of head; pronotum margined, nearly square; deeply emarginate at the mesometanotal suture; metanotum convex, 1st node of pedicel longer than the preceding petiole, petiolate posteriorly; 2nd node as broad as long, not petiolate; abdomen oval.

Length: W. 3.7 mm.

Distribution: INDIA : (East Khasi hills), Meghalaya; Karnataka.

41. *Tetraponera allaborans* (Walker) (Fig. 37)

Sima allaborans Walker, 1859, *Ann. Mus. Nat. Hist.* 4(3) : 375

Tetraponera allaborans, Hung et. al. 1972. *Ann. Entomol. Soc. Amer* 65(5) : 1023-12025.

Tetraponera (Tetraponera) allaborans, Tiwari et. al. 1994, *State Fauna Series 3: Fauna of West Bengal*, Part 8 : 36.

Material examined: 23 ex: 10 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 4 ex, East Khasi hills, Shillong, Botanical garden, 31.iii.79, Coll. R. Mathew; 4 ex, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, Shillong, 10.v.75, Coll. R. Mathew; 3 ex, East Khasi hills, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Lai-lad, 27.v.87, Coll. A. K. Karmakar.

Diagnostic characters: worker. Black, polished and shining; mandibles, antennae reddish yellow, head rectangular; mandibles obscurely longitudinally striate and punctured; thorax anteriorly flat; the pronotum nearly square, submargined, narrowed anteriorly to a neck; thorax emarginate at the meso-metanotal suture; abdomen elongate, oval.

Length: W. 5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; West Bengal. Elsewhere : China; Formosa; Java; Myanmar; Philippines; Singapore; Srilanka; Sumatra.

42. *Tetraponera nigra* (Jerdon)

Eciton nigra Jerdon, 1851, *Madras Jour. Lit. Sc.*, 17 : 112.

Tetraponera (Tetraponer) nigra, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1 : 81.

Tetraponera (Tetraponera) nigra, Tiwari *et al.* 1994, *State Fauna series 3: Fauna of West Bengal* ; Part 8 : 37.

Material examined: 5 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew.

Diagnostic characters: worker. Black, finely and moderately punctured, shining, antennae and legs reddish brown; head rectangular; clypeus narrow, its anterior margin transverse, not medially dentate, thorax deeply emarginate at the meso-metanotal suture; metanotum raised; nodes of pedicel petiolate in front, abdomen elongate.

Length: W. 7-8 mm.

Distribution: INDIA : (East Khasi hills), Meghalaya, South India Elsewhere : Borneo; Philippines.

43. *Tetraponera rufonigra* (Jerdon) (Fig. 38)

Eciton rufonigra Jerdon, 1851, *Madras Jour. Lit. Sc.*, 12 : 111.

Tetraponera rufonigra, Mathew, 1984, *Bull. zool. Surv. India*, 6 (1- 3) : 307.

Tetraponera (Tetraponera) rufonigra, Tiwari *et al.* 1994, *State Fauna Series 3: Fauna of West Bengal*, Part 8 : 37.

Material examined: 44 ex: 1 ex, India, Meghalaya, East Khasi hills, Nayabungalow, 21.iv.77, Coll. S.G. Patil; 1 ex, Garo hills, Songsak District Council IB compound, 17.xi.73, Coll. S. Biswas; 8 ex, Garo hills, Darugiri, Songsak road, 10.iv.73, Coll. S. Biswas; 1 ex, Garo hills Mongchalma, 18.ii.75, Coll. S. Biswas; 1 ex, East Khasi hills, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, Garo hills, Songsak, 24.i.82, Coll. C. Radhakrishnan; 3 ex, Garo hills, Rongrengiri, 13.xi.78, Coll. K.P. Singh; 6 ex, East Khasi hills, Shillong, 6.v.75, Coll. R. Mathew; 1 ex, East Khasi hills, Malki, 23.ix.75, Coll. M.S. Jyrwa; 2 ex, East Khasi hills, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 2 ex, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth; 8 ex, West Garo hills, Balphakram sanctuary, 12.xi.87, Coll. V.T. Darlong; 1 ex, East Khasi hills, Umtru, Alt. 900 ft., 26.iv.88, Coll. A.K. Karmakar; 8 ex, East Khasi hills, Lai-lad, 16.v.89, Coll. Y.P. Sinha; 1 ex, West Garo hills, Kherapara I.G. 14.x.88, Coll. K.K. Roy and Party; 6 ex, East Garo hills, Songsak, 5-6.v.79, Coll. J.K. Jonathan and party.

Diagnostic characters: worker. Orange-red or orange-yellow; head, 2nd joint of pedicel, abdomen and legs black; head, legs, 2nd joint of pedicel and the abdomen minutely and closely punctured, not opaque, shining; head rectangular, mandibles coarsely obsoletely striate; Ocelli present; pronotum broad, anterior lateral angles dentate; abdomen oval, sting exserted.

Length : W. 10.5-13 mm.

Distribution: INDIA : (East and West Khasi hills, East and West Garo hills), Meghalaya; throughout India. Elsewhere : Cambodia; China; Myanmar; Singapore; Srilanka; Sumatra; Java.

Remarks : Very commonly distributed throughout Meghalaya.

Subfamily MYRMICINAE

Subfamily Myrmicinae constitutes the largest subfamily of Formicidae. They are a cosmopolitan group, heterogeneous in both anatomy and habits, and ranging from primitive to highly specialized forms. Both the harvesters and fungus-growers belong to this subfamily. It also includes most of the social parasites, which in extreme cases have lost their worker caste.

Key to the genera of Myrmicinae.

1.	Antennae 12-jointed .	2
	Antennae with less than 12 joints	3
2.	Head, including the mandibles, heart-shaped in full face view with sides strongly convex; metanotum armed with a pair of spines.	<i>Rhoptromyrmex</i>
-	Without these characters	4
3.	Antennae with 11 joints	10
	Antennae with less than 11 joints	11
4.	Erect hairs on body trifold or multifid	<i>Triglyphothrix</i>

	Erect hairs on body simple	5
5.	Flagellum of antennae scarcely thickened towards apex, without distinct club	6
	Flagellum of antennae with distinct club	7
6.	Calcaria of posterior pair of legs pectinate;	<i>Myrmica</i>
	Calcaria of posterior pair of legs not pectinate; metanotum armed with two spines.	<i>Aphaenogaster</i>
7.	Clypeus bicarinate	<i>Monomorium</i>
	Clypeus not bicarinate	8
8.	Tibiae with simple calcaria	9
	Tibiae without calcaria	<i>Cardiocondyla</i>
9.	Workers monomorphic	<i>Tetramorium</i>
	Workers dimorphic	<i>Pheidole</i>
10.	Abdomen viewed in profile flat above, triangular beneath, apex of triangle pointing downwards	<i>Trigonogaster</i>
	Abdomen viewed in profile more or less convex above, not triangular beneath	12
11.	Antennae 9-jointed	17
	Antennae with less than 9-joints	18
12.	Lateral margins of head and thorax denticulate and spiny	<i>Cataulacus</i>
	Lateral margins of head and thorax not denticulate and spiny	13
13.	Pedicel attached to dorsal surface of abdomen	<i>Crematogaster</i>
	Pecidel attached to middle of front or to ventral surface of abdomen	14
14.	Pronotum armed with spines	<i>Lophomyrmex</i>
	Pronotum unarmed	15
15.	Club of antennae 2-jointed	<i>Pheidologeton</i>
	Club of antennae 3-jointed	16
16.	Antennal furrows present	<i>Tetramorium</i>

- Antennal furrows absent *Myrmecina*
- 17. Antennal furrows present *Meranoplus*
- Antennal furrows absent *Carebara*
- 18. Antennae 7-jointed *Myrmicaria*
- Antennae 6-jointed *Strumigenys*

18. Genus *Rhoptromyrmex* Mayr, 1901

Rhoptromyrmex Mayr, 1901, *Annlh naturh. Mus. Wien.*, **16** : 1-30.

Rhoptromyrmex, Bolton, 1976, *Bull. Br. Mus. nat. Hist. (Ent.)*, **34** : 281-379.

Diagnostic characters: worker. *Rhoptromyrmex* is a small genus of tetramoriine ants containing only six species of which two are in the Oriental and Indo-Australian regions. Characters that separate this genus from the other tetramoriines are their typical shape of head and the absence of antennal scrobes. Only one species distributed in Meghalaya.

44. *Rhoptromyrmex wroughtoni* Forel (Fig. 55)

Acidomyrmex wroughtoni Forel, 1902, *Rev. Suisse Zool.*, **10** : 231.

Rhoptromyrmex wroughtoni, Datta and Raychaudhuri, 1983, *AKITU N. Ser.*, **56** : 1-14.

Material examined : 78 ex : 3 ex, India, Meghalaya, East Khasi hills, Shillong, 29.x.76, Coll. R. Mathew; 3 ex, Shillong, 29.iv.78, Coll. R. Mathew; 4 ex, Shillong 25.ix.75, Coll. R. Mathew; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Nongpoh, 19.x.82, Coll. C. Radhakrishnan; 4 ex, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 4 ex, Shillong 27.vi.75, Coll. R. Mathew; 5 ex, Shillong, 29.iv.78, Coll. R. Mathew; 4 ex, Shillong, 13.x.78, Coll. Aquarius Mathew; 5 ex, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 8 ex, Shillong, 18.vi.75, Coll. R. Mathew; 12 ex, Shillong, 29.iv.75, Coll. R. Mathew; 5 ex, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 3 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 17 ex, Nongpoh, 6.xii.86, Coll. R. Mathew.

Diagnostic characters : worker. Brownish yellow; head and thorax with fine, close longitudinal striae; anterior margin of median portion of clypeus projecting; antennae with 3-jointed club; mandibles with 2 apical teeth; metanotal spines diverging; nodes of pedicel regucose; abdomen smooth, polished and shining.

Length : W. 2.5 mm.

Distribution : INDIA : (East and West khasi hills), Meghalaya; Karnataka. Elsewhere : Australia; China; Indonesia; Malaya; Philippines; Taiwan; Thailand; Cape York Peninsula.

19. Genus: *Triglyphothrix* Forel, 1890

Triglyphothrix, Forel, *Ann. Soc. Ent. Belge*, **34**, C.R. : 106.

Triglyphothrix, Bolton, 1976, *Bull. Br. Mus. nat. Hist. (Ent.)*, **34** : 281- 379.

Diagnostic characters : worker. Mandibles with three apical teeth, the third smaller than the second and followed by a row of three or four small or minute denticles; Eyes large, placed at or in front of the middle of the sides of the head; clypeus convex, with a median longitudinal carina; antennal furrows or scrobes present; thoracic sutures indistinct; metapleural lobes present; pilosity dense.

Key to the species of *Triglyphothrix* Forel

1. Node of pedicel in dorsal view strongly antero-posteriorly compressed, transverse, distinctly broader than long; hairs on basal abdominal tergite universally and conspicuously branched trifid.. *Walshi*

Node of pedicel in dorsal view not antero-posteriorly compressed, not transverse, generally as long as broad or very slightly broader than long; hairs on basal abdominal tergite universally simple or bifid or a mixture of simple and branched hairs. *lanuginosa*

45. *Triglyphothrix lanuginosa* (Mayr)

Tetramorium lanuginosa Mayr, 1870, *Verh. zool-bot-Ges. Wien.*, **20** : 972.

Triglyphothrix lanuginosa, Bolton, 1976, *Bull. Br. Mus. nat. Hist. (Ent.)*, **34** (5) : 281-379.

Material examined : 10 ex, India, Meghalaya, West Khasi hills, Balat river bed, 9.ix.86, Coll. M.R. Rynth.

Diagnostic characters : worker. Yellowish-brown, head, thorax and nodes of pedicel finely reticulate-rugose; basal abdominal segment smooth and shining; mandibles, antennal furrows well developed; metanotal spines long and acute, longer than the metapleural lobes, and somewhat upcurved.

Length : W. 2.2-3 mm.

Distribution : INDIA : (West Khasi hills, Garo hills), Meghalaya; Assam; Kerala; Maharashtra; Orissa; West Bengal, Elsewhere : Nepal; Srilanka; Myanmar; Philippines; Solomon Is; West Malaysia; Borneo; Australia; England; Germany; Japan; Lebanon; Sey Chelles is; Singapore; New Guinea; Mauritius; Mexico.

Remarks : An accomplished tramp-species with a world wide distribution.

46. *Triglyphothrix walshi* Forel

Triglyphothrix walshi Forel, 1890, *Ann. Soc. Ent. Belg.*, **34**:107.

Triglyphothrix walshi, Bolton, 1976, *Bull. Br. Mus. nat. Hist. (Ent.)*, **34** (5) : 281-379.

Material examined : 3 ex, India, Meghalaya, East Khasi hills, Shillong, 28.xi.75, Coll. R. Mathew.

Diagnostic characters : worker. Light brown; head, thorax, pedicel and basal half of abdomen finely and closely reticulate-rugose; basal abdominal segment finely longitudinally striate; antennal furrows strongly developed; thorax short and broad; pronotal angles sharp, giving the species a square shouldered appearance; metanotal spines acute, longer than the metapleural lobes. Node of pedicel in dorsal view strongly antero posteriorly compressed, transverse, distinctly broader than long; pilosity dense, uniform.

Length : W. 2.3-2.8 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Arunachal pradesh; Kerala; Orissa; Tamil Nadu; West Bengal; Western India. Elsewhere : China; Philippines; Sri Lanka; Singapore.

20. Genus *Myrmica* Latreille, 1804

Myrmica Latr., 1804 *Nouv. Dict. d' Hist. Nat.*, **24** : 179.

Myrmica Latreille, Datta and Raychaudhuri, 1983, *AKITU N. Ser.*, **56** : 1-14.

Diagnostic characters : worker. Antennae 12-jointed, head more or less oval; mandibles broad, masticatory region dentate; thorax convex, pro-mesonotal suture not distinct, meso-metanotal suture distinct; metanotum with a pair of long, curved spines; 1st node of pedicel petiolate anteriorly, 2nd node globose or subglobose; abdomen oval.

Only one species reported here.

47. *Myrmica margaritae* Emery (Fig. 39)

Myrmica margaritae Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova*, 27:502.

Myrmica margaritae, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:127.

Material examined : 20 ex; 1 ex, India, Meghalaya, East Khasi hills, Mawphlang, 19.xii.75, Coll. S. Biswas; 2 ex, Mawphlang, 19.iv.79, Coll. Asket Singh; 4 ex, Mawphlang, 6.v.79, Coll. R. Mathew; 11 ex, Mawphlang, 2.ix.81, Coll. M.R. Rynth; 2 ex, Mawphlang, 2.v.86, Coll. V.T. Darlong.

Diagnostic characters : worker. Brownish-black; head and thorax with broken, irregular, longitudinal coarse striae; mandibles finely striate; eyes prominent; metanotal spines long, slender, slightly curved downwards; nodes of pedicel coarsely sculptured, abdomen globose, smooth, polished and shining.

Length : W. 5-5.25 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Tenasserim.

Remarks : Reported, so far, only from the sacred forest of Mawphlang.

21. Genus *Aphaenogaster* Mayr, 1853.

Aphaenogaster Mayr, 1853, *Verh. zool.-bot. Ges. Wien*, 3 : 107.

Aphaenogaster, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Head elongate; mandibles sub- triangular, masticatory margin dentate, antennae 12-jointed, club of flagellum formed of apical 4 joints; thorax elongate, meso-metanotal suture distinct; metanotum with short spines; pedicel with two nodes, anterior node petiolate in front; andomen convex.

Key to the species *Aphaenogaster* Mayr

1.	Pronotum distinctly laterally bituberculate	<i>rothneyi</i>
	Pronotum not laterally bituberculate	2
2.	Head and thorax coarsely, very closely striate-recticulate, punctured and rugose	<i>schurri</i>
	Head and thorax very slightly and sparsely sculptured, shining	3
3.	Pro-and-mesonotum forming one continuous convexity, mesonotum anteriorly not raised into a transverse ridge or crest; pedicel proportionately little shorter.	<i>Sagei</i>
	Pro-and-mesonotum not forming one continuous convexity, pro-mesonotal suture distinct, anterior margin of mesonotum behind the suture raised into a ridge or crest; pedicel a little longer.	<i>Smythiesi</i>

48. *Aphaenogaster rothneyi* (Forel)

Stenamma rothneyi Forel, 1902, *Rev. Suisse Zool.* 10 : 224.

Aphaenogaster (Attomyrma) rothneyi, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1 : 327.

Material examined : 2 ex, India, Meghalaya, East Khasi hills, Shillong, 27.vii.75, Coll. R. Mathew.

Diagnostic characters : worker. Brown; head and thorax finely reticulate, striate, metanotum more coarsely and transversely sculptured; abdomen, smooth, polished and shining; mandibles striate at base, metanotum elongate, rounded above, metanotal spines thick at base, acute at apex; 1st node of pedicel conical, petiolate anteriorly and posteriorly, abdomen subglobose.

Length: W. 5.5 – 6.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Central India; Sikkim; West Bengal; North-West Himalayas.

49. *Aphaenogaster sagei* (Forel)

Stenamma (Aphaenogaster) sagei Forel, 1902, *Rev. Suisse Zool.* **10** : 221 F,M.

Aphaenogaster (Attomyrma) sagei, Chapman and Capco, 1951, Check List of Ants Asia, **1**: 132.

Material examined : India : Meghalaya : East Khasi hills, Upper Shillong, 4 -W, 11.ix.1988, Coll. A.R. Lihiri and party.

Diagnostic characters : worker. Shining polished black, legs lighter in colour. Head without mandibles somewhat rectangular; mandibles broadly triangular, finely longitudinally striate with three large acute teeth at the apex of masticatory margin; frontal area very distinct; antennae long and filiform. The pro-and mesonotum forming a single convexity, having a distinct suture; meso-metanotal suture deep; two triangular short spines at the apex of the basal portion of metanotum. 1st node of pedicel rounded above, sloped posteriorly with a short petiole in front; 2nd node longer than broad. Abdomen longer than broad.

Length : W. 5-6 mm; F. 6mm; M. 5.3 mm.

Distribution : INDIA : Meghalaya (East Khasi Hills); the Himalayas. Elsewhere : Tibet.

50. *Aphaenogaster schurri* (Forel) (Fig. 40)

Stenamma schurri Forel, 1902, *Rev. Suisse Zool.* **10** : 223.

Aphaenogaster schurri, Mathew, 1983, *Bull. zool. Surv. India*, **5** (1) 125-127.

Material examined : 11 ex: 5 ex, India, Meghalaya, East Khasi hills, Shillong, 1.viii.76, Coll. R. Mathew; 2 ex, Shillong, 23.viii.76, Coll. R. Mathew; 2 ex, East Khasi hills, Laitkor, 8.xii.82, Coll. R. Mathew; 2 ex, Shillong, 28.x.81, Coll. R. Mathew.

Diagnostic characters : worker. Brownish-black; head and thorax very coarsely longitudinally rugose striate, the striae broken and irregular, mandibles finely and closely longitudinally striate, thoracic sutures distinct; 1st node of pedicel conical, 2nd node broad, rounded above, abdomen smooth, polished and shining.

Length : W. 5.5 5.6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Central India; Elsewhere: Myanmar.

51. *Aphaenogaster smythiesi* (Forel) (Fig. 41)

Stenamma smythiesi Forel, 1902, *Rev. Suisse Zool.*, **10** : 222.

Aphaenogaster (Attomyrma) smythiesi, Collingwood, 1970, *Khumbu Himal*, Bd. 3, Lfg. 3, 371-388.

Material examined : 26 ex: 6 ex, India Meghalaya, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew; 1 ex, East Khasi hills, Shillong, 3.viii.75, Coll. R. Mathew; 6 ex, East Khasi hills, Mawphlang, 18.v.79, Coll. P.T. Cherian; 7 ex, Shillong 19.ii.79, Coll. R. Mathew; 1 ex, Shillong, 5.xii.79, Coll. Aquarius Mathew; 2 ex, East Khasi hills, Shillong, Botanical garden, 31.iii.79, Coll. R. Mathew; 3 ex, Mawphlang, 2.v.86, Coll. V.T. Darlong, 23 ex, East Khasi hills, Cherrapunjee, 24.vii.79, Coll. J.K. Jonathan and party.

Diagnostic characters : worker. Brownish-black; smooth, polished and shining; head with a few indistinct striae anteriorly; thorax emarginate at the meso-metanotal suture; metanotum with few indistinct striae; metanotal spines broad at base, short and acute; 1st node of pedicel petiolate in front, 2nd node longer than broad; abdomen broadly oval.

Length : W. 4.5 5.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; North-West Himalayas.

22. Genus *Monomorium* Mayr, 1855

Monomorium Mayr, 1855, *Verh. zool-bot. Ges. Wien*, **5** : 452.

Monomorium, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Antennae 11 or 12 jointed, head rectangular, mandibles narrow; clypeus bicarinate; thorax long and narrow; pro-mesonotal suture obsolete; pedicel with two nodes, 1st node petiolate in front; abdomen oval, truncate or emarginate anteriorly.

Key to the species of *Monomorium* Mayr.

1.	Head more or less rugulose, opaque.	2
	Head not rugulose, but more or less smooth and shining.	3
2.	Colour yellowish, abdomen posteriorly black; head not emarginate posteriorly.	<i>pharaonis</i>
	Colour brown all over.	4
3.	Head nearly square, almost as broad as long.	<i>aberrans</i>
	Head rectangular, distinctly longer than broad	5
4.	Antennae extending beyond the top of head	<i>longi</i>
	Antennae not reaching the top of head	<i>schurri</i>
5.	2nd node of pedicel broader than 1st	<i>floricola</i>

- 2nd node of pedicel not broader than 1st

*minutum*52. *Monomorium aberrans* Forel*Monomorium aberrans* Forel, 1902, *Rev. Suisse Zool.*, **10** : 209.*Monomorium aberrans*, Ettershank, 1966, *Aust. J. Zool.*, **14** : 73-171.

Material examined : 7 ex, India, Meghalaya, East Khasi hills, Nongpoh, 11.iv. 78, Coll. K.P. Singh.

Diagnostic characters : worker. Reddish yellow; abdomen dark brown; the whole insect smooth and shining; head as broad as long, emarginate posteriorly; mandibles finely longitudinally striate, clypeus bicarinate; antennae extending beyond the top of the head; thorax convex anteriorly, emarginate at the meso-metanotal suture; basal portion of metanotum rectangular, posterior lateral angles subdentate, apical portion obliquely truncate; abdomen oval.

Length : W. 3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Central India.

53. *Monomorium floricola* (Jerdon)*Atta floricola* Jerdon, 1851, *Madras Jour. Lit. Sc.*, **17** : 107.*Monomorium floricola*, Ettershank 1966, *Aust. J. Zool.* **14**: 73-171.

Monomorium floricola, Tiwari *et. al.*, 1994, *State of Fauna Series 5 : Fauna of West Bengal*, part **8** : 46.

Material examined : 25 ex: 3 ex, India, Meghalaya, East Khasi hills, Kyrdem Kulai, 25.ix.81, Coll. J.P. Sati; 8 ex, East Khasi hills, Shillong, 28.xi.75, Coll. R. Mathew; 14 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., 28.iv.88, Coll. V.T. Darlong, 80 ex, East Garo hills, 6.vi.90, Coll. M.S. Shishodia and party.

Diagnostic characters : worker. Head and abdomen black, thorax yellow; smooth, polished and shining; head rectangular, occiput slightly emarginate; mandibles narrow with 4 teeth; clypeus convex, placed below the middle of the head; thorax long, basal portion of metanotum rectangular; abdomen oval.

Length : W. 1.5 - 2 mm.

Distribution : INDIA : (East Khasi hills, East and West Garo hills), Meghalaya; throughout India.

54. *Monomorium longi* Forel (Fig. 46)*Monomorium longi* Forel, 1902, *Rev. Suisse Zool.*, **10** : 211.

Monomorium longi, Mathew, 1984, *Bull. zool. Surv. India* **6** (1-3) : 307- 308.

Material examined : 27 ex : 11 ex, India, Meghalaya, Jaintia hills, 14.xii.75, Coll. S.K. Chanda; 6 ex, East Khasi hills, Shillong, 28.xi.75, Coll. R. Mathew; 9 ex, Shillong, 13.x.78, Coll. Aquarius Mathew; 1 ex, East Khasi hills, Nongkhylllem reserve forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Reddish brown: Head, thorax and nodes of pedicel finely and densely rugulose, opaque; abdomen smooth and shining; head rectangular, mandibles opaque, finely sculptured; clypeus raised in the middle, carinae obsolete; thorax emarginate at the meso-metanotal suture; metanotum submargined at base; abdomen elongate, oval.

Length : W. 2.5 3 mm.

Distribution : INDIA : (East Khasi and jaintia hills), Meghalaya: Assam.

55. *Monomorium minutum* Mayr

Monomorium minutum Mayr, 1855, *Verh. zool.- bot. Ges. Wien*, **5** : 453.

Monomorium minutum, Ettershank, 1966, *Aust. J. Zool.* **14** : 73-171.

Material examined : 5 ex: India, Meghalaya, West Garo hills, Selbalgiri, 28.iv.88, Coll. V.T. darlong.

Diagnostic characters : worker. Reddish brown, abdomen black, smooth, polished and shining; antennae 12 jointed, scape not extending beyond the top of the head; eyes large, placed in the middle of the head; meso-metanotal suture emarginate; nodes of pedicel subequal, 1st node petiolate anteriorly, 2nd node transverse, broader than long; abdomen oval.

Length: W. 1.5-2 mm.

Distribution : INDIA : (West Garo hills), Meghalaya; Kerala; Elsewhere.: China: Southern Europe; Africa; America; Sri Lanka.

56. *Monomorium Pharaonis* (Linnaeus)

Formica pharaonis Linnaeus, 1758, *Syst. Nat.*, **I** : 580.

Monomorium pharaonis, Wheeler et al., 1994, *Great Lakes Entomol.*, **26** (4) : 297-310.

Material examined : 4 ex: India, Meghalaya, East Khasi hills, Lumparing, 25.ix.81, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Reddish yellow, abdomen posteriorly black; head, thorax and nodes of pedicel densely and minutely rugulose, granulate, abdomen smooth and shining;

pro-mesonotum distinctly longer than broad, head posteriorly not emarginate; 1st node anteriorly with a petiole, 2nd node globose, abdomen oval, truncate anteriorly, smooth and shining.

Length : W. 2.5-3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; throughout India. Elsewhere : Tropical Regions Of Both Hemispheres.

57. *Monomorium schurri* Forel

Monomorium schurri Forel, 1902, *Rev. Suisse Zool.*, **10** : 212.

Monomorium schurri, Ettershank, 1966, *Aust. J. Zool.*, **14** : 73-171.

Material examined : 3 ex: India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 28.xi.75, Coll. R. Mathew.

Diagnostic characters : worker. Dark brown; the flagellum of the antennae, the 2nd node of the pedicel, and the articulations of the abdominal segments pale yellow; head, thorax and node of pedicel very finely rugulose, abdomen smooth and shining; head may appear as longitudinally striate in certain lights; pronotum transversely striate, abdomen elongate, oval.

Length : W. 2.2 - 2.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, South India, the Nilgiris.

23. Genus *Cardiocondyla* Emery, 1869

Cardiocondyla Emery, 1869, *Ann. Acc. Asp. Nat. Naples, Era* **2**, ii : 20.

Cardiocondyla, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Head broadly oval, mandibles broad, masticatory margin with 5 teeth, antennae 12-jointed, thorax short and stout; metanotum armed with 2 spines; 1st node of pedicel cylindrical, 2nd node very much broader than long; abdomen oval.

Only one species reported from Meghalaya.

58. *Cardiocondyla nuda* (Mayr)

Leptothorax nuda Mayr, 1866, *Stitz., Akad. Wiss. Wien.*, **53** : 508.

Cardiocondyla nuda, Chapman and Capco, 1951, *Checklist of the ants of Asia* **1** : 83.

Material examined : 4 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew.

Diagnostic characters : worker. Head, thorax, legs and pedicel reddish yellow, abdomen black; head, thorax and pedicel finely granulate, abdomen polished and shining; head massive; mandibles minutely punctured; pronotum antero-laterally submargined; metanotum cubical; the basal portion long, about twice as long as the truncate face of the apical portion; 2nd node of pedicel three times broader than the first node, abdomen oval.

Length : W. 2.5-3 mm.

Distribution: INDIA : (East Khasi hills), Meghalaya, Sikkim, West Bengal. Elsewhere: Malaysia; Sri Lanka.

24. Genus *Tetramorium* Mayr, 1855

Tetramorium, Mayr, 1855, *Verh. zool-bot. Ges. Wien*, 5 : 423.

Tetramorium, Bolton, 1977, *Bull. Br. Mus. nat. Hist. (Ent.)* 36 (2) : 67-151.

Diagnostic characters: worker. Antennae 11 or 12 jointed; mandibles with three teeth apically, the third smaller than the second and followed by a row of 3-7 small or minute denticles; frontal carinae strongly developed, thoracic sutures indistinct; metanotum with a pair of spines, metapleural lobes acute or dentiform; anterior node of pedicel petiolate in front, abdomen oval.

Key to the species of *Tetramorium* Mayr

1.	Antennae 11 jointed	2
	Antennae 12 - jointed	3
2.	First node of pedicel longer than broad	<i>tortuosum</i>
	First node of pedicel as broad as, or broader than long	<i>smithi</i>
3.	Pronotal angles sharp in dorsal view giving the specimen a 'Square-shouldered' appearance	<i>bicarinatum</i>
	Pronotal angles rounded	4
4.	Base of first abdominal segment projecting forward as a pair of blunt teeth or horns	<i>mixtum</i>
	Base of first abdominal segment not projecting forward as horns	5
5.	Colour yellow or yellowish-brown	<i>simillium</i>
	Colour dark brown to black	7
6.	Anterior clypeal margin entire	7
	Anterior clypeal margin not entire, slightly notched in the middle	<i>browni sp. nov.</i>

7. Smaller, total length below 3 mm *barryi*
- Larger, total length above 3 mm *christiei*

59. *Tetramorium barryi* Mathew (Fig.56)

Tetramorium barryi Mathew, 1980, *Oriental Ins.*, 14 (4) : 425-427.

Tetramorium barryi, Mathew, 1983, *Bull. zoll. Surv. India*, 5 (1) : 125-127.

Material examined : 47 ex: 5 ex, India, Meghalaya, East Khasi hills, Shillong, Botanical garden, 31.iii.79, Coll. R. Mathew; 1 ex, Shillong, 16.viii.78, Coll. R. Mathew; 1 ex, Shillong, Botanical garden, 14.ix.79, Coll. R. Mathew; 4 ex, Shillong 30.iii.80, Coll. R. Mathew; 2 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan; 5 ex, Shillong, 28.x.81, Coll. R. Mathew; 9 ex, Shillong, 14.vii.81, Coll. R. Mathew; 7 ex, Shillong, 17.vi.75, Coll. R. Mathew; 13 ex, Shillong, 15.iv.77, Coll. R. Mathew.

Diagnostic characters : worker. Dark brown: Head longer than broad, occipital border slightly emerginate, the sides mildly convex; eyes placed about the middle of the head, anterior clypeal margin entire; mandibles finely striate; frontal carinae distinct, reaching almost to the occipital border; antennal scrobes distinct; propodeal spines about the size of the metapleural teeth, which are broader and acute; node of petiole with a few faint striae dorso-laterally; head and thorax reticulate rugose; nodes of petiole and abdomen smooth and shining.

Length : W. 2.3 -2.6

Distribution: INDIA : (East Khasi hills), Meghalaya.

60. *Tetramorium bicarinatum* (Nylander) (Fig. 57)

Myrmica bicarinata Nylander, 1846, *Acta. Soc. Scient. fenn.* 2, : 1041-1062.

Tetramorium bicarinatum, Datta and Ray Chaudhuri, 1983, *AKITU N. Ser.* 56 : 1-14.

Material examined : 22 ex: 5 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 1 ex, East Khasi hills, Old Barapani road, 6.x.79, Coll. R. Mathew; 2 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, East Khasi hills, Shillong, Risa Colony, 28.ix.81, Coll. R. Mathew; 4 ex, West Garo hills, Tura, May 78, Coll. M. Kamal; 1 ex, Shillong, Risa Colony, 5.viii.75, Coll. R. Mathew; 8 ex, Shillong, Risa Colony, 3.viii.75, Coll. R. Mathew.

Diagnostic characters : worker. Orange yellow; abdomen deep brown or black; head with scattered irregular longitudinal striae with cross meshes, behind the eye rugo-reticulate; mandibles densely and finely longitudinally striate; median portion of clypeus with three longitudinal carinae of about equal strength; frontal carinae strong; pronotal angles sharp, giving it a 'square-shouldered' appearance; metanotal spines long, slightly up-curved; metapleural lobes elongate, triangular and upcurved; basal abdominal tergite faintly costulate.

Length : W. 3.4-4.5 mm.

Distribution : INDIA : (East Khasi and West Garo hills), Meghalaya; Arunachal Pradesh; Assam; Karnataka; Andaman Islands. Elsewhere : China; Bhutan; Myanmar; Pakistan; Sri Lanka; Malaysia; Sumatra; Taiwan; Philippines; Britain; Australia; Brazil; Peru; U.s.a.; Holland; Colombia.

61. *Tetramorium browni* sp. nov. (Figs. 58,59)

Holotype worker : TL 2.97; HL 0.74; HW 0.61; CI 82; SL 0.55; SI 90; PW 0.53; Th L 0.71.

Head excluding the mandibles longer than broad, the occipital border emarginate, the sides convex; compound eyes moderate, placed more towards the lower half of the head; maximum diameter of the eye 0.11; anterior clypeal margin feebly notched in the middle, not entire; mandibles finely longitudinally striate, masticatory margin broad, with 6-7 unequal teeth; frontal carinae distinct, reaching almost to the occiput; antero-lateral angles of pronotum round; metanotal spines longer than the metapleural teeth, divergent and slightly upturned; metapleural teeth broad, acute; dorsum of head between the frontal carinae with not less than ten longitudinal rugae; dorsum of thorax reticulate rugose; sides of thorax with few diagonal striae; nodes of pedicel oval, subequal, smooth and shining; anterior node petiolate in front; abdomen smooth, polished and shining; all dorsal surfaces with numerous erect or suberect hairs of varying length; antennae and legs densely pubescent.

Colour Dark brown, abdomen darker, almost black; the appendages a shade lighter.

Paratype workers : TL 2.65-3.28; HL 0.66-0.76; HW 0.58-0.63; CI 82-90; SL 0.53-0.56 SI 90-95; PW 0.45-0.53; Th L 0.79-0.84.

Similar to holotype; colour varies from reddish brown to dark brown.

Holotype : worker : INDIA : Meghalaya, East Khasi hills, Pynursla, 6.viii.81, Coll. R. Mathew; Paratypes : 13 workers with the same collection data as the holotype.

Tetramorium browni belongs to the *bicarinatum* group of *Tetramorium* and can be distinguished by its round pronotal angles, unsculptured nodes of pedicel and moderate size of the metanotal spines.

62. *Tetramorium christiei* Forel

Tetramorium christiei Forel, 1902, *Rev. Suisse Zool.*, **10** : 232.

Tetramorium christiei, Datta and Ray Chaudhuri, 1983, *AKITU N. Ser.*, **56** : 1- 14.

Material examined : 8 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 14.ix.79, Coll. R. Mathew; 4 ex, Risa Colony, 8.v.80, Coll. R. Mathew; 3 ex, Upper Shillong, 9.viii.75, Coll. R. Mathew; 12 ex, Jaintia hills, Shangpang, 13.iii.91, Coll. K.K. Ray and Party.

Diagnostic characters : worker. Blackish brown, Mandibles striate, anterior clypeal margin entire; frontal carinae long; antennal scrobes or furrow feeble but distinct, metanotal spines shorter than the triangular metapleural lobes; head finely longitudinally striate, reticulate on the occiput, thorax reticulate-rugulose, hairs on body numerous; abdomen oval, truncate anteriorly.

Length : W. 3-3.5 mm.

Distribution : INDIA : (East Khasi hills and Jaintia hills), Meghalaya; Sikkim; West Bengal. Elsewhere: Bhutan.

63. *Tetramorium mixtum* Forel

Tetramorium mixtum Forel, 1902, *Rev. Suisse Zool.*, 10 : 236.

Tetramorium mixtum, Bolton, 1977, *Bull. Br. Mus. nat. Hist. (Ent.)*, 36 (2) : 67-151.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Shillong, 29.vii.76, Coll. R. Mathew.

Diagnostic characters : worker. Light to dark brown; mandibles striate; head, thorax and petiole longitudinally rugulose with some reticulation posteriorly on the head, thorax and the petiole; abdomen smooth, shining, basal abdominal segment very concave behind the 2nd node of petiole, its antero-lateral corners projecting forward as a pair of blunt teeth or horns.

Length : W. 3-3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Kerala; Tamil Nadu.

64. *Tetramorium simillimum* (Fred. Smith) (Fig. 60)

Myrmica simillimum Fred. Smith, 1851, *List. Brit. Anim. Brit. Mus.*, 6 : 118.

Tetramorium simillimum, Bolton, 1977, *Bull. Br. Mus. nat. Hist. (Ent.)*, 36 (2) : 67-151.

Material examined : 8 ex: 6 ex, India, Meghalaya, East Khasi hills, Shillong, 29.vii.76, Coll. R. Mathew; 1 ex, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth; 1 ex, Jaintia hills, Nartiang, 5.ix. 86, Coll. V.T. Darlong.

Diagnostic characters : worker. Reddish yellow, abdomen light brown, head finely and quite densely longitudinally rugulose, the spaces between the rugulae filled with a fine dense reticulate-punctulation or granulation; mandibles faintly striate; antenna; furrows broad and shallow; antennal furrows densely and finely reticulate-punctulate; thorax and pedicel finely longitudinally rugulose, spaces between the rugulae densely punctulate; abdomen smooth, polished and shining.

Length : W. 2-2.5 mm.

Distribution : INDIA : (East & West Khasi hills and Jaintia hills), Meghalaya; Assam; Punjab; Elsewhere : Sri Lanka; Seychelles; Mauritius; Malaysia; Java; Borneo; Philippines; Solomon Islands; New Guinea; Australia; Hawaii; Japan; Great Britain; Puerto Rico; Trinidad.

65. *Tetramorium smithi* Mayr (Fig. 61)

Tetramorium smithi Mayr, 1878, *Verh. zool-bot. Ges. Wien*, **28** : 645-686.

Tetramorium smithi, Bolton, 1977, *Bull. Br. Mus. nat. Hist. (Ent.)*, **36** : 67-151.

Material examined : 16 ex: India, Meghalaya, East Khasi hills, Shillong, Botanical garden 30.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Light to mid brown; head and thorax longitudinally rugose and with scattered gross meshes which are indistinct; nodes of the pedicel above and abdomen smooth and shining; mandibles smooth and shining, frontal carinae extending beyond the posterior margin of eyes, antennal furrows shallow, broad and long enough to accommodate the antennal scapes; antero-lateral margins of pronotum sharply angulate; metanotal spines short, sub-triangular, acute; node of pedicel rectangular.

Length : W. 2.6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam; Kerala; Maharashtra; West Bengal; Elsewhere.: Bhutan; Myanmar; Thailand; Vietnam; Malaysia; Borneo; Sulawesi.

66. *Tetramorium* sp.

Material examined : India : Meghalaya : West Garo Hills, Bokangiri, North of Phulbari, 700, 30.x.1988, Coll. K.K. Ray and party; East Garo Hills, Nisangram, 2 km. West of Dinadubi F.R.H., 2 W, 12.v 1979, Coll. S.B. Roy and R.N. Tiwari.

25. Genus *Xiphomyrmex* Forel

Xiphomyrmex Forel, 1887, *Mittheil, Schweiz. Ent. Ges.*, **7** : 385.

67. *Xiphomyrmex tortuosum* (Roger)

Tetramorium tortuosum Roger, 1863, *Berl. Ent. Zeit.*, **7** : 181.

Xiphomyrmex tortuosus, Chapman and Capco, 1951, *Check List of the ants of Asia*, **1** :180.

Material examined : India: Meghalaya: 1 ex, East Garo hills, North of Darugiri, 17.v.79, Coll. S.B. Rou and R.ON. Tiwari

Distribution : INDIA: Meghalaya (East Garo hills). Elsewhere: Sri Lanka.

Diagnostic characters : worker. Chestnut red, abdomen brown, legs lighter; head and thorax longitudinally striate-recticulate; pilosity fairly abundant and long. Head without mandibles elongate, trapezoidal, longer than broad; masticatory margin of mandibles broad, dentate; clypeus almost flat,

posterior margin well defined between the bases of antennae; antennal carinae produced posteriorly almost to the top of the head; eyes large. Thorax elongate, broad anteriorly; meso- and metanotum narrowing posteriorly; sutures almost obsolete; spines on posterior lateral angles of basal portion of metanotum slender, acute pointing divergently backwards, 1st node of pedicel longer than broad; 2nd node broader than long. Abdomen oval.

Length : W. 3-3.5 mm.

26. Genus *pheidole* Westwood, 1840.

Pheidole Westwood, 1841, *Arm. Maq. Nat. Hist.* 6 : 87.

Pheidole, Datta & Raychaudhuri, 1983, *AKITU N. Ser.* 56 : 1-14.

Diagnostic characters : Harvester ants, exhibiting great polymorphism; worker major forms have enormously large head with deep emargination dividing the head posteriorly almost into two lobes; mandibles strong, with or without teeth; antennae 12 jointed; eyes moderate or small, no ocelli; thorax convex; metanotum with a pair of spines or teeth; pedicel two-jointed; abdomen oval.

Key to the species of *Pheidole* Westwood Based on Soldiers

1.	Club of flagellum of antennae formed of the apical four joints.	2
	Club of flagellum of antennae formed of the apical three joints	3
2.	Light reddish-brown, head enormous, clypeus not carinate	<i>smythiesi</i>
	Very dark brown, almost black; head proportionately much smaller, clypeus medially carinate	<i>bhavanae</i>
3.	First joint of pedicel with a projection or appendis beneath	4
	First joint of pedicel with no projection or appendix beneath	5
4.	Head posteriorly smooth and shining, not sculptured	<i>lamellinoda</i>
	Head posteriorly more or less sculptured	<i>malinsi</i>
5.	Pro-and mesonotum not forming a single convexity; transverse mesonotal furrow and ridge or carina, or at any rate the later always present.	.11
-	Pro-and mesonotum forming a single convexity, transverse mesonotal furrow obsolete	6
6.	Head only as broad as long	<i>sagei</i>
-	Head distinctly longer than broad	7
7.	Occiput smooth and shining	8
-	Occiput more or less sculptured	9

8.	Occipital emargination narrow and deep, lateral lobes broad and rounded	<i>pronotalis</i>
	Occipital emargination broad and shallow, lateral lobes narrow and angular .	<i>wood-masoni</i>
9.	Head anteriorly beneath bidentate	<i>watsoni</i>
	Head anteriorly beneath not dentate	10
10.	Frontal grooves for reception of scapes of antennae absent	<i>mus</i>
	Frontal grooves for reception of scapes of antennae present	<i>. parva</i>
11.	Head below vertex vertically truncate, forming a flat plane with the clypeus	<i>capellini</i>
	Head below vertex normally developed, not truncate	12
12.	Frontal grooves for reception of scape of antennae obsolete	<i>constanciae</i>
	Frontal grooves for reception of scape of antennae distinct	13
13.	Pronotum convex, lateral tubercles quite or nearly obsolete	14
	Pronotum convex, lateral tubercles sometimes obtuse but always distinct	16
14.	Medial portion of clypeus opaque, longitudinally striate	<i>jucunda</i>
	Medial portion of clypeus smooth and shining	15
15.	Frontal grooves for reception of scape not well-marked, coarsely longitudinally striate within	<i>. feae</i>
	Frontal grooves for reception of scape more distinct, finely sculptured within	<i>roberti</i>
16.	Abdomen sculptured	<i>striativentris</i>
	Abdomen not sculptured, smooth and shining	<i>allani</i>

68. *Pheidole allani* Bingham

Pheidole allani Bingham, 1903, *Faun. Brit. Ind.* Hymenoptera, 2:264

Pheidole (Pheidole) allani, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1 : 139.

Material examined : 15 ex; India, Meghalaya, East Khasi hills, Shillong, 16.vi.75, Coll. R. Mathew.

Diagnostic characters : Reddish brown; head coarsely longitudinally striate, occiput and lateral lobes smooth; pronotum in front and metanotum transversely striate; the sides of the thorax irregularly closely rugulose, granulate; head as long as broad, occipital emargination moderate and wide; mandibles smooth and shining; clypeus transverse anteriorly; pronotum flat in front, lateral tubercles

fairly well-marked; transverse mesonotal furrow shallow, the ridge thick, basal portion of metanotum short, flat, slightly raised; metanotal spines short, erect and stout; 1st node of pedicel transverse and emarginate above. 2nd node rounded above; abdomen almost circular, depressed.

Length : 4 4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere. Myanmar.

69. *Pheidole bhavanae* Bingham

Pheidole bhavanae Bingham, 1903, Faun. Brit. Ind. *Hymenoptera* 2 : 506.

Ceratopheidole bhavanae, Collingwood, 1970, *KHUMBU HIMAL*, Bd. 3, Lfg. 3, 371-388.

Material examined : 5 ex, India, Meghalaya, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew; 39 ex, East Khasi hills, Shillong, 29.iii.59, Coll. A.P. Kapur; 1 ex, Shillong, Lalchand Basti, 25.vii.63, Coll. V.D. Srivastava; 12 ex, Shillong, 8 miles, 5.iii.91, Coll. S.K. Ghosh and party; 10 ex, Shillong, Polo Hills Forest, near Monsa, 10.iv.91, Coll. S.K. Ghosh and party.

Diagnostic characters : Dark brown, shining; head a little longer than broad and broader posteriorly than in front, longitudinally striate, reticulate on the lateral lobes; occipital emargination deep and wide, lateral lobes pointed; no antennal groove; thorax rounded anteriorly without lateral tubercles; transverse mesonotal groove and ridge well marked; basal portion of metanotum laterally margined; metanotal spines strong and erect; 1st node of pedicel cuneiform, 2nd node globose, laterally slightly tuberculate; abdomen smooth and shining.

Length : 4.5 mm.

Distribution : East Khasi hills, Meghalaya; Sikkim.

70. *Pheidole capellinii* Emery

Pheidole capellinii Emery, 1887, *Ann. Mus. Civ. Gen.* 25:463.

Pheidole capellinii, Bingham, 1903, *Faun. Brit. Ind. Hymenoptera* 2:246

Material examined : 1 ex, India, Meghalaya, West Khasi hills, Ranikor, 9.ii.87, Coll. V.T. Darlong.

Diagnostic charactes: Reddish; head longer than broad, feebly striate in front, reticulate on the lateral lobes; head below vertex and the clypeus remarkably flat, forming a plane; mandibles broad, massive, striate at base; clypeus anteriorly slightly emarginate in the middle; antennal grooves well marked; pronotum attenuate in front, the lateral tubercles prominent; transverse mesonotal groove shallow, ridge well marked; metanotal spines short; nodes of pedicel broader than long; abdomen oval.

Length : 4 5.5-6 mm.

Distribution : INDIA : (West Khasi hills), Meghalaya. Elsewhere : Java; Tenasserim.

71. *Pheidole constanciae* Forel

Pheidole constanciae Forel, 1902, *Rev. Suisse Zool.* **10**:176 & 194

Pheidole constanciae, Mathew, 1983, *Bull. zool. Surv. Indian* **5** (1) : 125- 127.

Material examined : 5 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 13.x.78, Coll. Aquarius.

Diagnostic characters : Reddish brown; head anteriorly somewhat coarsely longitudinally striate, reticulate posteriorly on the lateral lobes; mandibles smooth and shining; clypeus transverse anteriorly, medially incised; no antennal groove; pronotum coarsely sculptured; 1st node of pedicel cuneate, upper margin transverse, 2nd node about twice as broad as long; abdomen circular.

Length : S. 5-5 mm.

Distribution : INDIA : (East Khasi hill)s, Meghalaya; Tamil Nadu.

72. *Pheidole feae* Emery

Pheidole feae Emery, 1894, *Ann. Mus. Civ. Gen.*, **34**:469.

Pheidole feae, Bingham, 1903, *Fauna Brit. India, Hym.*, **2** : 260.

1951. *Pheidole feae*, Chapman and capco, *Monoqr. Inst. Sci. Tech., Manila* (Check List Ants Asia), **1** : 141.

Material examined : INDIA : Meghalaya: Jaintia Hills, Jowai, 900 (minor) and 3, 23.ix.1988, Coll. V.D. Srivastava and party.

Diagnostic characters : Light yellowish red all over; flagellum of antennae, legs and abdomen more yellowish; pilosity pale reddish yellow, abundant. Head rectangular, broader posteriorly, longitudinally striate; mandibles massive, obsoletely dentate; clypeus medially smooth, anteriorly emarginate in the middle; antennae slender, short; eyes small, lateral, placed well below the middle of head. Thorax short; pro- and mesonotum not forming a single convexity; transverse mesonotal groove broad and shallow; metanotal spines short, acute erect. Pedicel short, spumiform, 1st node petiolate in front, petiole laterally dentate; 2nd node transverse. Abdomen convex, smooth and shining.

Length :S. 3.5-4 mm; W. 2.5 mm, F. 4.5 mm.

Distribution : INDIA : Meghalaya (Jaintia Hills). Elsewhere: Tenasserim, Karennee.

73. *Pheidole jucunda* Forel

Pheidole jucunda Forel, 1885, *Jour. Asiat. Soc. Bengal* **54**, **2** : 179

Pheidole (Pheidole) jucunda, Chapman and Capco, 1951, *Check list of the ants of Asia*, **1**:144.

Pheidole (Pheidole) Jucunda, Tiwari et.al., 1993, *State Fauna Series 3: Fauna of West Bengal part 8:50*

Material examined : INDIA, Meghalaya, 1 ex, East Khasi hills, Shillong, Risa Colony, 29.vii.76, Coll. R. Mathew.

Diagnostic characters : Brownish red; head coarsely longitudinally striate; thorax finely but obscurely transversely sculptured; abdomen smooth; occipital emargination deep and wide; mandibles minutely obscurely striate and with few punctures; antennal groove deep and coarsely sculptured within; pronotum convex and elongate, lateral tubercles indistinct; transverse mesonotal groove and ridge well-marked; basal portion of metanotum rectangular, laterally margined; metanotal spines stout, short and acute; 1st node of pedicel squamiform, transverse above; 2nd node sculptured, laterally obtusely cone-shaped; abdomen oval.

Length : 4-4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Sikkim; West Bengal; Western India. Elsewhere : Sri Lanka.

74. *Pheidole lamellinoda* Forel

Pheidole lamellinoda Forel, 1902, *Rev. Suisse Zool.* 10:166, 186.

Pheidole (Pheidole) lamellinoda, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1:144

Material examined : INDIA, Meghalaya, 4 ex, East Khasi hills, Old Barapani road, 14.v.76, Coll. R. Mathew.

Diagnostic characters : Light reddish brown; smooth polished and shining; head anteriorly finely longitudinally striate; thorax on the sides sparsely punctured; mandibles sparsely punctate, masticatory margin with two indistinct blunt teeth at apex; clypeus medially incised anteriorly; no antennal groove; antennae short; pronotum convex above, laterally tuberculate; metanotal spines short and erect; 1st node of pedicel with an appendix beneath; 2nd node convex above, laterally angular; abdomen broadly oval, convex.

Length: 4.5-5 mm.

Distribution : East Khasi hills, Meghalaya; Central and Western India.

75. *Pheidole malinsii* Forel

Pheidole malinsii Forel, 1902, *Rev. Suisse. Zool.* 10:167, 187.

Pheidole (Pheidole) malinsii, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1:145.

Material examined : INDIA, Meghalaya, 25 ex, East Khasi hills, Shillong, Motinagar, 3.xii.76, Coll. R.S. Giri.

Diagnostic characters : Dark brown; pilosity erect and abundant; head longitudinally striate posteriorly, reticulate on the lateral angles; Clypeus carinate in the middle, anterior margin incised in the middle; mandibles shining, with scattered punctures; antennal groove the length of the scape; scape falling short of the top of the head by about half its own length; thorax coarsely transversely striate; pronotum tuberculate antero- laterally; mesonotum with a transverse groove and ridge; metanotum smooth and shining above; metanotal spines short and erect; 1st node of pedicel cuneiform, spined beneath; 2nd node transversely finely striate, about twice as broad as long; abdomen broadly oval, the basal segment finely longitudinally striate.

Length : 4.5-5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Sikkim; Elsewhere : Sri Lanka.

76. *Pheidole mus* Forel (Fig.42)

Pheidole mus Forel, 1902, *Rev. Suisse. Zool.* 10:174, 191.

Pheidole (Pheidole) mus, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1:146.

Pheidole (Pheidole) mus, Tiwari et. al. 1993, *State Fauna Series 3: Fauna of west Bengal*, part 8:50 (Syns.)

Material examined : INDIA, Meghalaya, 6 ex, Jaintia hills, 17 km. from Jowai, 14 km. from Passi on way to Mynso village, Alt. 4300', 5.i.88, Coll. A.K. Karmakar.

Diagnostic characters : Reddish brown; head longer than broad, finely and densely longitudinally striate; mandibles minutely punctured; no antennal groove; antennae short; thorax transversely striate; pronotum laterally tuberculate, metanotal spines stout and acute; abdomen oval.

Length : 2 mm.

Distribution : Jaintia hills, Meghalaya; Karnataka; West Bengal.

77. *Pheidole parva* Mayr

Pheidole parva Mayr, 1865, *Novara Reise. Formicid.* : 98, o. pl., figs.

Pheidole parva, Chapman and Capco, 1951, *Monogr. Inst. Sci. Tech., Manila* (Check List Ants Asia), 1 : 147.

Material examined : INDIA: Meghalaya: West Khasi Hills, Nongstion, near Civil Hospital, 2II : W and 3, 25.ii.1985, Coll. A.R. Lahiri and party.

Diagnostic characters : S. Head, thorax and pedicel reddish brown, the later two lighter in colour; abdomen brown; mandibles, antennae and legs dark yellow; body moderately covered with short, soft, semierect pale hairs. Head very much longer than broad, longitudinally striate; clypeus not emarginate anteriorly; antennae short. Thorax finely reticulate-punctate; pronotal tubercle distinct; pro-

and mesonotum forming a single convexity; metanotum short. Pedicel comparatively long; 1st node squamiform with no appendix beneath; 2nd node transverse. Abdomen short, smooth and shining.

Length : S. 3-3.2 mm.; W. 1.5-2 mm.; F. 4-4.5 mm.; M. 2.8-3.2 mm.

Distribution : INDIA : Meghalaya (West Khasi Hills), Western India. Elsewhere : Burma, Sri Lanka.

78. *Pheidole pronotalis* Forel

Pheidole pronotalis Forel, 1902, *Rev. Suisse Zool.* 10:175, 190.

Pheidole (Pheidole) pronotalis, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1:148

Material examined : INDIA, Meghalaya, 25 ex: East Khasi hills, Shillong, Fruit Garden, 6.iii.76, Coll. M.S. Jyrwa.

Diagnostic characters : Reddish brown, head narrow and long, longitudinally striate; occipital emargination deep, lateral lobes smooth and shining; antennal furrow long and deep enclosing part of flagellum as well; thorax emarginate at the meso-metanotal suture; pronotum laterally tuberculate; metanotal spines short and erect; abdomen smooth, polished and shining.

Length : 3.5-4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Sikkim. Elsewhere : Sri Lanka.

79. *Pheidole roberti* Forel

Pheidole roberti Forel, 1902, *Rev. Suisse Zool.* 10 : 183, 198.

Pheidole (Pheidole) roberti, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1:149.

Pheidole (Pheidole) roberti, Tiwari, et. al. 1993 *State Fauna series 3:Fauna of West Bengal, Part 8:5 (Syn)*

Material examined : 4 ex, India, Meghalaya, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew.

Diagnostic characters : Reddish; head longitudinally finely striate, the striae breaking into reticulations posteriorly; thorax finely transversely striate, finely punctured on the sides; pedicel slightly sculptured; abdomen smooth and shining; head longer than broad; mandibles smooth, polished and shining; clypeus emarginate in the middle; antennae short; thorax gibbous anteriorly; pronotum without lateral tubercles; transverse mesonotal groove and ridge well marked; metanotum narrow, metanotal spines long and acute; 1st node of pedicel squamiform, 2nd node from above transversely oval; abdomen oval.

Length : 4.5-5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Karnataka; Sikkim.

80. *Pheidole sagei* Forel

Pheidole sagei Forel, 1902, *Rev. Suisse Zool.* 10:174, 192, W

Pheidole sagei, Chapman and Capco, 1951, *Monogr. Inst. Sci. Tech. Manile* (Check List Ants Asia), 1:149.

Material examined : India: Meghalaya: East Khasi hills, Shillong, 1 W, 7.iv.1959, Coll. A.P. Kapur.

Diagnostic characters : Ferruginous red, abdomen brown. Head nearly square, sides somewhat convex, posterior half sculptured; clypeus carinate and emarginate; scape of antennae short; a wide transverse impression on the vertex. Pro- and mesonotum forming a single convexity; pronotum with some transverse striae. First joint of pedicel with no projection or appendix beneath. Abdomen posteriorly smooth.

Length : S. 2.5 mm, W. 1.8 mm.

Distribution : INDIA: Meghalaya: (East Khasi hills), North-West Himalayas (Dharamsala).

81. *Pheidole smythiesi* Forel (Fig. 43)

Pheidole smythiesi Forel, *Rev. Suisse Zool.* 10 (1902) 185.

Ceratopheidole smythiesi, Mathew, 1983, *Bull. zool. Surv. India* 5 (1) : 125- 127.

Material examined : 19 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 14.vi.75, Coll. R. Mathew; 11 ex, West Garo hills, Selbalgiri, Alt. 2000^l, (collected the day after burning of the jhum) 19.iii.88, Coll. V.T. Darlong; 7 ex, West Garo hills, Seibalgiri, Alt. 2000^l, 28.iv.88, Coll. V.T. Darlong; 12 ex, East Khasi hills, 5.iii.91, Coll. K.K. Roy and Party.

Diagnostic characters : Light reddish brown and slightly shining; head enormously large, much broader than long, deeply emarginate posteriorly, anteriorly finely longitudinally striate, the striae breaking into punctures and shallow reticulations posteriorly; mandibles sparsely striate, clypeus longitudinally striate; antennae short, scape reaching nearly half way to the top of the head, club formed of apical four joints; eyes small, placed in the lower third of the sides of the head; pronotum convex anteriorly, mesonotum widely and deeply transversely sulcate and with a transverse carina; metanotum short, longitudinally sulcate, metanotal spines stout and acute; 1st node of pedicel transverse above, 2nd node rounded above, much broader than long, slightly angularly produced at the sides; abdomen broadly oval.

Length : 6 -8.5 mm.

Distribution : INDIA : (East Khasi and West Garo hills), Meghalaya; Assam. Elsewhere : Singapore.

82. *Pheidole striativentris* Mayr

Pheidole striativentris Mayr, 1878, *Verh. zool-bot. Ges. Wien* **28** : 675, 678.

Pheidole (Pheidole) striativentris, Chapman and Capco, 1951, *Checklist of the ants of Asia, Manila*, 1:150.

Material examined : 15 ex, India, Meghalaya, East Khasi hills, Upper shillong, 1.viii.76, Coll. R. Mathew.

Diagnostic characters : Reddish brown; head longitudinally coarsely striate, transversely striate on the front of the lateral lobes, breaking into reticulations on the apex; occipital emargination deep; antennal grooves shallow, finely and delicately sculptured within; thorax stout, transversely striate; pronotum convex in front, slightly laterally tuberculate, metanotal spines long and acute; 1st node of pedicel cuneate, transeverse above, 2nd node twice as broad as long, laterally cone-shaped, punctured above, abdomen anteriorly finely and closely striate, posteriorly shining.

Length : 4 -4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; throughout India.

83. *Pheidole watsoni* Forel

Pheidole watsoni Forel, 1902, *Rev. Suisse Zool.* **10**:171.

Pheidole (Pheidole) watsoni, Chapman and Capco, 1951, *Checklist of the ants of Asia* 1:152.

Material examined : 15 ex: 3 ex, India, Meghalaya, East Khasi hills, Shining, Risa Colony, 28.vii.76, Coll. R. Mathew; 7 ex, Upper Shillong, 1.viii.76, Coll. R. Mathew; 5 ex, Risa Colony, 7.v.77, Coll. R. Mathew.

Diagnostic characters : Reddish brown; head anteriorly longitudinally straited, striae breaking down into reticulations on the lateral lobes, bidentate beneath; thorax and abdomen shining; mandibles slightly punctured, shining; antennae short, antennal groove indistinct; thorax gibbous anteriorly; pronotum somewhat flat above and bituberculate; basal portion of metanotum horizontal, flat and shining; metanotal spines short, acute and erect; 1st node of pedicel squamiform, petiolate in front, 2nd node somewhat rhombiform; abdomen oval.

Length : 3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, West Bengal. Elsewhere: Sri Lanka; Myanmar.

84. *Pheidole wood-masoni* Forel

Pheidole wood-masoni Forel, 1885, *Asiat. Soc. Bengal*, **54**:180

Pheidole (Pheidole) wood-masoni, Chapman and Capco, 1951, *Chicklist of the ants of Asia*, 1:152.

Pheidole (Pheidole) wood-masoni, Tiwari et.al., 1994, *State fauna series 3: Fauna of West Bengal*, part 8:52.

Material examined : 2 ex: India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew.

Diagnostic characters : Light yellow, abdomen brown; head twice as long as broad; mandibles smooth, sparsely punctured, with two acute teeth at apex; clypeus narrow and transverse; antennal carinae short; no antennal groove; head anteriorly finely striate, posteriorly sparsely punctured; pronotum laterally tuberculate; metanotal spines short and erect; abdomen oval.

Length : 2.5-4 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; spread sparingly through continental India. Elsewhere : Sri Lanka.

85. *Pheidole* sp.

Material examined : India: Meghalaya: East Khasi Hills, Shillong, Polo Hills Forest (1450m.) 1200(minor), 11.iv.1991, Coll. S.K. Ghosh and party.

27. Genus *Trigonogaster* Forel, 1890.

Trigonogaster Forel, 1890, *Ann. Soc. Ent. Belg*, **34**, C.R.P. cviii.

Trigonogaster, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : o. Head in side view truncate; mandibles narrow, armed with 4 teeth; antennae 11-jointed; metanotum armed with two strong recurved spines; petiole articulated to the abdomen by the whole of its posterior face; abdomen viewed from the side triangular, flat above, the apex of the triangular below.

86. *Trigonogaster recurvispinosa* Forel (Fig.50)

Trigonogaster recurvispinosa Forel, 1890, *Ann. Soc. Ent. Belg*, **34**:110.

Trigonogaster recurvispinosa, Ettershank, 1966, *Aust. J. Zool.* **14** : 73-171.

Material examined : 4 ex: 3 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : Yellowish; head, thorax and abdomen extremely finely and closely punctured, opaque; head rectangular, very slightly emarginate posteriorly; mandibles striate; eyes

lateral, a little to the front; pro-mesonotum forming a single convexity; 1st node of petiole with a long petiole anteriorly.

Length : o. 2 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Maharashtra. Elsewhere: China.

28. Genus *Cataulacus* Fred.Smith, 1853.

Cataulacus Smith, 1853, *Trans. Ent. Soc. Ser. 2* (2):225.

Cataulacus, Brown, 1993, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : Head broad, somewhat flat, transverse or emarginate posteriorly, posterior lateral angles prominent, dentate or spinous; sides of the head deeply grooved to contain the folded antennae; mandibles broad, armed with 4 or 5 teeth; antennae 10-jointed; thorax constricted posteriorly, the basal portion of the metanotum with spines; the sides and apex of the thorax more or less vertical and concave, the margins of the head and thorax denticulate; pedicel with nodes more or less globose; abdomen broadly oval.

Key to the species of *Cataulacus* Fred. Smith

Head, thorax and abdomen with more or less irregularly scattered raised acute granular tubercles above as well as on margins of head and thorax *simoni*

Head and thorax with a few granular tubercles on margins; abdomen without raised tubercles. *taprobanae*

87. *Cataulacus taprobanae* Fred. Smith (Fig.62)

Cataulacus taprobanae Smith, 1853, *Trans. Ent. Soc. ser. 2* (2):225

Cataulacus (Cataulacus) taprobanae, Chapman and Capco, 1951 *Checklist of the ants of Asia*, 1 : 86.

Material examined : India, Meghalaya, 9 ex: 1 ex, East Khasi hills, Kyrdekulai, 25.xi.81, Coll. J.P. Sati; 1 ex, East Khasi hills, Nongpoh, 23.i.82, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 3 ex, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, Nongpoh, 19.x.82, Coll. R. Mathew; 2 ex, Nongkhylllem Reserve Forest, Lai-lad, 27.v.87, Coll.A.K. Karmakar.

Diagnostic characters : worker. Black, appendages yellowish-red; head, thorax and abdomen with sparse, short, white bristly hairs; head and thorax coarsely striate; abdomen more finely and regularly striate; margins of head and thorax with minute denticulations, lateral angles of head produced, dentate, a small tooth, not very prominent, below the eye on each side of the head; pro-mesonotal shield very convex; the lateral metanotal spines short, horizontal, directed backwards

and slightly divergent; apical portion of metanotum slightly concave, obscurely transversely striate; nodes of pedicel more coarsely sculptured than the thorax and abdomen.

Length : W. 4 -4.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Sri Lanka; Java.

88. *Cataulacus simoni* Emery

Cataulacus simoni Emery, 1893, *Ann. Soc. Ent. Er.* **62**:248.

Cataulacus (Cataulacus) simoni, Devi & Singh, 1987, *Entomon* **12** (4), 309- 313.

Material examined : 3 ex, India, Meghalaya, East Khasi hills, Old Barapani road, 14.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Black; opaque, densely punctured, appendages reddish; head longitudinally rugulose reticulate; the sides of the head in front of the eyes and the posterior angles with an acute tooth; pronotum in front coarsely reticulate; remainder of the thorax longitudinally rugose; abdomen ovate.

Length : W. 3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere: Sri Lanka.

29. Genus *Crematogaster* Lund, 1831.

Crematogaster Lund, *Ann. Sc. Nat.* **xxiii** (1831), P. 132.

Crematogaster, Lund, Datta & Raychaudhuri, 1983, *AKITU N. Ser* **56**:1-14.

Diagnostic characters : worker. Head more or less square; mandibles with 4 teeth; antennae 11-jointed; pedicel with two joints; apex of pedicel attached to the upper basal surface of the 1st abdominal segment, abdomen more or less cordate.

Remarks : Many species of this genus make huge carton nests on trees.

Key to the species of *Crematogaster* Lund

1.	Head smooth and shining	2
	Head entirely sculptured	3
2.	Club of flagellum of antennae 2-jointed	<i>biroi</i>
	Club of flagellum of antennae 3-jointed	4
3.	Metanotal spines shorter than metanotum	8

- Metanotal spines longer than metanotum 9
- 4. Pronotum sculptured 5
- Pronotum not sculptured 6
- 5. Eyes elongate *hodgsoni*
- Eyes round *anthracina*
- 6. Basal level portion of metanotum sculptured, pronotum convex, not tuberculate walshi
- Basal level portion of metanotum smooth; pro-mesonotal suture obsolete 7
- 7. Metanotal spines short, shorter than the length of the basal level portion of metanotum *poliula*
- Metanotal spines long, longer than basal level portion of metanotum *travancorensis*
- 8. Metanotal spines thick at base, apex directed backwards and inwards *rothneyi*
- Metanotal spines slender, apex directed backwards and outwards; first flattened joint of pedicel with the sides rounded, not angular. *artifex*
- 9. Pronotum longitudinally striate, first flattened joint of pedicel with the sides strongly arched, nearly semicircular. *flava*
- Pronotum reticulate; first flattened joint of pedicel as broad as long, the sides angular in the middle. *rogenhoferi*

89. *Crematogaster anthracina* Fred. Smith

Crematogaster anthracina Fred. Smith, 1857, *J. Proc. Linn. Soc. Lond. Zool.* 2 : 75.

Crematogaster (Nemtocrema) anthracina, Chapman and Capco, 1951, *checklist of the ants of Asia*, 1:95.

Material examined : 15 ex, India, Meghalaya, East Khasi hills, Shillong, Tripura Castle Road, 23.ii.76, Coll. S.K. Goswami.

Diagnostic characters : worker. Reddish brown to black, smooth, polished and shining, the sides of the head and antennal hollows slightly longitudinally striate; the thorax and pedicel above finely rugulose; mandibles finely rugulose, opaque; clypeus strongly convex in the middle, the transverse anterior margin depressed and bent inwards; antennae short, scape not reaching the top the head; eyes placed about the middle of the head laterally; pronotum broad, convex and rounded anteriorly; mesonotum somewhat flat, rounded anteriorly; meso-metanotal suture deeply impressed; the basal portion of the metanotum horizontal, broadening posteriorly; metanotal spines divergent; 1st node of pedicel flat anteriorly, transversely oval, 2nd node slightly raised and longitudinally sulcate.

Length : W. 3.5 -4 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Sri Lanka; Tenasserim; Borneo; Malaya.

90. *Crematogaster artifex* Mayr

Crematogaster artifex Mayr, 1878, *Verh. zool-bot. Ges. Wien*, **28** : 681 & 684.

Crematogaster (Acrocoelia) dohrni Sub.sp. *artifex*, Chapman and Capco, 1951, *Checklist of the ants of Asia*, **1** : 90.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 23.viii.75, Coll. R. Mathew.

Diagnostic characters : worker. Reddish brown; pilosity abundant; head finely longitudinally striate; thorax and pedicel more or less coarsely rugose-reticulate; mesonotum finely longitudinally striate; abdomen smooth; thorax convex; pronotum rounded in front; pro-mesonotal sutures distinct; meso-metanotal sutures deeply impressed; metanotal spines long, pointing backwards and upwards; apical portion of metanotum smooth; 1st node of pedicel flat above, rounded at the sides, narrowed posteriorly; 2nd node slightly raised, longitudinally grooved; abdomen broad.

Length : W. 3.2 - 5.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : China; Myanmar; Tenasserim; Malaya.

91. *Crematogaster biroi* Mayr

Crematogaster biroi Mayr, 1892, *Term. Fuzetek* **20**:428.

Crematogaster biroi, Mathew, 1983, *Bull. zool. Surv. India* **5** (1) : 125- 129.

Material examined : 2 ex, India, Meghalaya, East, Khasi hills, Shillong, Spread Eagle Falls, 5.viii.76, Coll. M.S. Jyrwa.

Diagnostic characters : worker. Bright pale yellow; head, thorax and abdomen very minutely and delicately punctured; head slightly longer than broad; occiput transverse; mandibles armed with 4 acute teeth; scape of antennae just reaching the top of the head, club of flagellum formed of two joints; thorax proportionately short, pro-mesonotal suture obsolete; meso-metanotal suture deeply impressed; basal portion of metanotum short, apical portion concave; metanotal spines long, curved inwards and slightly downwards; 1st node of pedicel flat above, semicircular anteriorly and arched at the sides.

Length : W. 1.8-2.3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Karnataka; Sikkim; Uttar Pradesh. Elsewhere : Sri Lanka.

92. *Crematogaster flava* Forel (Fig.44)

Crematogaster flava Forel, 1887, *J. Asiat. Soc. Bengal* 55 : 248

Crematogaster flava, Devi & Singh, 1987, *Entomon* 12 (4) : 309-313.

Crematogaster flava, Tiwari et. al., 1994, *State Fauna series 5: Fauna of West Bengal*, part 8:42.

Material examined : 26 ex: 1 ex, India, Meghalaya, Jaintia hills, Garampani, Opposite Kopili river, 27.i.75, Coll. A.K. GHOSH; 25 ex, East Khasi hills, Old Barapani Road, 23.iv.77, Coll. R. Mathew. 2 ex, East Garo hills, Songsak, 6.v.91, Coll. J.K. Jonathan and party; 5 ex, West Garo hills, Darangiri, 30.iv.79, Coll. J.K. Jonathan and party.

Diagnostic characters : worker. Pale yellow, abdomen brown; head, thorax and abdomen finely and delicately granulate and with a silky shining appearance; head broader than long, occiput transverse; mandibles stout; Clypeus convex, its anterior margin transverse and bent inwards; thorax short, pronotum longitudinally striate; basal portion of metanotum longitudinally striate; metanotal spines long and slender; 1st node of pedicel flat above, broad, 2nd node tri-tuberculate; abdomen cordate, short and broad.

Length : W. 2.5-3 mm.

Distribution : INDIA : (East Khasi, East and West Garo hills and Jaintia hills), Meghalaya; Assam; Kerala; Orissa; Sikkim.

93. *Crematogaster hodgsoni* Forel

Crematogaster hodgsoni Forel, 1911, *Rev. Suisse Zool*, 10:204.

Crematogaster (Acrocoelia) hodgsoni, Chapman and Capco, 1951 *Checklist of the ants of Asia*, 1:91.

Material examined : 9 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 11 ex, East Khasi hills, Lachthra, cherrapunjee, 16.9.88, Coll. A.R. Lahiri and party.

Diagnostic characters : worker. Dark reddish brown, abdomen darker, appendages a shade lighter; head smooth, slightly shining, a few obsolete striae on the cheeks, clypeus and above the antennal hollows; pronotum reticulate, mesonotum and basal portion of the metanotum longitudinally striate, rugulose; pedicel and abdomen smooth but dull, very minutely reticulate; eyes slightly elongate; mandibles longitudinally striate and with a few scattered punctures; clypeus convex, anterior margin transverse, slightly turned inwards; antennae comparatively long; pronotum laterally bituberculate, mesonotum concave, margined; metanotal spines thick at base, acute at the apices, which are slightly curved inwards; abdomen broad, subcordate.

Length : W. 3.5-4 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Tenasserim.

94. *Crematogaster politula* Forel

Crematogaster subnuda Mayr, race *politula* Forel 1902, *Rev. Suisse Zool*; 10:207.

Crematogaster politula; Datta & Raychaudhuri, 1983, *AKITU N. Ser.* 56 : 1-14.

Material examined : 2 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, 1.viii.79, Coll. R. Mathew; 1 ex, Shillong, Risa Colony, 5.xii.79, Coll. Roselind.

Diagnostic characters : worker. Light chestnut-red; head, thorax and abdomen smooth and shining, very minutely, but sparsely punctured; head slightly longer than broad, the cheeks convex; mandibles punctured; antennae long, scape extending beyond the top of the head by about one-fifth its own length; pronotum broad, flat above, rounded in front, laterally somewhat angular; pro-mesonotal suture obsolete, meso-metanotal suture distinct; metanotal spines thick at base, short, acute; 1st node of pedicel flat above, broad, subtriangular; 2nd node with a short petiole in front, posteriorly longitudinally grooved with two equal rounded tubercles; abdomen cordate.

Length W. 3-3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Assam. Elsewhere : Myanmar.

95. *Crematogaster dohrni rogenhoferi* Mayr

Crematogaster rogenhoferi Mayr, 1878, *Verh. zool-Bot. Ges. Wien*, 28:681 & 683.

Crematogaster (Acrocoelia) dohrni subsp. *rogenhoferi* Mayr, Chapman and Capco 1951, Checklist of ants of Asia.

Crematogaster dohrni rogenhoferi, Tiwari et. al. 1993, *State Fauna series 3: Fauna of west Bengal*, part 8:42.

Material examined : 92, ex: 54 ex, India, Meghalaya, East Khasi hills, Nongpoh forest, 6.iii.86, Coll. R. Mathew; 34 ex, West Khasi hills, 25 km. South West of Nongstoin on Syrkon Road, 29.o.87, Coll. K.P. Singh; 1 ex, West Khasi hills, 15 km North of Nonghlaw on Guwahati Road, 20.ii.87 Coll. A.K. Karmakar; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Lai-lad, 27.v.87, Coll. A.K. Karmakar; 2 ex, Jaintia hills, 27 km from Jowai near Mynso village, 5.i.88, Coll. A.K. Karmakar; 11 ex, east Garo hills, Daru Giri, 17.v.79, Coll. S.B. Roy & Party.

Diagnostic characters : worker. Reddish brown abdomen darker brown to black; head finely longitudinally rugulose, clypeus slightly convex, anterior margin slightly squarely produced; scape of antennae reaching the top of head; ocelli distinct; thorax longitudinally rugose, pronotum somewhat flat; mesonotum margined at the sides and constricted; basal portion of metanotum longitudinally striate, apical portion concave, smooth and shining, nodes of pedicel rugulose above; 1st node of pedicel flat above, sides angular in the middle, 2nd node with three tubercles; abdomen elongate, basal segment minutely reticulate- punctate, opaque, apical segments shining.

Length : W. 3.5-4.5 mm.

Distribution : INDIA : (East & west Khasi hills, East Garo hills and Jaintia hills), Meghalaya; Assam; Kerala; Maharashtra; Sikkim; West Bengal; Western India. Elsewhere: Myanmar; Sri Lanka; Sumatra; Tenasserim.

96. *Crematogaster rothneyi* Mayr (Fig.45)

Crematogaster rothneyi Mayr, 1902, Verh. Zool-bot. Wien, 28:

Crematogaster (Acrocoelia) rothneyi, Chapman & Capco, 1951, of ants of Asia, 1:93.

Crematogaster rothneyi, Tiwari et. al., 1994, *State Fauna series 3: Fauna of West Bengal*, part 8:42.

Material examined : 22 ex: 4 ex, India, Meghalaya, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 1 ex, Old barapani, 6.ix.79, Coll. R. Mathew; 4 ex. East Khasi hills, Shella, 25.ix.81, Coll. C. Radhakrishnan; 7 ex, east Khasi hills, Kyrdem Kulai, 2.vi.78, Coll. s. Biswas; 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Nongpoh, 28.x.83, Coll. R. Mathew; 4 ex, West Khasi hills, 9.ix.86, Coll. M.R. Rynth; 1 ex, West Garo hills, Selbalgiri, 14.v.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Rufo-ferruginous, abdomen fuscous brown to black; pilosity fairly abundant; head, thorax and pedicel opaque, abdomen smooth and shining; head longitudinally striate; eyes large, prominent; mandibles striate; thorax finely and very closely reticulate-punctate, rugulose, submargined along the sides; pronotum somewhat flat above, rounded anteriorly; mesonotum slightly concave, meso-metanotal suture very distinct; basal portion of metanotum transversely rectangular, longitudinally striate; metanotal spines long and stout, divergent, apical portion of metanotum finely minutely punctured, shining; 1st node of pedicel flat above, narrow posteriorly, sides rounded, 2nd node tri-tuberculate in dorsal view, pedicel rugulose above, abdomen cordate.

Length : W. 3-3.5 mm.

Distribution : East and West Khasi and West Garo hills, Meghalaya; Maharashtra; Sikkim; West Bengal.

97. *Crematogaster travancorensis* Forel

Crematogaster travancorensis Forel, 1902, Rev. Suisse Zool, 10:200.

Crematogaster (Oxygyne) travancorensis, Chapman & Capco, 1951 *Checklist of ants of Asia*, 1:101.

Material examined : 7 ex. India, Meghalaya, East Khasi hills, Old Barapani Road, 23.iv.77, Coll. R. Mathew.

Diagnostic characters : worker. Black; sides of head and antennal hollows striate; pro-mesonotal suture lightly impressed; metanotal spines slender, a little longer than the basal face of the metanotum; 1st node of pedicel flat above; abdomen cordate.

Length : W. 3-3.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Kerala.

98. *Crematogaster walshi* Forel

Crematogaster walshi Forel, 1902, *Rev. Suisse Zool*, **10** : 205.

Crematogaster (Orthocrema) walshi, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:99

Material examined : 17 ex: 2 ex, India Meghalaya, Garo hills, Aravali forest, 5.iii.75, Coll. S. Biswas; 2 ex, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew; 13 ex, West Khasi hills, 15 km. North of Nongkhlaw on Guwahati Road, 20.ii.87, Coll. A.K. Karmakar.

Diagnostic characters : worker. Dark piceous, smooth and shining, pilosity fairly abundant; head rectangular, occiput transverse; mandibles longitudinally striate; anterior margin of clypeus transverse; antennae short, scape not reaching the top of the head; basal portion of metanotum short, longitudinally striate; metanotal spines short; node of pedicel broad and flat anteriorly, narrowed posteriorly; 2nd node raised, longitudinally divided by a broad groove; abdomen short and broad.

Length : W. 3-3.5 mm.

Distribution : INDIA : (East and West Kashi and Garo hills), Meghalaya; Orissa; Sikkim; West Bengal.

99. *Crematogaster* sp.

Material examined : India: Meghalaya: Jaintia Hills, Jowai, 13 FF, 4.iii.1991, Coll.K.K. Ray and party.

30. Genus : *Lophomyrmex* Emery, 1892.

Lophomyrmex Emery, 1892, *Ann. Mus. Civ. Gen.* **22**:114

Lophomyrmex, Datta & Raychoaudhuri, 1983, *AKITU N. Ser.*, **56**:1-14.

Diagnostic characters : worker. Pronotum, in side view, raised above the head, anterior lateral angles furnished with spines or teeth; metanotum armed with two long spines; antennae with 11 joints. Species of this genus tunnel up their paths, like many species of Pheidole.

Key to the species of *Lophomyrmex* Emery

1. Pronotum unarmed.

bedoti

- Pronotum armed with 2 spines or teeth. 2
- 2. Nodes of pedicel sculptured. *quadrispinosus*
- Nodes of pedicel smooth. *burmanus*

100. *Lophomyrmex bedoti* Emery (Fig. 48)

Lophomyrmex bedoti Emery, 1893, *Rev. Suisse Zool.* 1 : 192.

Lophomyrmex bedoti, Datta and Raychaudhuri, 1983, *AKITU N. Ser.*, 56 : 1- 14.

Material examined : 65 ex: 7 ex, India, Meghalaya, East Khasi hills, Old Barapani, 23.iv.77, Coll. R. Mathew; 3 ex, East Khasi hills, Nongpoh, 10.x.82, Coll. R. Mathew; 3 ex, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth; 46 ex, Jaintia hills, 90 km away from Shillong towards Khanduli, 7.v.87, Coll. C. Radhakrishnan; 4 ex, West Garo hills, Selbalgiri, 14.v.88, Coll. V.T. Darlong; 2 ex, West Garo hills, Balphakram National park, 12.v.88, Coll. V.T. Darlong; 18 ex, East Khasi hills, Umwal, 15.ix.88, Coll. A.R. Lahiri & Party.

Diagnostic characters : worker. Yellowish brown; head longer than broad, slightly convex, much broader posteriorly than in front, sides convex; antennae long, scape extending to the top of the head; eyes large, situated about the middle of the sides of the head; pronotum unarmed; metanotal spines erect; 1st node of pedicel petiolate in front, 2nd node broader than the 1st node; abdomen oval, slightly truncate anteriorly; on the whole shining.

Length : W. 2-2.5 mm.

Distribution : INDIA : (East and West Khasi and West Garo and Jaintia hills), Meghalaya; Sikkim. Elsewhere : Myanmar; Sumatra.

101. *Lophomyrmex burmanus* Emery

Lophomyrmex burmanus Emery, 1893, *Rev. Suisse Zool.*, 1 : 192.

Lophomyrmex burmanus, Datta and Raychaudhuri, 1983, *AKITU N. Ser.*, 56 : 1-14.

Material examined : 5 ex, 1 ex, Meghalaya, East Khasi hills, Old Barapani Road, 6.ix.79, Coll. R. Mathew; 4 ex, Khasi hills, Nonglhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Reddish brown, head and abdomen darker, appendages a lighter shade; mandibles armed with 4 or 5 teeth, the apical two strongly pilosity reddish yellow, fairly abundant; eyes placed about the middle of the head on lateral sides; pronotum raised, antero-laterally margined; metanotal spines broad at base, long and divergent; 2nd node of pedicel broader than the first; abdomen oval; on the whole shining.

Length : W. 3-3.5 mm.

Distribution : East Khasi hills, Meghalaya. Elsewhere : Myanmar.

102. *Lophomyrmex quadrispinosus* (Jerdon) (Fig.49)

Ocodoma quadrispinosus Jerdon, 1851, *Madras J. Lit. Sc.*, **17** : 111.

Lophomyrmex quadrispinosus, Devi and Singh, 1987, *Entomon.*, : **12** (4), 309-313.

Lophomyrmex quadrispinosus, Tiwari *et al.*, 1994, *State Fauna series 3 : Fauna of West Bengal*, Part **8** : 43.

Material examined: 10 ex: 4 ex, India Meghalaya, East Khasi hills, Nongpoh, 28.i.82, Coll.C. Radhakrishnan; 3 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll.K.P. Singh; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 2 ex, West Garo hills, Selbalgiri, 14.v.88, Coll. V.T. Darlong; 1 ex, East Khasi hills, Umwai, 15.ix.86, Coll. A.R. Lahiri & party.

Diagnostic characters : worker. Reddish brown; head and thorax anteriorly smooth and shining; mandibles striate at base; antennae long, scape reaching the top of the head; eyes small, lateral, placed about the middle of the head; pronotal spines short, a slight transverse carina between them; mesonotum with a prominent transverse carina about the middle, generally bidentate; metanotal spines long and slightly curved; nodes of pedicel punctured and opaque, abdomen oval.

Length : W. 3-3.5 mm.

Distribution : INDIA : (East and West Khasi and West Garo hills), Meghalaya; Karnataka; Kerala Orissa; Sikkim; Uttar Pradesh; West Bengal.

31. Genus *Pheidologeton* Mayr, 1862

Pheidologeton Mayr, 1862, *Verh. zool.-bot. Ges. Wien*, **12** : 750.

Pheidologeton, Brown, 1973, *In Tropical forest ecosystems in Africa and South America : A comparative review* : 161-185.

Diagnostic characters : Soldier. Closely resembles pheidole. Antennae 11-jointed, Club of antennae formed of 2 joints; thorax massive and gibbous.

103. *Pheidologeton affinis* (Jerdon)

Ocodoma affinis Jerdon, 1851, *Madras. Lit. Sc.*, **17** : 110.

Pheidologeton affinis, Ettershank, 1966, *Aust. J. Zool.*, **14** : 118.

Pheidologeton affinis, Tiwari, *et al.*, 1994, *State Fauna series 5 : Fauna of West Bengal*, Part **8** : 52.

Material examined : 1 ex, India, Meghalaya, West Khasi hills, Shella, 25.vii.81, Coll. C. Radhakrishnan; 30 ex. West Khasi hills, Nongstion, 24.ix.86, Coll. A.R. Lahiri & party; 10 ex, East Garo hills, Nisangram, 12.v.91, Coll. S.B. Roy & R.N. Tiwari.

Diagnostic characters : soldier. Reddish brown, polished and shining, the mandibles black, the antennae and legs yellowish red; head anteriorly and thorax on the sides longitudinally striate, the posterior lobes of the head in front, the pronotum anteriorly and the basal portion of the metanotum transversely striate; ocellus absent; 1st node narrow above, conical and not emarginate, abdomen broadly oval.

Length : S. 5-11 mm.

Distribution : INDIA : (West Khasi hills & East Garo hills), Meghalaya; Assam; Kerala; Maharashtra; West Bengal. Elsewhere : Myanmar; Sri Lanka; Tenasserim.

32. Genus *Myrmecina* Curtis, 1829.

Myrmecina Curtis, *Brit. Ent.*, 4 : 226.

Myrmecina, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Myrmecina, Tiwari, 1994, *Rec. Zool. Surv. India*, 94 (2-4) : 151.

Diagnostic characters : worker. Antennae 11-jointed; clypeus bicarinate; mandibles indistinctly dentate; thoracic stutres obsolete; metanotum with a pair of spines; pedicel with 2 nodes; 1st node quadrate without a petiole in front; abdomen oval.

104. *Myrmecina striata* Emery (Fig. 51)

Myrmecina striata Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova*, 27 : 500.

Myrmecina striata, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1 : 118.

Material examined : 25 ex: 18 ex., India, Meghalays, East Khasi hills, Shillong, Risa Colony, 18.v.79, Coll. R. Mathew ; 4 ex, Risa Colony , 28.x.81, Coll. R. Mathew

Diagnostic characters : worker. Black, the mandibles, the antennae , the legs, the sides of the abdomen, the apical marginh of the basal and the whole of the remainhing abdominal segments reddish yellow; head, thorax above and on the sides, and the nodes of the pedicel above longitudinally channeled; antero/lateral angles of lpronotum produced; pro-msonotum convex,sides vertical; metanotal spines divergent, pointing backwards and slightly upwards; abdomen highly polished and shining.

Length : W. 3.75 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar.

Remarks : Specimens of this species were colected from humus.

33. Genus *Meranoplus* Fred. Smith, 1853

Meranoplus Smith, 1854, *Trans. Ent. Soc. Ser.*, (2) 2 : 224.

Meranoplus, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Head trapezoidal; sides of head deeply grooved for the reception of the antennae; mandibles with 4 teeth; antennae 9-jointed; eyed prominent; pedicel with 2 nodes; abdomen cordate.

Key to the species of *Meranoplus* Fred. Smith.

1.	Mesonotum armed posteriorly with two long acute spines.	<i>bicolor</i>
	mesonotum armed posteriorly with comparatively shorter teeth.	2
2.	Abdomen finely reticulate, subopaque.	<i>rothneyi</i>
	Abdomen highly polished, smooth and shining.	<i>laeviventris</i>

105. *Meranoplus bicolor* (Guérin) (Fig .52)

Cryptocerus bicolor Guérin, 1845, *Inconogr. Regne. Anim. Insect*, 7 : 425.

Meranoplus bicolor, Devi and Singh, 1987, *Entomon.*, 12 (4) : 309-313

Meranoplus bicolor, Tiwari *et al.*, 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part 8 : 44

Material examined : 14 ex, India, Meghalaya, East Khasi hills, Umran, 12.ix.67, Coll. R.K. Varshney; 2 ex, East Khasi hills, Lai-lad, 27.v.87, Coll. A.K. Karmakar; 2 ex, East Khasi hills, Umtru, Alt. 900', 26.iv.88, Coll. A.K. Karmakar; 22 ex, East Garo hills, Dianadubi, 9-10.v.79, Coll. S.B. Roy & R.N. Tiwari; 1 ex, West Garo hills, Anogiri, 6.x.88, Coll. K.K. Roy & party.

Diagnostic characters : worker. Ferruginous red, abdomen black; head thorax and the 2nd node of pedicel coarsely sculptured, cribrate; abdomen closely and finely reticulate, head longer than broad; mandibles narrow, obscurely striate; promesonotal shield about as broad as long, with the anterior angles prominent and acute, the sides posteriorly with a small incision, and beyond that produced backwards into a long, somewhat laminate spine, on each side overhanging the metanotum; metanotum vertical, slightly concave, with a carina on each side ending above in an acute spine; 1st node of pedicel smooth with its apex bevelled; 2nd node globose; abdomen cordate.

Length: W. 4-5 mm.

Distribution : INDIA : (East Khasi hills, East and West Garo hills), Meghalaya; Continental and Insular India.

Remarks : Slow moving species. They feign dead when touched.

106. *Meranoplus rothneyi* Forel (Fig. 53)

Meranoplus rothneyi Forel, 1902, *Rev. Suisse Zool.*, **10** : 241.

Meranoplus rothneyi, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1** : 113.

Meranoplus rothneyi, Tiwari *et al.*, 1994, *State Fauna series 3 : Fauna of West Bengal*, part **8** : 44.

Material examined : 7 ex: 1 ex, India, Meghalaya, East Khasi hills, Shillong, Risa Colony, 18.iv.76, Coll. R. Mathew, 1 ex, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 5 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., 28.iv.88, Coll. V.T. Darlong, 4 ex, R1-Bhoi, hongoh., 28.ix.88, Coll. A.K. Lahiri & party.

Diagnostic characters : worker. Brownish; pro-mesonotum nearly square, margined laterally with a lamellate border; metanotum bordered laterally by carinae which are armed in the middle with a slender pointed spine longer than half the metanotum; transversely striate; abdomen finely reticulate, subopaque.

Length : W. 2.5-2.8. mm.

Distribution : INDIA : Meghalaya; (East Khasi R1-Bhoi and west Garo hills), Kerala. Elsewhere : China.

107. *Meranoplus laeviventris* Emery (Fig. 54)

Meranoplus laeviventris Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova*, **27** : 506.

Meranoplus laeviventris, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1** : 113

Material examined : 8 ex: 3 ex, India Meghalaya, East Khasi hills, Naga bungalow, 21.iv.77, Coll. S.G. Patil; 4 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. c. Radhakrishnan; 1 ex, east Khasi hills, Old Barapani Road, 14.v.76, coll. R. Mathew.

Diagnostic characters : worker. Dark, reddish-ferruginous, abdomen brown; antennae short and stout, antennal groove deep; pro- mesonotal shield armed with six stout spinous teeth; head pro-mesonotal shield and nodes of pedicel coarsely sculptured, rugose; metanotum smooth and shining, slightly concave, bicarinate, the carinae ending above in slender spines pointing backwards; abdomen smooth and shining.

Length : W. 3.5-4 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Tenasserim.

34. Genus *Carebara* Westwood, 1840

Carebara Westwood, 1841, *Ann. Mag. Nat. Hist.*, **6** : 46.

Carebara Westwood, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Antennae 9-jointed, the club of flagellum formed of apical 2-jointed; eyes and ocelli absent; promesonotal suture obsolete, meso-metanotal suture distinct; pedicel 2 jointed; abdomen oval.

108. *Carebara lignata* Westwood (Fig. 47)

Carebara lignata Westwood, 1841, *Ann. Mag. Nat. Hist.* 6 : 86.

Carebara lignata Collingwood, 1970, *Khumbu Himal*, Bd. 3, Lfg. 3 371-388.

Material examined : 4 ex: 3 ex, India, Meghalaya, East Khasi hills, Shillong, Bishnupur, 24.v.81, Coll. C. Radhakrishnan; 1 ex, West Garo hills, Selbalgiri, Alt. 2000', 28.iv.88, Coll. V.T. Darlong.

Diagnostic characters : worker. pale yellow, masticatory margin of mandibles brown; head finely and closely, sides of the thorax more sparsely punctate; thorax nearly as broad as the head; nodes of pedicel rounded above, abdomen oval.

Length : W. 2.5 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills), Meghalaya; Assam. Elsewhere : Indo-china; Malaysia; Sumatra; Tenasserim.

Remarks : Males and females are large winged forms having no similarity with the worker forms.

35. *Strumigenys* Fred. Smith, 1860

Strumigenys Smith, *Jour. Ent.*, 1 : 72.

Strumigenys, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Head more or less cordate, the anterior portion narrowed, mandibles very long, the shaft linear, slender; turned inwards at the apex and tridentate; antennae 6-jointed, the flagellum folded back into the antennal grooves; thorax convex anteriorly, slightly and widely emarginate at the mesonotum; with pair of spines; nodes of pedicel sub-ovate; abdomen broadly oval.

109. *Strumigenys godeffroyi* Mayr

Strumigenys godeffroyi Mayr, 1866, *Sitzb. ber. Akad. Wiss. Wien*, 53 : 516.

Strumigenys (Strumigenys) godeffroyi, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1 : 108.

Material examined : 23 ex: 6 ex, India Meghalaya, East Khasi hills, Shillong, 27.v.76, Coll. R. Mathew, 15 ex, Shillong, 17.viii.75, coll. R. Mathew; 1 ex, Shillong, 20.vi.75, Coll. R. Mathew; 1 ex, Shillong, 18.vi.79, Coll. R. Mathew.

Diagnostic characters : worker. Pale reddish yellow; head and thorax somewhat coarsely and very closely punctate-reticulate and opaque; punctures on the thorax less deep than on the head; abdomen smooth and shining with the base above covered with short longitudinal striae; the innermost of the three mandibular teeth long and spiniform; antennal scape not reaching much beyond the level of the eyes.

Length : W. 2.5-3 mm.

Distribution : INDIA : Meghalaya; (East Khasi hills), Western and Southern India. Elsewhere : Malaysia; Myanmar.

36. Genus *Myrmicaria* Saunders, 1841

Myrmicaria Saunders, 1841, *Trans. Ent. Soc.* 3 :57

Myrmicaria Saunders, Brown, 1973, *In Tropical forest ecosystems in Africa and south America* : 161.

Diagnostic characters : worker. Antennae 7-jointed; clypeus broad, arched in front; mandibles armed with 4 teeth; eyes prominent, placed on the sides of the head; pronotum more or less globose, anterior lateral angles above and below marked by distinct tubercles or spines; mesonotum ending posteriorly in a more or less thick, transverse carina often subdentate at the lateral angles; metathorax cubical, the basal and apical faces subequal, margined by a carina, posterior lateral angles of the basal portion armed with an acute oblique spine; 1st node petiolate anteriorly and posteriorly; abdomen subglobose.

110. *Myrmicaria brunnea* Saunders

Myrmicaria brunnea Saunders, 1841, *Trans. Ent. soc. London*, 3 : 57.

Myrmicaria brunnea; Chapman and Capco, 1951, *Checklist of ants of Asia* 1 : 124.

Myrmicaria brunnea, Tiwari *et al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, Part 8 : 47.

Material examined : 1 ex : India, Meghalaya, East Khasi hills, Shillong, 5.viii.75, Coll R. Mathew.

Diagnostic characters : worker. Reddish brown, shining; head and thorax longitudinally striate; mandibles finely and closely striate; nodes of pedicel smooth or only slightly rugulose; pilosity long and abundant; abdomen smooth and polished.

Length : W. 5.5-8 mm.

Distribution : INDIA : Meghalaya, (East Khasi hills), throughout India. Elsewhere : Indo-china; Java; Sumatra; Sri Lanka.

37. Genus: *Vollenhovia* Mayr, 1865

Vollenhovia Mayr, 1865, *Novara Reise, Formicid.* : 21, w.

111. *Vollenhovia* sp.

Material examined : India: Meghalaya: East Khasi Hills, Shillong, 6 W, 29.iii.1959, Coll. A.P. Kapur and party.

Distribution : INDIA : Meghalaya, (East Khasi Hills).

VI. SUBFAMILY DOLICHODERINAE

Clypeus produced upward between the frontal carinae; antennae 12- jointed; pedicel 1-jointed; cloacal opening a vertral transverse slit; sting vestigial; when irritated the workers expel the secretion of the anal glands which becomes resinous in contact with air and gives off a characteristic aromatic odour.

Key to the species of *Dolichoderinae*

1.	Clypeus with an oval side process overlapping the base of the mandibles on each side.	<i>Liometopum</i>
	Clypeus without such side processes	2
2.	Base of abdomen gibbous, overhanging the pedicel; anal orifice inferior	3
-	Base of abdomen not gibbous, not overhanging the base of pedicel	4
3.	Pedicel with a small, low, but distinct node inclined obliquely forward	<i>Bothriomyrmex</i>
	Pedicel without a distinct node	<i>Tapinoma</i>
4.	Metanotum laterally compressed, with a basal face more or less horizontal, and an apical face truncate, vertical, often concave.	<i>Dolichoderus</i>
	Metanotum not laterally compressed, rounded, its basal face passing into the obliquely truncate sloping apical face by a more or less rounded curve.	<i>Iridomyrmex</i>

38. Genus *Liometopum* Mayr 1861

Liometopum Mayr, 1861, *Europ. Form.* :38.

Liometopum, Brown 1973, *In Tropical forest ecosystems in Africa and South America* , 161-185.

Diagnostic characters : worker. Antennae 12-jointed; mandibles broad, with 8-10 teeth, apical tooth long, acute and curved; clypeus triangular, rounded posteriorly and extending to between the antennal carinae, laterally it extends in little oval processes over the basal portion of the mandibles, its anterior margin transverse; thoracic sutures well marked; node of pedicel oval erect abdomen broadly oval.

112. *Liometopum lindgreeni* Forel (Fig.66)

Liometopum lindgreeni Forel, 1902, *Ann. Soc. Ent. Belg.*, **46**:293.

Liometopum lindgreeni, Mathew, 1983, *Bull. zool.Surv. India* **5** (1) : 125- 127.

Material examines : 9 ex: 7 ex, India Meghalaya, East Khasi hills, Shillong, 4.viii.77, Coll. K.K. Deb; 2 ex, East Khasi hills, Nongkhylllem reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan, 3 ex, East Garo hills, Songsok, 6.v.79, Coll. J.K. Jonathan and party.

Diagnostic characters : worker. Reddish yellow, abdomen brownish; pilosity spars, more on abdomen, pubescence dense and decumbent, giving the insect an opaque appearance.

Length : W. 4.5-5 mm.

Distribution : INDIA : (East Khasi hills & East Garo hills), Meghalaya; Assam. Elsewhere : Myanmar.

39. Genus *Bothriomyrmex* Emery, 1869

Bothriomyrmex Emery, 1865, *Ann. Mus. Zool. Univ. Nap.*, **5**:117.

Bothriomyrmex, Brown, 1973, *In Tropical forest ecosystems Africa and in South America*, 161-185.

Diagnostic characters : W. Broader in proportion to its length, head nearly square; mandibles narrow, when closed, hidden under the anterior margin of the clypeus, which is not incised; antennae 12-jointed; thoracic sutures distinct; node of pedicel distinctly raised and not flattened on the pedicel.

113. *Bothriomyrmex myops* Forel

Bothriomyrmex myops Forel, 1895, *Jour. Bour. Nat. Hist. Soc.* **9** : 761.

Bothriomyrmex myops, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:187.

Material examined : 11 ex, India, Meghalaya, East Khasi hills, Shillong, Motinagar forest, 23.viii.75, Coll. R. Mathew.

Diagnostic characters : worker. Pale yellowish, abdomen slightly brownish; head proportionately large, convex anteriorly; mandibles broad, punctured; clypeus widely subtriangular, anterior margin transverse; antennae short, scape barely reaching the top the head; eyes small; thorax

short and broad; node of pedicel very low, strongly inclined forward; abdomen large and massive, very convex in front.

Length : W. 1.5-2 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Sikkim; Western India.

Remarks : Forages in the forest floor.

40. Genus *Iridomyrmex* Mayr, 1862

Iridomyrmex Mayr, 1862, *Verh. zool.-bot. Ges. Wien*, **12**:702.

Iridomyrmex, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Mandibles broad, armed with 7-8 teeth; Clypeus convex, anteriorly transverse; antennae long, scape extending beyond the top of the head; thorax, convex, mesonotum somewhat cylindrical; metanotum more or less raised, convex and gibbous; node of pedicel slightly inclined forward; abdomen short, broadly oval.

114. *Iridomyrmex anceps* (Roger)

Formica anceps Roger, 1863, *Berl. ent. Zeitschr.*, **7**:164.

Iridomyrmex anceps, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:188.

Iridomyrmex anceps, Tiwari *et al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part **8**.

Material examined : 88 ex: 31 ex, India Meghalaya, Jaintia hills, Shangpung, 8.xii.75, Coll. S.K. Chanda; 2 ex, East Khasi Hills, Nongkhylllem Reserve Forest, Umtasor, 19.i.83, Coll. C. Radhakrishnan; 6 ex, Jaintia hills, Garampani, 21.i.83, Coll. C. Radhakrishnan; 3 ex, East Khasi hills, Cherrapunjee, 16.xii.82, Coll. Raj Tilak; 4 ex, Jaintia hills, Nartiang, 5.ix.86, Coll. V.T. Darlong; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 41 ex, Jaintia hills, 24 km. before Garampani; 9.iii.88, Coll. K.P. Singh.

Diagnostic characters : W. Greyish; pubescence fine, silky and somewhat abundant; node of pedicel slightly inclined to the front.

Length : W. 3.5-4.5 mm.

Distribution : INDIA : (East and West Khasi hills, Jaintia hills), Meghalaya; Assam; throughout India excepting Punjab. Elsewhere : Myanmar; Tennaserim; Malaya; Java.

Remarks : Very fast moving insects.

41. Genus *Dolichoderus* Lund, 1831.

Dolichoderus Lund, 1831, *Ann. Sc. Nat.* 23:130.

Dolichoderus, Brown, 1973, *In Tropical forest ecosystems in Africa and South America*: 161-185.

Diagnostic characters : Mandibles broad, with 10-12 small teeth; Clypeus convex, anterior margin transverse; antennae 12-jointed; thorax laterally compressed; pronotum convex or flat; thorax emarginate at the mesometanotal suture; pedicel with a single joint.

Key to the species of *Dolichoderus* Lund.

1.	Mesonotum longitudinally sulcate above	2
	Mesonotum not longitudinally sulcate above; thorax coarsely punctate	<i>sundari</i>
2.	Head, thorax and abdomen with erect hairs	3
	Head, thorax and abdomen without erect hairs, but with abundant silky pubescence	<i>fuscus</i>
3.	Head finely punctured, pubescent and opaque; thorax very coarsely rugose	<i>bituberculatus</i>
-	Head smooth and shining, not opaque	4
4.	Head and thorax reddish yellow; abdomen black	<i>tuporbanae</i>
-	Head, thorax and abdomen concolourous	<i>affinis</i>

115. *Dolichoderus affinis* Emery

Dolichoderus affinis Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova.*, 27:508.

Dolichoderus (Hypoclinea) affinis, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:181.

Material examined : 68 ex: 3 ex, India, Meghalaya, West Garo hills, Anogiri, 22.iii.75, Coll. S. Biswas; 15 ex, East Khasi hills, Umran, 12.ix.67; Coll. R.K. Varshney; 25 ex, Jaintia hills, Nartiang, 7.v.87, Coll. C. Radhakrishnan; 25 ex, West Garo hills, Selbalgiri, Alt. 2000¹, 28.iv.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Reddish brown to dark brown, head shining, very finely closely punctate; apical tooth of mandibles acute and slightly curved; eyes placed above the middle of the head; pronotum slightly flat and anteriorly margined; mesonotum raised, somewhat flat, indistinctly medially sulcate; metanotum slightly convex, and sloping from back to front, its apical portion truncate and concave; the whole thorax irregularly but very distinctly punctured wrinkled and sculptured; abdomen smooth and shining.

Length : W. 3.5-4 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills, Jaintia hills), Meghalaya; Assam. Elsewhere : Myanmar; Siam; Tenasserim.

116. *Dolichoderus bituberculatus* Mayr (Fig.63)

Dolichoderus bituberculatus Mayr, *Verh. zool.-bot. Ges., Wien.*, 12 (1862), 705.

Dolichoderus (Hypoclinea) bituberculatus, Chapman and Capco, 1951 *Checklist of ants of Asia*, 1 :182.

Dolichoderus bituberculatus, Tiwari *et. al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part 8:35.

Material examined: 30 ex: 25 ex, India, Meghalaya, Jaintia hills, Garampani, 12.xii.75, Coll. S.K. Chanda; 5 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan.

Diagnostic characters : W. Black, head convex in front and on sides; mandibles triangular, masticatory margin broad, the teeth minute; eyes flat; head densely punctured and opaque; thorax very coarsely cribrately punctured and wrinkled; pronotum more or less flat and margined anteriorly mesonotum longitudinally sulcate, the sides raised into tubercles, more marked in some specimens than others; apical portion of metanotum truncate, inwardly curved and concave, the sides of metanotum flat, smooth, margined above and posteriorly; node of the pedicel and abdomen smooth and shining.

Length : W 3-3.5 mm

Distribution : INDIA : (East Khasi hills, Jaintia hills), Meghalaya; Sikkim; Western India. Elsewhere : Myanmar; Tenasserim; Malaya; Java.

117. *Dolichoderus fuscus* Emery

Dolichoderus feae race *fuscus*, Emery, *Ann. Mus. Civ. Stor. Nat. Genova*; 27 (1895), 509.

Dolichoderus (Hypoclinea) feae subsp. *Fusca*, Chapman and Capco 1951, *Checklist of ants of Asia*, 1:183.

Material examined : 4 ex, India, Meghalaya, East Khasi hills, Pynursla, 17.vii.87, Coll. C. Radhakrishnan.

Diagnostic Characters : W. Head, thorax and abdomen dark fuscous brown; head finely and closely reticulate punctate, subopaque; thorax irregularly punctured and wrinkled, longitudinally and obliquely striate on the sides.

Length : W. 6.5-7 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar And Tenasserim.

118. *Dolichoderus sundari* sp.nov. (Fig.64,65)

Holotype Worker : TL 4.00; HL 0.87; HW 0.87; CI 100; SL 0.68; SI 78; PW 0.58; Th L 1.05.

Head massive, with the mandibles cordate, the sides convex and round; antennae long, reaching back the top of head; clypeus region with short longitudinal striae, anterior clypeal margin not entire, feebly impressed in the middle; mandibles broad, shagreened; masticatory margin with ten to twelve minute teeth, apical two prominent; eyes large, placed about the middle of the head towards the front; pronotum concave; promesonotal suture distinct; mesonotum feebly raised; thorax emarginate at the meso- metanotal suture; basal portion of metanotum flat, apical portion truncate, concave, the concavity smooth and shining; the node of pedicel scale like, inclined forward; abdomen convex, massive; head, abdomen and node of pedicel smooth, polished and shining; thorax coarsely punctate; hairs on body numerous.

Colour : Head, thorax, node of pedicel and abdomen pitch black, the mandibles, antennae and legs brownish yellow, legs a lighter shade.

Paratype Workers : TL 3.24-3.95; HL 0.79-0.87; HW 0.79-0.87; CI 97-100; SL 0.66-0.68; SI 78-86; PW 0.55-0.58; Th L 1.05.

Similar to holotype

Holotype Worker : India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, 28.i.82, Coll. R. Mathew. Paratypes: 9 workers with the same collection data as the holotype.

Dolichoderus sundari comes closer to *sulcaticeps* and is distinguishable from it by the former's smaller size and structure and sculpture of the thorax.

Remarks : The type specimens were collected from within a wild fruit of a creeper in the reserve forest.

119. *Dolichoderus taprobanae* (Fred. Smith)

Formica taprobanae Fred.Smith, 1858, *Cat. Hym. Brit. Mus.*, 6 : 13.

Dolichoderus (Hypoclinea) taprobanae, Chapman and Capco 1951, *Checklist of ants of Asia*, 1:185.

Material examined : 9 ex, India Meghalaya, East Khasi hills, Pynursla, 17.vii.81, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Brownish red; abdomen black; head smooth and shining; thorax laterally compressed; pronotum anteriorly margined, convex, mesonotum longitudinally sulcate; meso-metanotal emargination deep, well-marked; apical portion of metanotum truncate, slightly concave.

Length : W. 2.5-3.3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, throughout India.

120. *Dolichoderus* sp.

Material examined : India: Meghalaya: West Garo hills, Tura, On the way to Tura peak (700m.) 9 ww + 1o, 1.v. 1979, Coll. J.K. Jonathan and party.

Distribution : INDIA : (West Garo hills), Meghalaya.

42. Genus *Tapinoma* Foerster, 1850.

Tapinoma, Foerster, 1850, *Hym. Stud.* i : p. 43.

Tapinoma foerster, Brown, 1973, *In Tropical forest ecosystems in Africa and South America*, 161-185.

Diagnostic characters : worker. Antennae 12-jointed; clypeus broad anterior margin not incised; eyes large, lateral, placed a little to the front; thoracic sutures distinct; pedicel with the node flat, strongly inclined to the front; abdomen oval, the basal segment gibbous, overhanging the node.

Key to the species of *Tapinoma* Foerster

Antennae long, the scape extending beyond the top of the head . . . *melanocephalum*

Antennae short, the scape not extending beyond the top of the head *indicum*

121. *Tapinoma indicum* Forel

Tapinoma indicum Forel, 1895, *J. Bomb. Nat. Hist. Soc.*, 9 : 472

Tapinoma indicum, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1:193.

Material examined : 35 ex; 15 ex, India Meghalaya, East Khasi hills, Shillong, 24.viii.75, Coll. R. Mathew; 20 ex, Jaintia hills, Nartiang, 7.v.87, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Black; head, thorax and abdomen somewhat smooth, with a few scattered erect hairs; pubescence white; head longer than broad, oval; mandibles triangular, masticatory margin with numerous minute teeth; clypeus convex, anterior margin transverse or slightly arched; thoracic sutures distinct, thorax slightly constricted at the meso-metanotal suture.

Length : W. 1.5-2 mm.

Distribution : INDIA : (East Khasi hills, Jaintia hills), Meghalaya; throughout India.

122. *Tapinoma melanocephalum* (Fabricius)

Formica melanocephalum Fabricius, 1793, *Ent. syst.*, 2:353.

Tapinoma melanocephalum, Mathew, 1983, *Bull. zool. Surv. India*, **5** (1) : 125-127.

Material examined : 16 ex : 6 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.i.83, Coll. C. Radhakrishnan; 10 ex, East Khasi hills, Shillong, Risa Colony, 8.vii.79, Coll. R. Mathew.

Diagnostic characters : worker. Reddish or brownish yellow all over; pilosity entirely wanting; thorax proportionately much broader in front, posteriorly laterally compressed; thoracic suture distinct.

Length : W. 1.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Western India.

43. Genus: *Technomyrmex* Mayr

Technomyrmex Mayr, 1870, *Ann. Mus. Civ. Ges.* **2**:147

123. *Technomyrmex* sp.

Material examined : India: Meghalaya: East Garo Hills, Bamandanga, east of Phulbari, 5 ww, 27.x.1988, Coll. K.K. Ray and party.

Distribution : INDIA : (East Garo hills), Meghalaya.

VII SUB-FAMILY FORMICINAE

Formicinae is morphologically the most highly developed of all ants, their habits are diverse and exhibit specialized form of social behaviour. Diet is largely vegetarian and they show great predilection for sugary substances. The species of *Oecophylla*, *Polyrhachis* and *Camponotus* build silk nests on leaves using their larvae as silk-producing shuttles. This subfamily also has making ants and true social parasites. Workers have single jointed pedicel; vestigial sting; and an acidopore, ciliated round the margin.

Key to the genera of Formicinae

1.	Antennae 12-jointed	2
-	Antennae 11-jointed	3
2.	Maxillary palpi 5-jointed	<i>Oecophylla</i>
-	Maxillary palpi 6-jointed	4
3.	Metanotum and node of pedicel bispinous or bidentate	<i>Acantholepis</i>
-	Metanotum and node of pedicel without spines or teeth	7
4.	Antennae inserted at a perceptible distance from posterior margin of clypeus	5

	Antennae inserted immediately above posterior margin of clypeus, almost touching it	6
5.	Thorax and or node of pedicel with spines or teeth	<i>Polyrhachis</i>
	Thorax and node of pedicel without spines or teeth	<i>Camponotus</i>
6.	Antennal and clypeal hollows confluent, eyes small, ocelli absent	<i>Pseudolasius</i>
	Antennal and clypeal hollows not confluent	<i>Paratrechina</i>
7.	Mesonotum not constricted nor impressed in front	<i>Anoplolepis</i>
	Mesonotum constricted or impressed	<i>Plagiolepis</i>

44. Genus *Oecophylla* Fred.Smith, 1860

Oecophylla Smith, 1861, *J. Linn. Soc.* 5:101.

Oecophylla, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Dimorphic; head slightly broader posteriorly; mandibles long, masticatory margin very broad, apical tooth acute and curved; clypeus strongly convex; antennae 12-jointed; eyes large, ocelli absent; thorax elongate; pronotum narrowed anteriorly into a collar; mesonotum constricted, saddle shaped in side view; metanotum rounded above, gibbous; thoracic sutures distinct, pedicel scarcely nodiform; abdomen short oval.

124. *Oecophylla smaragdina* (Fabricius)

Formica smaragdina Fabricius, 1775, *Syst. Ent.*:828, Worker, pl., figs.

Oecophylla smaragdina, Greenslade, 1971, *J. appl.Ecol.*, 8 : 323-352

Oecophylla smaragdina, Tiwari *et.al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part 8:67.

Material examined : 180 ex: 50 ex, India, Meghalaya, Garo hills, Rengsengiri, 13.xi.73, Coll. S. Biswas; 28 ex, Garo hills, Naphok bil, 8 km. east of Songsak, 12.iv.73, Coll. S. Biswas; 11 ex, East Khasi hills, Nongpoh, 6.xii.86, Coll. R. mathew; 8 ex, West Garo hills, Balphakram Sanctuary, 12.xi.87, Coll. V.T. Darlong; 56 ex, East Khasi hills, Lai-lad, Alt. 1000', 12.iii.87, Coll. V.T. Darlong; 56 ex, East Khasi hills, Lai-lad, Alt. 1000', 12.iii.87, Coll. V.T. Darlong; 27 ex, Lai-lad, 16.v.89, Coll. Y.P. Singha; 10 ex west Garo hills, Tura, 3.v.75, Coll. J.K. Jonathan and party; 15 ex, Ri-Bhoi, Nagthymme, 2.ix.88, Coll. A.R. Lahiri and party; 14 ex, East Garo hills, William Nagar, 11.iii.91, Coll. B.C. Das and party.

Diagnostic characters : worker. Yellowish or orangish red; head, thorax, legs, node of pedicel and abdomen dull, sub-opaque.

Length : W. 9.5-11 mm.

Distribution : INDIA : (East Khasi, West Garo hills, East Garo hills and Ri-Bhoi), Meghalaya; throughout India. Elsewhere : China Myanmar; Sri Lanka; New Britain.

45. Genus *Pseudolasius* Emery, 1866

Pseudolasius Emery, 1886, *Ann. Mus. Civ. Gen.* **24**:244

Pseudolasius, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters: worker. Mandibles with 4 teeth; antennae 12- jointed; clypeus convex in middle, anterior margin transverse; clypeal and antennal hollows confluent; eyes small, ocelli absent; head square, deeply emarginate posteriorly pronotum rounded, convex; viewed from above mesonotum circular; metanotum obliquely truncate, the basal portion much shorter than the oblique apical portion; thoracic sutures distinct; node of the pedicel quadrangular, slightly emarginate above, posteriorly fitting into a hollow in the abdomen; abdomen short, broad and convex, somewhat gibbous in front; dimorphic.

125. *Pseudolasius familiaris* (Fred.Smith)

Formica familiaris Fred.Smith, 1860, *J. Proc. Linn. Soc.Lond. Zool.* **4** suppl. 68.

Pseudolasius familiaris, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:204.

Material examined : 6 ex, India, Meghalaya, East Khasi hills, Cherra-Shellia Road, Alt. 2000^l, 3.ix.86, Coll. K.P. Singh.

Diagnostic characters : worker. Reddish yellow, abdomen reddish brown; head, thorax and abdomen very minutely but closely reticulate- punctate, and covered copiously with minute piligerous tubercles; pubescence silky and dense on the abdomen.

Length : W. 6-7 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Sikkim. Elsewhere : Java; Myanmar.

46. Genus: *Myrmecocystus* Wesmael

Myrmecocystus Wesmael, 1838, *Bull. Acad. Sc. Brux.*, **5**:770.

126. *Myrmecocystus setipes* Forel

Myrmecocystus viaticus, race *setipes* Forel, 1894, *Journ. Bombay Nat. Hist. Soc.*, **8** : 401, w.

Myrmecocystus setipes, Tiwari et al., 1994, *State Fauna Series 3 : Fauna of West Bengal*, Part **8** : 278.

Material examined : India: Meghalaya: West Garo hills, Darangiri, 14 ww, 30.iv.1979, Coll. J.K. Jonathan and party; West Garo hills, Tura, 5oo, 2.v.1979, Coll. J.K. Jonathan.

Diagnostic characters : worker. TL 10-12mm. Head, thorax, legs and node of pedicel dark red, abdomen black. Head without the mandibles quadrangular; the sides straight; mandibles large, strongly dentate, apical tooth remarkably long, curved and acute; antennae 12-jointed. Thorax viewed from the side constricted in the middle, saddle-shaped, sutures well-marked. Pedicel one-jointed, node rounded, not much raised; abdomen somewhat short, oval.

Distribution : INDIA : Meghalaya (West Garo Hills), Punjab, West Bengal, Central India. Elsewhere : Parsia.

47. Genus *Acantholepis* Mayr, 1861.

Acantholepis Mayr, 1861, *Eur. Form.*, P. 42.

Acantholepis, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : worker. Clypeus broad and high, sharply carinate down the middle; antennae 11-jointed, scape extending beyond the top of the head; eyes moderate, ocelli distinct; thorax constricted at the mesonotum; thoracic sutures distinct; metanotum obtusely dentate on each side; pedicel single jointed, node dentate or spinous; abdomen broadly oval.

Key to the species of *Acantholepis* Mayr

1. Scape of antennae remarkably long, extending more than half its length beyond the top of the head. *. frauenfeldi*
- Scape of antennae shorter, extending beyond the top of the head by not more than one third of its length. 2
2. Head, thorax and abdomen abundantly pilose; head highly polished, shining; head and abdomen black *capensis*
- Head, thorax and abdomen smooth, without hairs except at the apex of the abdomen *simplex*

127. *Acantholepis capensis* Mayr

Acantholepis capensis Mayr, 1862, *Verh-zool. Bot. Ges. Wien*, 12:699.

Acantholepis capensis, Majer, 1976, *J. appl. Ecol.*, 13:145-155.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Shillong, 28.vi.75, Coll. R. Mathew.

Diagnostic characters : worker. Black, shining; pilosity abundant; mandibles small, when closed hidden under the clypeus; metanotum finely sculptured; node of pedicel emarginate and bidentate; abdomen oval, rapidly narrowing towards apex.

Length : W. 2.3-3.3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Central India; Maharashtra; Himalayas. Elsewhere : Sri Lanka; Africa.

128. *Acantholepis frauenfeldi* Mayr

Acantholepis frauenfeldi Mayr, 1855, *Verh. zool-bot. Ver. Wien*, 5:378.

Acantholepis frauenfeldi, Wheeler & Wheeler, 1968, *Ann. Entomol. Soc. Amer.* 61 (1) : 205-222.

Acantholepis frauenfeldi; Tiwari *et.al.*, 1994, *State Fauna series 3: Fauna of West Bengal*, part 8:69.

Material examined : 1 ex, India, Meghalaya, East Khasi hills, Shillong, Nongthymmai, 12.iii.76, coll. R.S. Giri.

Diagnostic characters : worker. Brownish, abdomen dark brown; head, thorax and abdomen smooth and shining mandibles narrow, curved, with the apical tooth long and acute; clypeus convex, with a faint transverse subapical furrow parallel to its anterior margin; pronotum from above appears almost circular; mesonotum strongly constricted; metanotal teeth thick and broad at base, obtuse; node of pedicel seen from above pentagonal, the upper border slightly emarginate; with a tooth at its lateral angles; abdomen oval.

Length : W. 2.5-3 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; West Bengal; throughout continental India. Elsewhere : Europe; Africa.

129. *Acantholepis capensis simplex* Forel

Acantholepis simplex Forel, 1892, *Ann. Soc. Ent. Belge*, 36:43

Acantholepis capensis subsp. *simplex*, Chapman and Capco, 1951, *Checklist of the ants of Asia*, 1:210.

Acantholepis capensis simplex; Tiwari *et al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part 8:68 (Syns.)

Material examined : 5 ex: 1 ex, India, Meghalaya, East Khasi hills, Nongpoh, 28.x.83, Coll. R. Mathew; 4 ex, East Khasi hills, Nongkhylliem Reserve Forest, Umtasor, 31.iii.84, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Black; entirely without pilosity or pubescence; mandibles acutely dentate; scape of antennae extending little beyond the top of the head; node of pedicel slightly emarginate above, lateral angles of the margin above not spinous or dentate.

Length : W. 2 mm.

Distribution : INDIA : East Khasi hills, Meghalaya; Orissa; Northern India. Elsewhere : Arabia; Africa.

48. Genus *Anoplolepis* Santschi, 1914

Plagiolepis, Subgen. *Anoplolepis*, Santschi, 1914, *Vox. Alluand and Jeannel, Afr. or Hym* : 123.

Anoplolepis, Brown, 1973, *In Tropical forest ecosystems in Africa and South America*, 161-185.

Diagnostic characters : o. Antennae 11-jointed; mandibles narrow with 5 teeth, apical tooth long and acute; clypeus large, convex, carinate, anterior margin arched and partially covering the mandibles; mesonotum not constricted.

130. *Anoplolepis longipes* (Jerodon)

Formica longipes Jerdon, 1851, *Madras Jour. Lit. Sc.*, 17:122.

Anoplolepis longipes, Devi & Singh, 1987, *Entomon.*, 12 (4) : 309-313.

Anoplolepis longipes, Tiwari et al., 1994, *State Fauna series 3: Fauna of West Bengal*, part 8:69.

Material examined : 24 ex: 2 ex, India, Meghalaya, Jaintia hills, Rotachara, 24.i.75, Coll. A.K. ghosh; 1 ex, East Khasi hills, Shillong, Bishnupur, 24.v.81, Coll. C. Radhakrishnan; 21 ex, East Khasi hills, 4 km. away from Lai-lad on the forest road to Patharkhma, 22.iv.88, Coll. A.K. Karmakar.

Diagnostic characters : worker. Light yellow to orange-yellow, abdomen brown; head, thorax and abdomen very minutely and closely reticulate-punctate, shining; metanotum rounded, convex and gibbous; node of pedicel thick, low rounded above, abdomen oval.

Length: W. 3.5-4.5 mm.

Distribution : INDIA : (East Khasi hills, Jaintia hills), Meghalaya; throughout India. Elsewhere : Myanmar; sri lanka.

49. Genus *Plagiolepis* Mayr, 1861

Plagiolepis Mayr, 1861, *Eur. Form.*, p. 42.

Plagiolepis, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* 161-185.

Diagnostic characters : worker. Antennae 11-jointed; clypeus carinate; thorax often saddle shaped at the mesonotum; metanotum unarmed, rounded; node of pedicel inclined in front, not emarginate above; ocelli absent.

131. *Plagiolepis dichroa* Forel

Plagiolepis dichroa Forel, 1902, *Rev. Suisse. Zool.* **10**:235.

Plagiolepis dichroa, Chapman and Capco, 1951, *Checklist of the ants of Asia*, **1**:213.

Plagiolepis dichroa, Tiwari *et.al.*, 1994, *State Fauna series 3: Fauna of West Bengal*, part **8**:70

Material examined: 15 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Yellowish, head light or dark brown; head thorax and abdomen smooth and shining, head much broader posteriorly and proportionately more narrowed anteriorly; metanotum transversely concave down the middle.

Length : W. 2 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Sikkim; West Bengal.

50. Genus *Paratrechina* Motschoulsky 1863

Paratrechina Motschoulsky, 1863, *Bull. Soc. Imp. Nat. Moscou* **36**:13

Paratrechina, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* 161-185.

Diagnostic characters : worker. Head slightly longer than broad, emarginate posteriorly; eyes large, placed about the middle of the head; antennae 12-jointed; pedicel one jointed.

132. *Paratrechina longicornis* Latreille

Formica longicornis Latreille, 1802, *Nat. Hist. Fourmis*, 113.

Paratrechina longicornis, Devi & Singh, 1987, *Entomon* **12** (4) : 309-313.

Paratrechina longicornis, Tiwari *et.al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part **8**:67

Material Examined : 12 ex: 2 ex, India, Meghalaya, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth; 7 ex, East Khasi hills, Nongkhylllem Reserve Forest, Lai-lad, Alt. 1000 ft., 12.iii.87, Coll. V.T. Darlong; 3 ex, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Dull coppery brown; pilosity abundant all over; eyes large, prominent; mandibles small, with 5 or 6 teeth; clypeus convex, rounded, thoracic sutures distinct, thorax lightly emarginate at the mesonotum; abdomen anteriorly gibbous.

Length : W. 2.5-3 mm.

Distribution : INDIA : (East and West Khasi hills), Meghalaya throughout India.

51. Genus *Camponotus* Mayr, 1861

Camponotus Mayr, 1861, *Eur. Form.* p. 35.

Camponotus, Brown, 1973, *In Tropical forest ecosystems in Africa and South America* 161-185.

Disgnostic characters : worker. Antennae 12-jointed; clypeus trapeziform; eyes large; ocelli absent; head may or may not be obliquely and rather sharply truncate anteriorly beyond the clypeus; thorax posteriorly more or less compressed, sutures distinct; pedicel one jointed; abdomen broadly oval; dimorphic.

Key to the spicel of *Camponotus* Mayr

1.	Head anteriorly obliquely and rather sharply truncate from just beyond the base of the clypeus	2
	Head differently formed	3
2.	Head, thorax and abdomen entirely black	4
	Head black and red, with a yellow spot on each side of the base of abdomen	<i>cotesii</i>
3.	Thorax viewed in side view, forming a regular continuous arch	5
	Thorax viewed in side view, not forming a regular arch	6
4.	Pubescence thin and grey	<i>stricta</i>
	Pubescence dense and yellow	<i>pubescens</i>
5.	Head, thorax and abdomen black	7
	Head, thorax and andomen not all black; abdomen with dense silky pubescence; clypeus with a distinct medial lobe produced anteriorly.	<i>rufoglausus</i>
6.	Metanotum armed with horizontal, laminate spines	<i>selene</i>
	Metanotum unarmed	9
7.	Tibiae of legs prismatic	8

- Tibiae of legs compressed, not prismatic; pubescence yellowish, length over 9 mm *paria*
- 8. Large species, length over 17-21 mm *angusticollis*
- Smaller species, length 11-16 mm *compressus*
- 9. Metanotum raised, rounded above and gibbous 10
- Metanotum not raised; its basal portion horizontal, flat; apical portion excavate; node of pedicel thick, globose *sericeus*
- 10. Antero lateral angles of pronotum dentate *wasmani*
- Antero lateral angles of pronotum not dentate 11
- 11. Thorax posteriorly and node of pedicel coarsely punctured, cribrate *holosericeus*
- Thorax posteriorly and node of pedicel finely reticulate- punctate, rugulose *camelinus*

133. *Camponotus cotesii* (Forel)

Colobopsis cotesii Forel, 1893, *Jour. Bomc. Nat. Hist. soc.* 7: 438.

Camponotus (Colobopsis) cotesii, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1 :223.

Material examined : 4 ex, India, Meghalaya, Jaintia hills, Khanduli, 7.v.87, Coll.C. Radhakrishnan.

Diagnostic characters : worker. Black and shining; the truncated portion of head, including the base of the clypeus, antennae and the front of the mandibles reddish; base of abdomen with two spots; a line along the base of the 2nd abdominal segment; head above coarsely rugose; thorax widely emarginate at the meso- metanotal suture; metanotum rounded, raised, node of pedicel notched above, abdomen massive.

Length : W. 8 mm.

Distribution : INDIA : (Jaintia and Garo hills), Meghalaya.

134. *Camponotus pubescens* (Mayr)

Colobopsis pubescens Mayr, 1862, *Verh. zool bot. Gesell. Wien* 12 : 691.

Camponotus (Colobopsis) pubescens, Chapman and capco, 1951, *Checklist of ants of Asia*, 1:226.

Material examined : 3 ex, India, Meghalaya, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Black; head large, convex, posterior margin of the truncate portion coarsely longitudinally striate; clypeus medially vertically carinate; thorax cylindrical, not sloping or emarginate; pubescence thick, yellowish, hiding the sculpture.

Length : W. 10-11 mm.

Distribution : INDIA : (West Garo hills), Meghalaya. Elsewhere : JAvA; Sumatra; Philippines.

135. *Camponotus strictus* (Jerdon)

Formica stricta Jerdon, 1851, *Madras. J. Lit. Sc.* 17: 123.

Camponotus (colobopsis) strictus, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:227

Material examined : 1 ex, India, Meghalaya, West Khasi hills, 7 km. north of Nongkhlaw, 20.ii.87, Coll. A.K. Karnakar.

Diagnostic characters : worker. Black; head massive, little narrower anteriorly than posteriorly; anterior truncated portion of the head depressed, thus the basal portion of clypeus bent downwards and inwards; the cheeks on either side of the depressed portion acutely ridged and coarsely obliquely striate; lower portion of head above truncation longitudinally striate; apical portion of metanotum obliquely truncate.

Length : W. 11-12 mm.

Distribution : INDIA : (West Khasi hills), Meghalaya, Kerala. Elsewhere : Borneo; Myanmar.

136. *Camponotus angusticollis* (Jerdon)

Formica angusticollis Jerdon, 1851, *Madras. Jour. Lit. Sc.* 17: 120.

Camponotus (Dinomyrmex) angusticollis, Collingwood, 1970, *KHUMBU. HIMAL*, Bd. 3, Lfg. 3, 371-388.

Componotus angusticollis, Tiwari *et.al.* 1994, *State Fauna Series 5: Fauna of West Bengal*, Part 8:58.

Material examined : 1 ex, India, Meghalaya, West Garo hills, Selbalgiri, Alt. 2000', 28.iv.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Black; opaque; head subtriangular; occipital angles widely emarginate, prominent; mandibles with 6 teeth; clypeus with a very prominent vertical carino, and a broad median lobe, transverse in front, very shortly produced; thorax elongate, narrow, node of pedicel thick, anteriorly flat at base, above convex, upper margin transverse and notched; posteriorly flat and truncate; abdomen massive.

Length : W. 17-21 mm.

Distribution : INDIA : (West Garo hills), Meghalaya; Assam. Elsewhere : Myanmar.

137. *Camponotus camelinus* (Fred.Smith)

Formica Camelina Fred.Smith, 1857, *J. Proc. Linn. Soc. Lond. Zool.* 2 : 57.

Camponotus camelinus, Mathew, 1984, *Bull. zool. Surv. India*, 6 (1-3) : 307- 308.

Material examined : 5 ex: 1 ex, India Meghalaya, east Khasi hills, Nongkhylllem Reserve Forest, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, Nongkhylllem Reserve Forest, Lai-lad, 23.i.82, Coll. C. Radhakrishnan; 1 ex, Nongpoh, 28.x.83, Coll. R. Mathew; 1 ex, West Garo hills, Selbalgiri, Alt. 2000', 28.iv.88, Coll. V.T. Darlong; 1 ex, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Black; pilosity abundant, erect; head, thorax and abdomen minutely reticulate-punctate and with minute scattered tubercles; head oval; occiput constricted and narrowed into a neck; mandibles with 7 teeth; clypeus with a median vertical carina, median lobe of clypeus broad and slightly produced, its anterior margin waved; node of pedicel rounded; abdomen massive.

Length : W. 14-15 mm.

Distribution : INDIA : (East Khasi and West Garo hills), Meghalaya; Sikkim. Elsewhere : Myanmar; Tenasserim; Singapore; Sumatra.

138. *Camponotus compressus* (Fabricius) (Fig.67)

Formica compressus Fabricius, 1787, *Mant. Insect* I:307.

Camponotus compressus, Mathew, 1984, *Bull. zool. Surv. India* 6 (1- 3) : 307-308.

Camponotus compressus, Tiwari *et.al.* 1994, *State Fauna Series 3 : Fauna of west Bengal*, part 8:59.

Material examined : 2 ex: 1 ex, India, West Khasi hills, Balat, 9.ix.86, Coll. M.R. Rynth; 1 ex, East Khasi hills, Cherra- Shella Road, Alt. 2000', 3.ix.86, Coll. K.P. Singh. 1 ex, East Garo hills, Dianadubi, 6-13.v.79, Coll. S.B. roy and R.N. Tiwari; 5 ex, Jaintia hills, Narliang, 11.iii.91, Coll. K.K. Roy and Party.

Diagnostic characters : worker. Black, opaque, very finely and densely reticulate-punctate, the pedicel and base of abdomen sometimes shining, mandibles with 7 teeth; clypeus medially vertically carinate, the middle portion anteriorly rectangularly produced into a lobe; eyes placed above the middle of the head, more to the front; thorax anteriorly produced into a collar; node of pedicel transverse, convex in front, flat posteriorly; abdomen broad and massive.

Length : W. 11-16 mm.

Distribution : INDIA : (East, West Khasi hills, East Garo hills and Jaintia hills), Meghalaya; Assam; Southern India. Elsewhere : Borneo; Myanmar; Sri Lanka; Philippines; Russia; Arabia; Africa.

139. *Camponotus holosericeus* Emery (Fig.68)

Camponotus holosericeus Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova* **27** : 515.

Camponotus (Myrmosaulus) holosericeus, Chapman and capco, 1951, *Checklist of the ants of Asia*, 1:238.

Material examined : 2 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Black; pubescence silky, recumbent, shining and yellowish; erect hairs few; head, thorax and abdomen very finely and closely reticulate-punctate with widely spaced shallow punctures; mandibles with 6 teeth; clypeus medially vertically carinate, median lobe slightly produced; thorax emarginate at the meso-metanotalsuture; the metanotum gibbous; node of pedicel convex on both sides; abdomen broad and short.

Length : W. 15 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Tenasserim.

140. *Camponotus paria* Emery

Camponotus micans race *paria* Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova*, **27**:513.

Camponotus rufoglaucus race *paria*, Forel 1892, *J. Bombay. Nat. Hist. Soc.*, **7**:226-238.

Camponotus paria, Bingham 1903. *Fauna. Brit. India*, Hymenoptera, **2**:364.

Camponotus (Myrmoscricus) rufoglaucus subsp. *paria*; Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:238.

Material examined : 6 ex, India Meghalaya, East Khasi hills, Upper Shillong, 1.viii.76, Coll. R. Mathew.

Diagnostic characters : worker. Black; clypeus produced in the middle, its lateral angles rounded, with a notch or emargination in the middle; pilosity dense, silky and equally spread.

Length : W. 9-10 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam; throughout India. Elsewhere : Myanmar; Sri Lanka.

141. *Camponotus rufoglaucus* (Jerdon)

Formica rufoglauca Jerdon, 1851, *Madras J. Lit. Sc.* **17**: 124.

Camponotus (Myrmosericus) rufoglaucus, Collingwood, 1970, *KHUMBU HIMAL*, Bd. 3, Lfg. 3, 371-388.

Material examined : 6 ex: 2 ex, India, Meghalaya, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 3 ex, East Khasi hills, Shillong, 24.v.81, Coll. C. Radhakrishnan; 1 ex, West Garo hills, Selbalgiri, Alt. 2000^l, collected the day after burning the jhum, 19.iii.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Head and thorax dried, abdomen brown, covered with close fine, silky pilosity; head widely emarginate, mandibles with 7 teeth; clypeus carinate, its median lobe anteriorly produced; abdomen large and massive.

Length : W. 9-10 mm.

Distribution : INDIA : (East Khasi and West Garo hills), Meghalaya; Assam; Delhi; Central India; Kerala. Elsewhere : Myanmar; Sri Lanka.

142. *Camponotus selene* (Emery)

Polyrhachis selene Emery, 1889, *Ann. Mus. Civ. Stor. Nat. Genova* 27 (1889), 516.

Camponotus (Orthonotomyrmex) selene, Chapman and capco, 1951, *Checklist of ants of Asia*, 1:242.

Camponotus selene, Mathew, 1983, *Bull. zool. Surv. India*, 5 (1) : 125-127.

Material examined : 21 ex; 3 ex, India Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P.Singh; 2 ex, East Khasi hills, Shillong, 16.vii.81, Coll. R. Mathew; 2 ex, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 3 ex, Shillong, Botanical Garden, 31.iii.79, Coll. R. Mathew; 4 ex, East Khasi hills, Mawpar, 16.iv.79, Coll. S.G. Patil; 7 ex, East Khasi hills, Nongpoh, 6 xii.86, coll. R. Mathew; 4 ex, East Khasi hills, Shillong, Polo-Bazar, 7.iv.91, Coll. S.K. Ghosh and party.

Diagnostic characters : worker. Black, opaque; head and thorax finely abdomen minutely and more finely rugulose; clypeus convex with a medial vertical carina, its anterior margin strongly arched and rounded; anterior lateral angles of pronotum pointed; pronotum much broader than long; mesonotum flat, transversely oval; basal portion of metanotum posteriorly forked into two backwardly pointing laminate, inwardly curved spines or lobes node of pedicel thick, conical, raised in the middle, above transversely grooved; abdomen comparatively massive.

Length : W. 3-4 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Tenasserim.

Remarks : Nests are observed in rotten tree trunks. Its is a slow moving species and feigns dead when disturbed.

143. *Camponotus sericeus* (Fabricius) (Fig.69)

Formica sericeus Fabricius, 1798, *Suppl. Ent. Syst.* 279.

Camponotus sericeus, Basalingappa et.al. 1986, *Entomon* 11 (2) : 101-106.

Camponotus sericeus, Tiwari et.al. 1994, *State Fauna Series 3: Fauna of West Bengal*, Part 8:61.

Material examined : 5 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew.

Diagnostic characters : worker. Black, opaque; head and thorax granulate; mandibles with 5 teeth; clypeus broad, the anterior border broadly emarginate in the middle; thorax broad in front, strongly compressed posteriorly, emarginate at the meso-metanotal suture; basal portion of metanotum horizontal, flat, the sides margined; apical portion of metanotum concave; node of pedicel rounded, knob-like; abdomen globose, with dense recumbent silky golden pubescence.

Length : W. 8-10 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, throughout India. Elsewhere : Myanmar; Sri Lanka; Africa.

144. *Camponotus wasmanni* Emery (Fig.70)

Camponotus wasmanni Emery, 1893, *Rev. Suisse Zool.* 1:224.

Camponotus (Orthonotomyrmex) wasmanni; Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:248.

Material examined : 12 ex: 3 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 23.iv.77, Coll. R. Mathew; 1 ex, Jaintia hills, Shangpung, 7.xii.75, Coll. S.K. Chanda; 4 ex, Old Barapani, 30 xii.81, Coll. C. Radhakrishnan; 1 ex, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 3 ex, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 19.v.82, Coll. C. Radhakrishnan.

Diagnostic characters : worker. Black, thickly covered with erect hoary white pubescence; mandibles bright castaneous red; head thorax and abdomen closely finely reticulate-punctate; head broadly triangular; clypeus with a prominent vertical carina and a very shortly produced median lobe; thorax short and dbroad, lateral angles of pronotum dentate; thoracic sutures distinct; narrow emargination at the meso-metanotal suture; node of pedicel knob-like; abdomen broadly oval.

Length : W. 11-13 mm.

Distribution : INDIA : (East, Khasi and Jaintia hills), Meghalaya; throughout India; Sikkim.

52. Genus *Polyrhachis* Fred.Smith, 1858.

Polyrhachis Fred.Smith, 1858, *J. Proc. Linn. Soc. Lond. Zool.*, 2:58.

Polyrhachis, Brown, *In Tropical forest ecosystems in Africa and South America* : 161-185.

Diagnostic characters : o. Head more or less orbicular; thorax and or pedicel armed with spines or teeth.

Key to the species of *Polyrhachis*

1.	Thorax wholly unarmed, pedicel with 4 subequal spines or teeth	<i>rastellata</i>
	Thorax armed with spines or teeth	2
2.	Thorax more or less rounded above, the sides not margined along their whole length	3
-	Thorax more or less flat above, the sides margined along their whole length	12
3.	Pronotum with a short tooth on each side; mesonotum and metanotum unarmed	<i>laevissima</i>
	Pronotum with short tooth or spine on each side; metanotum with a spine on each side	4
4.	Pronotum with a short tooth	<i>ceylonensis</i>
	Pronotum with a spine on each side	5
5.	Pubescence soft, erect and abundant	<i>furcata</i>
-	Pubescence short, silky and recumbent, or sparse and erect, or entirely absent	6
6.	Basal portion of metanotum distinctly margined laterally	7
-	Basal portion of metanotum not margined laterally	8
7.	Pro-and metanotal spines subequal	<i>abdominalis</i>
	Metanotal spines nearly twice the length of pronotal spines	<i>mutata</i>
8.	Pubescence sparse, almost entirely wanting	<i>armata</i>
-	Pubescence dense, silky and recumbent	9
9.	Abdomen red	<i>bicolor</i>
-	Abdomen black	10
10.	Pubescence silvery	<i>tibialis</i>
	Pubescence bronzy yellow or golden	11
11.	Two small teeth between spines of node of pedicel	<i>dives</i>
-	Three small teeth between spines of node of pedicel	<i>affinis</i>

12.	Pronotum with a short spine or tooth	<i>punctillata</i>
	Pronotum with a long spine	13
13.	Node of pedicel armed with 4 short subequal spines	<i>convexa</i>
	Node of pedicel with 2 long spines on upper angles, and two short lateral spines or teeth on sides.	14
14.	Lateral spines or teeth truncate at apex	15
	Lateral spines or teeth pointed at apex	16
15.	Pubescence very dense	<i>proxima</i>
	Pubescence sparsely	<i>intermedia</i>
16.	Pubescence absent or very sparse	<i>striata</i>
	Pubescence fairly present	17
17.	Pubescence moderately dense	<i>illaudata</i>
	Pubescence very dense	<i>mayri</i>

145. *Polyrhachis abdominalis* Fred.Smith

Polyrhachis abdominalis Fred.Smith, 1858, *Cat. Hym. Brit. Mus.* 6:63.

Polyrhachis (Myrmhopla) abdominalis, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:283.

Material examined : 2 ex: 1 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Lai-lad, 23.i.82, Coll. C. Radhakrishnan; 1 ex, West Khasi hills, 33 km. from Nongstoin on Syrkon Road, Alt. 2400', 8.iv.87, Coll. J.R.B. Alfred.

Diagnostic characters : worker. Head, thorax, legs and node of pedicel black, abdomen fuscous red; head, thorax and abdomen finely granulate; thorax elongate, metanotum flat, in front of the spines and between them slightly concave; pronotal spines slender, pointing forwards; metanotal spines broad and flat at base; modal spines wide spread; abdomen globose.

Length : W. 8-9 mm.

Distribution : INDIA : (East and West Khasi hills), Meghalaya. Elsewhere : Myanmar; Sumatra; Tenasserim.

146. *Polyrhachis affinis* Smith

Polyrhachis affinis Smith, 1858, *Cat. Hym. Brit. Mus.*, 6:63.

Polyrhachis (Myrmhopla) affinis, Chapman and Capco, 1951, *CheckList of Ants of Asia*, 1 :284.

Material examined : India : Meghalaya : East Khasi hills, Cherrapunjee (1300m.), 1o, 25.iv.1979, Coll. J.K. Jonathan and party; Jaintia Hills, Garampani, on the bank of Kapil river, 9oo, 4.x.1988, Coll. V.D. Srivastava and party.

Diagnostic characters : worker. Black, with dense, bronzy, golden recumbent pubescence. Head short and broad, cheeks convex; Clypeus medially vertically carinate. Thorax convex, pronotal spines pointing forward, outward; metanotal spines erect, divergent. Node of pedicel high, flat and truncate in front with three short obtuse teeth between two laterally placed spines. Abdomen short and broad.

Length : W. 4.5 mm.

Distribution : INDIA : Meghalaya (East Khasi Hills, Jaintia Hills). Elsewhere : Burma.

147. *Polyehachis armata* (Le Guillou)(Fig.71)

Formica armata Le Guillou, 1841, *Ann. Soc. Ent. France*, 10:313.

Polyrhachis (Myrmhopla) armata, Chapman and Capco, 1951, *Checklist of ants of Asia* 1:285.

Material examined : 18 ex: 5 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, Umtasor, 19.v.82, Coll. C. Radhakrishnan, 1 ex, East Khasi hills, Nongkhylllem Reserve Forest, Nongpoh, 19.x.82, Coll. R. Mathew; 3 ex, Nongpoh, 28.x.83, Coll. R. Mathew; 1 ex, Nongpoh, 25.iv.80, Coll. C. Radhakrishnan; 5 ex, Lai-lad, Alt. 1000 ft., 12.iii.87, Coll. V.T. Darlong; 2 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., 28.iv.88, Coll. V.T Darlong.

Diagnostic characters : worker. Black; head, thorax and node of pedicel coarsely punctured; abdomen, granulated opaque; head narrowed posteriorly thoracic and pedicel spines stout, subequal; node of pedicel antero- laterally with a vertical tooth, posteriorly with widespread, curved spines; globose.

Length : W. 9-11 mm.

Distribution : INDIA : (East and West Khasi hills, West Garo hills), Meghalaya; Assam. Elsewhere : Myanmar; Borne; Jana; Philippines; Tenasserim.

148. *Polyrhachis bicolor* Fred.Smith (Fig.72)

Polyrhachis bicolor Fred.Smith, 1858, *Cat. Hym. Brit. Mus.*, 6:65.

Polyrhachis (Myrmhopla) bicolor, Chapman and capco, 1951, *Checklist of ants of Asia*, 1:286.

Material examined : 2 ex, India, Meghalaya, East Khasi hills, Kyrdem Kulai, 25.ix.81, Coll. J.P. Sati.

Diagnostic characters : W. Head, thorax and node of pedicel black, antennae, mandibles, legs and abdomen reddish; pubescence long and dense, hiding the sculpture; thoracic spines short, slender and acute; node of pedicel, at its lateral angles, with slender erect spines.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills,) Meghalaya; West Bengal; Elsewhere : Myanmar; Philippines.

149. *Polyrhachis ceylonensis* Emery

Polyrhachis hippomanes race *ceylonensis* Emery, (in Forel, 1893) *Jour. Bombay N. Hist. Soc.*, 8:22.

Polyrhachis hippomanes sub.sp. *ceylonensis*, Mathew, 1984, *Bull. zool. Surv. India*, 6 (1-3) : 307-308.

Material examined : 12 ex: 5 ex, India, Meghalaya, East Khasi hills, Shillong, Golflinks, 23.v.79, Coll. K.K. Deb; 7 ex, Shillong, Botanical garden, 31.iii.79, Coll. R. Mathew.

Diagnostic characters : worker. Black; the flagellum of antennae, the femorae, tibiae and tarsi of the legs reddish yellow; the mandibles and scape of the antennae fuscous red; head and thorax finely, abdomen minutely, reticulate punctate; pronotum with a short tooth pointing outwards; metanotum with two short erect spines at the posterior lateral angles; node of pedicel with two wide spreading spines.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Sri lanka.

150. *Polyrhachis convexa* Roger

Polyrhachis convexa Roger, 1863, *Berl. ent. Zeitschr.* 7:153.

Polyrhachis (Myrma) Convexa, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:270.

Material examined : 3 ex, India Meghalaya, East Khasi hills, Mawpat, 17.iv.76, Coll. S.G. Patil.

Diagnostic characters : worker. Black; very finely rugulose; pubescence recumbent, glistening grey; thorax in lateral view, strongly arched, pronotal spines acute; mesonotum unarmed; basal portion of metanotum with two short erect points at its posterior lateral angles, a slight carina between them; apical portion of metanotum deeply concave; node of pedicel biconvex, armed with four short subequal spines spaced equidistantly; abdomen short, globose.

Length : W. 5.5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Sri Lanka.

151. *Polyrhachis dives* Fred.Smith (Fig.73)

Polyrhachis dives Fred.Smith, 1858, *J. Proc. Linn. Soc. Lond. Zool.* **2** : 64.

Polyrhachis dives, Hung et.al. 1972, *Ann. Entomol. Soc. Amer.* **65** (5) : 1023.

Material examined : 373 ex: 23 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew; 5 ex, East Khasi hills, Mawiong, 7.xii.67, Coll. B.K. Tikader; 7 ex, East Khasi hills, Umsning, 26.ii.70, Coll. G.M. Yazdanil 5 ex, Old Barapani Road, 23.iv.77, Coll. R. Mathew; 25 ex, Garo hills, Remgiri, 25.ix.73, Coll. S. Biswas; 11 ex, East Khasi hills, cherrapunjee, 17.v.77, Coll. H. Khajuria; 1 ex, West Khasi hills, Nongkhlaw, 1.xii.77, Coll. K.R. Rao; 81 ex, West Khasi hills, Nongstoin, 27.ix.77, K.R. Rao; 5 ex, Jaintia hills, Shangpung, 6.xii.75, Coll. S.K. Chanda; 2 ex, West Garo hills, Tura, May 78, Coll. M. Kamal; 6 ex, East Khasi hills, Umran, 9.vii.81, Coll. R. Mathew; 2 ex, Garo hills, Rongrengiri, 13.xii.78, Coll. K.P. Singh; 1 ex, West Khasi hills, Sonapahar, 30.x.86, Coll. C. Radhakrishnan; 20 ex, West Khasi hills, Kyllang Rock, 19.ix.86, Coll. C. Radhakrishnan; 35 ex, West Khasi hills, 7 km. North east of Nongstoin, 7.i.87, Coll. A.K. Karmakar; 64 ex, West Khasi hills, 25 km. South west of Nongstoin on Syrkon Road, 29.i.87, Coll. K.P. Singh; 69 ex, West Khasi hills, 2 km. north of Nongkhlaw, 20 ii. 87, Coll. A.K. Karmakar; 4 ex, Jaintia hills, 27 km. from Jowai, near Mynso village, 5.i.88, Coll. A.K. Karmakar; 2 ex, West Garo hills, Selbalgiri, Alt. 2000', 19.iii.88, Coll. V.T. Darlong; 5 ex, West Garo hills, Balphakram National Park, 12.v.88, Coll. V.T. Darlong. 8 ex. East Garo hills, Darugiri, 14-20.v.79, Coll. S.B. Roy & R.N. Tiwari; 6 ex, East Garo hills, William Nagar, 9.iii.91, Coll. B.C. Das and party.

Diagnostic characters : worker. Black; pubescence golden yellow, dense and recumbent; spares on the head, dense on thorax and abdomen hiding the sculpture; pronotal spines pointing forward, outward and slightly bent downward; metanotal spines erect, divergent, their apices slightly bent outward; node of pedicel laterally with two wide spreading spines and with two median, short, obtuse teeth.

Length : W. 6-7 mm.

Distribution : INDIA : (East and West Khasi hills, East and West Garo hills, Jaintia hills), Meghalaya. Elsewhere : China; Java; Indo-china; Japan; New Guinea; Sumatra; Philippines; Formosa; Borneo; Malay.

152. *Polyrhachis furcata* Fred.Smith

Polyrhachis furcata Fred.Smith, 1858, *Cat. Hym. Brit. Mus.*, **6**:64.

Polyrhachis (Myrmhopla) furcata, Chapman and capco, 1951, *Checklist of ants of Asia*, 1:290.

Material examined : 10 ex, 4 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Lasi-lad, 23.i.82, Coll. C. Radhakrishnan; 1 ex, Nongkhylllem Reserve Forest, Umtasor,

19.v.82, Coll. C. Radhakrishnan; 3 ex, Lai-lad, 12.iii.87, Coll. V.T. Darlong; 2 ex, Lai-lad, 27.v.87, Coll. A.K. Karmakar.

Diagnostic characters : worker. Black, apical half of the flagellum of the antennae, legs and abdomen castaneous, head and abdomen polished and shining, thorax and node of pedicel coarsely punctured; pronotal spines pointing forward and outward and curved slightly downward; metanotal spines longer than the pronotal spines, erect and slightly curved backwards; node of pedicel with two long spines, their apical half curved backwards, downward and slightly outward.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills), Maghalaya, Assam. Elsewhere : Borneo; Myanmar, Tenasserim.

153. *Polyrhachis illaudata* Walker (Fig.74)

Polyrhachis illaudata Walker, 1859, *Ann. Mag. Nat. Hist.*, (3) 4: 373.

Polyrhachis illaudata, Mathew, 1984, *Bull. zol. Surv. India* 6 (1-3) : 307.

Material examined : 13 ex, 2 ex, India, Meghalaya, East Khasi hills, Umsning, 23.vii.63, Coll. S.N. Prasad; 4 ex, East Khasi hills, Old Barapani Road, 30.xii.81, Coll. C. Radhakrishnan; 3 ex, East Khasi hills, Shillong, Laban, 14.xi.85, Coll. B. Rani; 4 ex, East Khasi hills, Umran, 9.vii.89, Coll. R. Mathew.

Diagnostic characters : worker. Black and stout; covered with dense, golden, recumbent pubescence; erect hairs abundant; thorax short, strongly arched, broader anteriorly; pro-meso and meso-metanotal sutures distinct; pronotal spines broad at base, pointing forward and outward; a sharp transverse carina, with its lateral points subdentate separates the basal portion of metanotum from the oblique concave apex; node of pedicel biconvex, with a pair of spines diverging outwards on its upper lateral angles and a pair of short, mucronate teeth on its sides; abdomen massive; pilosity abundant, the teeth on the lateral sides of the node broader at base.

Length : W. 9.5-10.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya, Karnataka, Kerala; Sikkim; West Bengal. Elsewhere : Myanmar; Sri Lanka; Tenasserim; Java; Sumatra; Borneo; China; Philippines.

154. *Polyrhachis intermedia* Forel

Polyrhachis mayri race *intermedia* Forel, 1886, *J. Asiat. Soc. Benal*, 55 : 242.

Polyrhachis (Myrma) mayri sub.sp. *intermedia*; Chapman and 1951, Checklist of ants of Asia, 1:272.

Material examined : 2 ex: 1 ex, India Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.xii.82, Coll. K.P. Singh; 1 ex, East Khasi hills, Kyrdemkulai, 25.ix. 81, Coll. J.P. Sati.

Diagnostic characters : worker. Black and stout; thorax short, narrowed posteriorly; pronotal spines broader at base, pointing forwards, outwards, and downward; metanotal carina not prominent, basal portion of metanotum laterally dentate; pubescence sparse, not hiding the sculpture, node of pedicel biconvex; upper lateral angles with two longspines pointing backward, outward and downward, laterally with two short curved pointed spines, a very minute spine in the middle of the upper margin of the node.

Length : W. 8-9 mm.

Distribution : East Khasi hills, Meghalaya; Assam. Elsewhere : Myanmar.

155. *Polyrhachis laevissima* Fred.Smith (Fig.75)

Polyrhachis laevissima Fred.Smith, 1858, *Cat. Hym. Brit. Mus.*, 6:64.

Polyrhachis (Cyrtomyrma) laevissima, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:264.

Polyrhachis laevissima, Tiwari *et.al.*, 1994, *State Fauna Series 3: Fauna of West Bengal*, part 8:62 (syns.).

Material examined : 14 ex: 3 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. singh; 2 ex, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 3 ex, West Garo hills, Tura, May, 78, Coll. M. Kamal; 3 ex, East Khasi hills, Shillong, Bishnupur, 25.iv.81, Coll. C. Radhakrishnan; 3 ex, West Khasi hills, Ranikor, 9.ii.87, Coll. V.T. Darlong; 6 ex, East Garo hills, Darugiri, 17.v.79, Coll. S.B. Roy and R.N. Tiwari.

Diagnostic characters : worker. Black, polished and shining, legs red, thorax in lateral view strongly arched and gibbous; lateral angles of pronotum with a short tooth; pro-mesonotal suture distinct; meso-metanotal suture indistinct; node of pedicel biconvex, upper margin emarginate in the middle, lateral angles pointed.

Length : W. 6-7 mm.

Distribution : INDIA : (East and West Khasi hills, East Garo hills and West Garo hills), Meghalaya; Assam; Orissa; west Bengal. Elsewhere : Java; Borneo; Siam; Singapore; Myanmar; Tenasserim.

156. *Polyrhachis mayri* Roger

Polyrhachis mayri Roger, 1863, *Verz. Formicid.* :7, M.

Polyrhachis mayri, Tiwari *et al.* 1994, *State Fauna Series 3 : Fauna of West Bengal, Part 8 : 276 (Syns.)*.

Material examined : India : Meghalaya : East Garo Hills, Darugiri, Zoo, 14-20.v.1979, Coll. S.B Roy and party.

Diagnostic characters : worker. Black, with dense golden recumbent pubescence. Head from in front very broadly oval, almost circular; clypeus convex, anterior margin arched. Thorax strongly arched, wide anteriorly, narrowing posteriorly rapidly; promeso and meso-metanotal sutures distinct, pronotal spines broad at base, slender and acute at apex, pointing almost horizontally forwards and outwards. Node of pedicel broad, cuneiform biconvex, two spines at upper lateral angles and below their bases on each side of the node is a short laterally pointed acute tooth or spine. Abdomen very massive, broadly oval.

Length : W. 9.5-10.5 mm.; M. 11-12 mm.

Distribution : INDIA : Meghalaya (East Garo hills), West Bengal. Elsewhere : Borneo, Burma, China, Java, Philippines, Sri Lanka, Sumatra.

157. *Polyrhachis mutata* Fred.Smith (Fig.76)

Polyrhachis mutata Fred. Smith, 1858, *Cat. Hym. Brit. Mus.*, 6:64.

Polyrhachis (Myrmhopla) mutata, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:293.

Material examined : 6 ex; 2 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, East Khasi hills, Nongkhylllem Reserve forest, Lai-lad, 23.i.82, Coll. C. Radhakrishnan; 1 ex, Nongkhylllem Reserve forest, Nongpoh, 19.x.82, Coll. R. Mathew; 2 ex, Lai-lad, 27.v.87, Coll. A.K. Karmakar.

Diagnostic characters : worker. Black, shining; head and thorax minutely rugulose-granulate and opaque, abdomen more finely so; mandibles striate armed with five teeth; pronotal spines pointing forward, outward and slightly downward; metanotal spines broader at base, much larger than the pronotal spines; metanotum margined laterally and concave; node of pedicel with two wide spread spines which are almost the length of the pronotal spines.

Length : W. 7-8 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya. Elsewhere : Myanmar; Sumatra; Tenasserim.

158. *Polyrhachis proxima* Roger (Fig.77)

Polyrhachis proxima Roger, 1863, *Berl. ent. Zeit*, 7:155.

Polyrhachis (Myrma) proxima, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:274.

Material examined : 4 ex: 2 ex, India, Meghalaya, East Khasi hills, Old Barapani Road, 14.v.76, Coll. R. Mathew; 1 ex, West Garo hills, Songsak, 17.xi.73, Coll. S. Biswas; 1 ex, West Garo hills, Selbalgiri, Alt. 2000 ft., (collected the day after burning of the jhum), 19.iii.88, Coll. V.T. Darlong.

Diagnostic characters : worker. Black, covered with dense golden shining pubescence; thorax strongly arched; lateral nodal spines bimucronate; abdomen massive, broadly oval.

Length : W. 8-9 mm.

Distribution : INDIA : (East Khasi hills, West Garo hills), Meghalaya. Elsewhere : Java; China; Singapore; Myanmar; Sri Lanka; Sumatra.

159. *Polyrhachis punctillata* Roger (Fig.78)

Polyrhachis punctillata Roger, 1863, *Berl. ent. Zeitschr.*, 7:152.

Polyrhachis (myrma) punctillata Roger, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:275.

Material examined : 2 ex, India Meghalaya, East Khasi hills, Old Barapani Road, 23.iv.77, Coll. R. Mathew.

Diagnostic characters : worker. Black; minutely rugulose; pubescence, thin, fine and silky; thorax convex, narrowed posteriorly; laterally incised at the pro-meso and meso-metanotal sutures; anterior lateral angles of pronotum with a tooth on either side; basal portion of metanotum trapezoidal, the posterior lateral angles with a very short erect tooth, the bases jointed by a slight carina; apical portion of metanotum concave; node of pedicel biconvex, laterally with two small spines, upper margin emarginate.

Length : W. 5-6 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Karnataka. Elsewhere: Java; Sri Lanka; Myanmar.

160. *Polyrhachis rastellata* Latreille (Fig.79)

Polyrhachis rastellata Latreille, 1802, *Hist. Nat. Fourm.*:130.

Polyrhachis (Cyrtomyrma) rastellata Latreille, Chapman and Capco, 1951, *Checklist of ants of Asia*, 1:265.

Material examined : 12 ex: 2 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Signh; 7 ex, Umtasor, 19.v.82, Coll. C. Radhakrishnan; 1 ex, Nongkhylllem Reserve Forest, Nongpoh, 19.x.82, Coll. R. Mathew; 1 ex, Umtasor, 31.iii.84, Coll. C. Radhakrishnan; 1 ex, Umtasor, 19.i.83, Coll. C. Radhakrishnan; 3 ex, East Khasi hills, Cherrapunjee, 15.ix.88, Coll. A.R. Lahiri and party.

Diagnostic characters : worker. Black, the coxae, femorae and tibiae of the legs red; head, thorax and abdomen smooth, polished and shining; thorax in lateral view strongly arched and gibbous anteriorly; pro-mesonotal sutures distinct; meso-metanotal sutures obsolete; node of pedicel armed with four subequal acute teeth or spines; the median two close together and vertical.

Length : W. 5-6.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Karnataka; Maharashtra. Elsewhere : Myanmar; Siam; Sumatra; Borneo; Tenasserim.

161. *Polyrhachis striata* Mayr

Polyrhachis striata Mayr, 1862, *Verh. zool.-bot.Ges. Wien*, **12**:686.

Polyrhachis (Myrma) striata Mayr, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:278.

Material examined : 2 ex; 1 ex, India, Meghalaya, East Khasi hills, Nongkhylllem Reserve Forest, Umtasor, 24.ix.82, Coll. K.P. Singh; 1 ex, East Khasi hills, Kyrdemmkulai, 25.ix. 81, Coll. J.P. Sati.

Diagnostic characters : worker. Black; head, thorax and node of pedicel longitudinally striate; abdomen very finely punctured, rugulose; pronotal spines long, broad at base, pointing forward, outward and slightly curved downwards; basal portion of metanotum transversely submargined; apical portion concave, transversely striate; node of pedicel biconvex, armed on its upper lateral angles with two stout erect, slightly divergent spines as long as the pronotal spines; and on the sides beneath the base of the above with a short, acute, laterally pointed tooth; abdomen massive.

Length : W. 9.5-10 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Assam; Sikkim. Elsewhere : Borneo; China; Indo-china; Java; Sumatra; Myanmar.

162. *Polyrhachis tibialis* Fred.Smith (Fig.80)

Polyrhachis tibialis Fred.Smith, 1858, *Cat. Hym. Brit. Mus.*, **6**:63.

Polyrhachis (Myrmhopla) tibialis Fr.Smith, Chapman and Capco, 1951, *Checklist of ants of Asia*, **1**:298.

Polyrhachis tibialis, Tiwari *et.al.*, 1994, *State Fauna Series 3: Fauna of West Bengal, Part 8*:63 (Syns.).

Material examined : 17 ex; 12 ex, India, Meghalaya, East Khasi hills, Umran, 14.iii.72, Coll. S. Biswas; 12 ex, India, Meghalaya, East Khasi hills, Sumer, 17.iii.77, Coll. S. Biswas; 1 ex, East Khasi hills, Nongpoh, 28.i.82, Coll. C. Radhakrishnan; 2 ex, East Khasi hills, Lai-lad, 1 km. from Tasku

village, 27.v.87, Coll. A.K. Karmakar; 1 ex., East Khasi hills, Shillong, 29.iii.59, Coll. A.P. Kapur and party.

Diagnostic characters : worker. Black; legs castaneous red; pubescence fine, dense, silky, silvery and hiding the sculpture; thorax convex, pronotal spines short, acute, pointing forwards; metanotal spines straight, pointing backwards, a somewhat distinct ridge between them across the metanotum; node of pedicel biconvex, with two short teeth on its middle margin, laterally with two long wide spreading spines curved to the shape of the abdomen.

Length : W. 4-5.5 mm.

Distribution : INDIA : (East Khasi hills), Meghalaya; Karnataka; West Bengal. Elsewhere Myanmar; Tenasserim.

163. *Polyrhachis* sp.

Material examined : India : Meghalaya : East Garo Hills, Darugiri, 2-w, 20.v.1979, Coll. S.B. Roy and party. East Khasi Hills, Shillong, Polo Bazar, 1 w, 7.iv.1991, Coll. S.K. Ghosh and party.

Distribution : INDIA : East Garo hills and East Khasi hills.

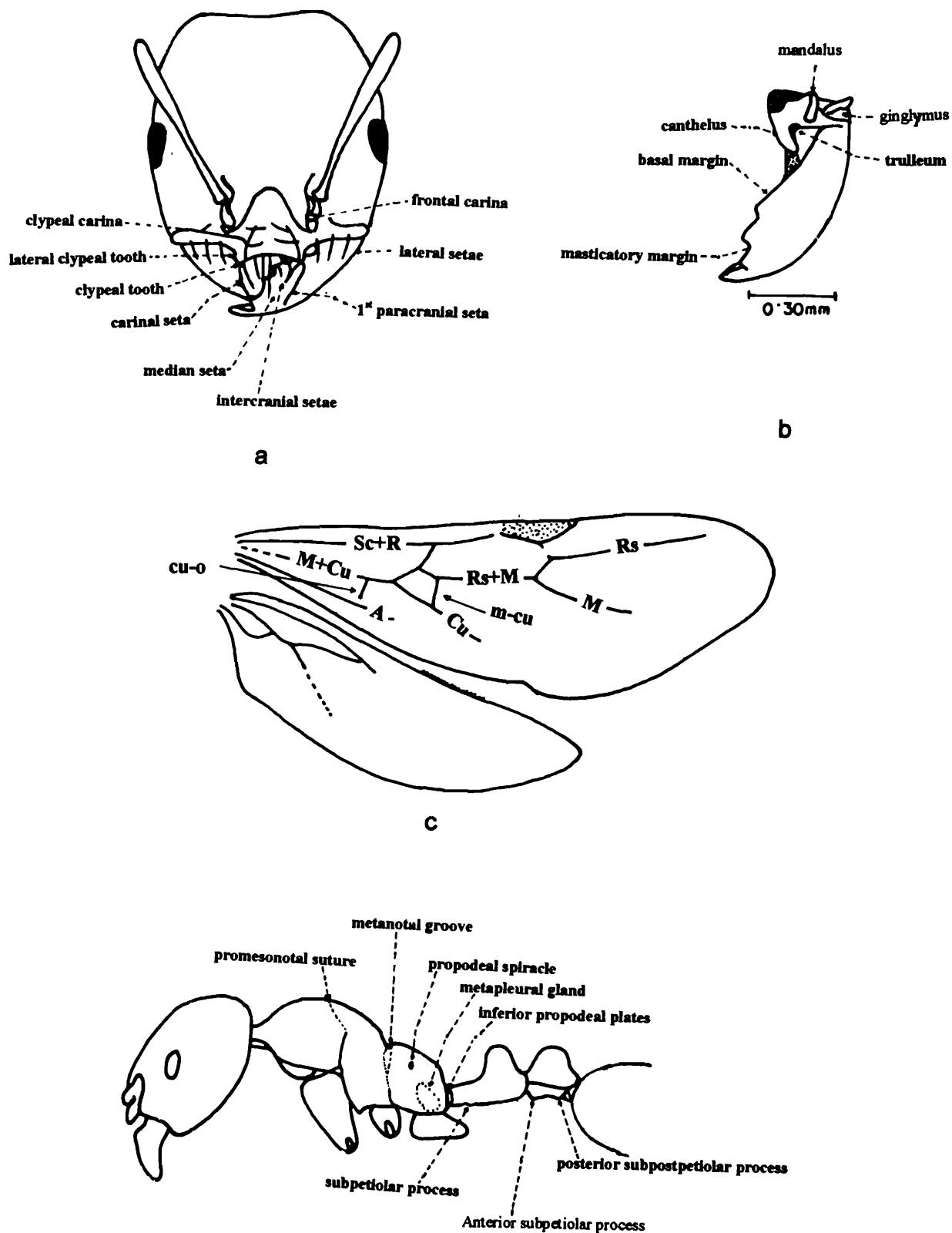


Figure 1. a - Head of a typical ant (*Solenopsis* sp worker) showing various parts; b - Mandible of *Solenopsis* sp worker; c- Wing venation of fore and hind wings of *Solenopsis* sp female; d - body parts of a typical ant (*Solenopsis* sp worker).

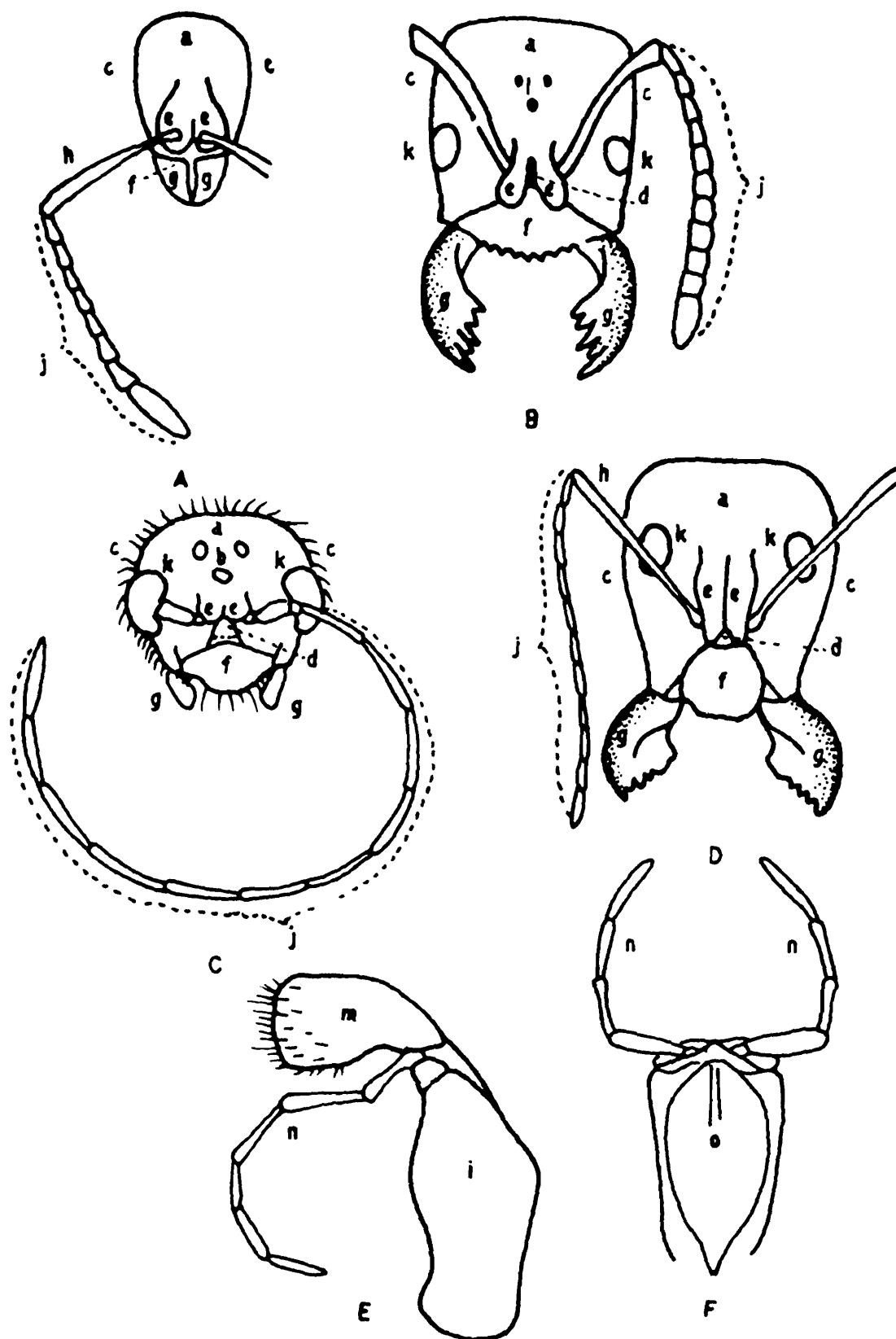


Figure 2. A - Head of Dorylinae worker; B Head of a Ponerinae female; C - Head of a Ponerinae male; D Head of a Camponotinae worker; E - Mouth parts (Maxilla) of Camponotinae; F Mouth parts (Labium) of Camponotinae. a, vertex; b, ocelli; c, sides of head; d, frontal area; e, antennal carinae; f, clypeus; g, mandible; h, scape; j, flagellum; k, compound eye; i, stipes; m, galea; n, palpus (palpi); o, ligula.

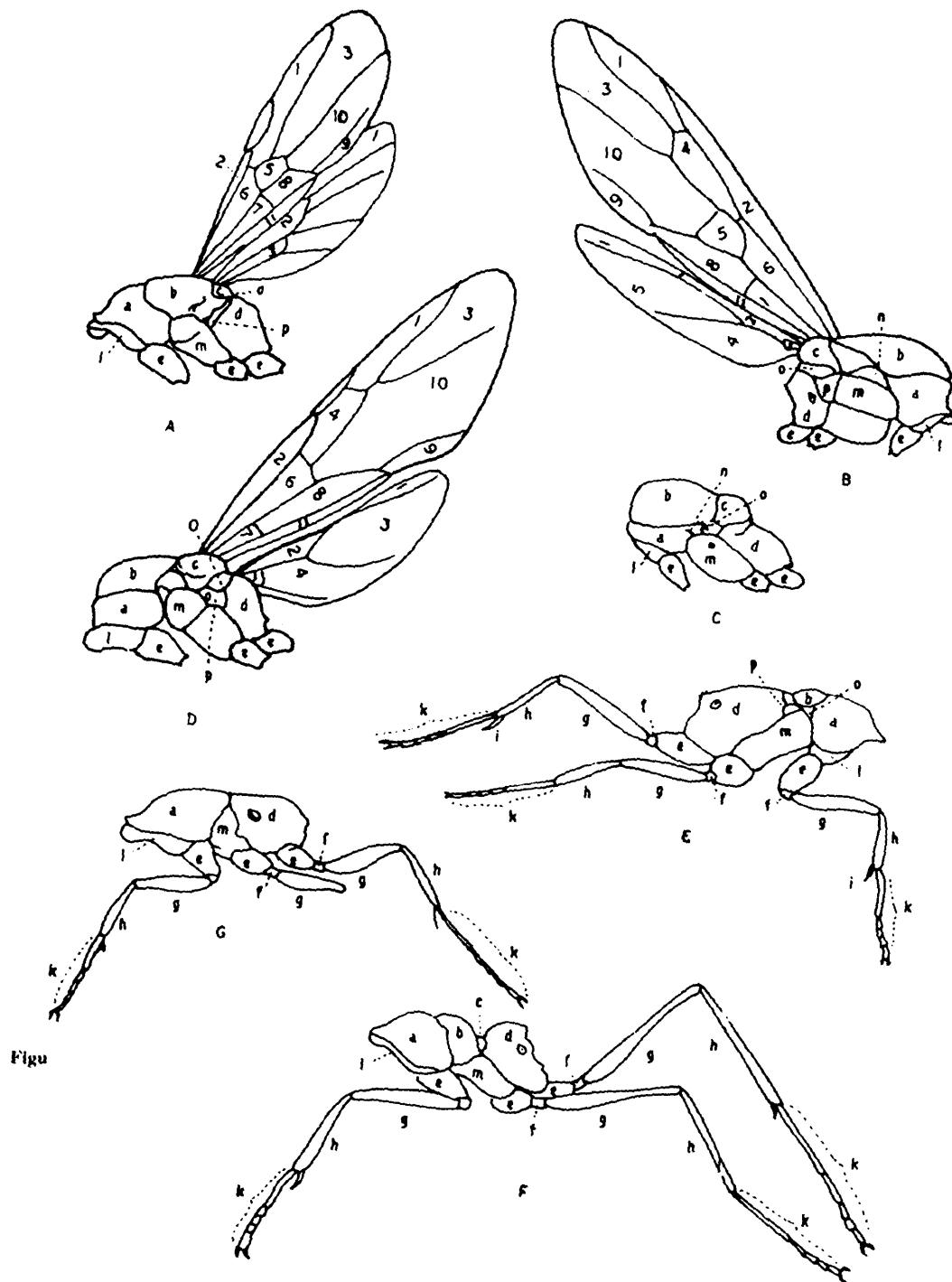


Figure 3. A - Thorax and wings of Ponerinae female; B - Thorax and wings of Myrmecinae female; C - Thorax of Ponerinae male; D - Thorax and wings of Camponotinae female; E - Thorax of Ponerinae worker; F - Thorax and legs of Dolichoderinae worker; G - Thorax and legs of Drylinae worker. a - pro-thorax; b, meso-thorax; c, scutellum; d, median segment; l, pro-pleurae; m, meso-pleurae; p, meta-pleurae; f, trochanters; g, femora.

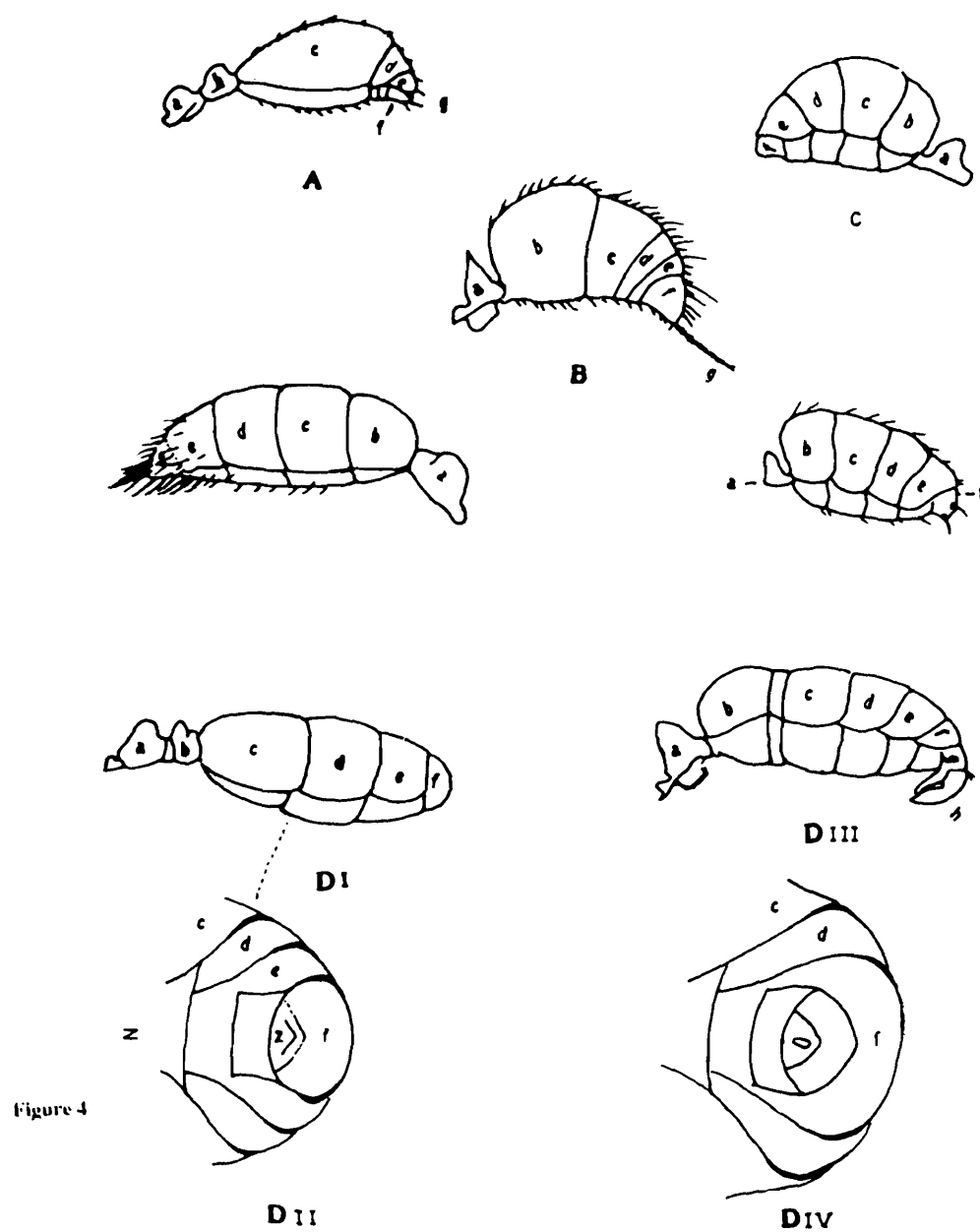


Figure 4

Figure 4. A- Abdomen of Dorylinae worker; B - Abdomen of Ponerinae worker; C - Abdomen of Dolichoderinae worker; D (i) & (ii) - Abdomen of Myrmecinae; (iii) - Abdomen of Ponerinae male; (iv) Abdomen of camponotinae female; E - Abdomen of Caponotinae worker.

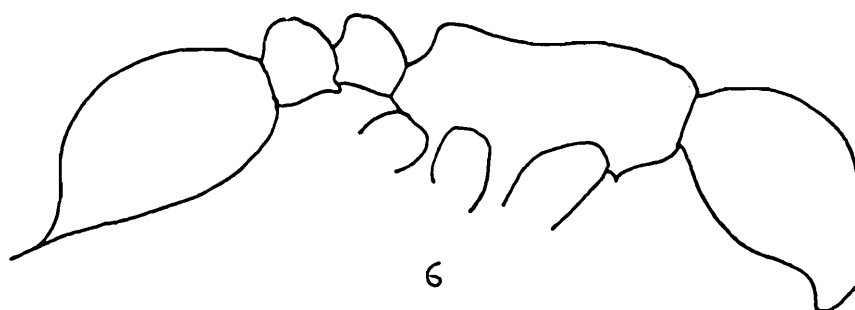
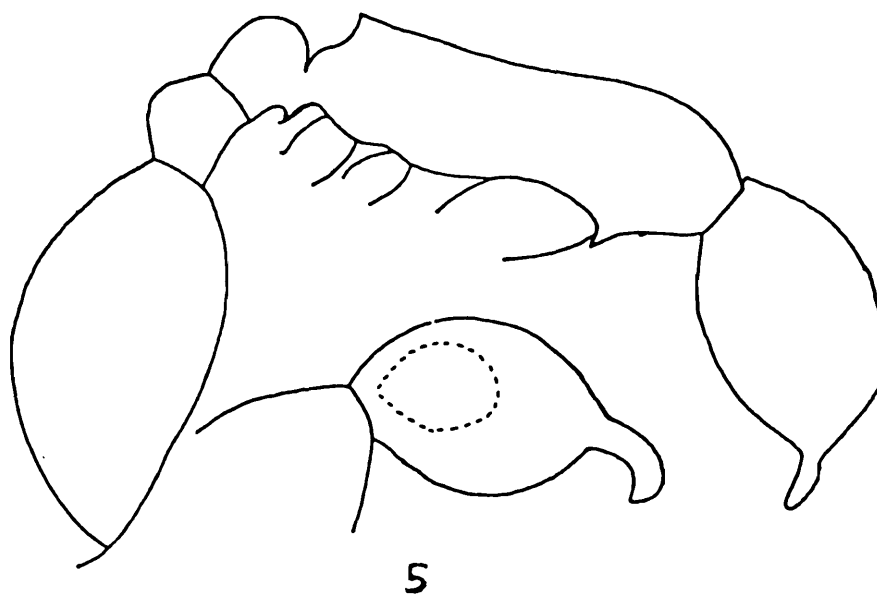
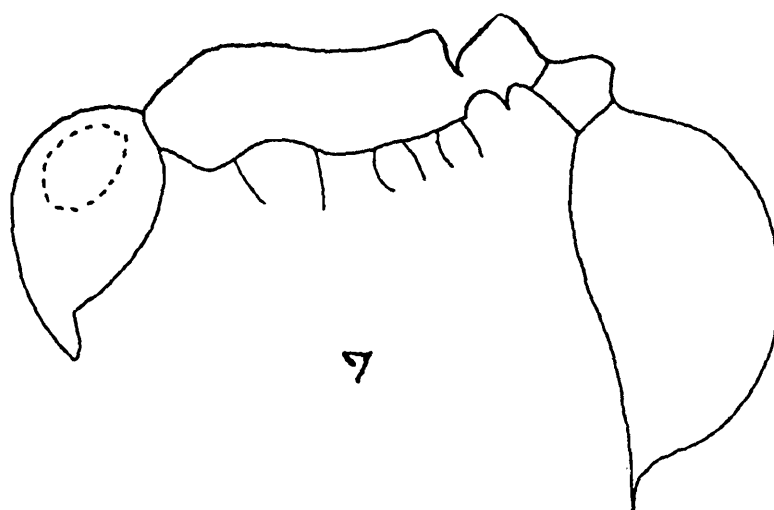
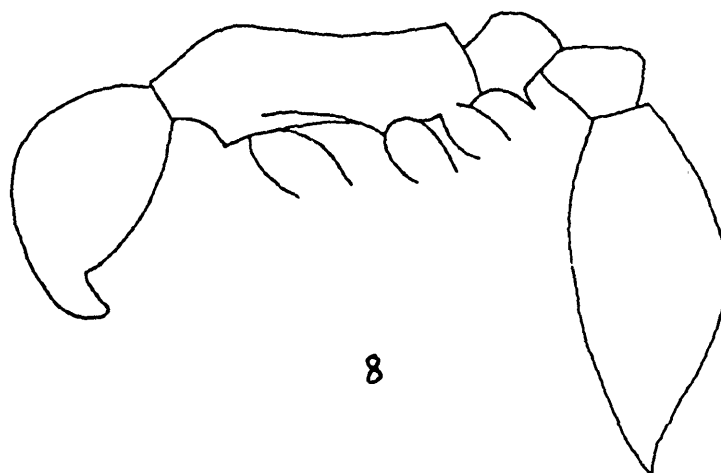


Fig. 5. *Aenictus binghami* Forel (5x10)

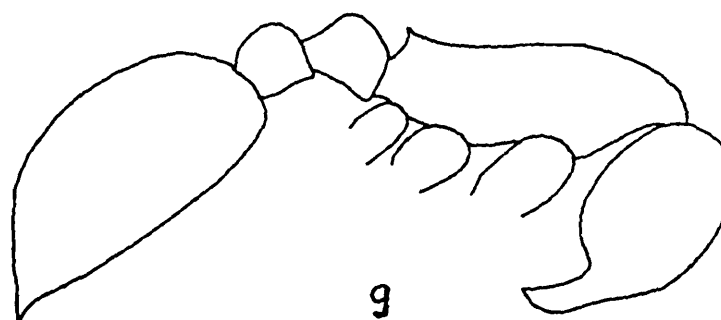
Fig. 6. *Aenictus brevicornis* (Mayr) (5x10)



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Fig. 7. *Aenictus fergusonii* Forel (5x10)

Fig. 8. *Aenictus laeviceps* (Fred. Smith) (5x10)

Fig. 9. *Aenictus shillongensis* sp. nov. (5x10)

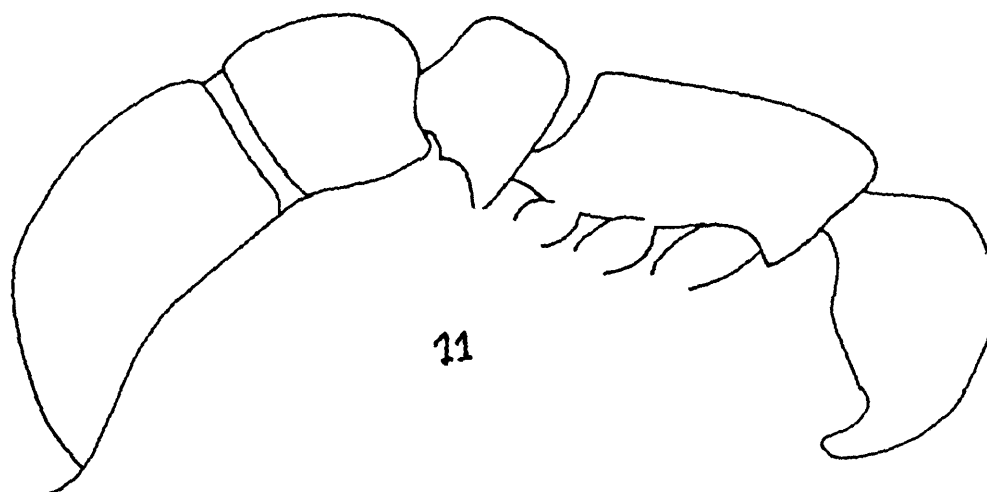
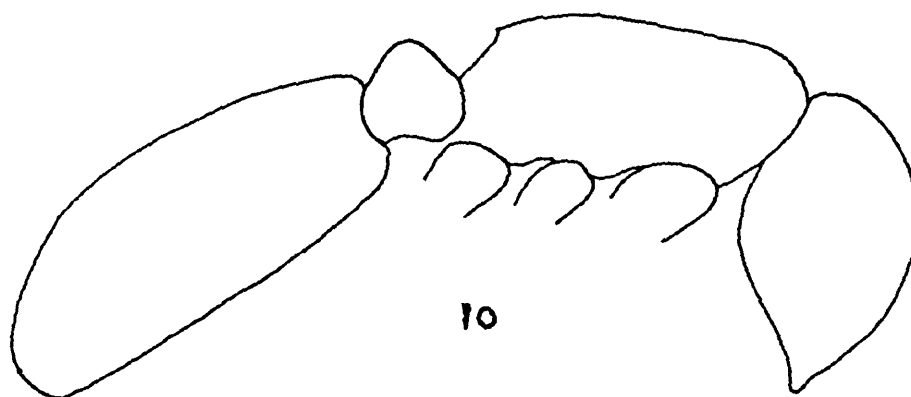


Fig. 10. *Dorylus orientalis* Westwood (5x10)

Fig. 11. *Cerapachys aitkenii* Forel (5x10)

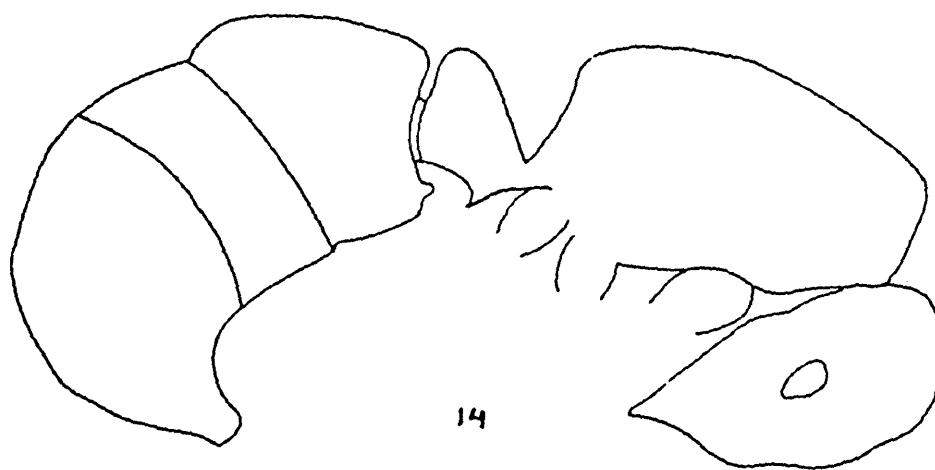
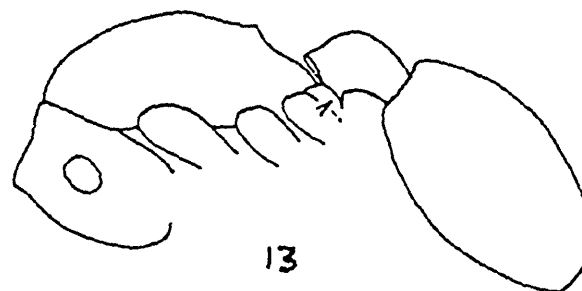
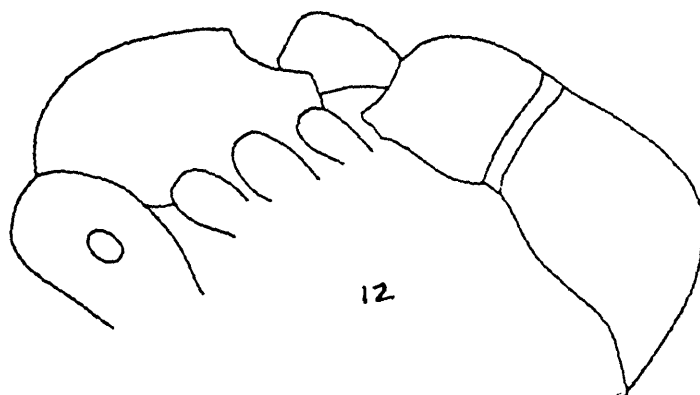


Fig. 12. *Cerapachys risii* Forel (2.5x10)

Fig. 13. *Gnamptogenys bicolor* (Emery) (2.5x10)

Fig. 14. *Proceratium williamsi* sp. nov. F. (5x10)

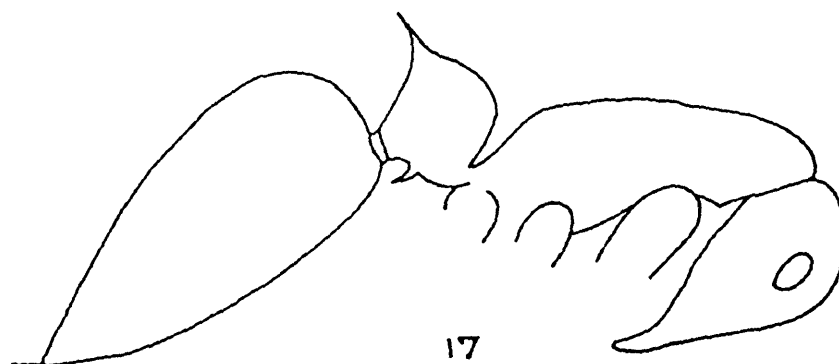
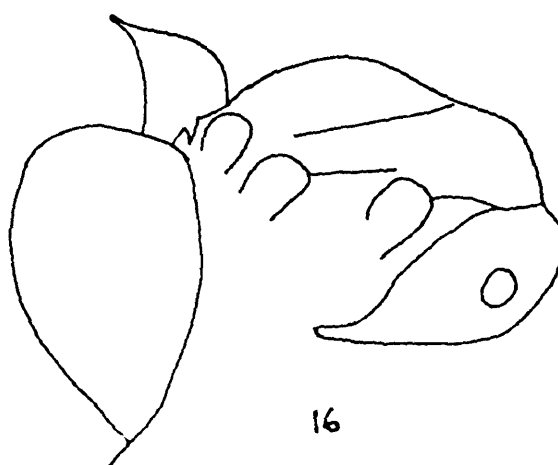
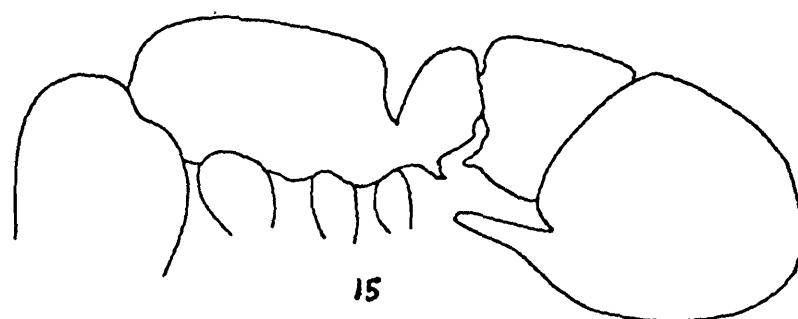


Fig. 15. *Proceratium williamsi* sp. nov. (5x10)

Fig. 16. *Diacamma rugosum* (Le Guillou) (1.6x10)

Fig. 17. *Diacamma scalpratum* (Fred. Smith) (1x10)

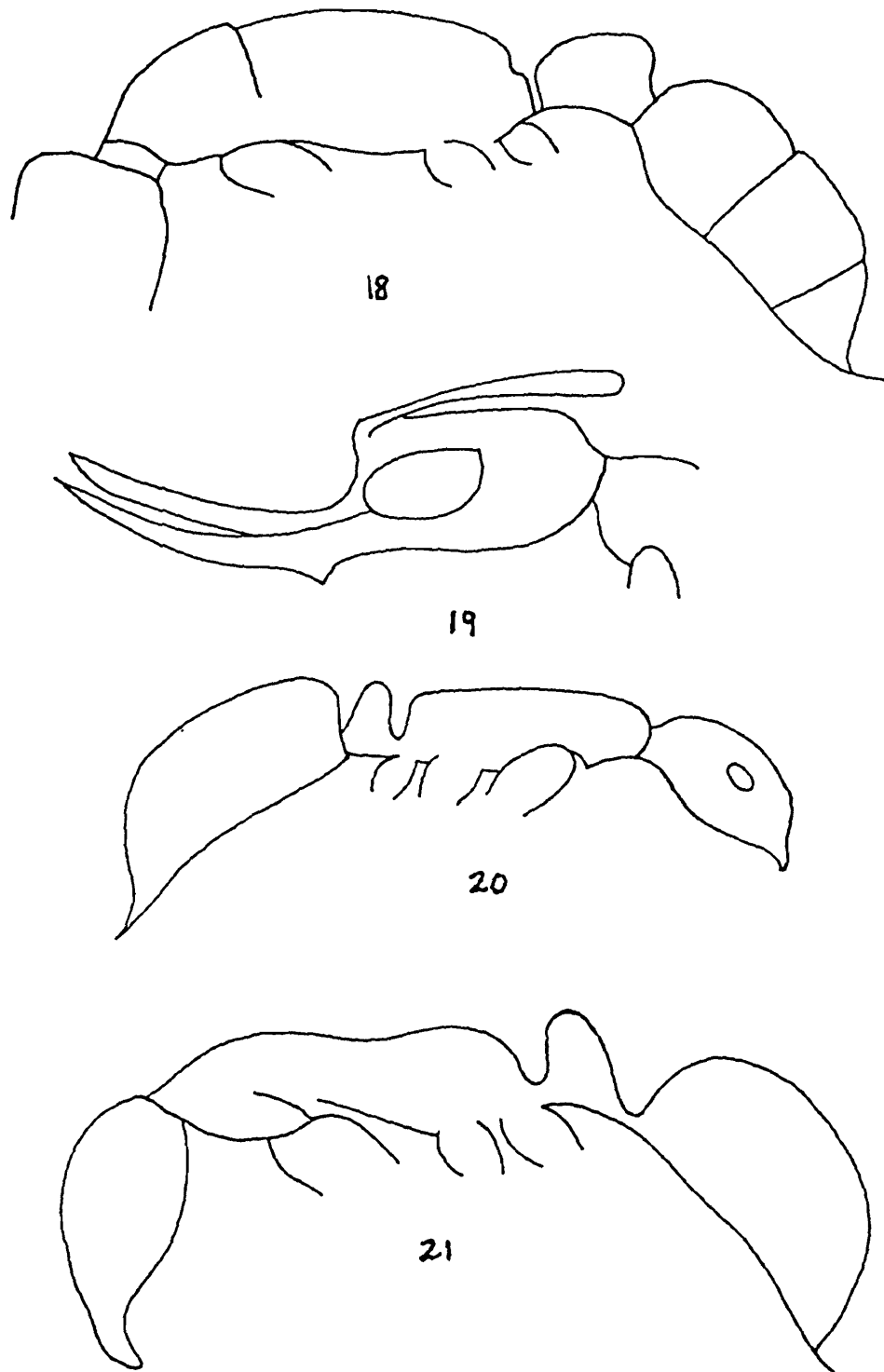


Fig. 18. *Harpegnathos venator* (Fred Smith) (1.6x10)

Fig. 19. *Harpegnathos venator* (Fred Smith) (1.6x10)

Fig. 20. *Leptogenys (Lobopelta) assamensis* Forel (2.5x10)

Fig. 21. *Leptogenys (Lobopelta) diminuta* (Fred Smith) (2.5x10)

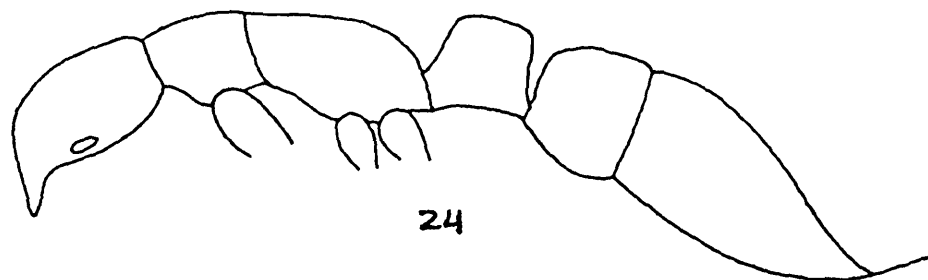
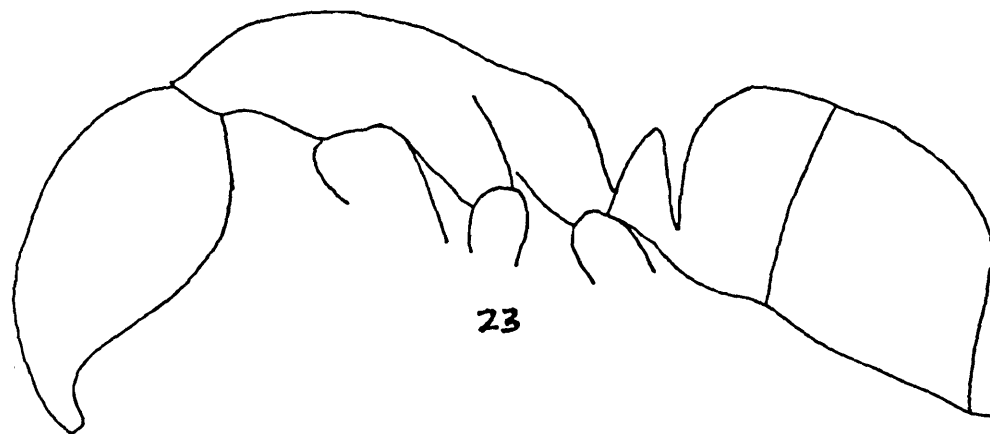
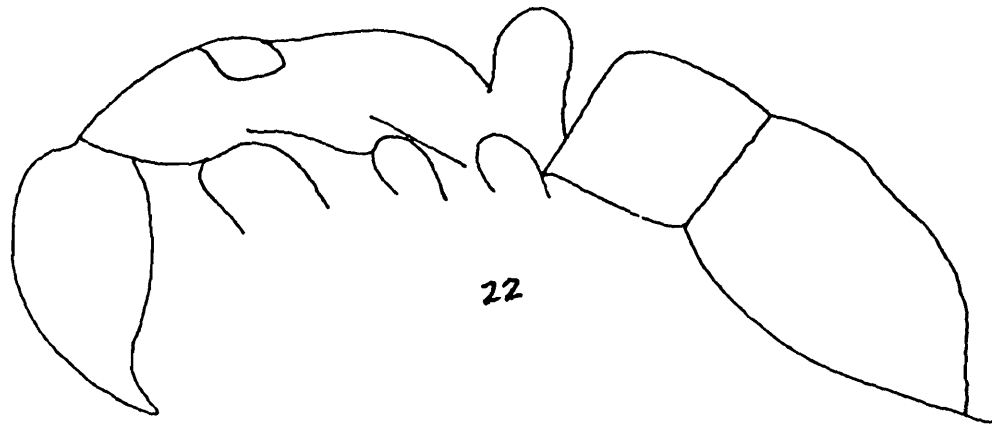


Fig. 22. *Leptogenys (Lobopelta) kitteli* Mayr (2.5x10)

Fig. 23. *Leptogenys (Lobopelta) processionalis* Jerdon (2.5x10)

Fig. 24. *Leptogenys (Lobopelta) punctiventris* Mayr (2.5x10)

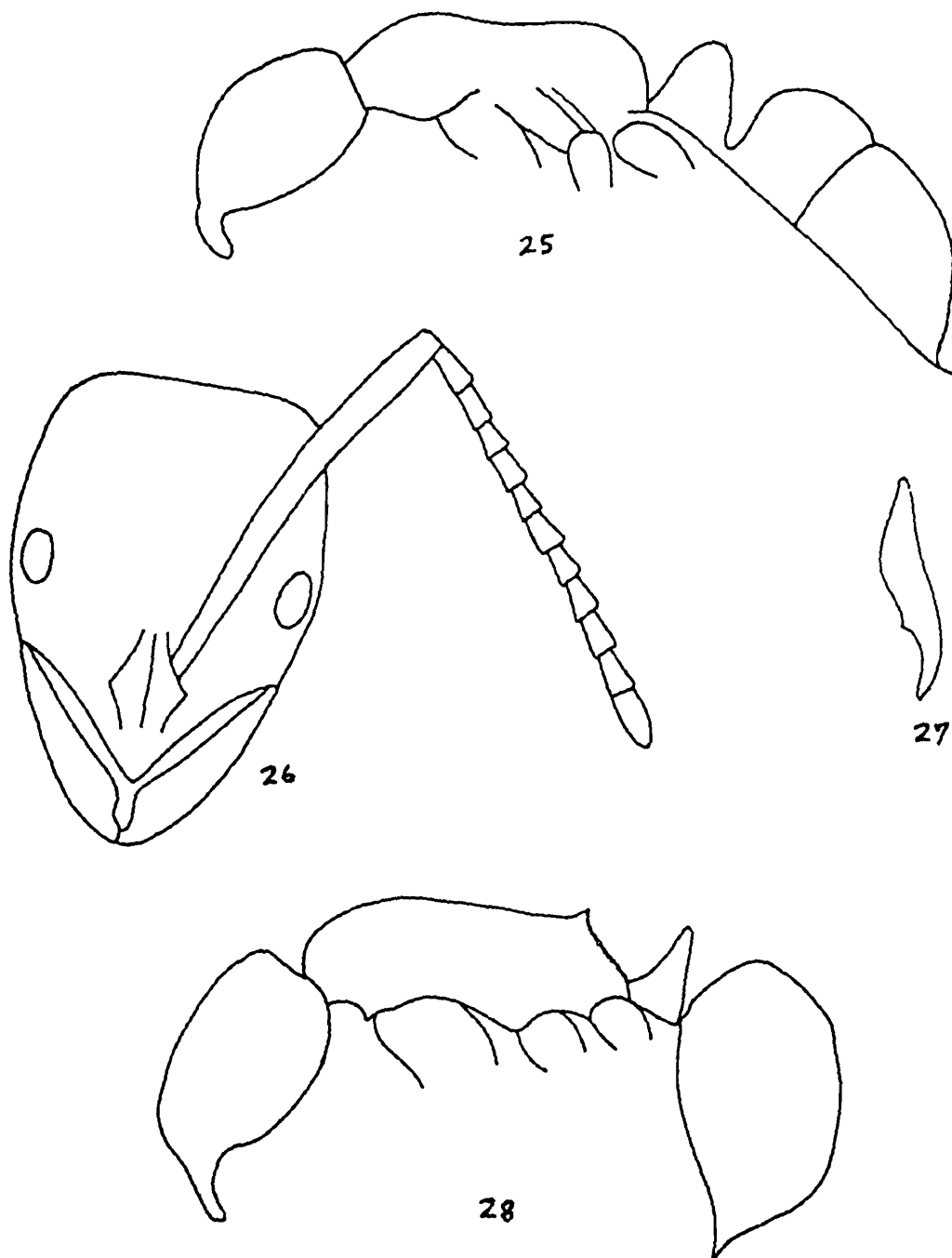


Fig. 25. *Leptogenys jeanettei* sp. nov. (2.5x10)

Fig. 26. *Leptogenys jeanettei* sp. nov. (2.5x10), Head front view.

Fig 27. *Leptogenys jeanettei* sp. nov. (2.5x10), mandible

Fig. 28. *Odontoponera transversa* (Fred Smith) (1.6x10)

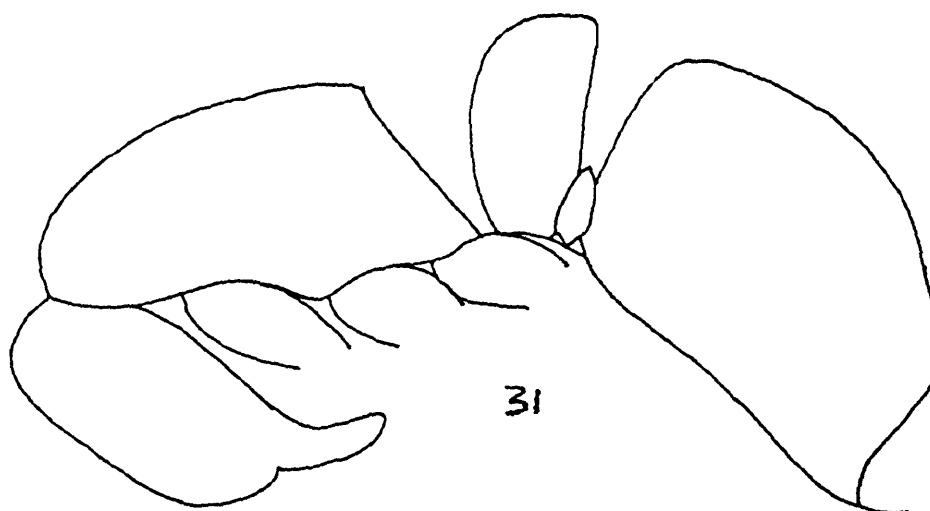
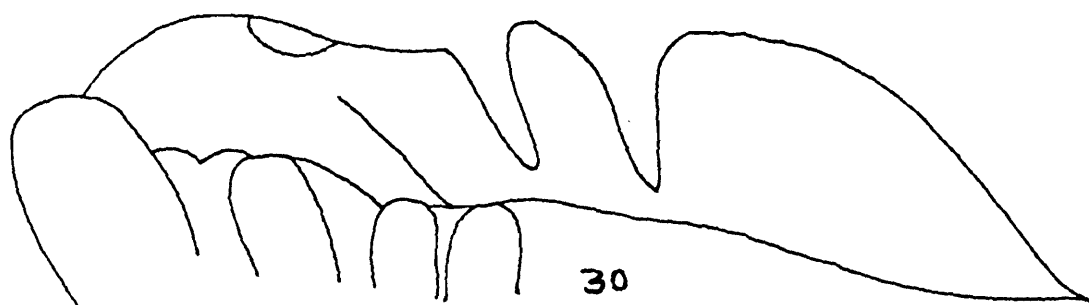
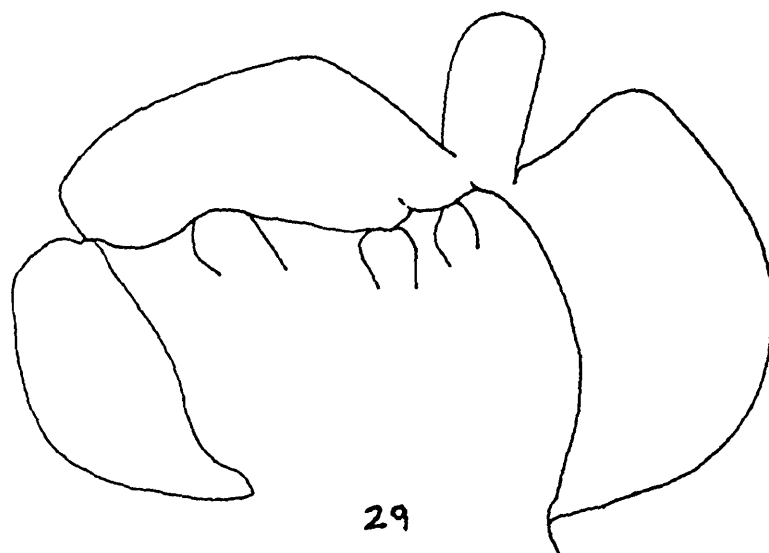
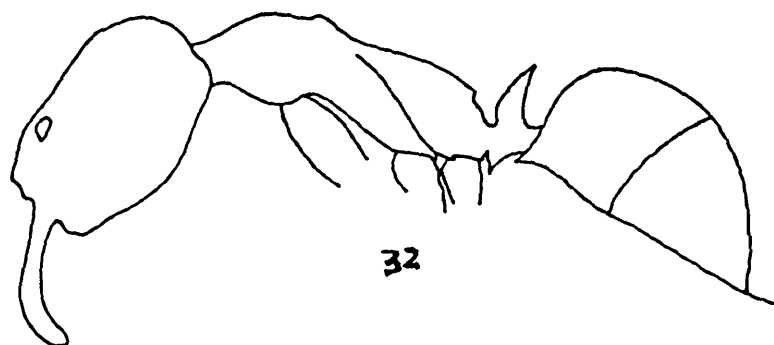


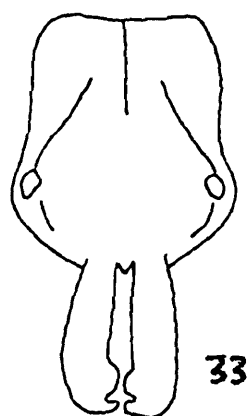
Fig. 29. *Pachycondy leeuwenhoekii* (Forel) (2.5x10)

Fig. 30. *Brachyponera luteipes* (Mayr) (5x10)

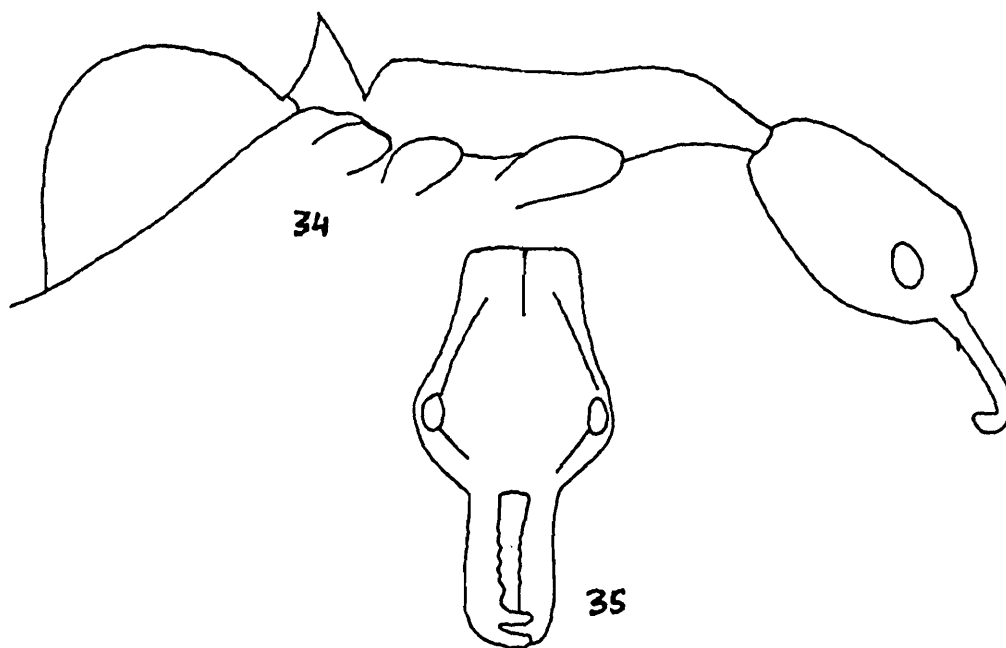
Fig. 31. *Bothroponera rufipes* (Jerdon) (1.6x10)



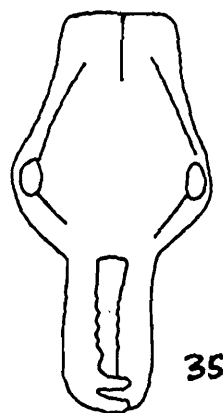
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Fig. 32. *Odontomachus monticola* Emery (1.6x10)

Fig. 33. *Odontomachus monticola* Emery (1.6x10), Head front view.

Fig. 34. *Odontomachus rixosus* Fred. Smith (1.6x10)

Fig. 35. *Odontomachus rixosus* Fred. Smith (1.6x10), Head front view.

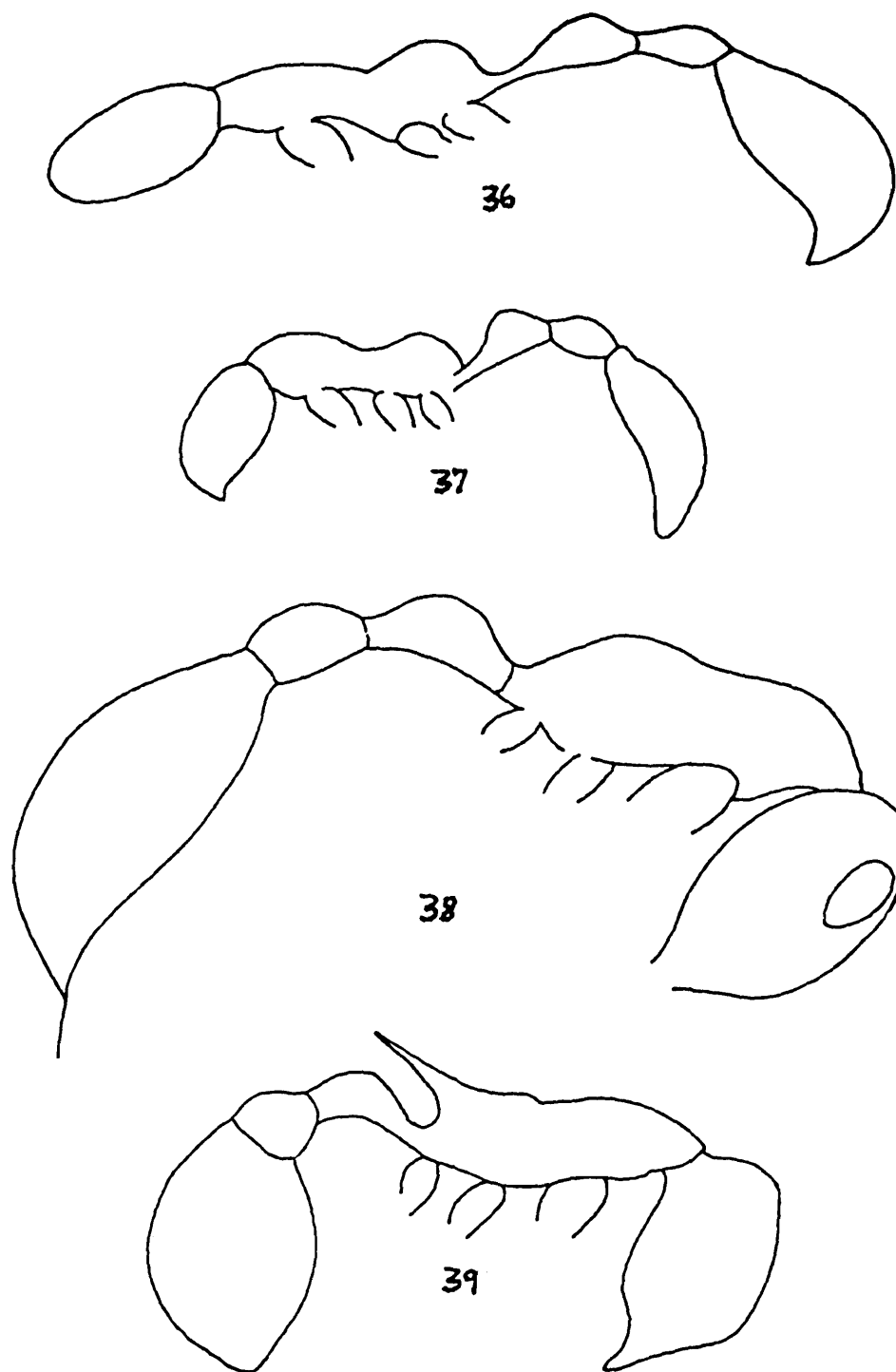


Fig. 36. *Tetraponera aitkenii* (Forel) (2.5x10)

Fig. 37. *Tetraponera allaborans* (Walker) (2.5x10)

Fig. 38. *Tetraponera rufonigra* (Jerdon) (2.5x10)

Fig. 39. *Myrmica margaritae* Emery (2.5x10)

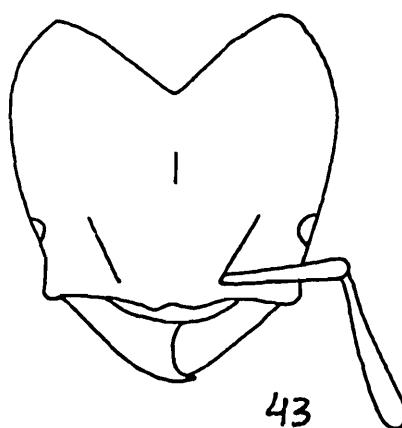
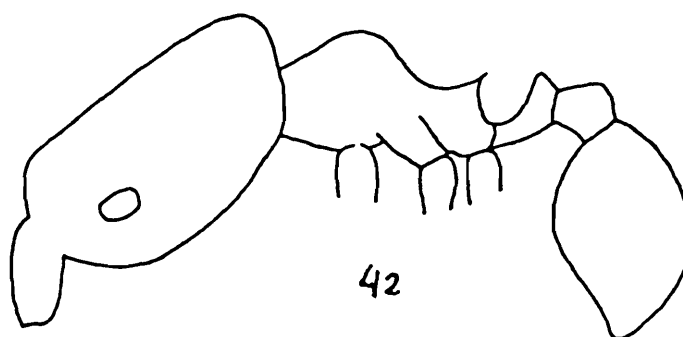
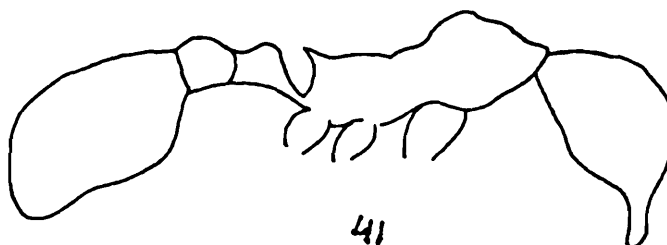
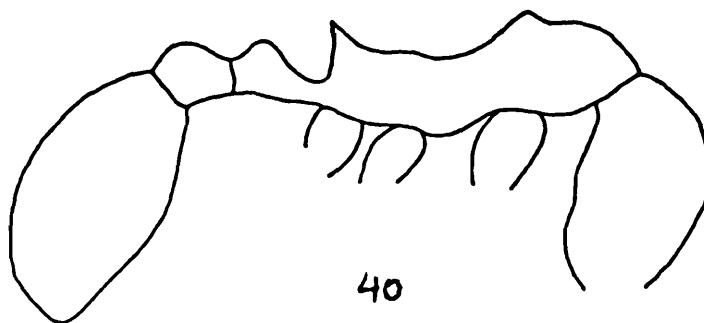


Fig. 40. *Aphaenogaster schurri* Forel (2.5x10)

Fig. 41. *Aphaenogaster smythiesi* (Forel) (2.5x10)

Fig. 42. *Pheidole mus* Forel (5x10)

Fig. 43. *Pheidole smythiesi* Forel (1.6x10), Head front view.

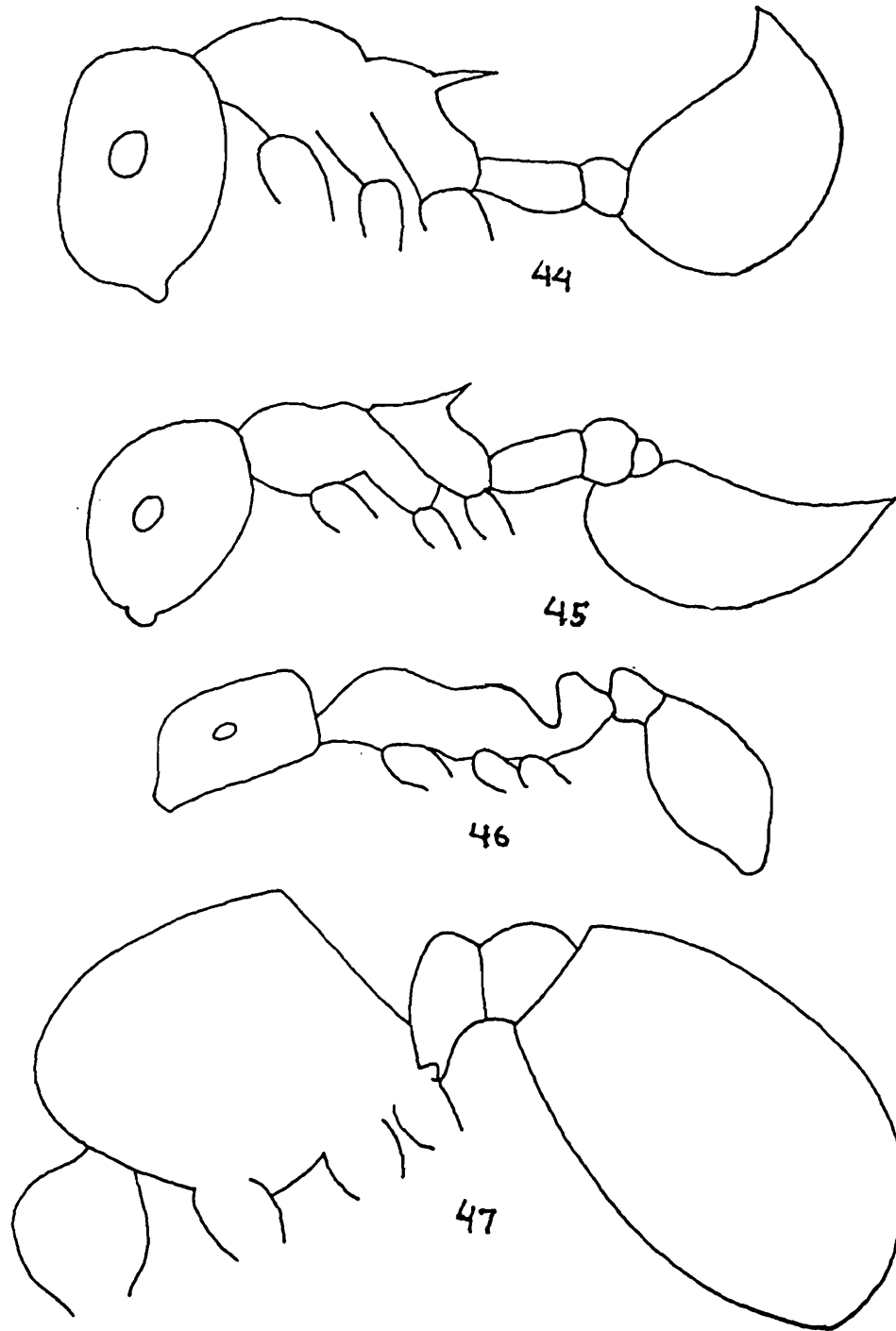


Fig. 44. *Crematogaster flava* Forel (5x10)

Fig. 45. *Crematogaster rothneyi* Mayr (5x10)

Fig. 46. *Monomorium longi* Forel (5x10)

Fig 47. *Carebara lignata* Westwood (1x10) F.

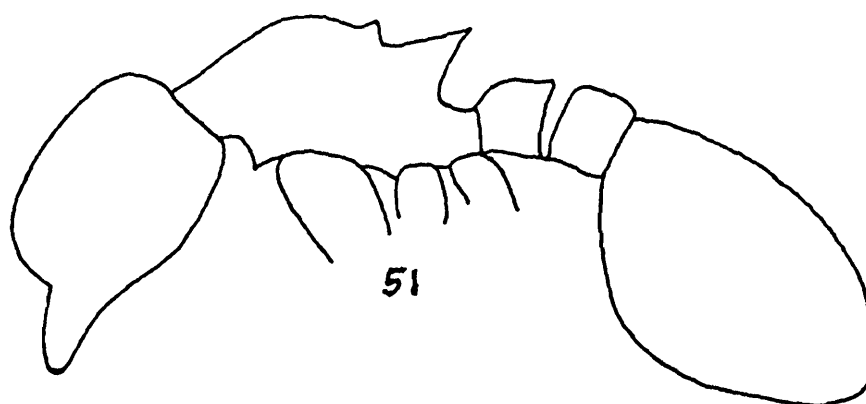
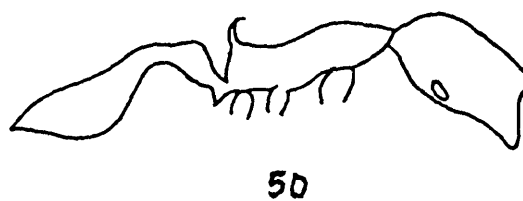
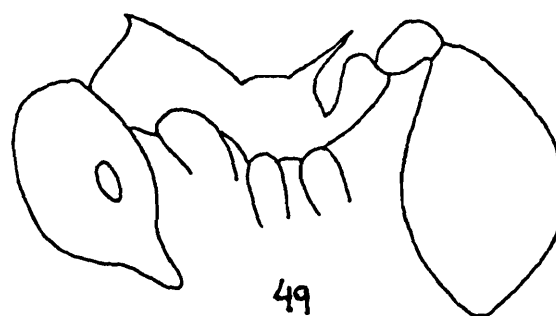
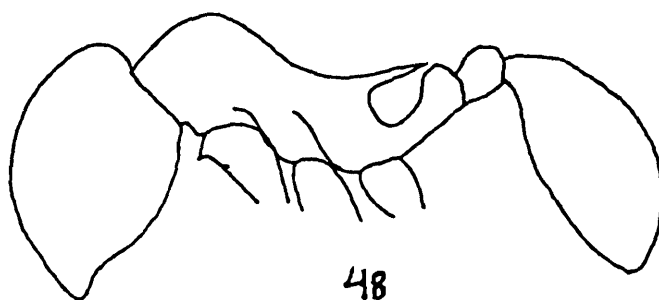


Fig. 48. *Lophomyrmex bedoti* Emery (5x10)

Fig. 49. *Lophomyrmex quadrispinosus* (Jerdon) (5x10)

Fig. 50. *Recurvidris recurvispinosa* Forel (5x10)

Fig. 51. *Myrmecina striata* Emery (5x10)

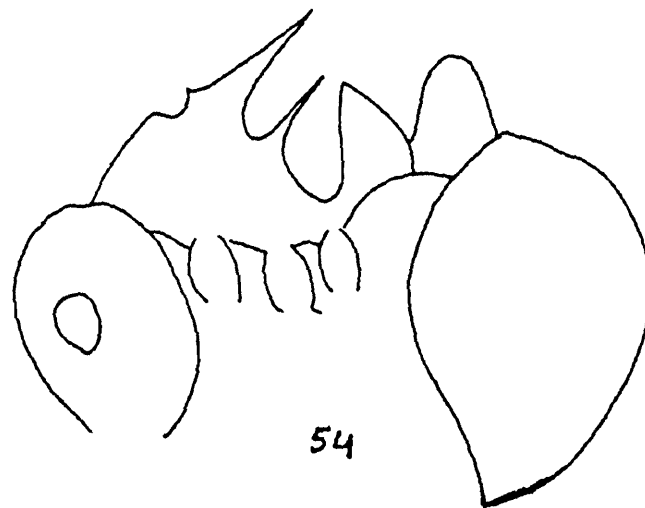
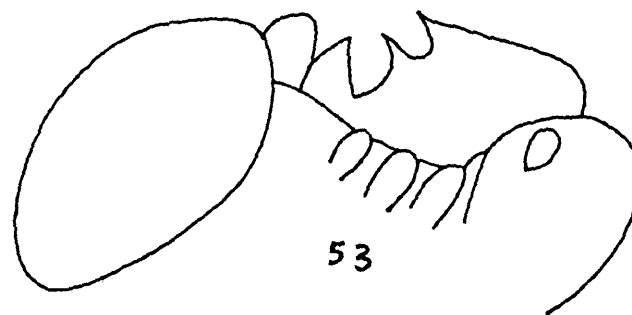
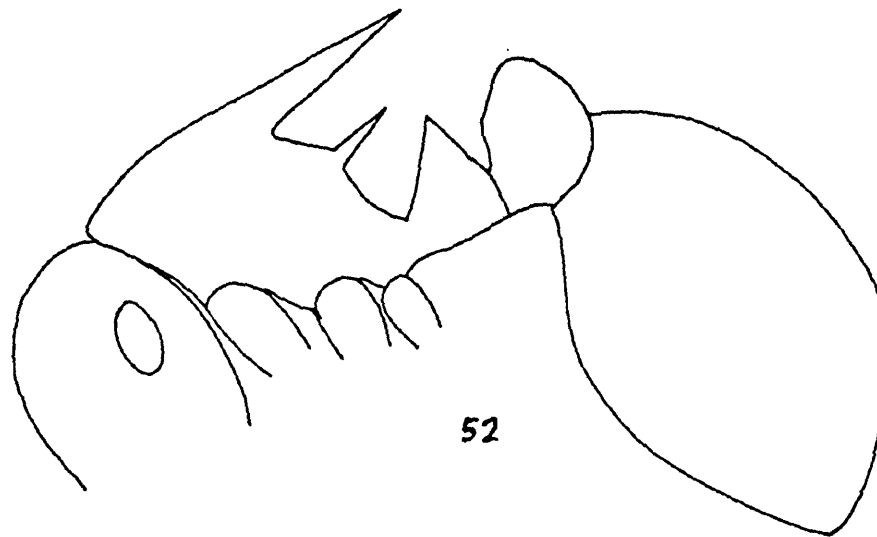


Fig. 52. *Meranoplus bicolor* (Guerin) (5x10)

Fig. 53. *Meranoplus rothneyi* Forel (5x10)

Fig. 54. *Meranoplus laeviventris* Emery (5x10)

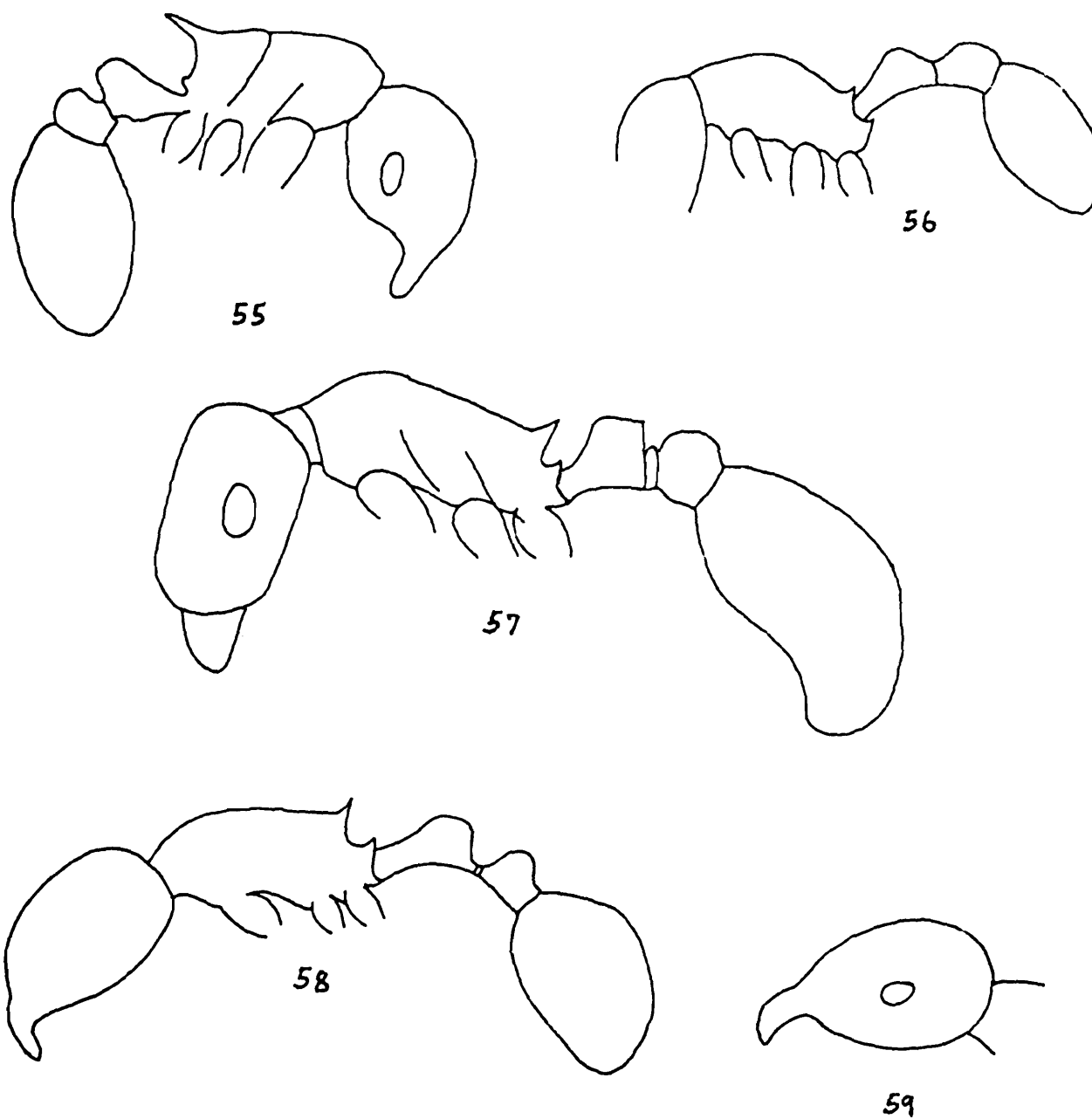


Fig. 55. *Roptromyrmex wroughtonii* Forel (5x10)

Fig. 56. *Tetramorium barryi* Mathew (5x10)

Fig. 57. *Tetramorium bicarinatum* (Nylander) (5x10)

Fig. 58. *Tetramorium browni* sp. nov. (5x10)

Fig. 59. *Tetramorium browni* sp. nov (5x10), Head front view.

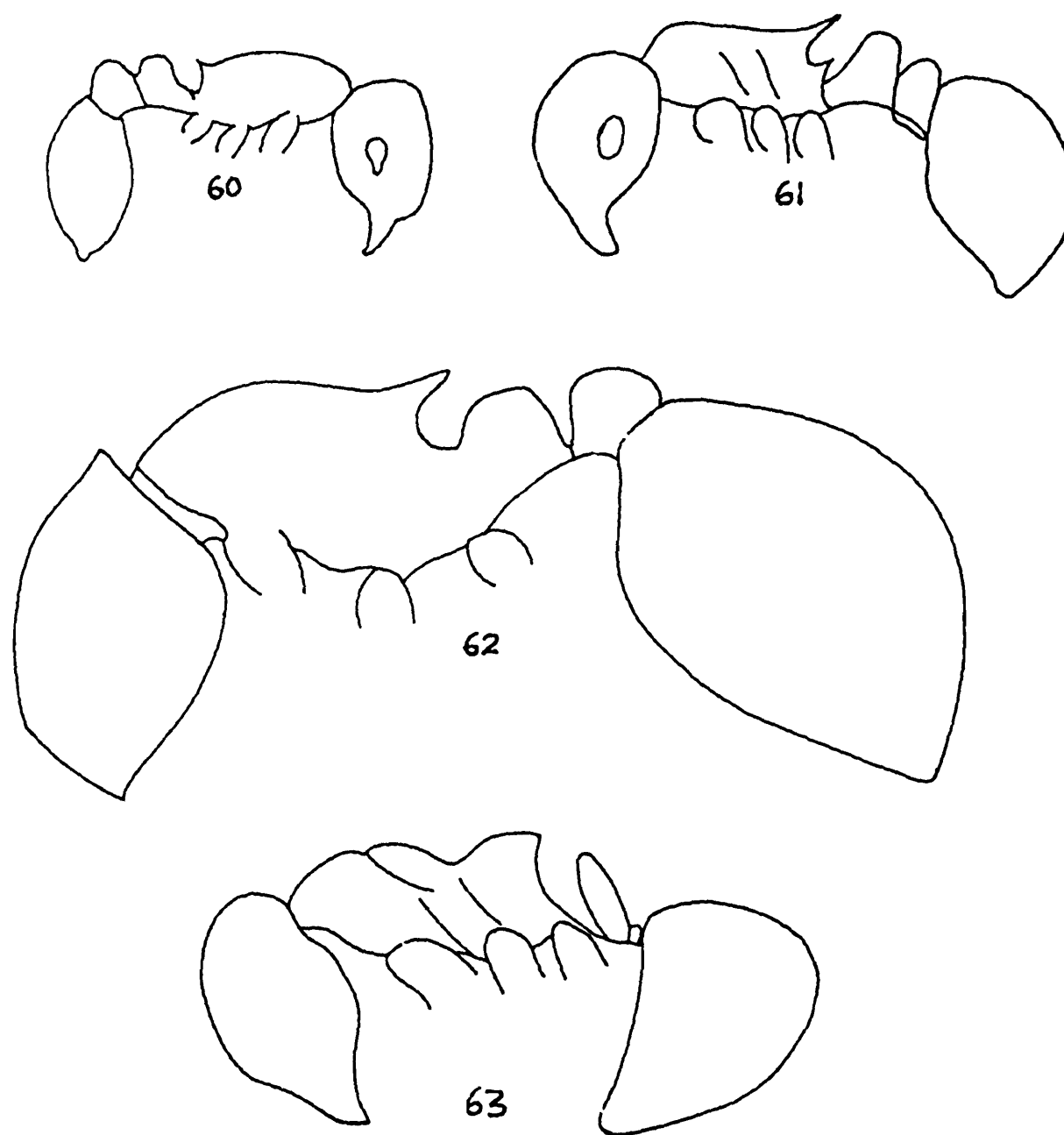


Fig. 60. *Tetramorium simillimum* (Fred. Smith) (5x10)

Fig. 61. *Tetramorium smithi* Mayr (5x10)

Fig. 62. *Cataulacus taprobanae* Fred. Smith (5x10)

Fig. 63. *Dolichoderus bituberculatus* Mayr (5x10)

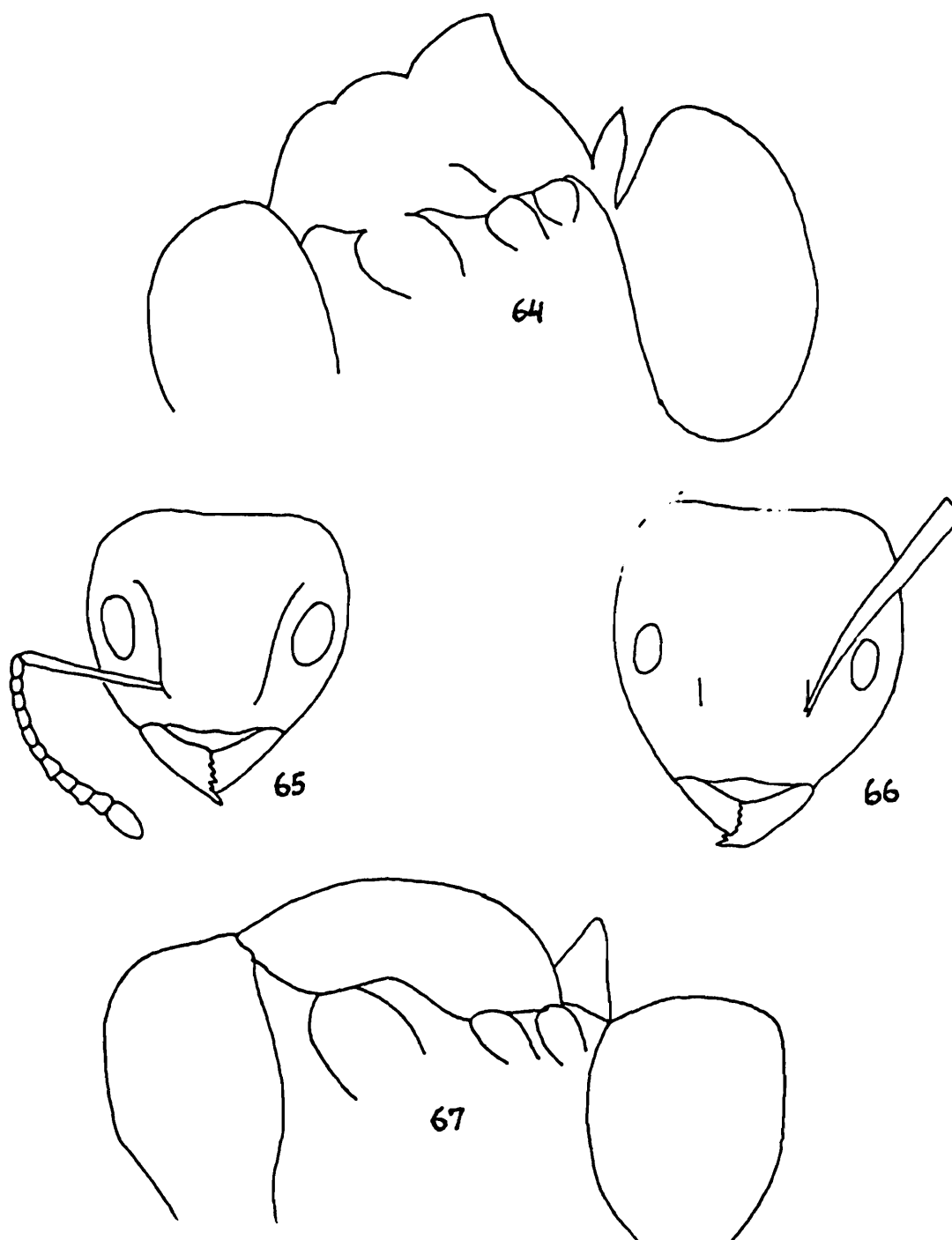


Fig. 64. *Dolichoderus sundari* sp. nov. (5x10)

Fig. 65. *Dolichoderus sundari* sp. nov. (5x10), Head front view.

Fig. 66. *Liometopum lindgreeni* Forel (5x10), Head front view.

Fig. 67. *Camponotus compressus* Fabricius (1.6x10)

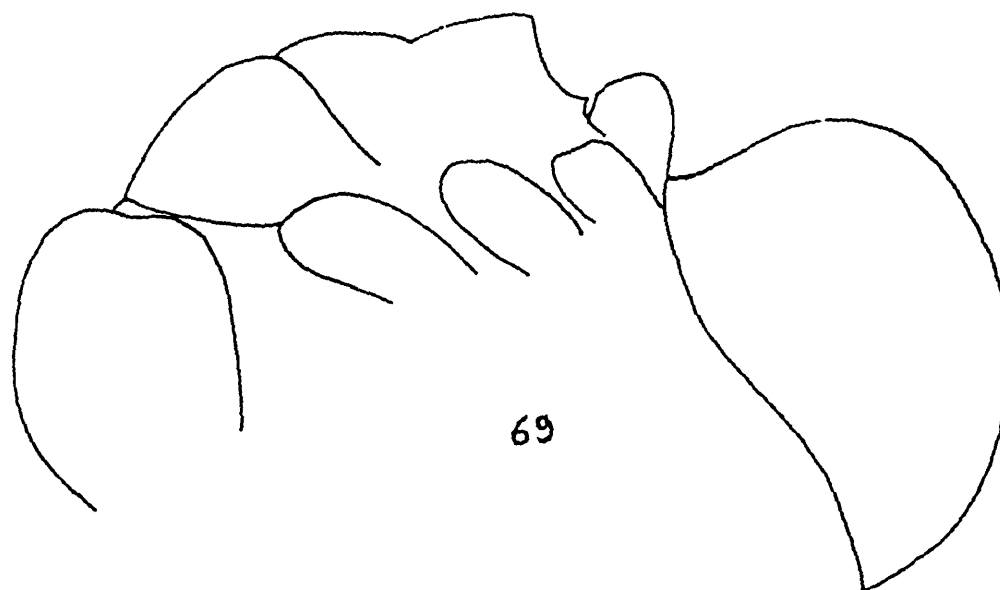
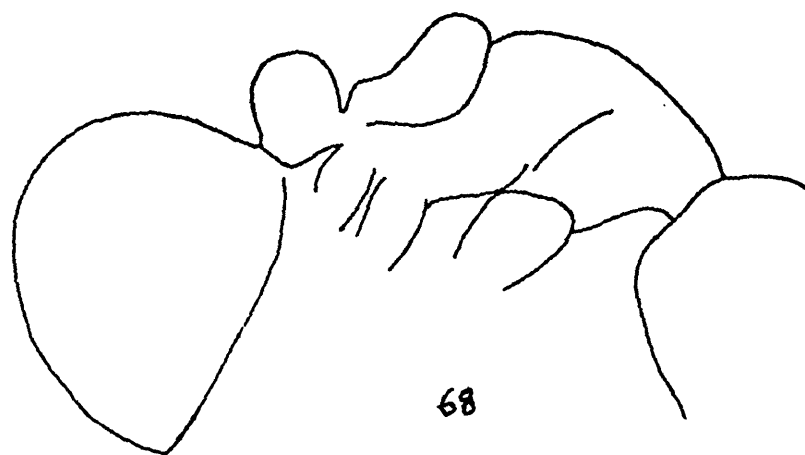


Fig. 68. *Camponotus holosericeus* Emery (2.5x10)

Fig. 69. *Camponotus (sericeus)* Fabricius (2.5x10)

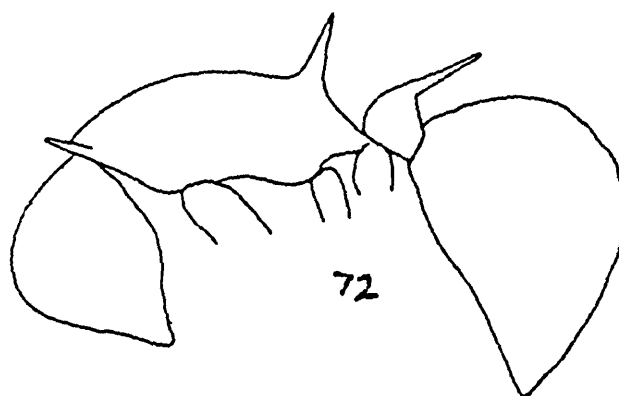
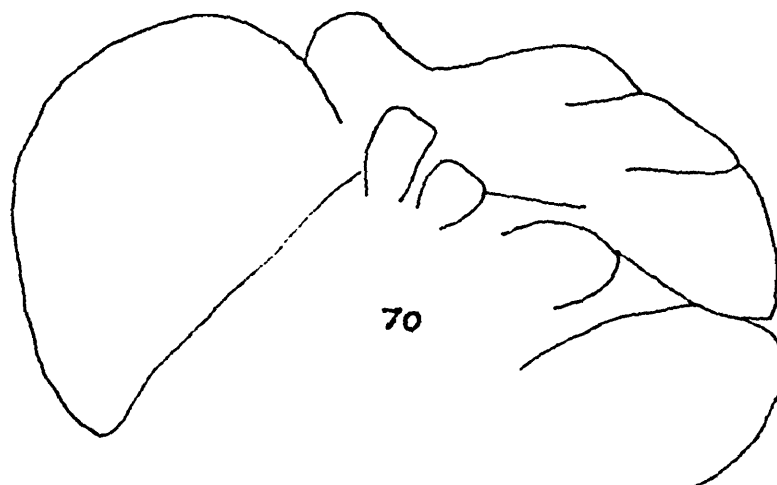


Fig. 70. *Camponotus wasmanni* Emery (2.5x10)

Fig. 71. *Polyrhachis armata* (Le Guillou) (1.6x10)

Fig. 72. *Polyrhachis bicolor* Fred. Smith (2.5x10)

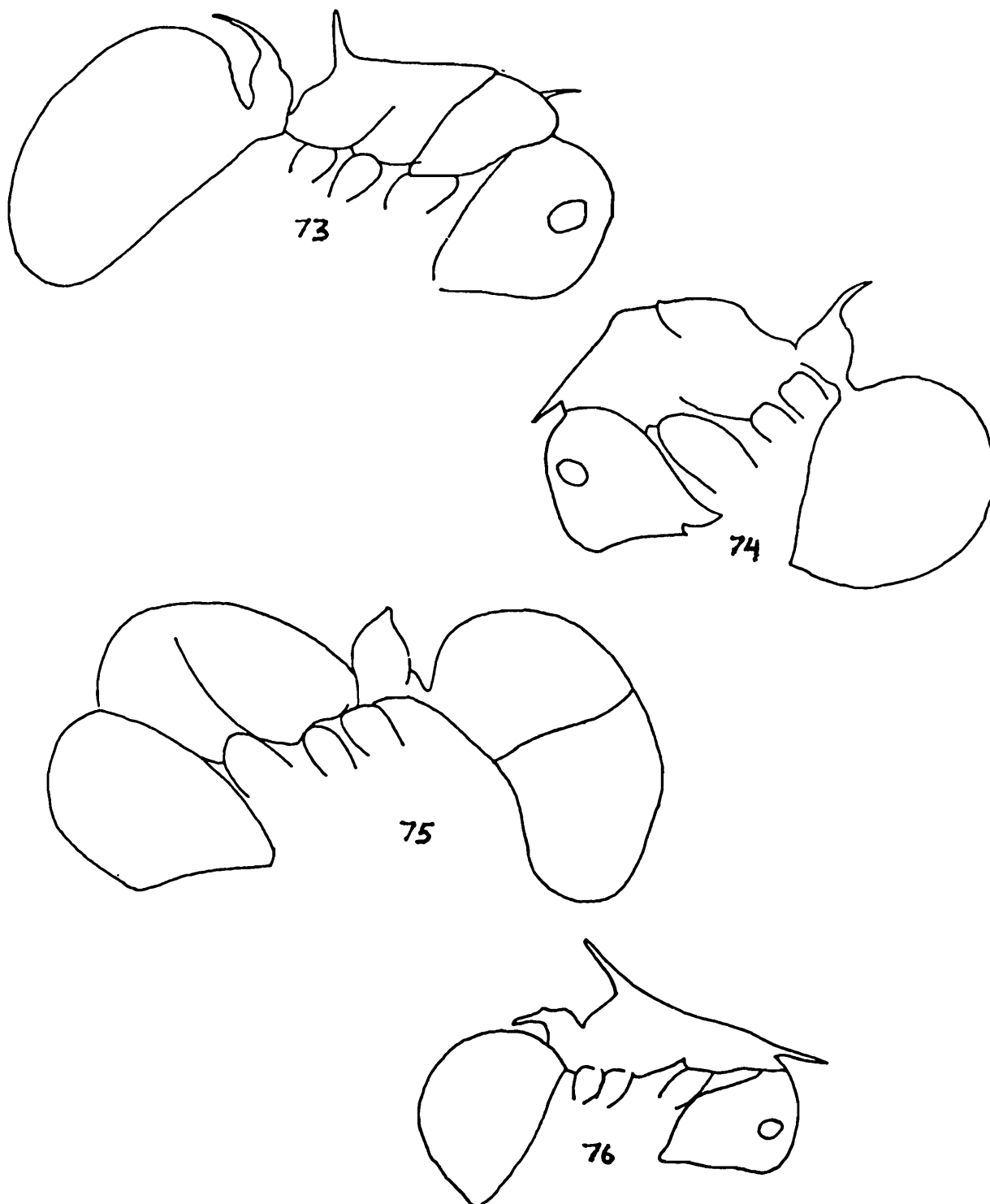


Fig. 73. *Polyrhachis dives* Fred. Smith (2.5x10)

Fig. 74. *Polyrhachis illaudata* Walker (1.6x10)

Fig. 75. *Polyrhachis laevissima* Fred. Smith (2.5x10)

Fig. 76. *Polyrhachis mutata* Fred. Smith (1.6x10)

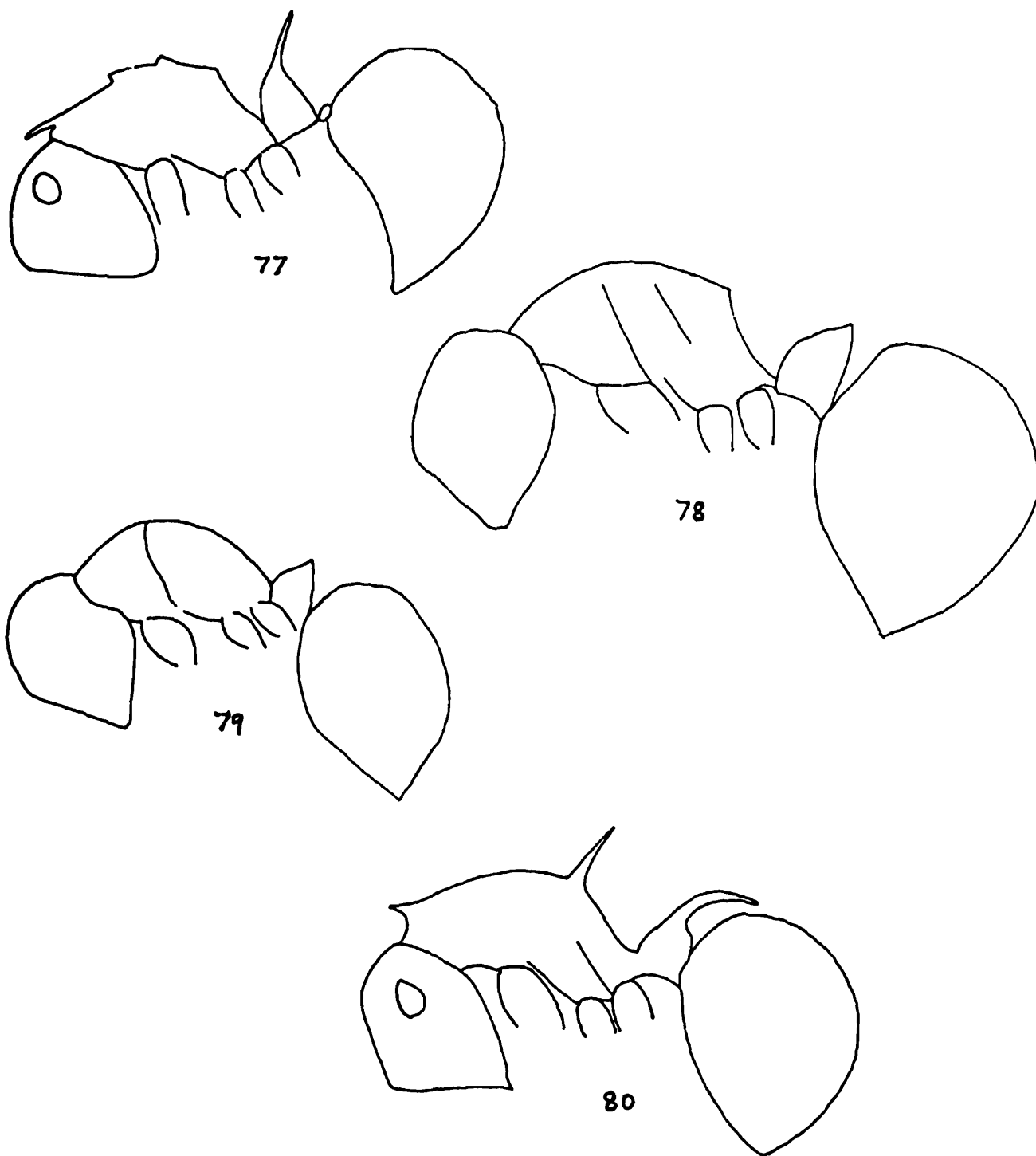
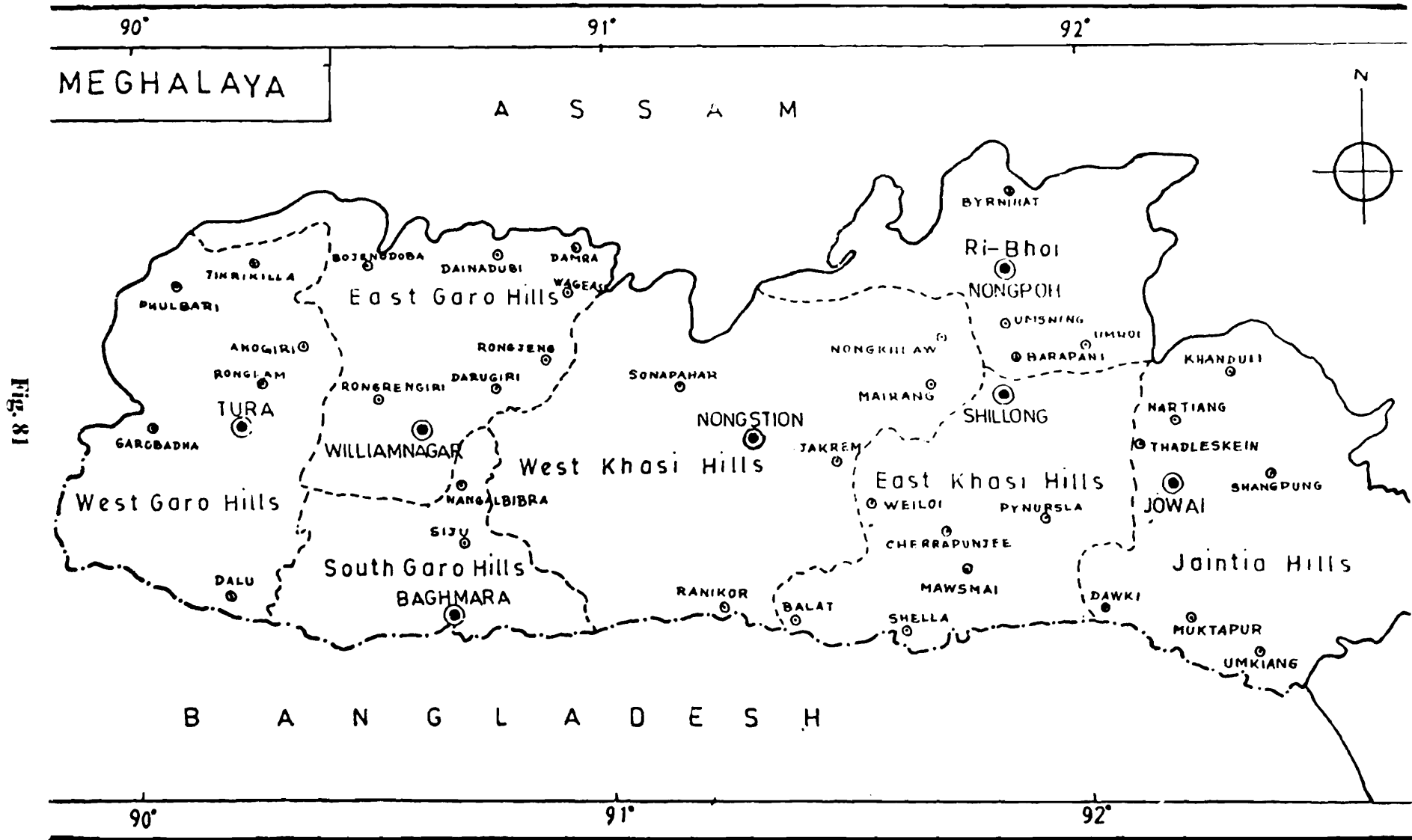


Fig. 77. *Polyrhachis proxima* Roger (1.6x10)

Fig. 78. *Polyrhachis punctillata* Roger (2.5x10)

Fig. 79. *Polyrhachis rastellata* Latrielle (2.5x10)

Fig. 80. *Polyrhachis tibialis* Fred. Smith (2.5x10)



FAUNA OF MEGHALAYA (INSECTA : HYMENOPTERA : FORMICIDAE)
DISTRICT-WISE DISTRIBUTION

Name of the species	Name of the Districts						
	West Gar Hills	East Gar Hills	South Gar Hills	West Khasi Hills	East Khasi Hills	Ri-Bhoi	Jaintia Hills
	1	2	3	4	5	6	7

FAMILY : FORMICIDAE

I Subfamily DORYLINAE Forel

1. Genus *Aenictus* Schuckard

1. <i>Aenictus binghami</i> Forel	+			+	+		
2. <i>Aenictus brevicornis</i> (Mayr)					+		
3. <i>Aenictus fergusonii</i> Forel					+		
4. <i>Aenictus laeviceps</i> Smith	+				+		
5. <i>Aenictus longi</i> Forel	+	+					
6. <i>Aenictus shillongensis</i> sp. nov.					+		

2. Genus *Dorylus* Fabricius

7. <i>Dorylus orientalis</i> Westwood					+		+

II Subfamily CERADACHYINAE Forel

3. Genus *Lioponera* Mayr

8. <i>Lioponera longitarsus</i> Mayr					+		
9. <i>Lioponera parva</i> Forel					+		

4. Genus *Cerapachys*

10. <i>Cerapachys risii</i> Forel					+		
11. <i>Cerapachys aitkeni</i> Forel					+		

	1	2	3	4	5	6	7
III Subfamily PONERINAE Lepeletier							
5. Genus <i>Gnamptogenys</i> Roger							
12. <i>Gnamptogenys bicolor</i> Emery					+		
6. Genus <i>Proceratium</i> Roger.							
13. <i>Proceratium williamsi</i> sp. nov.					+		
7. Genus <i>Diacamma</i> Mayr							
14. <i>Diacamma rugosum</i> (Le Guillou)				+	+		
15. <i>Diacamma scalpratum</i> (Fred. Smith)	+				+		
8. Genus <i>Harpegnathos</i>							
16. <i>Harpegnathos venator</i> (Fred. Smith)					+		
9. Genus <i>Leptogenys</i> Roger							
17. <i>Leptogenys assamensis</i> Forel					+		
18. <i>Leptogenys birmana</i> Forel							+
19. <i>Leptogenys binghami</i> Forel				+			
20. <i>Leptogenys diminuta</i> (Fred. Smith)					+		
21. <i>Leptogenys kitteli</i> Mayr	+			+	+		+
22. <i>Leptogenys peuqueti</i> Er. Andre					+		
23. <i>Leptogenys ocellifera</i> (Rger)					+		
24. <i>Leptogenys punctiventris</i> Mayr	+				+		
25. <i>Leptogenys jeanettei</i> sp. nov.					+		
10. Genus <i>Odontoponera</i> Mayr							
26. <i>Odontoponera transversa</i> (Fred. Smith)	+			+	+	+	+
11. Genus <i>Pachycondyla</i> Fred Smith							
27. <i>Pachycondyla amblyops</i> (Emery)				+	+		
12. Genus <i>Ectomomyrmex</i> Mayr							

	1	2	3	4	5	6	7
28. <i>Ectomomyrmex astuta</i> (Fred. Smith)				+	+		+
29. <i>Ectomomyrmex givana materna</i> (Forel)		+					
30. <i>Ectomomyrmex leeuwenhoekii</i> (Forel)	+				+		
13. Genus <i>Brachyponera</i> Emery							
31. <i>Brachyponera luteipes</i> (Mayr)				+	+		+
32. <i>Brachyponera nigrita</i> (Emery)					+		
14. Genus <i>Bothroponera</i> (Mayr)							
33. <i>Bothroponera rufipes</i> (Jerdon)	+			+	+		+
15. Genus <i>Odontomachus</i> Latreille							
34. <i>Odontomachus huematodos</i> (Linnaeus)					+		
35. <i>Odontomachus monticola</i> Emery	+	+			+		
36. <i>Odontomachus punctulatus</i> Forel	+				+		+
37. <i>Odontomachus rixosus</i> Fred Smith					+		
16. Genus <i>Anochetus</i> Mayr							
38. <i>Anochetus myops</i> (Emery)					+		
39. <i>Anochetus punctiventris</i> (Mayr)					+		
IV Subfamily PSEUDOMYRMECINAE Emery							
17. Genus <i>Tetraponera</i> Smith							
40. <i>Tetraponera aitkeni</i> (Forel)					+		
41. <i>Tetraponera allaborans</i> (Walker)					+		
42. <i>Tetraponera nigra</i> (Jerdon)					+		
43. <i>Tetraponera rufonigra</i> (Jerdon)	+	+		+	+		
V Subfamily MYARMICINAE Lepelletier							
18. Genus <i>Rhoptromyrmex</i> Mayr							
44. <i>Rhoptromyrmex wroughtonii</i> Forel				+	+		

	1	2	3	4	5	6	7
19. Genus <i>Triglyphothrix</i> Forel							
45. <i>Triglyphothrix lanuginosa</i> (Mayr)	+			+			
46. <i>Triglyphothrix walshi</i> Forel					+		
20. Genus <i>Myrmica</i> Latreille							
47. <i>Myrmica margaritae</i> Emery					+		
21. Genus <i>Aphaenogaster</i> Mayr							
48. <i>Aphaenogaster rothneyi</i> (Forel)					+		
49. <i>Aphaenogaster Sagei</i> (Forel)					+		
50. <i>Aphaenogaster schurri</i> (Forel)					+		
51. <i>Aphaenogaster smythiesi</i> (Forel)					+		
22. Genus <i>Monomorium</i> Mayr							
52. <i>Monomorium aberrans</i> Forel					+		
53. <i>Monomorium floricola</i> (Jerdon)	+	+			+		
54. <i>Monomorium longi</i> Forel					+		+
55. <i>Monomorium minutum</i> Mayr	+						
56. <i>Monomorium pharaonis</i> (Linnaeus)					+		
57. <i>Monomorium schurri</i> Forel					+		
23. Genus <i>Cardiocondyla</i> Emery							
58. <i>Cardiocondyla nuda</i> (Mayr)							
24. Genus <i>Tetramorium</i> Mayr							
59. <i>Tetramorium harryi</i> Mathew					+		
60. <i>Tetramorium bicarinatum</i> (Nylander)	+				+		
61. <i>Tetramorium browni</i> sp. nov.					+		
62. <i>Tetramorium christiei</i> Forel					+		+
63. <i>Tetramorium mixtum</i> Forel					+		

	1	2	3	4	5	6	7
64. <i>Tetramorium simillimum</i> (Fred. Smith)				+	+		+
65. <i>Tetramorium smithi</i> Mayr					+		
66. <i>Tetramorium</i> sp	+	+					
25. Genus <i>Xiphomyrmex</i> Forel							
67. <i>Xiphomyrmex tortuosum</i> (Roger)		+					
26. Genus <i>Pheidole</i> Westwood							
68. <i>Pheidole allaoni</i> Bingham					+		
69. <i>Pheidole bhavanae</i> Bingham					+		
70. <i>Pheidole capellinii</i> Emery				+			
71. <i>Pheidole constanciae</i> Forel					+		
72. <i>Pheidole feae</i> Emery							+
73. <i>Pheidole jucunda</i> Forel					+		
74. <i>Pheidole lamellinoda</i> Forel					+		
75. <i>Pheidole malinsii</i> Forel					+		
76. <i>Pheidole mus</i> Forel							+
77. <i>Pheidole parva</i> Mayr				+			
78. <i>Pheidol pronotales</i> Forel					+		
79. <i>Pheidole roberti</i> Forel					+		
80. <i>Pheidole sagei</i> Forel					+		
81. <i>Pheidole smythiesi</i> Forel	+				+		
82. <i>Pheidole striativentris</i> Mayr					+		
83. <i>Pheidole watsoni</i> Forel					+		
84. <i>Pheidole wood-masoni</i> Forel					+		
85. <i>Pheidole</i> sp.					+		

	1	2	3	4	5	6	7
27. Genus <i>Trigonogaster</i> Forel							
86. <i>Trigonogaster recurvispinosa</i> Forel					+		
28. Genus <i>Cataulacus</i> Fred. Smith							
87. <i>Cataulacus taprobanae</i> Fred. Smith					+		
88. <i>Cataulacus simoni</i> Emery					+		
29. Genus <i>Crematogaster</i> Lund							
89. <i>Crematogaster anthracina</i> Fred. Smith					+		
90. <i>Crematogaster artifex</i> Mayr					+		
91. <i>Crematogaster biroi</i> Mayr					+		
92. <i>Crematogaster flava</i> Forel	+	+			+		+
93. <i>Crematogaster hodgsoni</i> Forel					+		
94. <i>Crematogaster politula</i> Forel					+		
95. <i>Crematogaster dohrni rogenhoferi</i> Mayr		+		+	+		+
96. <i>Crematogaster rothneyi</i> Mayr	+			+	+		
97. <i>Crematogaster travancorensis</i> Forel					+		
98. <i>Crematogaster walshi</i> Forel	+			+	+		
99. <i>Crematogaster</i> sp.							+
30. Genus <i>Lophomyrmex</i> Emery							
100. <i>Lophomyrmex bedoti</i> Emery	+			+	+		+
101. <i>Lophomyrmex burmanus</i> Emery					+		
102. <i>Lophomyrmex quadrispinosus</i> (Jerdon)	+			+	+		
31. Genus <i>Pheidologeton</i> Mayr							
103. <i>Pheidologeton affinis</i> (Jerdon)		+		+			
32. Genus <i>Myrmecina</i> Curtis							
104. <i>Myrmecina striate</i> Emery					+		

	1	2	3	4	5	6	7
33. Genus <i>Meranoplus</i>							
105. <i>Meranoplus bicolor</i> (Guerin)	+	+			+		
106. <i>Meranoplus rothneyi</i> Forel	+				+	+	
107. <i>Meranoplus laeviventris</i> Emery					+		
34. Genus <i>Carebara</i> Westwood							
108. <i>Carebara lignata</i> Westwood	+				+		
35. Genus <i>Strumigenys</i> Fred. Smith							
109. <i>Strumigenys godeffroyi</i>					+		
36. Genus <i>Myrmicaria</i> Saunders							
110. <i>Myrmicaria brunnea</i> Saunders					+		
37. Genus <i>Vollenhovia</i>							
111. <i>Vollenhovia</i> sp.					+		
VI Subfamily: DOLICHODERINAE Forel							
38. Genus <i>Liometopum</i> Mayr							
112. <i>Liometopum lindgreeni</i> Forel		+			+		
39. Genus <i>Bothriomyrmex</i> Emery							
113. <i>Bothriomyrmex myops</i> Forel					+		
40. Genus <i>Iridomyrmex</i> Mayr							
114. <i>Iridomyrmex anceps</i> (Roger)				+	+		+
41. Genus <i>Dolichoderus</i> Lund							
115. <i>Dolichoderus affinis</i> Emery	+				+		+
116. <i>Dolichoderus bituberculatus</i> Mayr					+		+
117. <i>Dolichoderus fuscus</i> Emery					+		
118. <i>Dolichoderus sundari</i> sp. nov.					+		
119. <i>Dolichoderus taprobanae</i> (Fred. Smith)					+		

	1	2	3	4	5	6	7
120. <i>Dolichoderus</i> sp.	+						
42. Genus <i>Tapinoma</i> Foerster							
121. <i>Tapinoma indicum</i> Forel					+		+
122. <i>Tapinoma melanocephalum</i> (Fabricius)					+		
43. Genus <i>Technomyrmex</i>							
123. <i>Technomyrmex</i> sp.		+					
Subfamily FORMICINAE Lepeletier							
44. Genus <i>Oecophylla</i> Fred. Smith							
124. <i>Oecophylla smaragdina</i> (Fabricius)	+	+			+	+	
45. Genus <i>Pseudolasius</i> Emery							
125. <i>Pseudolasius familiaris</i> (Fred. Smith)					+		
46. Genus <i>Myrmecocystus</i> Wesmael							
126. <i>Myrmecocystus setipes</i> Forel	+						
47. Genus <i>Acantholepis</i> Mayr							
127. <i>Acantholepis capensis</i> Mayr					+		
128. <i>Acantholepis frauenfeldi</i> Mayr					+		
129. <i>Acantholepis capensis simplex</i> Forel					+		
48. Genus <i>Anoplolepis</i> Santschi							
130. <i>Anoplolepis longipes</i> (Jerdon)					+		+
49. Genus <i>Plagiolepis</i> Mayr							
131. <i>Plagiolepis dichroa</i> Forel					+		
50. Genus <i>Paratrechina</i> Motschoulsky							
132. <i>Paratrechina longicornis</i> Latreille				+	+		
51. Genus <i>Camponotus</i> Mayr							
133. <i>Camponotus cotesii</i> (Forel)	+						+

	1	2	3	4	5	6	7
134. <i>Camponotus pubescens</i> (Mayr)	+						
135. <i>Camponotus strictus</i> (Jerdon)				+			
136. <i>Camponotus angusticollis</i> (Jerdon)	+						
137. <i>Camponotus camelinus</i> (Fred. Smith)	+				+		
138. <i>Camponotus compressus</i> (Fabricius)		+		+	+		+
139. <i>Camponotus holosericeus</i> Emery					+		
140. <i>Camponotus paria</i> Emery					+		
141. <i>Camponotus rufoglaucus</i> (Jerdon)	+				+		
142. <i>Camponotus selene</i> (Emery)					+		
143. <i>Camponotus sericeus</i> (Fabricius)					+		
144. <i>Camponotus wasmanni</i> Emery					+		+
52. Genus <i>Polyrhachis</i> Fred. Smith							
145. <i>Polyrhachis abdominalis</i> Fred. Smith				+	+		
146. <i>Polyrhachis affinis</i> Smith					+		
147. <i>Polyrhachis armata</i> (Le Guillou)	+			+	+		
148. <i>Polyrhachis bicolor</i> Fred. Smith					+		
149. <i>Polyrhachis ceylonensis</i> Emery					+		
150. <i>Polyrhachis convexa</i> Roger					+		
151. <i>Polyrhachis dives</i> Fred. Smith	+	+		+	+		+
152. <i>Polyrhachis furcata</i> Fred. Smith					+		
153. <i>Polyrhachis illaudata</i> Walker					+		
154. <i>Polyrhachis intermedia</i> Forel					+		
155. <i>Polyrhachis lacvissima</i> Fred. Smith		+		+	+		
156. <i>Polyrhachis mayri</i> Roger		+					
157. <i>Polyrhachis mutata</i> Fred. Smith					+		

	1	2	3	4	5	6	7
158. <i>Polyrhachis proxima</i> Roger	+				+		
159. <i>Polyrhachis punctillata</i> Roger					+		
160. <i>Polyrhachis rastellata</i> Latreille					+		
161. <i>Polyrhachis striata</i> Mayr					+		
162. <i>Polyrhachis tibatilis</i> Fred. Smith					+		
163. <i>Polyrhachis</i> sp.		+			+		

SUMMARY

The monograph deals with the ants (Family Formicidae:Hymenoptera) collected from different districts of Meghalaya, India. Altogether 163 species pertaining to 52 genera and 7 subfamilies have been reported. Before the present work, a total of 4 species under 4 genera in 4 subfamilies only were known from the State (Bingham, 1903 Mathew 1980, 84) The present paper also records 159 species under 52 genera and 7 subfamilies for the first time from Meghalaya. Keys to the identification of subfamilies, genera and species dealt within the monograph and diagnostic features of the species included, have been incorporated. The paper also includes 5 new species, described in detail and illustrated. A separate chart showing the distributional pattern, district-wise has been provided to show the distribution of the concerned species at a glance. Notes on topography, morphology and methodology have been provided to delineate the basic concept of the family.

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INSECTA : HYMENOPTERA : ICHNEUMONIDAE

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INTRODUCTION

The family Ichneumonidae of the order Hymenoptera is one of the largest of all animal groups. Of all the species of insects known from the world, 5-8% belong to family Ichneumonidae. The ichneumonids are associated with foliage and found mainly in cool, humid and temperate climate. They not only, are parasitic in cocoons, usually of Lepidoptera, but also parasitise cocoons of Symphyta, Braconidae, Ichneumonidae, Neuroptera, Diptera and spiders.

Till 1955, very limited research work was done on Ichneumonidae of Indian subregion. Morley (1913) published "Fauna of British India, Hymenoptera, Vol. III (Part I) Ichneumonidae" but did not give any comprehensive account of two important groups viz., Cryptinae and Ichneumoninae. Cushman (1927), Rao (1953), Heinrich (1930-1965), Betrem (1932-1941), Cheesman (1938-1953), Perkins (1958-1963) and Porter (1963-1967) described a few more species under this family. Subsequently Townes (1969-1985), Kamath and Gupta (1972), Jonathan and Gupta (1973), Gupta and Tikar (1976), Gupta and Gupta (1977), Gupta and Maheshwary (1977), Chandra and Gupta (1977), Kaur and Jonathan (1979), Jonathan (1980, 1993), Gauld and Mitchell (1981) and Gupta and Gupta (1983) have published monographs and revisionary work on Ichneumonidae of Indian subregion (Oriental).

An attempt has been made to consolidate our knowledge of the Ichneumonidae fauna of the state of Meghalaya, India. The present work is based on the collection of this family made by several survey parties of the Zoological Survey of India and material received on loan/donation from various institutions in India and abroad. A major collection of this family was received through the mopping survey of Meghalaya by J.K. Jonathan & Party, 1979; S.B. Roy and Party, 1979 and old "Museum Collection" of Zoological Survey of India, which includes collections made by E. Brunetti (1908), N. Annandale (1911), Lord Carmichael (1913) and S.L. Hora (1930).

SYSTEMATICS

It is estimated that 60,000 species of Ichneumonidae are known from the world and are classified in 26 subfamilies. In India the family is represented by about 1200 species and subspecies under 23 subfamilies.

The present study of the fauna of Meghalaya reveals that about 29% of the species recorded from India are distributed in this region. The ichneumonid species from this region were mainly recorded from Khasi Hills and surrounding areas.

The present paper deals with 345 species/subspecies from Meghalaya under 110 Genera and 18 subfamilies. The subfamily Ichneumoninae has not been treated in detail. The genera and species/subspecies of subfamily Ichneumoninae are difficult to classify. A large portion of them are only weakly differentiated and often there is convergence, parallelism and annectant forms (Townes, 1961). Most species are based on their types, located in various museum abroad. In the present paper the species/subspecies of the subfamily Ichneumoninae have been classified (Appendix I) up to generic level, according to the classification as given by Townes (1961). All the species/subspecies of this subfamily known from the state of Meghalaya have been listed under each genus along with its synonymy and distribution. These taxa are not shown in distributional table and Maps.

MATERIAL AND METHODS

Most ichneumonids prefer humid and temperate climate. They are active fliers except a few wing-less forms. During the day time these ichneumonids can be spotted by the insect collector in the shrubs, bushes and in tall grasses, resting or flying about. In cool and humid forests and cultivated areas, the mopping survey parties collected these insects by sweeping insect nets through the vegetation. Certain species of ichneumonids are nocturnal and are attracted towards light during the night. These are collected in large numbers on light traps.

Specimens so collected are preserved dry in paper envelopes after killing in a jar with a cotton pad soaked with ethyl acetate or benzene. Some small forms are preserved in 70% alcohol.

All ichneumonids are set, pinned and labelled in usual manner and stored in insect drawer/boxes for study purposes.

Male genitalia in several cases was found to be very useful in identification of closely related genera and species. The methodology for the extraction and mounting of male genitalia is as follows:

Genital capsule could be extracted with the help of a needle, while the abdomen was held steady by means of a pair of forceps, after relaxing the specimen for about 24 hours. However, with this method subgenital plate may not be extracted well without being damaged. Therefore, it is better to cut the last 2 or 3 abdominal segments and keep the same in 10% KOH solution overnight. Following day, the gonoforceps, penis valves and subgenital plates are teased apart by a pair of fine needles and genitalia are mounted on a slide after thorough washing and dehydration.

TAXONOMIC TERMINOLOGY

The morphological terms used in the present work are mainly based on Townes (1969); Kamath and Gupta (1972); Jonathan and Gupta (1973); Gupta and Tikar (1976); Gupta and Maheshwary (1977); Gupta and Gupta (1977); Chandra and Gupta (1977); Kaur and Jonathan (1979); and Jonathan (1980).

The morphological terms frequently used in the Keys and description are illustrated in the figures 1-2 (Jonathan & Gupta, 1973).

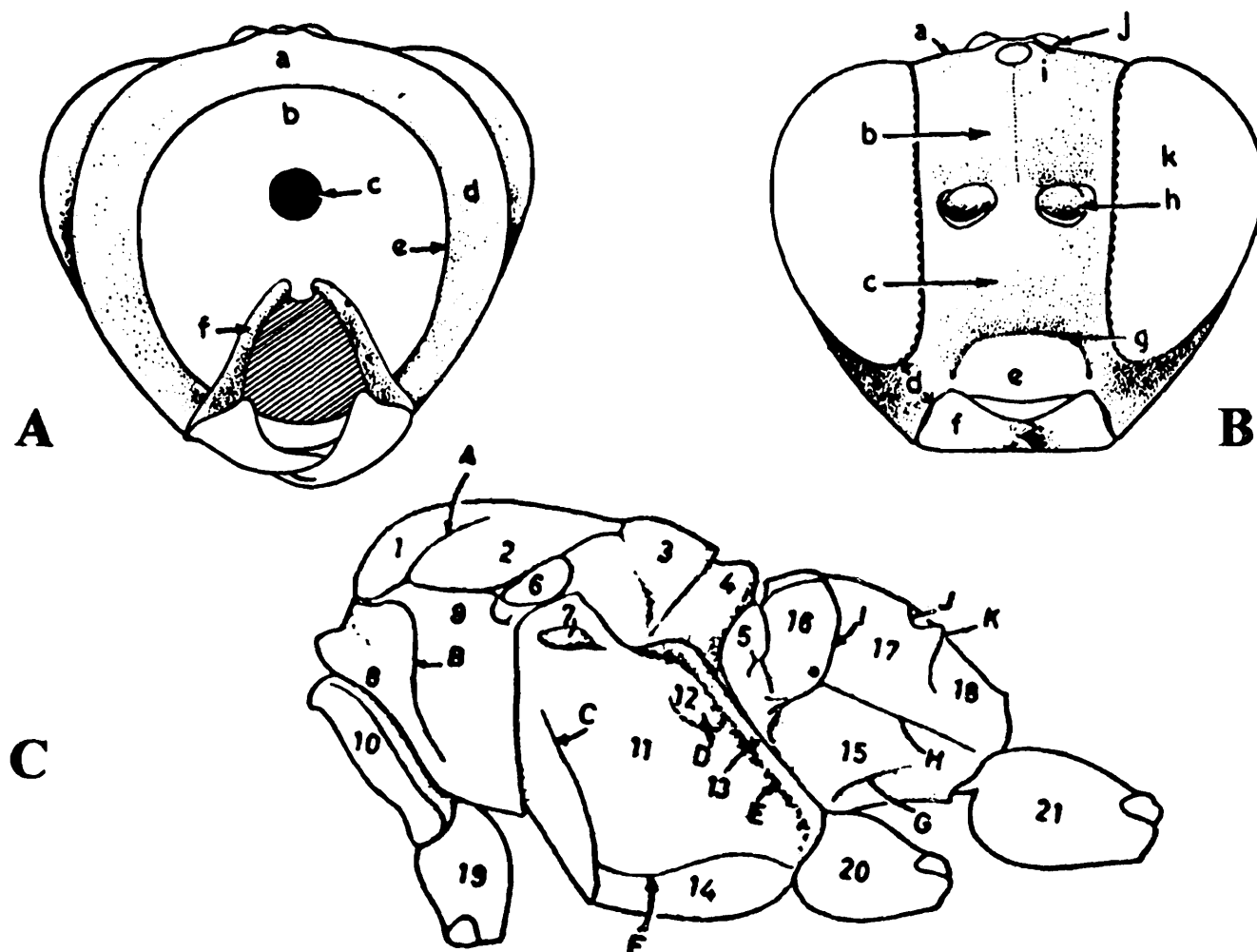


Fig. 1 (A-C) : (A) Front view of head of an Ichneumonid : a. Vertex, b. Frons, c. Face, d. Malar space, e. Clypeus f. Mandible, g. epistomal suture, h. Antennal socket, i. Median ocellus, j. Lateral ocellus, k. Eye.

(B) Rear view of head of an Ichneumonid : a. Vertex, b. Occiput, c. Foramen magnim, d. Temple, e. Occipital carina, f. Hypostomal carina.

(C) Side view of thorax of an Ichneumonid :

AREAS

1. Median lobe of mesoscutum	2. Lateral lobe of mesoscutum	3. Scutellum
4. Metascutellum	5. Hind margin of metanotum	6. Tegula
7. Subtegular ridge	8. Pronotal collar	9. Upper margin of pronotum
10. Propleurum	11. Mesopleurum	12. Speculum
13. Mesepimeron	14. Mesosternum	15. Metapleurum
16. Basal area of propodeum	17. Middle area of propodeum	18. Apical area of propodeum
19. Fore coxa	20. Middle coxa	21. Hind coxa

CARINAE and GROOVES

A. Notaulus	B. Epomia	C. Prepectal carina
D. Mesopleural pit	E. Mesopleural suture	F. Sternaulus
G. Justacosal carina	H. Pleural carina	I. Basal carina of propodeum
J. Apical carina of propodeum	K. Apophyses	

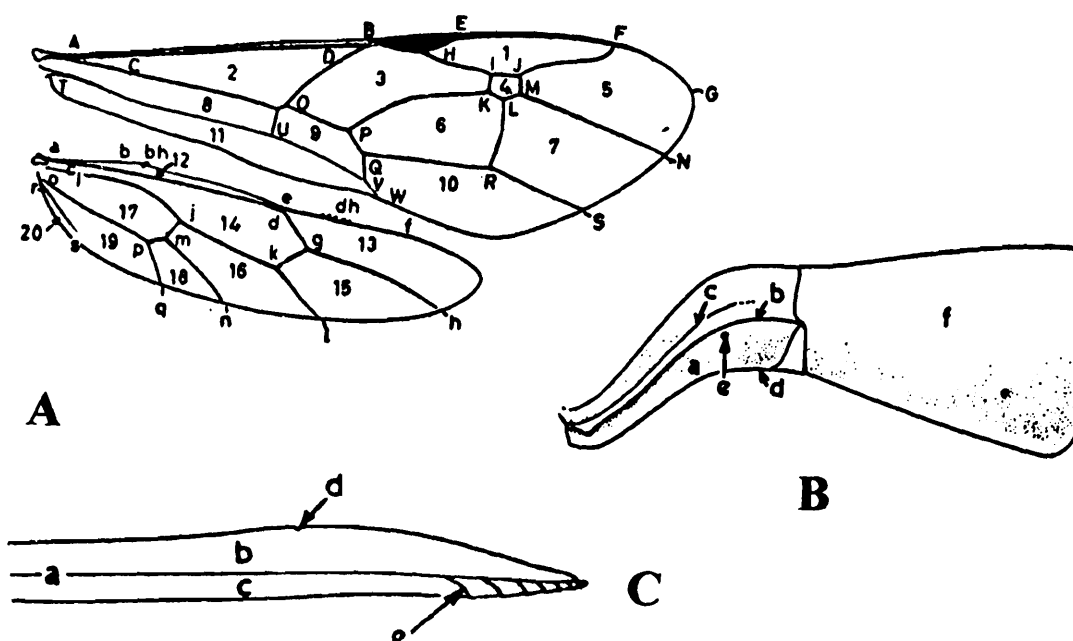


Fig. 2 (A-C) : (A) Fore and hind wings of an Ichneumonid.

VEINS

<i>Fore wing</i>		<i>Hind wing</i>	
AB = Costa	UVW = Brachius	ab = Costella	pq = Brachiella
CD = Subcosta	BEH = Stigma	cde = Subcostella	bh = Basal hamulus
EFG = Metacarpus	DO = Basal vein	ef = Metacarpella	dh = Distal hamuli
HIJF = Radius	IK = First intercubitus	dgh = Radiella	rs = Axillus
KLMN = Cubitus	JM = Second intercubitus	jkl = Cubitella	jmp = Nervellus
OPQV = Discoideus	PK = Discocubitus	mn = Discoidella	
QRS = Subdiscoideus	LR = Second recurrent vein	kg = Intercubitella	
CO = Medius	OU = Nervulus	ij = Mediella	
TU = Submedius	PQV = Postinervulus	op = Submediella	

CELLS

<i>Fore wing</i>		<i>Hind wing</i>
1 = Radial cell	10 = Second brachial cell	12 = Constellan cell
2 = Median cell	11 = Anal cell	13 = Radiellan cell
3 = Discocubital cell		14 = Mediellan cell
4 = Areolet		15 = Cubitellan cell
5 = Third cubital cell		16 = Discoidellan cell
6 = Second discoidal cell		17 = Submediellan cell
7 = Third discoidal cell		18 = Brachiellan cell
8 = Submedian cell		19 = Anellan cell
9 = First brachial cell		20 = Postellan cell

(B) Side view of first and second tergites of an Ichneumonid.

a. First tergite	b. Dorso-lateral carina	c. Dorso-median carina
d. Ventro-lateral carina	e. Spiracle	f. Second tergite

(C) Ovipositor of an Ichneumonid.

a. Shaft	b. Upper valve	c. Lower valve
d. Nodus	e. Teeth	

SYSTEMATIC ACCOUNT

Family ICHNEUMONIDAE

1. Subfamily PIMPLINAE

1. Tribe PIMPLINI

1. Genus *Eremochila* Forster1. *E. kamrupa* Gupta & Tikar2. Genus *Dolichomitus* Smith2. *D. khasianus* Gupta & Tikar3. *D. melanomerus tinctipennis* (Cameron)4. *D. nigrutarsis* (Cameron)3. Genus *Flavopimpla* Betrem5. *F. nigromaculata* (Cameron)4. Genus *Afrephialtes* Benoit6. *A. robustus* Gupta & Tikar5. Genus *Iseropus* Foerster1. Subgenus *Iseropus* (*Gregopimpla*) Momol7. *I. (G). himalayensis* (Cameron)6. Genus *Scambus* Hartig2. Subgenus *Scambus* (*Scambus*) Hartig8. *S. (S.) assamensis* Gupta & Tikar7. Genus *Acropimpla* Townes9. *A. bicarinata* (Cameron)10. *A. leucostoma* (Cameron)11. *A. uchidai* (Cushman)8. Genus *Camptotypus* Kriechbaumer12. *C. arianus* (Cameron)

13. *C. olynthus* (Cameron)

2. Tribe EPHIALTINI

9. Genus *Itopectis* Foerster

14. *I. himalayanesis* Gupta

10. Genus *Coccygomimus* Saussure

15. *C. bilineatus* (Cameron)

16. *C. cameronii* (Dalla- Torre)

17. *C. carinifrons* (Cameron)

18. *C. erebus* (Cameron)

19. *C. flavipalpis* (Cameron)

20. *C. laothoe* (Cameron)

21. *C. turionellae* (Linnaeus)

11. Genus *Echthromorpha* Holmgren

22. *E. agrestoria notulatoria* (Fabricius)

12. Genus *Lissopimpla* Kreichbaumer

23. *L. albopicta albopicta* (Walker)

13. Genus *Xanthopimpla* Saussure

24. *X. appendicularis appendicularis* (Cameron)

25. *X. bidfida* Townes & Chiu

26. *X. brachycentra obscuricornis* Townes & Chiu

27. *X. clivulus indicata* Gupta

28. *X. conica* Cushman

29. *X. curvimaculata curvimaculata* (Cameron)

30. *X. despinosa leipephelis* Townes & Chiu

31. *X. elegans apicipennis* (Cameron)

32. *X. glaberima* Roman

33. *X. honorata honorata* (Cameron)

34. *X. lepcha* (Cameron)

35. *X. nana nana* Schilz

36. *X. pedator* (Fabricius)

37. *X. pleuroschista* Townes & Chiu

38. *X. stemmator* (Thunberg)

3. Tribe THERRONIINI

14. Genus *Parema* Gupta

39. *P. nigrobalteata nigrobalteata* (Cameron)

4. Tribe NEOXORIDINI

15. Genus *Eugalta* Cameron

40. *E. albitarsis albitarsis* Cameron

41. *E. leucops* Townes & Gupta

42. *E. linearis linearis* Morley

43. *E. strigosa strigosa* Cameron

16. Genus *Achrocephalus* Kreichbaumer

44. *A. nigricolis nigricolis* (Cameron)

45. *A. punctulatus punctulatus* (Cameron)

46. *A. spinosus* (Cameron)

5. Tribe RHYSSINI

17. Genus *Lytarmes* Cameron

47. *L. maculipennis hyalinipennis* Cameron

18. Genus *Megarhyssa* Ashmead

48. *M. fulvipennis* (Cameron)

19. Genus *Trianyra* Baltazar

49. *T. maculicornis* (Cameron)

50. *T. sarojinae* Kamath and Gupta

20. Genus *Sychnostigma* Baltazar

51. *S. anamika* Jonathan

52. *S. assamense* Kamath & Gupta

53. *S. flavobalteatum* (Cameron)

21. Genus *Myllenysis* Baltazar

54. *M. carnifrons* (Cameron)

2. Subfamily TRYPHONINAE

6. Tribe SPHINCTINI

22. Genus *Sphinctus* Gravenhorst

55. *S. trichiosoma* (Cameron)

7. Tribe PHYTODIETINI

23. Genus *Netelia* Gray

3. Subgenus *Netelia* (*Longiterebates*) Kaur & Jonathan

56. *N. (L.) interstitialis* (Cameron)

4. Subgenus *Netelia* (*Toxochiloides*) Tolkanitz

57. *N. (T.) latro latro* (Holmgren)

5. Subgenus *Netelia* (*Netelia*) Gray

58. *N. (N.) corrugata* Kaur & Jonathan

59. *N. (N.) intermedia* (Cameron)

60. *N. (N.) lavis* (Cameron)

61. *N. (N.) orientalis* (Cameron)

62. *N. (N.) ramosa* (Enderlein)

63. *N. (N.) siva* Kaur & Jonathan

64. *N. (N.) vinulae* (Scopoli)

3. Subfamily XORIDINAE

24. Genus *Xorides* Latreille

6. Subgenus *Xorides* (*Epixorides*) Smith

65. *X. (E.) elizabethae* (Bingham)

7. Subgenus *Xorides* (*Cyanoxorides*) Cameron

66. *X. (C.) abaddon* (Morley)

4. Subfamily BANCHINAE

8. Tribe GLYPTINI

25. Genus *Apophua* Morley

67. *A. carinata* Morley

9. Tribe LISSONOTINI

26. Genus *Lissonota* Gravenhorst

68. *L. albomaculata* (Cameron)

69. *L. castaneae* Chandra & Gupta

70. *L. nigromoniata* Chandra & Gupta

71. *L. xuthosoma* Chandra & Gupta

27 Genus *Syzeuctus* Foerster

72. *S. villosus* (Cameron)

28. Genus *Leptobatopsis* Ashmead

73. *L. indica* (Cameron)

74. *L. bicolor* Cushman

29. Genus *Banchus* Fabricius

75. *B. nox* Morley

5. Subfamily CTENOPELMATINAE

10. Tribe MESOLEIINI

30 Genus *Perispuda* Foerster76. *P. khasiana* (Cameron)

6. Subfamily PORIZONTINAE

11. Tribe NESOMESOCHORINI

31. Genus *Klutiana* Betrem77. *K. khasiana* Gupta

12. Tribe PORIZONTINI

32. Genus *Campoplex* Gravenhorst78. *C. oriens* Gupta & Maheshwary79. *C. maximalus* Gupta & Maheshwary80. *C. septentrionalis septentrionalis* Gupta & Maheshwary33. Genus *Venturia* Schrottky81. *V. assamensis* Maheshwary82. *V. inquinata* (Morley)34. Genus *Casinaria* Holmgren83. *C. minima* (Morley)84. *C. pedunculata pendunculata* (Szepligati)35. Genus *Charops* Holmgren85. *C. bocular* (Szepligeti)86. *C. obtusa obtusa* Morley

13. Tribe CYMODUSINI

36. Genus *Menaka* Gupta & Gupta87. *M. brunea* Gupta & Gupta

37. Genus *Delopia* Cameron

88. *D. brevisocrea* (Gupta & Gupta)

89. *D. cameroni* (Dalla-Torré)

90. *D. femoralis* (Gupta & Gupta)

91. *D. himalayensis* (Cameron)

92. *D. pyrtanes* (Cameron)

93. *D. simlaensis* (Cameron)

94. *D. sumptuosa* (Cameron)

95. *D. tyrannus* (Cameron)

14. Tribe MACRINI

38. Genus *Campoletis* Foerster

96. *C. chlorideae* Uchida

39. Genus *Diadegma* Foerster

97. *D. albicalcar* (Morley)

40. Genus *Hyposoter* Foerster

98. *H. ebeninus* Gravenhorst

99. *H. indicus* (Cameron)

100. *H. volens* (Cameron)

41. Genus *Eriborus* Foerster

101. *E. buddha* (Cameron)

102. *E. spinipes* (Cameron)

7. Subfamily CREMASTINAE

42. Genus *Pristomerus* Curtis

103. *P. marginicollis* (Cameron)

43. Genus *Trathala* Cameron

104. *T. striata* Cameron

8. Subfamily TERISILOCHINAE

44. Genus *Diaparsis* Foerster105. *D. caudata* Morley

9. Subfamily OPHIONINAE

15. Tribe OPHIONINI

45. Genus *Ophion* Fabricius106. *O. areolatus* Cameron107. *O. fuscomaculatus* Cameron

16. Tribe ENICOSPILINI

46. Genus *Leptophion* Cameron108. *L. maculipennis* (Cameron)109. *L. radiatus* (Uchida)47. Genus *Dicamptus* Szepligeti110. *D. cantoni* Gauld & Mitchell111. *D. reticulatus* Gauld & Mitchell48. Genus *Enicospilus* Stephens112. *E. bharatensis* Nikam113. *E. fittoni* Nikam114. *E. hedilis* Gauld & Mitchell115. *E. heliothidis* Viereck116. *E. lineolatus* (Roman)117. *E. melanocarpus* Cameron

10. Subfamily MESOCHORINAE

49. Genus *Mesochorus* Gravenhorst118. *M. confusus* Holmgren

11. Subfamily METOPIINAE

50. Genus *Metopius* Panzer

8. Subgenus *Metopius* (*Metopius*) Panzer

119. *M. (M.) rufus rufus* Cameron

51. Genus *Colpotrochia* Holmgren

9. Subgenus *Colpotrochia* (*Colpotrochia*) Holmgren

120. *C. (C.) assamensis* Townes et al

121. *C. (C.) coenuta* Cameron

122. *C. (C.) melanosoma* Morley

10. Subgenus *Colpotrochia* (*Scallama*) Cameron

123. *C. (C.) trilineata* (Cameron)

52. Genus *Hypsicera* Latreille

124. *H. parca* (Morley)

53. Genus *Macromalon* Townes

125 *M. orientale* Kerrich

54. Genus *Exochus* Gravenhorst

126. *E. coronellus* (Morley)

12. Subfamily GRAVENHORSTINAE

55. Genus *Aphanistes* Foerster

127. *A. carnifrons* (Cameron)

56. Genus *Barylypa* Foerster

128. *B. apicate* (Cameron)

57. Genus *Therion* Curtis

129. *T. circumflexum* (Linnaeus)

130. *T. missouriense* (Cameron)

58. Genus *Heteropelma* Wesmael131. *H. amictum* (Fabricius)132. *H. flavitarse* Cameron133. *H. orbitale* (Morley)59. Genus *Trichomma* Wesmael134. *T. nigricans* Cameron60. Genus *Agrypon* Foerster135. *A. nox* Morley61. Genus *Brachynervus* Uchida136. *B. confusus* Gauld

13. Subfamily ACAENITINAE

62. Genus *Siphimedia* Cameron137. *S. varipes* (Cameron)63. Genus *Yezoceryx* Uchida138. *Y. ferrugineus* (Cameron)139. *Y. luteus* (Cameron)140. *Y. nigricans* (Cameron)

14. Subfamily DIPLAZONTINAE

64. Genus *Diplazon* Viereck141. *D. orientalis* (Cameron)65. Genus *Sussaba* Cameron142. *S. cognata albicoxa* (Thomson)

15. Subfamily PHYGADEUONTINAE

17. Tribe CHIROTICINI

66. Genus *Caenopimpla* Cameron143. *C. ruficollis* Cameron

18. Tribe GELINI

67. Genus *Formocryptus* Uchida

144. *F. bidentatus* (Cameron)

145. *F. khasianus* (Cameron)

146. *F. pulcherrimus* (Cameron)

19. Tribe MASTRINI

68. Genus *Charitopes* Foerster

147. *C. densus* Townes

20. Tribe ROTHNEYIINI

69. Genus *Rothneyia* Cameron

148. *R. annulicornis* Cameron

16. Subfamily HEMIGASTERINAE

70. Genus *Mansa* Tosquinet

149. *M. fulgidipennis* (Cameron)

150. *M. fulvipennis* (Cameron)

151. *M. pulchricornis* Tosquinet

152. *M. tarsalis* (Cameron)

153. *M. tibialis* (Cameron)

154. *M. tuberculata* (Cameron)

71. Genus *Hemigaster* Brulle

155. *H. carinifrons* Cameron

156. *H. fulvipes* Cameron

157. *H. malayensis* Cushman

72. Genus *Platymystax* Townes

158. *P. striatifrons* (Cameron)

73. Genus *Javra* Cameron159. *J. longicornis* Cameron160. *J. parvicep* Cameron74. Genus *Aptesis* Foerster162. *A. latianulata* (Cameron)162. *A. pallidinervis* (Cameron)163. *A. pulchripes* (Cameron)

17. Subfamily MESOSTENINAE

21. Tribe GABUNINI

75. Genus *Apocryptus* Uchida164. *A. biserratus* Gupta & Gupta165. *A. fusciventris* (Cameron)166. *A. laevifrons* (Cameron)167. *A. nitidus* Gupta & Gupta168. *A. plumbeus* (Cameron)169. *A. tikari* Gupta & Gupta76. Genus *Dinocryptus* Cameron170. *D. apicalis* (Cameron)171. *D. femoratus* (Cameron)172. *D. fulgidipennis* (Cameron)77. Genus *Xoridesopus* Cameron173. *X. flavispeculum* Gupta & Gupta174. *X. kamathi* Gupta & Gupta175. *X. orientalis* Gupta & Gupta176. *X. xanthosema* Gupta & Gupta

78. Genus *Hedrocryptus* Cameron

177. *H. ditissimus* (Tosquinet)

79. Genus *Arhytis* Townes

178. *A. maculiscutis* (Cameron)

80. Genus *Dagathia* Cameron

179. *D. brunnea* Cameron

81. Genus *Torbda* Cameron

180. *T. geniculata* Cameron

181. *T. maculipennis* Cameron

182. *T. nigromaculata* Cameron

183. *T. violaceipennis* Cameron

22. Tribe AGROTHEREUTINI

82. Genus *Agrothereutes* Foerster

184. *A. pilosus* (Cameron)

185. *A. rufofemoratus* (Cameron)

83. Genus *Idiolispa* Foerster

186. *I. analis* (Gravenhorst)

23. Tribe ISCHNINI

84. Genus *Etha* Cameron

187. *E. striatifrons* Cameron

85. Genus *Ischnus* Gravenhorst

188. *I. curvimaculatus* (Cameron)

189. *I. striatifrons* (Cameron)

86. Genus *Nippocryptus* Uchida

190. *N. missippus* Cameron

87. Genus *Buathra* Cameron191. *B. rufiventris* Cameron88. Genus *Hedycryptus* Cameron192. *H. orientalis* (Cameron)193. *H. rufopetiolatus* (Cameron)89. Genus *Neodontocryptus* Uchida194. *N. brilliantus* Uchida

24. Tribe BARYCERATINI

90. Genus *Jonathania* Gupta195. *J. multimaculata* (Jonathan)91. Genus *Chlorocryptus* Cameron196. *C. coeruleus* Cameron197. *C. metallicus* Cameron

25. Tribe MESOSTENINI

92. Genus *Gotra* Cameron198. *G. cariniformis* Cameron199. *G. longicornis* Cameron200. *G. marginata* (Brulle)93. Genus *Mesostenus* Gravenhorst201. *M. penetralis* (Cameron)

26. Tribe GORYPHINI

94. Genus *Necolio* Cheeman202. *N. testaceipes* (Cameron)95. Genus *Friona* Cameron203. *F. curvicarinata* Cameron204. *F. frontella* Cameron

96. Genus *Listrognathus* Tschek10. Subgenus *Listrognathus* (*Listrognathus*) Tschek205. *L. (L.) assamensis* Gupta & Kamath206. *L. (L.) laevifrons* (Cameron)207. *L. (L.) nigriabdominalis* Gupta & Kamath208. *L. (L.) pallidinerva* (Cameron)209. *L. (L.) rugifrons* (Cameron)11. Subgenus *Listrognathus* (*Stivadens*) Townes210. *L. (S.) annulipes* (Cameron)97. Genus *Goryphus* Holmgren211. *G. albomaculatus* (Cameron)212. *G. apollonis* Jonathan & Gupta213. *G. brahminus* Jonathan & Gupta214. *G. cestus cestus* Jonathan & Gupta215. *G. dravidus dravidus* Jonathan & Gupta216. *G. saluator* (Cameron)98. Genus *Skeatia* Cameron217. *S. cameroni* Jonathan & Gupta218. *S. cariniscuta* (Cameron)219. *S. fuscinervis* (Cameron)220. *S. maculiceps* (Cameron)221. *S. mysorensis* Jonathan & Gupta222. *S. rubricata* Jonathan & Gupta223. *S. rugosa* Jonathan & Gupta224. *S. rotheyi* Jonathan & Gupta225. *S. simulator* Jonathan & Gupta

226. *S. versatilis* (Cameron)

99. Genus *Gambroides* Betrem

227. *C. javensis* (Rohwer)

100 Genus *Isotima* Foerster

228. *I. ruficollis* (Holmgren)

101. Genus *Formostenus* Uchida

12. Subgenus *Formostenus* (*Formostenus*) Uchida

229. *F. (F.) cherraensis* Jonathan

230. *F. (F.) flavorbitalis* Jonathan

231. *F. (F.) rugipectus* Jonathan

232. *F. (F.) striatus* Jonathan

102. Genus *Melcha* Cameron

232. *M. veripes* Cameron

103. Genus *Euchalinus* Townes

234. *E. respondens* (Cameron)

235. *E. reticulatus* (Cameron)

104. Genus *Baltazaria* Townes

236. *B. caligatus* (Cameron)

27. Tribe COESULINI

105. Genus *Coesula* Cameron

237. *C. erugens* Gupta & Jonathan

238. *C. flavorbitalis flavorbitalis* Gupta & Jonathan

239. *C. varuna* Gupta & Jonathan

28. Tribe CERATOCRYPTINI

106. Genus *Fitatsia* Seyrig

240. *F. hypsipylae* Kamath

241. *F. tuberculata* Kamath

107 Genus *Ceratocryptus* Cameron

242. *C. bituberculatus* Cameron

243. *C. tibialis* Cameron

108. Genus *Silsila* Cameron

244. *S. fulvipes* Cameron

29. Tribe OSPRYNCHOTINI

109. Genus *Nematopodius* Gravenhorst

13. Subgenus *Nematopodeus* (*Nematopodius*) Gravenhorst

245. *N. (N.) longiventris* (Cameron)

110. Genus *Acroricnus* Ratzeberg

246. *A. peronatus* (Cameron)

Family ICHNEUMONIDAE

Key to the subfamily of Ichneumonidae

1. Clypeus and face forming a broad, rather weakly convex surface, the clypeus not separated by a distinct groove. Areolet rhombic, usually large. Posterior mesosternal carina not complete. Tarsal claws more or less pectinate. First tergite with a large glymma, its spiracle near or a little behind the middle. Second and following tergites nearly always polished. Male clasper ending in a long rod; female subgenital plate large, triangular in profile. 10. MESOCHORINAE
- Not agreeing entirely with the above. (Face and clypeus usually narrower and with a more irregular surface, the clypeus usually separated by a groove. Areolet various, sometimes absent, seldom rhombic, or sometimes the wings reduced or absent. Posterior mesosternal carina complete or incomplete. Tarsal claws pectinate or not. First tergite with or without a glymma, its spiracle varying in position: near base, near middle or near apex. Second and following tergites polished, mat, and/or punctate. Male clasper not ending in a long rod except in some species of *Nematopodius* and *Charops* and rarely in other genera. Female subgenital plate various often inconspicuous in side view .. 2
2. Spiracle of first abdominal tergite placed behind the midlength of the tergite. (Some genera are borderline in this character. These can be traced through either half of the couplet). 3
- Spiracle of first abdominal tergite placed near the midlength of the tergite or definitely in front of the midlength. .. 13

3. Abdomen compressed, its third and fourth segments deeper than wide. 4

Abdomen depressed or cylindric, its third and fourth segments wider than deep. .9

4. Second branchial cell with a long spurious vein that parallels its hind margin. First intercubital vein (or the intercubital vein that is present) joining cubital vein distad of second recurrent vein by a distance greater than half its length. Wings never reduced or absent. Epomia absent. Outer apical edge of front tibia without a spine or tooth. Medium to large sized species, usually pale brown in colour and with very large ocelli. 9. OPHIONINAE

Second brachial cell without a spurious vein or with only a short one. First intercubital vein joining cubital vein basad, opposite, or less than half its length distad of second recurrent vein, or if rarely it joins cubitus more than half its length beyond second recurrent, then the epomia is present and long (or wings sometimes reduced or absent). Outer apical edge of front tibia often with a small spine or tooth. 5

5. Propodeum without areas bounded by regular carinae, with at most a transverse basal carina, its sculpture usually coarse and reticulate. Occipital carina usually at outer hind margin of temple so that the head is nearly as wide at this carina as at the eyes. Areolet absent. Hind tarsus often swollen, especially in males. 6

Propodeum usually areolated or with other carinae than the basal transverse one, its sculpture usually fine, not coarsely reticulate. Occipital carina (when present) in its normal location, so that the head is much narrower at the carina than the eyes. Areolet present or absent. Hind tarsus usually not swollen. .7

6. Epipleurm of third tergite separated by a longitudinal crease just beneath the spiracle; intercubitus joining cubitus beyond second recurrent vein by a distance greater than 0.6 its length; middle tibia with one spur; dorsal part of occipital carina well below the hind ocelli; ovipositor sheath 3x as long as the apical depth of abdomen. . . .

ANOMALONINAE (Not reported from Meghalaya)

Epipleurum of third tergite not separated by a crease; intercubitus joining cubitus based, opposite, or sometimes distad of second recurrent vein by a distance greater than 0.6 its length; middle tibia usually with two spurs, but sometime with one spur; dorsal part of occipital carina usually close to the level of hind ocelli, but sometimes well below; Ovipositor sheath about 1-3.5x as long as apical depth of abdomen. 12.GRAVENHORSTINAE

7. Posterior transverse carina of mesosternum absent, or interrupted in front of each middle coxa, clypeus separated from face by a groove. (Maxillary palpus 4-segmented. Labial palpus 3-segmented. Clypeus with an apical fringe of long parallel bristles. Areolet absent.

8. TARSIOCHINAE

Posterior transverse carina of mesosternum complete, or rarely interrupted in front of each middle coxa, in such cases the clypeus is confluent with face. 8

8. Tribal spurs inserted in a common area with the tarsus, the apex of each tibia thus having a single membranous insertion area. Clypeas usually confluent with face. Face usually black. . .
4. PORIZONTINAE
- Tibial spurs inserted in a separate area from that of the tarsus, the apex of each tibia thus having two insertion areas separated by a sclerotized bridge. Clypeus separated from face by a groove. Face usually more or less pale. 7. CREMASTINAE
9. Ovipositor tip with a dorsal subapical notch and the tip of lower valve without distinct teeth. First sternite often not fused with its tergite. .4. BANCHINAE (a few genera)
- Ovipositor tip without a dorsal subapical notch, or with a weak notch and the lower valve tip bearing distinct teeth. First sternite fused with its tergite. .10
10. Sternaulus short or absent, less than half as long as mesopleurm. Ovipositor not extending conspicuously beyond apex of abdomen, its sheath always rigid. Second intercubital vein present. Mandible with two teeth or sometimes only one. Clypeas usually broad and weakly convex, its apex usually rather broadly truncate or subtruncate, its apical margin not impressed 18. ICHNEUMONINAE
- Sternaulus usually present and usually at least half as long as mesopleurm. Ovipositor usually extending conspicuously beyond apex of abdomen, its sheath flexible except when very short. Second intercubital vein present or absent. Mandible with two teeth. Clypeus various, usually moderately strongly convex and its apical margin usually impressed. 11
11. Second recurrent vein with two bullae or sometimes with one, nearly always sloping outward posteriorly so that posterodistal corner of second discoidal cell is somewhat longer and more pointed than anterodistal corner (in the few cases when second recurrent vein is vertical and with a single bulla the stermaulus reaches hind edge of mesopleurm a little above its lower hind corner, and/or the apical truncation of the scape is only moderately oblique, and/or the epipleurm of second tergite is turned mesad). Face of male rarely marked with white or yellow. Propodeum usually areolated, with longitudinal as well as transverse carinae. .15. PHYGADEUONTINAE
- Second recurrent vein with a single bulla, usually not sloping outward posteriorly and usually meeting subdiscoidal vein at a right angle. Sternaulus, when it reaches hind edge of mesopleurm, ending just below lower hind corner of mesopleurm. Apical truncation of scape strongly oblique. Face of male frequently marked with white or yellow. 12
12. Dorsal rim of metanotum with a posterior sublateral, triangular projection, this projection opposite front end of sublateral longitudinal carina of propodeum (which is nearly always present). Propodeum with longitudinal carinae as well as transverse carinae, or in some females only transverse carinae present but in these the basal transverse carina is weak or absent and the apical carina strong. 16. HEMIGASTERINAE

- Dorsal rim of matanotum without a posterior sublateral projection (though sometimes there is such a projection just below the dorsal rim), Propodeum without longitudinal carinae, if only one transverse carina is present on propodeum it is the basal carina rather than the apical one 17.MESOSTENINAE
- 13. Clypeus not separated from face by a groove, the face and clypeus either forming a smooth, strongly convex surface or with a large shield-shaped flat or concave area that is bounded by a carina. 11. METOPINAE
- Clypeus separated from face by a more or less distinct groove, or if rarely the groove is absent then the face is rather flat. 14
- 14. Upper tooth of mandible broad, more or less distinctly divided into an upper and lower point by a weak notch or impression on its apical margin, the mandible thus tending to appear 3-toothed. First tergite rectangular, not distinctly narrowed basad. Front wing 3.5 to 9.0 mm long. Ovipositor not extending beyond apex of abdomen. 14. DIPLAZONTINAE
- Upper tooth of mandible not divided into two points, the mandible thus 2-toothed or 1-toothed, or if rarely the upper tooth is more or less divided (some Banchinae and Scolobatinae), the first tergite is narrowed basad. 15
- 15. Female subgenital plate very large, folded on the middle line, triangular, usually elongated, with its point projecting beyond tip of abdomen. Front and middle tarsal claws either simple or with a subapical appressed tooth, or rarely with an internal lobe. Ovipositor long, without a subapical dorsal notch. .13. ACAENITINAE
- Female subgenital plate smaller, sometimes triangular but not projecting conspicuously beyond apex of abdomen. Front and middle tarsal claws simple, pectinate, or with a large basal lobe, without a subapical tooth except in some Pimplinae (in such genera the prepectal carina absent). Ovipositor short to long, sometimes with a subapical dorsal notch. 16
- 16. Apical-margin of front tibia produced on the outer edge into a small tooth; ovipositor short, not distinctly surpassing tip of abdomen; tarsal claws often pectinate, never with a lobe or tooth. 5. CTENOPELMATINAE
- Apical margin of front tibia rounded on outer edge, without a tooth. 17
- 17. Upper valve of ovipositor with a subapical dorsal notch, not raised at the notch. Lower valve of ovipositor tip smooth or with very small inconspicuous teeth or ridges at the apex. Second recurrent vein with one bulla or rarely with two, the vein subvertical or inclivous. Tarsal claws usually pectinate. Submetapleural carina usually forming a strong lobe just behind middle coxa. Female subgenital plate in lateral view large and conspicuous. First sternite not fused with its tergite. .4. BANCHINAE (most genera)

..... ..2.TRYPHONINAE

19. First sternite more or less free from its tergite (and the first tergite with a glymma), and/or propodeum entirely without the basal transverse carina. Tarsal claws often with a tooth or basal lobe, especially in females. 1. PIMPLINAE

First sternite completely fused with its tergite (and the first tergite without a glymma), and propodeum with at least a trace of basal transverse carina. Tarsal claws simple, (Sternaulus indistinct, absent, or less than half as long as mesopleurum. Flagellum of male without tyloids. Propodeum with longitudinal carinae) .3. XORIDINAE

Key to the tribes of subfamily Pimplinae:

4. Tarsal claws of female without a basal tooth; tergites 2 to 4 with fine indistinct punctures, polished or in the extralimital genera strongly mat; areolet present. .Theronini

- Tarsal claws of female, or at least the front claws of female with a basal tooth; tergites 2 to 4 usually with rather coarse, distinct punctures; areolet present or absent. Pimplini

1. Tribe PIMPLINI

Key to the genera of tribe Pimplini

1. Occipital carina absent above medially; nervellus intercepted below the middle; (Apico-lateral corners or tergites 2-5 with a sharp right angle or with a small acute tooth; prepectal carina extending up to mid-height of pronotum. 8. *Camptotypus*
- Occipital carina complete above, or sometimes obsolescent at the midline, nervellus intercepted below, at, or above the middle. ... 2
2. Nervellus intercepted below the middle, rarely at middle; areolet triangular in outline. .3
- Nervellus intercepted at or above the middle; areolet variable. .4
3. Second abdominal tergite with distinct oblique grooves cutting off its basolateral corners; clypeus of male and sometimes part or whole of face of male or of both sexes white or yellow; areolet receiving second recurrent vein usually at its outer corner (sometimes areolet absent); tip of dorsal valve of ovipositor in profile a little concave behind the nodus; basal ridge of lower valve of ovipositor tip at about 15^0 from the horizontal .7. *Acropimpla*
- Second abdominal tergite without oblique grooves cutting off its basolateral corners; clypeus and face of both sexes black or concolorous with the rest of the head; areolet receiving second recurrent vein basad of its outer corner; tip of dorsal valve of ovipositor in profile convex or straight behind the nodus or occasionally a little concave; basal ridge of lower valve of ovipositor tip at 20^0 to 90^0 from the horizontal .6. *Scambus*
4. Second tergite with conspicuous oblique basolateral grooves running from base near midline towards the spiracle, the groove more longitudinal than transverse making an angle of more than 45^0 with the transverse axis; first tergite usually long and often as long as the second; first intercubitus often as long as the second; nervellus intercepted near or above the middle; Tip of lower valve of ovipositor with a dorsal lobe that partly encloses the tip of the upper valve; tip of upper valve of ovipositor rounded above, without a dorsolateral ridge. 2. *Dolichomitus*
- Second tergite without conspicuous oblique basolateral grooves or when such grooves present, they are shallow and more transverse than longitudinal, making an angle of less than 45^0 with the transverse axis; first tergite moderately short to very short; ovipositor compressed or cylindric; first intercubitus a little shorter or equal to the second; nervellus intercepted at or above the middle.. .. 5

5. Basal half or more of clypeus rather strongly convex; ovipositor somewhat compressed, its sheath about 0.3 to 0.7 as long as fore wing; basal ridges of ovipositor tip about 30° from the horizontal; hind tibia usually with conspicuous black and white bands .5. *Iseropus*
- Basal half of clypeus nearly flat; ovipositor cylindric, its sheath about as long as or longer than fore wing; basal ridges of ovipositor tip mostly 40° to 90° from the horizontal; hind tibia without conspicuous black and white bands .6
6. Median longitudinal carinae of propodeum distinct on basal 0.25 or more of propodeum. (Abdominal tergites finely, closely punctate; tergites more or less elongate, their impunctate bands comparatively wider. 1. *Eremochila*
- Median longitudinal carinae of propodeum absent or indistinct. . . 7
7. Notauli indistinct in front; propodeum wider, smooth and shiny dorsally; first tergite with a broad declivity, its median dorsal carinae subparallel; its dorsolateral carina indistinct; body colour yellow. .3. *Flavopimpla*
- Notauli deep in front, mesoscutum trilobate in front; propodeum narrow, more rounded and coarsely punctate dorsally; first tergite with a short, narrow declivity; its median dorsal carinae convergent posteriorly; its dorsolateral carina complete or distinct at base; body colour usually black or marked — with red. .4. *Afrephialtes*

1. Genus *Eremochila* Foerster

1868. *Eremochila* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 165.

Type-species : *Pimpla ruficollis* Gravenhorst

1. *Eremochila kamrupa* Gupta & Tikar

1976. *Eremochila kamrupa* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:38. M, F. Key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Shillong, 1462 m. (Type in Gupta collection). India : Meghalaya: Upper Shillong, Host : *Petrova cristata*.

Diagnostic characters : Clypeus flat at base, bilobed; face 1.5 as wide as long, punctate; malar space 0.3; frons and vertex punctate, interocellar distance slightly more than or equal to ocello-ocular distance; hind corner of pronotum and mesoscutum largely punctate; notauli deep. Mesopleurum sparsely, scutellum and metapleurum closely punctate. Propodeum short with median longitudinal carinae long, distinct and diverging, spiracle roundish-oval. Legs in general short. Nervellus intercepted at its upper 0.3. First tergite as long as or a little longer than its apical width, deeply punctate; its median dorsal and dorso-lateral carina sharp and distinct, spiracles rounded. Second tergite a little longer than wide at apex, all tergites closely punctate, except for their apical 0.2 smooth area. Ovipositor straight, subcylindric; ovipositor sheath hairy.

Body largely black, with clypeus, stigma and wing veins reddish-brown. Hind corner of pronotum, tegula, yellow. Legs in general reddish-yellow, all femora and hind coxae more reddish, all trochanters, fore and middle coxae, tibiae and tarsi tending to be more yellowish. Hind tibia in apical

0.3 and apices of tarsal joints infusate.

Male similar to female except the first tergite comparatively longer, its median dorsal carinae extending up to the apex.

Material examined : India : Meghalaya : East Khasi Hills; Shillong, 4 female, 14.IV. 1966, M.K. Kamath (GUPTA).

Distribution : India : Meghalaya (Shillong).

Host : *Petrova cristata*.

2. Genus *Dolichomit* Smith

1874. *Closterocerus* Hartig. *Ber. Naturw. Ver. Hartz*, 1846-47; 18. Name preocc. by Westwood, 1833.

1877. *Dolichomit* Smith. *Proc. Zool. Soc. London*, 1877: 411.

Type-species : *Dolichomit longicauda* Smith

Key to the species of *Dolichomit*

1. Body yellow with black markings. *.nigritarsus*
- Body black; abdomen sometimes reddish. .2
2. Mandible strongly narrowed apically, bent at the middle, its lower tooth shorter than the upper. *.khasianus*
- Mandible slightly narrowed apically, not bent, its teeth equal. (Fore and middle coxae reddish-yellow). *.melanomerus tinctipennis*

2. *Dolichomit khasianus* Gupta & Tikar

1976. *Dolichomit khasianus* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:64. F. key, des., fig. Type: F, India : Meghalaya : Khasi Hills (Munich Museum).

Material examined : No material of this species was available for study.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is recognized by having the mandible bent in the middle at right angle and lower tooth little shorter than the upper tooth. The first tergite with strong median dorsal carinae. This a large species having body 36 mm long. Gupta & Tikar (1976) described this species on a single from Khasi Hills. The type is in Munich.

3. *Dolichomit melanomerus tinctipennis* (Cameron)

1899. *Ephialtes tinctipennis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 151. "M"=F. key, des. Type : F, India : Meghalaya : Khasi Hills (Type in British Museum).

Material examined : No material of this species was available for study Meghalaya.

Distribution : India : Meghalaya (Khasi Hills) (Loc. ?), Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh. Elsewhere: Sri Lanka, Taiwan.

Remarks : This subspecies is recognised by having mandible slightly narrowed apically, not bent in the middle, teeth equal in length; fore and middle coxae reddish-yellow.

4. *Dolichomitus ? nigratarsis* (Cameron)

1899. *Ephialtes nigratarsis* Cameron. *Mem. & Proc. Manchester Lit. Phil. Soc.* 43(3): 148. M. key, des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1976. *Dolichomitus ? nigratarsis* Gupta & Tikar. *Oriental Ins. Monogr.*, 1:65. M. key, des. India : Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Gupta & Tikar (1976) reported that the placement of this species under *Dolichomitus* was doubtful. The male type was examined by Dr. V.K. Gupta and it appeared to be very different from other species of this genus.

3. Genus *Flavopimpla* Betrem

1932. *Flavopimpla Betrem*, *Treubia*, 14 : 21.

Type-species : *Flavopimpla mangae* Betrem=*nigromaculata mangae* Betrem

5. *Flavopimpla nigromaculata nigromaculata* (Cameron)

1899. *Ephialtes nigromaculatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 150. F. key, des. Type: F, India: Meghalaya : Khasi Hills (Type in Oxford Museum).

1976. *Flavopimpla nigromaculata nigromaculata* Gupta & Tikar. *Oriental Ins. Monogr.*, 1:72. F. Key, des., fig. India: Sikkim. Meghalaya : Khasi Hills. Taiwan. Host : *Pectinophora gossypiella*.

Diagnostic characters : Last segment of antennal flagellum almost equal to the total length of preceding two segments. Face squarish; clypeus as wide as long; malar space 0.35 the basal width of mandible; epomia short. Mesoscutum and mesopleurum minutely punctate. Scutellum and metascutellum smooth and shiny. Nervulus opposite basal vein; nervellus intercepted at or slightly above middle. First tergite as long as or slightly longer than wide at apex, strongly punctate dorsally, its spiracle round and protruded; apex of first sternite distad of its spiracle; tubercles on third to fifth tergites distinct, rounded and punctate. Ovipositor slender, straight, valve subequal.

Body in general yellow. Face with a median spot, apices of mandibles, scape, flagellum, a broad mark on frons, vertex and occiput, black. Pronotum largely, three longitudinal lines on mesoscutum, an oblique elongate mark on mesopleurum, scutellum at apex, post scutellum and propodeum apically, black; middle and hind trochanters, base and apex of hind tibia, a basal line on the outer side of fore and middle tibia, apices of abdominal tergites, black.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Taiwan.

Remarks : Gupta & Tikar (1976) gave a detailed description of this subspecies. No material of this species was available for study from Meghalaya.

4. Genus *Afrephialtes* Benoit

1953. *Afrephialtes* Benoit. *Rev. Bot. Zool. Africane*, 48:81.

Type-species : *Ephialtes navus* Tosquinet.

6. *Afrephialtes robustus* Gupta & Tikar

1976. *Afrephialtes robustus* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:86. F. Key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1355 m. (Type in Gupta collection). Burma: Mt. Victoria, 1000 m.

Diagnostic characters : Clypeus a little more than twice as wide as long; face as wide as long, punctate; mandible striated basally; malar space 0.3-0.4 the basal width of mandible; vertex pubescent; epomia strong; mesoscutum pubescent, finely punctate; Mesopleurum finely punctate; scutellum densely punctate; metapleurum punctate in the upper half, submetapleurual carina with a flange behind middle coxa. Propodeum coarsely punctate, spiracle oval. Legs stout. Nervulus opposite basal vein; areolet oblique, longer than high, receiving second recurrent vein at its apical 0.3; nervellus intercepted at its upper 0.4. First tegite as long as wide at apex, dorsal carinae strong, lateral carinae flanged basally; second tergite 1.5 as wide as apex as long, with deep gastrocoelus; tubercles on tergites third to fifth very prominent and transverse, all tergites strongly punctate. Ovipositor straight, its valves subequal.

Body in general black. Palpi, apex of scape, tegula, basal corners and central parts of 2-5 tergites, 6 and 7 tergites apically, fore and middle coxae and trochanters and hind trochanters, yellow. Hind leg largely reddish-yellow.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1 female, 7.iv. 1966. Kamath (GUPTA).

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : Gupta & Tikar (1976) described this species in detail. This is the only species under his genus known from Meghalaya.

5. Genus *Iseropus* Foerster

1. Subgenus *Iseropus* (*Gregopimpla*) Momoi

1965. *Gregopimpla* Momoi, In Townes, Momoi & Townes, *Mem. Amer. Ent. Inst.* 5 : 601.

Type-species : *Pimpla* (*Epiurus*) *kuwanae* Veireck

7. *Iseropus* (*Gregopimpla*) *himalayensis* (Cameron)

1899 *Pimpla himalayensis* Cameron. *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 178. "M"=F. Key, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1976. *Iseropus (Gregopimpla) himalayensis* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:105. M, F. n. status, key, des., fig. India: Meghalaya: Jaintia Hills; Khasi Hills. Assam. West Bengal: Darjeeling. Sikkim. Himachal Pradesh: Dalhousie Hills: Khajjiar: Chattarnag, 1700 m. China.
1983. *Iseropus (Gregopimpla) himalayensis* Gupta, *Contrib. Amer. Ent. Inst.*, 19(7): 55. M, F. key, des Northern India. China. Japan.

Diagnostic characters : Face as long as wide, punctate in upper half; clypeus convex in basal 0.5, punctate, bilobed; antenna 30-segmented; pronotum shiny, smooth; mesoscutum shallowly punctate; mesopleurum shiny; scutellum convex; propodeum hairy, sparsely punctate in basal 0.5, puncto-reticulate in basal 0.5 to 0.75; first tergite longer than wide at apex, strongly punctate, tubercles on 3-5 tergites distinct; ovipositor shorter than fore wing, its upper valve slanting dorsally beyond nodus. Scape, tegula, hind corner of pronotum, all legs, reddish-yellow, except hind tibia and tarsus.

Distribution : India : Meghalaya (Jaintia Hills), Assam, Himachal Pradesh, Kashmir, Sikkim, West Bengal. Elsewhere: China, Korea, Japan.

Remarks : This species can be recognized by having legs in general moderately stout; hind tibia yellow, black subbasally and in apical 0.4. Propodeum and sides of tergites with short greasy hairs, its median carinae on its basal 0.5. No material of this species was available for study.

6. Genus *Scambus* Hartig

2. Subgenus *Scambus (Scambus)* Hartig

1838. *Scambus* Hartig, Jahresber. Fortscher. forstw. Forst. Naturk., 1 : 267.
Type-species : *Pimpla (Scambus)* Sagax Hartig

8. *Scambus (Scambus) assamensis* Gupta & Takar

1968. *Scambus (Scambus) assamensis* Gupta & Tikar, *Oriental Ins.*, 1:222. F. key, des., fig. Type: F, India : Meghalaya : Shillong, near Elephant Falls, 1500 m. (Type in Gupta collection).
1976. *Sacambus (Scambus) assamensis* Gupta & Tikar, *Oriental Ins., Monogr.*, 1:115. F. key, des., fig. India: Meghalaya.

Diagnostic characters : Face sparsely punctate and pubescent, wider than long; pronotum smooth and shiny; mesoscutum, scutellum and mesopleurum with sparse and shallow punctures; metapleurum smooth and shiny; propodeum coarsely punctate at sides, sparsely at base, median carinae strong and widely diverging posteriorly. Nervellus intercepted at its lower 0.3; areolet petiolate. Legs hairy; first abdominal tergite about 1.2 as wide at apex as long, its median dorsal carinae strong and extending well beyond middle. Abdominal tergites 1-5 strongly punctate, 6th and the following smooth, tubercles distinct on 3-5 tergites. Ovipositor strong moderately compressed, concave between nodus and apex, basal ridge of lower valve sinuate.

Body black. Clypeus ferruginous, mandible in basal half, palpi, pronotum along upper margin and in hind corner, tegula, front and middle legs, yellow. Fore and middle femora with orange markings on outsides; hind coxa and femur reddish; hind tibia yellow, darker at apex and base. Body 9 mm; fore wing 8 mm. Ovipositor 6 mm.

Material examined : India : Meghalaya : East Khasi Hills Shillong, 1 Female, 30. iii. 1966. D. Ram.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by a single female from Shillong. Gupta & Tikar (1968, 1976) gave a detailed description of this species.

7. Genus *Acropimpla* Townes

1960. *Acropimpla* Townes, *Bull. U.S. Natl. Mus.*, 216(2):159.

Type-species : *Charitopimpla leucostoma* Cameron.

Key to the species of *Acropimpla*

1. Propodeum with distinct median longitudinal carinae reaching up to the middle. Propodeum dorso-laterally punctate, clypeus reddish *bicarinata*
- Propodeum without distinct median longitudinal carinae; propodeum convex and dorsally smooth and shiny. Clypeus blackish-brown 2
2. Upper margin of face concave between antennal sockets; face with a distinct impression and with definite minute punctures; propodeum and abdomen largely reddish. *uchidai*
- Upper margin of face straight; face without impression surrounding the median swelling which may be weak; propodeum and abdomen largely black to reddish-brown, with 6-7 tergites with yellow markings. *leucostoma*

9. *Acropimpla bicarinata* (Cameron)

1899. *Pimpla bicarinata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):171. F. key, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1976. *Acropimpla bicarinata* Gupta & Tikar. *Oriental Ins. Monogr.*, 1:144. M, F. key, syn., des., fig. India: Meghalaya: Khasi Hills: Cherrapunji, 1387 m. Burma: Kambaiti, 2000 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1 Female, 4.iv. 1966, D.T. Tikar.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere: Burma.

Remarks : This species is mainly recognized by having first tergite 1.3x as long as wide at apex. Ovipositor short, abdomen largely red and the characters as mentioned in the key. Gupta & Tikar (1976) gave a detailed description of this species.

10. *Acropimpla Leucostoma* (Cameron)

1907. *Charitopimpla leucostoma* Cameron, *Tijdschr. v. Ent.*, 50:97 F. key, des. Type: F, India: Sikkim (Type in British Museum)

1976. *Acropimpla leucostoma* Gupta & Tikar. *Oriental Ins. Monogr.*, 1:131. M, F. key, des., fig. Several localities in India: Bihar; Uttar Pradesh; Meghalaya; Karnataka; Tamil Nadu. Burma, Taiwan, Laos, North Vietnam, Indonesia: Java. Moluccas: Halmahera. Sumatra. Sri Lanka. Host : *Hyblaea puera*; *Lygropia quaternalis*.

Material examined : India : Meghalaya : East Khasi Hills : Pyrursla, 1350 m, 1 Female, 11.iv. 1966, J.K. Jonathan.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Sikkim, Tamil Nadu, Karnataka, Uttar Pradesh. Elsewhere: Burma, Indonesia, Laos, Sri Lanka, Vietnam.

Remarks : This species is easily recognised by its yellow markings on 6-7 tergites and 5th tergite being completely black. The scutellum and metascutellum are marked with yellow and legs are largely reddish.

Host : *Hyblaea puera*

11. *Acropimpla uchidai* (Cushman)

1933. *Charitopimpla uchidai* Cushman. *Insecta Matsumurana*, :39. F. key, des. Type: F, Taiwan: Talin (=Taihorin) (Type in Eberswalde Museum).

1976. *Acropimpla uchidai* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:137. F. key, des., fig. Taiwan (=Taihorin). Burma: Kambaiti, 2000 m. India: Meghalaya: Cherrapunji., 1360 m. Sikkim: Gangtok, 1675 m. West Bengal: Darjiling Hills: Rangiroon, 200 m. Uttar Pradesh: Bhowali, 1700 m. Nepal: Kathmandu Valley: Godavari, 1830 m.

Material examined : India : Meghalaya : East khasi Hills: Cherrapunji, 1 Female, 7.IV. 1966, M.K. Kamath.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Uttar Pradesh, West Bengal. Elsewhere: Burma, China, Nepal, Taiwan.

Remarks : This species is distinguished by a mark in dorsal part of prepectus and white line along mesopleural suture and also by the characters as given in the key. Gupta and Tikar (1976) gave a detailed description of this species.

8. Genus *Camptotypus* Kriechbaumer

1889. *Camptotypus* Kriechbaumer, Ent. Nachr., 15:311.

Type-species : *Camptotypus sellus* Kriechbaumer

Key to the species of *Camptotypus*

1. Notauli shallow, indistinct; second to fifth tergites with a median longitudinal carina (Inner orbits of the eyes slightly converging; dorsal hump on postpetiole very prominently raised; Wings light yellowish-brown with the margins tinged with black *arianus arianus*

Notauli distinct up to the middle of mesoscutum; second to fifth tergites without a longitudinal carina. (Propodeal spiracle elongate. Body wholly yellowish brown with wings yellow and blackish along the margin; median dorsal carina of first tergite very strong). *.olyntius*

12. *Camptotypus arianus arianus* (Cameron)

1899. *Pimpla ariana* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 43 (3):157. F. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1906. *Erythropimpla himalayensis* Schulz, *Spolia Hymenopterologica*, 1906:110. F. Des. Type: F, India: F, India: West Bengal: Darjeeling (Type in Strasbourg Museum). Syn. by Gupta & Tikar, 1978.
1976. *Camptotypus arianus arianus* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:188. M. F. n. status, key, syn., des., Sikkim. West Bengal: Darjeeling Rangiroon. Kerala: Walayar Forest, S. Malabar, 300 m. Burma.

Distribution : India : Meghalaya (East Khasi Hills), Kerala, Nagaland, Sikkim, West Bengal. Elsewhere: Myanmar.

Remarks : No material of this species was available for study from Meghalaya.

13. *Camptotypus olyntius* (Cameron)

1899. *Pimpla olyntia* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):156. F. key, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1900. *Erythropimpla abbottii* Ashmead, *Proc. U.S. Natl. Mus.*, 23:57. (F). des. in key. Type: F, Thailand: (Trang) (Type in U.S.N.M.). syn. by Gupta & Tikar, 1976.
1976. *Camptotypus olyntius* Gupta & Tikar, *Oriental Ins. Monogr.*, 1:205. M, F. key, syn., des., fig. India: Sikkim; Sikkim: Tukuat, 1524 m. Meghalaya: Khasi hills. E. India. Thailand: Trang; Khao Ram, Nakhon Si Thammarat. Indonesia: Sumatra.

Distribution : India : Meghalaya (Khasi Hills), Sikkim. elsewhere : Burma, Indonesia, Thailand.

Remarks : No material of this species was available for study from Meghalaya. This species is characterized by having an elongate propodeum which is produced medially at base, propodeal spiracles elongated; first sternite with a flap-like ventral fold. Gupta and Tikar (1976) gave a detailed description of this species.

2. Tribe EPHIALTINI

Key to the genera of tribe Ephialtini

1. Labrum normally hidden when mandible is closed, somewhat inside the plane of the clypeus; mandible broad at tip and with the lower tooth not decidedly smaller than upper tooth. 2
- Labrum exposed, plate-like, in about the same plane as the clypeus; mandible tapered to a narrow tip and with the lower tooth much smaller than upper tooth. .3

2. Inner margin of eye weakly concave above antennal socket; trasal claws of female without a basal tooth. *Coccygomimus*
- Inner margin of eye rather strongly concave at antennal socket; front taral claws of female usually with a large tooth. (Ovipositor striaght; face and orbits of both sexes entirely black).. *Itoplectis*
3. Tip of mandible turned 90 degree, so that the lower tooth is inward; propodeum polished and usually with strong carinae; colouration yellow and usually with black spots. *Xanthopimpla*
- Tip of mandible not or only slightly turned ; propodeum punctate, striate, or mat and without carinae; colouration various. (Hind femur without a tooth beneath; nervellus far distad of basal vein) *Ecthromorpha*

9. Genus *Itoplectis* Foerster

1869. *Itoplectis* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25:164.

Type-species : (*Ichneumon scanisus* (Villers)=*maculator* Fabricius).

14. *Itoplectis himalayensis* Gupta

1913. *Itoplectis alternans* Morley, *Fauna of British India, Hymenoptera*, 3:169. M, misdet. of *alternans* Gravenhorst. India; Kashmir, 5000-6000 ft. Himachal Pradesh : Simla.

1968. *Itoplectis himalayensis* Gupta, *Oriental Ins.*, 1:52 (1967). M, F. key syn., des., fig. type: F. India : Himachal Pradesh: Simla Hills: Narkanda, 2745 m. (Gupta collection). India: Himachal Pradesh: Simla Hills: Chini Bungalow (Kufri), 2621 m.; Kumarsen and Chail, 2258 m.; Dalhousie Hills: Kalatop, 2440 m. Kashmir: Pahalgam, 2700 m.; Srinagar, Batote. Uttar Pradesh (Dehra Dun). Meghalaya : Shillong, Khasi Hills, Sikkim. Gangtok, 1675 m.

Material examined : India : Meghalaya: east Khasi Hills, Shillong, 1 Female, 3 males, 29.iii. 1966-1.vi. 1966, D.T. Tikar, M.K. Kamath, J.K. Jonathan.

Distribution : India : Meghalaya (Khasi Hills), Himachal Pradesh, Kashmir, Sikkim.

Remarks : This species is recognised by having front claw in female with a subbasal tooth; antenna and stigma black; all coxae and first trochanteral segment of middle and hind legs black; hind tibia black in apical 0.5.

Host : *Eucosma stebbingi*; *Dioryctria* sp.

10. Genus *Coccygomimus* Saussure

1892. *Coccygomimus* Saussure, In Grandidier : *Histoire Physique Naturelle et Politique de Madagascar*, 20: (Hymenopteres), Part 1, pl 14, fig-1.

Type-species : *Coccygomimus madecassus* Saussure.

Key to the species of *Coccygomimus*

1. Ovipositor tip depressed and curved, its upper valve with distinct parallel transverse ridges. Scutellum flat dorsally. Epipleura narrow. large species, 15-22 mm. Propodeal spiracles linear and elongate.. *The Habropimpla Group.* (Hind coxa black with a large dorsal yellow marks. Fore and middle coxae yellow. Thorax and abdomen largely black with yellow marks) *bilineatus*

Ovipositor tip subcylindric, not depressed and not decurved. Scutellum convex to subconvex. Epipleura narrow or wide. Clypeus apically emarginate. Spiracles linear or oval. .2

2. All epipleura narrow, linear, more than 3.0x as long as wide. Nervulus usually distad of basal vein. Hind tibia either wholly black, wholly yellow, or basally yellow and apically black, rarely with a submedian narrow yellow band. Propodeum usually elongate and with a lateral ridge. Propodeal spiracle usually linear or elongate oval. First tergite with or without dorsal hump. *The Instigator Group.* .3

Fourth and fifth epipleura wider than 1-3, trapezoidal rather than rectangular, about 2.5 to 2.0x as wide as long, or nervulus interstitial or distad of basal vein, or hind tibia with a submedian yellow band. Propodeum without distinct lateral ridge and dorsal and pleural areas roundly merging with each other. Propodeal spiracles usually oval to elongate-oval. *The Turionellae Group.* .5

3. All legs and body in general black. Fore leg on innerside with yellowish marks. Abdominal tergites with sparse scattered punctures. Third tergite onwards with leathery wrinkles medially. Nervulus distad of basal vein by 0.2 its length and vertical. *.erebus*

Not as above. Legs variously coloured, never wholly black. 4

4. Hind femora black. Hind tibiae yellow basally and black apically. Fore and middle legs, including femora yellow. Abdomen with yellow apical bands on tergites. Mesopleurum and abdomen closely punctate *carinifrons*

All femora and tibiae yellow to orange-brown. Abdomen black. (scutellum with or without a yellow spot. Nervulus distad of basal vein. Frons striate. Tegula partly to wholly yellowish-brown. Scutellum often marked yellow. Trochanters black). *.loathoe*

5. All coxae not black, variously marked. (Abdomen black with yellow apical stripes. Fore and middle coxae yellow with brown marks. Hind coxa black with a yellow dorsal mark. Mesopleurum finely punctate. Median dorsal carina of propodeum indistinct). *.flavipalpis*

All coxae black. .6

6. Mesopleurum polished, punctate. Mesoscutum and scutellum distinctly punctate. Frons, striato-punctate. Hind tibia with a submedian yellow band. Hind corner of pronotum yellow. *turionellae*

- Mesopleurum not shiny, leathery, its punctures tending to be ruguloso-punctate. Frons finely striate. Hind tibia brown with a faint yellow band. Pronotum wholly black. *.cameronii*

15. *Coccygomimus bilineatus* (Cameron)

1900. *Habropimla bilineata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **44** (15): 97. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in British Museum).
1987. *Coccygomimus bilineatus* Gupta & Saxena, *Oriental Ins.*, **21**:412 M, F. key, des., fig. Burma: Kambaiti. Nepal: Godavari. India: Localities in Himachal Pradesh; Meghalaya; Sikkim; Uttar Pradesh; West Bengal.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, several males and females (no other data).

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Burma, China, Nepal.

Remarks : This species is distinguished by its black hind coxae with yellow dorsal marks and black propodeum with yellow markings. The wings are lightly tinged with yellow.

16. *Coccygomimus cameronii* (Dalla Torre)

1899. *Pimpla vidua* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43**(3):180. M. Name preocc. by Walsh, 1873. key, des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1901. *Pimpla cameroni* Dalla Torre, *Catalogus Hymenopterorum*, **3**:426. n. name.
1913. *Itoplectis orientalis* Morley, 1913. *Fauna of British India, Hymenoptera*, **3**:171. M. n. name, key, des. India: Meghalaya: Khasi Hills. Syn. by Townes & Townes, 1960.
1987. *Coccygomimus cameronii* Gupta & Saxena, *Oriental Ins.*, **21**:405. M, F. key, des., fig. Burma: Kambaiti, 2000 m. India: Localities in Assam; Himachal Pradesh; Karnataka; Meghalaya; Sikkim; Uttar Pradesh; West Bengal; Tamil Nadu. Indonesia, Nepal, Taiwan.

Material examined : India : Meghalaya : East Khasi Hills, Cherrapunjee and Shillong, several males and females in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh, Sikkim, Assam, Karnataka, Tamil Nadu, West Bengal. Elsewhere : Nepal, Burma, Indonesia, Taiwan.

Remarks : This is one of the common species widely distributed in Orient. This species can be identified by the characters mentioned in the key.

Host : *Hyponomeuta podella*.

17. *Coccygomimus carinifrons* (Cameron)

1899. *Pimpla carinifrons* Cameron. *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43**(3):172. F. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in B.M.N.H.)

1922. *Ephialtes formosana* Cushman, *Philippine J. Sci.*, 20:590. F. des., biol. Type: F, Taiwan (Type in U.S.N.M.) Host: *Dendrolimus punctatus*. Syn. by Gupta, 1987.
1987. *Coccygomimus carinifrons* Gupta & Sexena, *Oriental Ins.*, 21: 386. M, F. key, des. India: Several Localities in Himachal Pradesh; Kashmir; Uttar Pradesh; West Bengal; Sikkim. Nepal: Godavari. Burma, Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Kashmir, Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal. Elsewhere : Nepal, Burma, Taiwan.

Remarks : This species has yellow apical bands on abdominal tergites. Hind leg black except for a broad band on tibia. Frons is smooth and shiny. No material of this species was available for study.

18. *Coccygomimus erebus* (Cameron)

1899. *Pimpla erebus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.* 43(3):184. F. key, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1987. *Coccygomimus erebus* Gupta & Sexena, *Oriental Ins.*, 21:372. M, F. key, des., fig. Burma: Kambaiti. India : Localities in Kashmir, Himachal Pradesh; Uttar Pradesh; West Bengal.

Distribution : India : Meghalaya (East Khasi Hills), Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal. Elsewhere : Burma, China.

Remarks : This species has body and legs in general black, except for yellowish streaks on the inner side of fore femur and tibia. Abdomen is with a metallic shine. It can further be distinguished by the characters as mentioned in the key.

19. *Coccygomimus flavipalpis* (Cameron)

1899. *Pimpla flavipalpis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):174. M, F. key, des. Lectotype (designated by Townes, Townes & Gupta): F, India: Meghalaya: Khasi Hills (Type in British Museum).
1913. *Phytodiaetoides megaera* Morley, *Fauna of British India, Hymenoptera*, 3:221. F. des., fig. Type: F, India: Meghalaya: Khasi Hills, 6000 ft. (Type in B.M.N.H.) Syn. by Townes & Townes, 1960.
1987. *Coccygomimus flavipalpis* Gupta & Sexena, *Oriental Ins.*, 21:400. M, F. key, des., fig. Burma: Kambaiti, 1800-2000 m. India: Localities in Meghalaya; Sikkim; Tamil Nadu; Uttar Pradesh; West Bengal. Nepal.

Material examined : Several males and females. India : Meghalaya: East Khasi Hills: Shillong and Cherrapunji in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Burma, Nepal, Taiwan.

Remarks : This species has fore and middle coxae yellow, hind coxa black with a dorsal yellow spot. Propodeum with yellow apical spots and abdomen with yellow apical bands.

20. *Coccygomimus laothoe* (Cameron)

1897. *Pimpla laothoe* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **41** (4):22. F. des. Type: F, India: Uttar Pradesh: Mussoorie (Type in Oxford Museum).
1897. *Pimpla nepe* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **41** (4) : 23. F. des., fig. Type: F, India: Uttar Pradesh: Mussoorie (Type in Oxford Museum). Syn. by Townes & Townes, 1960.
1899. *Pimpla poesia* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43** (3): 176. F, key, des. Type: F, India : Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes & Townes, 1960.
1987. *Coccygomimus laothoe* : Gupta and Sexena, *Oriental Ins.*, **21**:380. M, F. key, des., fig. Burma, China, Indonesia, Nepal, Sri Lanka. India: Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Karnataka, Maharashtra, Manipur, Meghalaya, Sikkim, Uttar Pradesh, West Bengal.

Material examined : Several males and females were seen in Gupta collection from East Khasi and Jaintia Hills.

Distribution : India : Meghalaya (Khasi and Jaintia Hills), Assam, Bihar, Delhi, Himachal Pradesh, Kashmir, Karnataka, Maharashtra, Manipur, Sikkim, Uttar Pradesh, West Bengal. Elsewhere: Burma, China, Indonesia, Nepal, Sri Lanka.

Remarks : This is one of the common species in the Oriental region. It is characterised by having the whole body strongly punctate, all legs red except for the black coxae and trochanters.

21. *Coccygomimus turionellae* (Linnaeus)

1758. *Ichneumon turionellae* Linnaeus, *Systema Naturae* Ed. 10, : 564 F. des. Type: F, Sweden? (Linnean Soc., London).
1987. *Coccygomimus turionellae* : Gupta & Sexena, *Oriental Ins.*, **21**:396. M, F. key, des. fig. Burma. Afghanistan: Paghman. India: Localities in Kashmir; Uttar Pradesh.

Distribution : India : Meghalaya (East Khasi Hills), Kashmir, Uttar Pradesh, West Bengal. Elsewhere: Burma, China, Japan, Korea, Rhykyus, Eurasia, Afghanistan.

Remarks : Morley (1913) recorded this species from Shillong in Khasi Hills, Meghalaya. No material of this species was seen. Gupta and Saxena (1987) redescribed this species in detail.

Host : *Blastesthia turionella*, *Hyponomeuta podella*, *Lymantria obfuscata*.

11. Genus *Echthromorpha* Holmgren

1868. *Echthromorpha* Holmgren, *Kongliga Svenska fregatten Eugenies Resa*, **2**(1):406.
Type-species : (*Echthromorpha maculipennis* Holmgren)= *Ichneumon agrestoria fuscator* Fabricius.

22. *Echthromorpha agrestoria notulatoria* (Fabricius)

1804. *Cryptus notulatorious* Fabricius, *Systema piezatorum*, : 77. F. des. Type: F, India: Tamil Nadu (Type in Kiel Museum).
1846. *Pimpla continua* Brulle, In Lepeletier: *Histoire Naturelle des Insectes*. Hymenopteres 4:92. (F). des. Type: F, locality? (Type in Paris Museum). Syn. by Krieger, 1909.
1897. *Pimpla pulchrimaculata* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 41(4):20. F. des. Type: F, Sri Lanka: Trincomalee (Type in Oxford Museum). Syn. by Townes, Townes & Gupta 1961.
1897. *Pimpla bilineata* Koningsberger, *Meded. Uit's Lands Plantentuin* 20:45, 46, 80. F. fig. Type: F, Indonesia. Syn. by Krieger, 1909.
1899. *Chrysopimpla ornatipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.* 43(3):186. M, F. des. Lectotype (Type in B.M.N.H.) F, India : Meghalaya : Khasi Hills. Syn. by Krieger, 1909.
1899. *Chrysopimpla persimilis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 188. "M"=F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.
1903. *Echthromorpha laeva* Cameron, *J. Straits Brach Roy. Asiatic Soc.* 39 : 135. M. des. Lectotype M, Singapore (Type in B.M.N.H.). Syn. by Morley, 1913.
1905. *Echthromorpha robusta* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, 44 : 120. F. des. Lectotype F, Indonesia: Borneo: Matang (Type in B.M.N.H.) Syn. by Townes, Townes & Gupta, 1961.
1905. *Echthromorpha maculipes* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, 44:121. (F). des. Lectotype F, Malaysia: Sarawak: Kuching (Type in B.M.N.H.) Syn. with leave by Morley, 1913.
1907. *Echthromorpha latibalbeata* Cameron, *Trans. Linn. Soc. London.* (2) 12 (1): 81. M, des. Type: M, Chagos Archipelago: Peros Banhos (Type in B.M.N.H.) Syn. by Townes, Townes & Gupta, 1961.
1909. *Echthromorpha notulatoria* var. *insulana* Krieger, *Mitt. Zool. Mus. Berlin*, 4:313. M, F. key, des., Lectotype F, Indonesia: Sumatra Liangagas (Type in Warsaw Museum). Sumatra: Sukaranda; Fort de Kock; Sarik. Malaysia: Sarawak: Lundu. Moluccas: Batjan. Syn. with *leava* by Morley, 1913.
1913. *Echthromorpha notulatoria* Morley, *Fauna British India*, Hymenoptera, 3:100. M, F. key, syn., des., biol. India: Sikkim. Mizoram: Aizal, Lushai Hills. Uttar Pradesh: Oudh. Meghalaya: Khasi Hills. West Bengal: Buxa Duars; Calcutta. Bihar: Pusa; Chapra; Samstipur. Maharashtra : Poona, Tamil Nadu: Samalkota. Karnataka: Bangalore. Burma, Sri Lanka, Singapore, Malaysia.
1961. *Echthromorpha agrestoria notulatoria* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:39.

Diagnostic characters : Face shallowly and distinctly punctate. Clypeus apically truncate. Malar space 1.0X the basal width of mandible. Thorax mainly black. Mesoscutum with two elongate black marks. Propodeum yellowish-brown laterally, at base black, spiracles large, elongate. Abdomen black, with the apices of all segments yellow. Legs in general yellow.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Karnataka, Maharashtra, Sikkim, Tamil Nadu, West Bengal. Elsewhere : Burma, China, Indonesia, Malaysia, Sri Lanka, Thailand.

12. Genus *Lissopimpla* Kreichbaumer

1889. *Lissopimpla* Kreichbaumer. *Ent. Nachr.* 15:309.

Type-species : (*Lissopimpla 8-guttata* Kreichbaumer) = *excelsa* Costa.

23. *Lissopimpla albopicta albopicta* (Walker)

1859. *Pimpla albopicta* Tennent, Ceylon: *An account of the island ... with notices of its natural history ... & Productions*, (Edition 3) 1:282. Nomen nudum.

1860. *Pimpla albopicta* Walker, *Ann. Mag. Nat. Hist.* (3) 5:306. F. Des. Type: F, Sri Lanka (Type in British Museum).

1905. *Lissopimpla rufipes* Cameron, *Spolia Zeylanica*, 3:140. F. Name Preocc. in *Lissopimpla* by Tryon, 1900. des., fig. Lectotype (designated by Townes, & Gupta, 1961): F, Sri Lanka: Peradeniya (Type in British Museum). Sri Lanka: Maskeliya, Syn. by Morely, 1913.

1961. *Lissopimpla albopicta albopicta* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:46. Lectotype design., n. comb. India. Sri Lanka.

Diagnostic characters : Face punctate, longitudinally tricarinate; clypeus half as long as face. Malar space broader than the base of mandible; eyes deeply emarginate next to scrobes. Antennae long and slender. Notauli deep and long. Propodeum trans-striate, apophysis large and obtuse, petiolar area subglabrous and basally produced into a large and stout spine, spiracles large and elongated. Abdomen smooth and shiny; second and following tergites at base with oblique depressions. Ovipositor half as long as abdomen. Areolet in fore wing subsessile.

Body black. Head pale yellow (except vertex and middle of frons, black). Mesosternum, mesopleurum, metapleurum, a transverse line below hind wing, basal carinae of scutellum, postscutellum, apices of abdominal tergites, yellowish. Legs in general brownish-yellow.

Material examined : Nil

Distribution : India : Meghalaya (Khasi Hills), Sikkim, Tamil Nadu. Elsewhere: Sri Lanka.

Remarks : This is a little known species. No material of this species was available for study.

13. Genus *Xanthopimpla* Saussure

1892. *Xanthopimpla* Saussure. In Grandider : *Histoire Physique, Naturelle et Politique de Madagascar*, 20: (Hymenopteres) Part 1.

Type-species : (*Xanthopimpla nova* (1) Saussure = *hova* Saussure.

Key to the species of *Xanthopimpla*

1. Abdomen glabrous and entirely impunctate. propodeal areola quadrate. *lepcha*
- Abdomen distinctly punctate atleast in the centre of central segments. 2
2. Mesonotal vittae carinate; scutellum more distinctly bordered. *.honorata honorata*
- Mesonotal vittae not carinate; scutellum less distinctly bordered. 3
3. Antennae not longer than body; areolet not or hardly petiolate. .4
- Antennae longer than body, or areolet distinctly petiolate. .7
4. Propodeal areola entirely wanting beyond the costulae. (Antennae basally reddish; eighth abdominal segment with two black spots. *.curvimaculata curvimaculata*
- Propodeal areola distinctly carinate throughout. .5
5. Areola not transverse, usually distinctly hexagonal (terebra shorter than half of abdomen; scutellum subpyramidal. *.pedator*
- Areola more or less transverse and often not hexagonal. 6
6. Petiolar fascia entire; hind femora yellow with black, markings. *.elegans apicipennis*
- Petiolar fascia centrally interrupted; hind femora immaculate. *.stemma*
7. Body length not less than 10 mm. Mesonotal disc marked black; disc closely punctate. *appendicularis appendicularis*
- Body length about 6 mm. Mesonotal disc not marked (Notauli obsolete; hind trochanter with black markings; hind femora yellow, without black markings. *nana nana*

24. *Xanthopimpla appendicularis appendicularis* (Cameron)

1899. *Pimpla appendicularis* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43(3): 160. Female, key, des. India. Meghalaya : khasi Hills (Type in Oxford Museum).
1899. *Xanthopimpla tigris* Krieger, *Sitzber. Naturf. Gesell. Leipzig*. 1897/98 : 75. Male, female. key, des. India: Meghalaya: Khasi Hills. (Type in Berlin Museum).
1989. *Xanthopimpla appendicularis appendicularis* (Cameron:) Gupta, *Mem. Amer. Ent. Inst.*, 41(1) : 115. Syn.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Uttar Pradesh, West Bengal.

Remarks : No material was available for study. However, this species can be distinguished by the characters given in the key.

25. *Xanthopimpla bifida* Townes & Chiu

1970. *Xanthopimpla bifida* Townes & Chiu, *Mem. Amer. Ent. Inst.* 14:140. Male and Female. India : Sikkim; Meghalaya.
1987. *Xanthopimpla bifida* Townes & Chiu : Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 118.

Distribution : India : Meghalaya (Jaintia Hills), Sikkim.

Remarks : No material or description of this species was available for study, therefore, this species could not be included in the key.

26. *Xanthopimpla brachycentra obscuricornis* Townes & Chiu

1970. *Xanthopimpla brachycentra obscuricornis* Townes & Chiu, *Mem. Amer. Ent. Inst.*, 14:195. Female., key, des, fig. Type female, India : Meghalaya : Cherrapunji (Type in Gupta Collection).
1987. *Xanthopimpla brachycentra obscuricornis* Townes & Chiu: Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 119. Syn.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material or description of this species was available for study, therefore this species could not be included in the key.

27. *Xanthopimpla clivulus indicata* Gupta

1970. *Xanthopimpla clivulus indica* Townes & Chiu, *Mem. Amer. Ent. Inst.*, 14 : 162. Female. Name pre-occ. by Rao & Grover, 1960. Key, des., fig. Type : female, India : Meghalaya : Jaintia Hills : Dawki (Type in Gupta Collection).
1987. *Xanthopimpla clivulus indicata* Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 122. New name.

Distribution : India : Meghalaya (Jaintia Hills).

Remarks : No material or description of this species was available for study, therefore, this species could not be included in the key.

28. *Xanthopimpla conica* Cushman

1925. *Xanthopimpla conica* Cushman, *Ent. Mitt.*, 14:45. Male, female, key, des. Type : female. Taiwan. (Type in Eberswalde Museum).
1987. *Xanthopimpla conica* Cushman : Gupta. *Mem. Amer. Ent. Inst.*, 41(1): 122. Syn.

Distribution : India : Meghalaya (Jaintia Hills), Assam, Bihar, Kerala, Tamil Nadu. Elsewhere : China, Indonesia, Malaysia, Taiwan, Vietnam.

29. *Xanthopimpla curvimaculata curvimaculata* (Cameron)

1899. *Pimpla curvimaculata* Cameron..*Mem. Proc. Manchester Lit. Phil. Soc.*, **43**(3) : 158. M, key, des. Type : Male, India : Meghalaya ; Khasi Hills (Type in Oxford Museum).

1987. *Xanthopimpla curvimaculata curvimaculata* (Cameron) : Gupta. *Mem. Amer. Ent. Inst.*, **41**(1) : 124. Syn.

Distribution : India : Meghalaya (East khasi Hills), Sikkim. Elsewhere : Thailand.

30. *Xanthopimpla despinosa leipephelis* Townes & Chiu

1970. *Xanthopimpla despinosa leipephelis* Townes & Chiu, *Mem. Amer. Ent. Inst.* **14**:212. Female, key, des, fig. Type : Female India : meghalaya: Jaintia Hills : Dawki

1987. *Xanthopimpla despinosa leipephelis* Townes & Chiu : Gupta., *Mem. Amer. ent. Inst.*, **41**(1):125. Syn.

Distribution : India : Meghalaya (Jaintia Hills), Karnataka, Uttar Pradesh. Elsewhere : Nepal, Thailand.

Remarks : No material and description of this subspecies was available for study, therefore, this subspecies could not be included in the key.

31. *Xanthopimpla elegans apicipennis* (Cameron)

1899. *Pimpla apicipennis* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **43** (3) : 161. F, key, des. Type : Female, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1987. *Xanthopimpla elegans apicipennis* (Cameron) : Gupta. *Mem. Amer. Ent. Inst.*, **41**(1) : 127. Syn.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Karnataka, Nagaland, Nicobar Is., Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Burma, Laos, Nepal, Thailand.

Remarks : This subspecies is close to *stigmator* (Thunberg) in having areola more or less transverse and often not hexagonal. It can be distinguished by having hind femore yellow with black markings and petiolar fascia entire (not interrupted).

32. *Xanthopimpla glaberima* Roman

1913. *Xanthopimpla glaberima* Roman, *Arkiv. Fär Zool.*, **8** (15):22. F. key, des. Type: Female, Philippines (Type in Stockholm Museum).

1987. *Xanthopimpla glaberima* Roman : Gupta, *Mem. Amer. Ent. Inst.*, **41**(1) : 135. Syn.

Distribution : India : Meghalaya (Jaintia Hills), Assam, Tamil Nadu. Elsewhere : Indonesia, Philippines, Taiwan, Thailand.

Remarks : No material or description of this species was available for study, therefore, found no place in the key to the species.

33. *Xanthopimpla honorata honorata* (Cameron)

1899. *Pimpla honorata* Cameron. *Mem. Proc. Manchester Lit. Phil. Soc.*, 43(3):170. Female, key, des. Type : Female, India: Meghalaya (Type in Oxford Museum).

1987. *Xanthopimpla honorata honorata* (Cameron) : Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 136. Syn.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere: Malaysia, Nepal, Philippines, Singapore, Taiwan, Thailand, Vietnam.

Remarks : This species is recognised by having abdomen distinctly punctate in the central segments; mesonotal vittae carinate and scutellum distinctly punctate in the central segments; mesonotal vittae carinate and scutellum distinctly bordered.

34. *Xanthopimpla lepcha* (Cameron)

1899. *Pimpla lepcha* Cameron, *Mem. & Manchester Lit. Phil. Soc.*, 43(3): 163. Female, key, des. Type : Female, India: Meghalaya : Khasi Hills (Type in British Museum).

1987. *Xanthopimpla lepcha* (Cameron) : Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 142. Syn.

Distribution : India : Meghalaya (East Khasi and Jaintia Hills), Assam, Bihar, Maharashtra, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh. Elsewhere : Burma, Hongkong, Indonesia, Malaysia, Singapore, South East Asia, Taiwan.

Remarks : This species is recognised by having abdomen glabrous and entirely impunctate; and propodeal areola quadrate.

35. *Xanthopimpla nana nana* Schulz

1905. *Xanthopimpla prava* Cameron, *Spolia Zeylanica*, 3:136, Name preocc. by Krieger, 1899. Type : Male, Sri Lanka (Type in British Museum).

1906. *Xanthopimpla nana* Schulz, *Spolia Hymenopterologica*, : 114. n. name.

1987. *Xanthopimpla nana nana* Schulz : Gupta, *Mem. Amer. Ent. Inst.*, 41(1):149. Syn.

Distribution : India : Meghalaya (Jaintia Hills), wide spread in most Indian states. Elsewhere : Cambodia, Hongkong, Indonesia, Nepal, Sri Lanka, Thailand, Vietnam.

Remarks : This is a small species, mesonotal disc not marked; hind trochanter with black markings, and hind femora entirely yellow.

36. *Xanthopimpla pedator* (Fabricius)

1767. *Ichneumon punctator* Linnaeus, *Systema Naturae* Ed. 12, 1(2):935. Name Preocc. by Allioni, 1766, Female, des. Type : Female, "Indies" Type lost. Syn by Fab. 1793.

1775. *Ichneumon pedator* Fabricius, *Systema Entomologiae*, : 828. Female. des. Type : Female (Type in Glasgow Museum).

1987. *Xanthopimpla pedator* (Fabricius) : Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 153. Syn.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Karnataka, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Burma, China, Hong Kong, Indonesia, Malaysia, Pakistan, Singapore, Taiwan.

Remarks : This species is distinguished by having ovipositor half as long as abdomen, scutellum subpyramidal and areola hexagonal.

37. *Xanthopimpla pleuroschista* Townes & Chiu

1970. *Xanthopimpla pleuroschista* Townes & Chiu. *Mem. Amer. Ent. Inst.*, 14:232. Female. key, des, fig. Type : Female, India : Meghalaya : Khasi Hills (Type in Gupta Collection)

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Material not seen.

38. *Xanthopimpla stemmator* (Thunberg)

1822. *Ichneumon stemmator* Thunberg, *Mem. Acad. Imp. Sci. St. Petersburg*, 8:262. Type : Male, China (Type in Uppsala Museum).

1987. *Xanthopimpla stemmator* (Thunberg) : Gupta. *Mem. Amer. Ent. Inst.*, 41(1) : 167. Syn.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Delhi, Karnataka, Tamil Nadu, Gujarat, Maharashtra, Uttar Pradesh, Sikkim, Kerala, West Bengal. Elsewhere : Bangladesh, China, Hong Kong, Indonesia, Laos, Malaysia, Nepal, Pakistan, Philippines, Singapore, Sri Lanka, Taiwan.

Remarks : No material of this species was available for study, however, this species is readily recognised by having body and legs entirely yellow without any black marking and abdominal segments (except sixth) with two black lateral spots.

3. Tribe THERONINI

This tribe is represented by a single species under genus *Parema* Gupta.

14. Genus *Parema* Gupta

1962. *Theronia* (*Parema*) Gupta. *Pacific Ins. Monogr.* 4 : 54.

Type-species : *Theronia* (*parema*) *nigrobalteata nigrobalteata* Cameron.

39. *Parema nigrobalteata nigrobalteata* (Cameron)

899. *Theronia nigrobalteata* Cameron, *Mem. & Proc. Manchester Lits. Phil. Soc.*, 43(3):153. F, des. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1899. *Theronia gracilis* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 43(3):154. (F), des, Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.
1906. *Theronia zebra* var. *continentalis* Krieger, *Ztschr. System. Hymen. Dipt.*, 6 : 236. M, F, des. in key. Lectotype (designated by Townes, Townes & Gupta, 1961) : F, Burma : (Toungoo, 3000 ft. in Karenni Dist.) (Type in Berlin Museum). India : West Bengal : Darjiling. Vietnam (Annam). Syn. by Townes, Townes & Gupta, 1961.
1961. *Theronia nigrobalteata* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:75. n. status. India. Burma. Vietnam.

Diagnostic characters : Face punctate; pro- and mesopleurae smooth and shiny, areola on propodeum subquadrate.

This is a pale yellow species with black markings, wings apically infumate and the stigma pale. Mesoscutum blackish, at sides yellow; lateral carina of scutellum and tegula, black; scutellum also at apex black. Abdomen reddish with apices of segments yellow; three basal segments at base black. Anterior legs yellow with their femora and the intermediate tibiae and tarsi deep yellow; hind coxa broadly black at base, trochanters apically, femora broadly in the middle and tibiae, red; tarsi infusate.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal.

Remarks : No specimen of this species was available from Meghalaya for study. Morely (1913) gave a detailed account of this species, based on a female collected from Khasi Hills in Meghalaya.

4. Tribe NEOXORIDINI

Key to the tribe Neoxoridini

1. Areolet in fore wing absent; ventral tooth on first abdominal sternite usually absent; second abdominal tergite usually punctate. Ovipositor subcylindric, not so strongly compressed.

Eugalta
- Areolet in fore wing present; first abdominal sternite with a sharp tooth ventrally; second abdominal tergite mostly smooth and shiny, sometimes with a few scattered punctures
Ovipositor compressed laterally *Achorocephalus*

15. Genus *Eugalta* Cameron

1899. *Eugalta* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 135.
Type-species : *Eugalta strigosa* Cameron.

Key to the species of *Eugalta*

1. Propodeum striato-punctate, transverse striae clear; dorsal face of propodeum sharply constricted from the metapleurum. 2
- Propodeum rugoso-reticulate, without clear transverse striations, but reticulations; propodeum evenly arched. 3

2. Thorax reddish; scutellum black; first abdominal sternite extending beyond the level of spiracle; ovipositor as long as body. *.strigosa*

Thorax black; scutellum yellowish-white; first abdominal sternite ending at the level of spiracle; ovipositor about 0.5X the body length. *.leucops*

3. First abdominal sternite extending well beyond the level of spiracle, about 0.5-0.75x the length of petiole; petiole long and slender, usually circular in cross section at base; first tergite rugoso-punctate or rough basally and in the middle. Tegula yellow. *albitarsis*

First abdominal sternite ending at the level of spiracle or a little short of it. Facial yellow mark not so extensive only the inner orbit, yellow; mesopleurum and propodeum without yellow mark. *.linearis*

40. *Eugalta albitarsis albitarsis* Cameron

1899. *Eugalta albitarsis* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **43** (3):138. F. des. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1980. *Eugalta albitarsis albitarsis* Gupta, *Oriental Ins.*, **14**:95. M, F. key, des., fig. India : Meghalaya : Khasi Hills; Dawki, Jaintia Hills. Sikkim. Burma : Pynchaung Res., S. toungoo., Nanhlaing Res., Shwebo; Gwethe Res., North Toungoo; Maymyo; 800 m.; Mt. victoria, 1000 m.

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 1 female, 13.iv. 1966, J.K. Jonathan, Coll. No. J 129, in Gupta Collection.

Distribution : India : Meghalaya (Jaintia Hills), Sikkim. Elsewhere : Burma.

41. *Eugalta leucops* Townes

1900. *Tilgida albitarsis* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, **44** (15) : 109. M. Name preocc. in *Eugalta* by Cameron, 1899. des. Type : M, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1961. *Eugalta leucops* : Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, **1**:80. new name, India.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Kashmir, Sikkim, Uttar Pradesh.

42. *Eugalta linearis linearis* Morley

1913. *Eugalta linearis* Morely, *Fauna of British India, Hymenoptera*, **3**:73. M, F, key, des., fig. Type : F, India : Sikkim (Type in B.M.N.H.). India : Meghalaya : Mahjain, Khasi Hills, 1000-3000 ft.

1980. *Eugalta linearis linearis* Gupta, *Oriental Ins.*, **14**:102. M, F, key, des., fig. India : Sikkim. Meghalaya : Mahjain, Khasi Hills. West Bengal : Runjit Valley, 1000 ft.; Darjeeling. "East Fort Darvant". Burma : Wetpyuya, 2800 ft.

Distribution : India : Meghalaya (Khasi Hills), Sikkim, West Bengal. Elsewhere : Burma.

Remarks : No specimen of this species was available from Meghalaya for study. Gupta (1980) gave a detailed description of this species.

43. *Eugalta strigosa strigosa* Cameron

1899. *Eugalta strigosa* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43(3):136. F. key, des. Type; F, India: Meghalaya : Khasi Hills (Type in Oxford Museum).

1980. *Eugalta strigosa strigosa* Gupta, *Oriental Ins.*, 14:91. M, F. key, des., fig., India : Meghalaya : Khasi Hills; Cherrapunji. N.E. Burma : Kambaiti, 2000 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1 male, 3.iv. 1966, D.Ram in Gupta Collection.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

16. Genus *Achorocephalus* Kreichbaumer

1899. *Achorocephalus* Kreichbaumer, *Ent. Nachr.*, 25:295.

Type-species : *Achorocephalus cinctipes* Kriechbaumer; monobasic.

Key to the species of *Achorocephalus*

1. Mesoscutum smooth and shiny (except for a few punctures in large females); mesopleurum also smooth and shiny with minute setiferous punctures. *nigricollis*

- Mesoscutum punctate; mesopleurum also distinctly punctate, may be minutely at time. 2

2. Thorax reddish anteriorly; scutellum and post-scutellum reddish or blackish; mesoscutum strongly and coarsely punctate and hairy; hind femur wholly black; yellow mark on face extending on to vertex; first sternite with a pointed tooth *.spinosus*

Thorax black with scutellum and post-scutellum yellow mesoscutum closely punctate not so hairy; (second abdominal tergite quadrate, nearly as long as wide, punctures sparse and shallow; lateral lobe of mesoscutum with rows of punctures in the middle and without a smooth central area; tarsus largely, yellow. *.punctulatus*

44. *Achorocephalus nigricollis nigricollis* (Cameron)

1899. *Eugalta nigricollis* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43(3) 141. M. key, des. Type : M, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1919. *Pseudegaltia aspasia* Turner, *Ann. Mag. Nat. Hist.*, (9) 4:391. F. des. Type : F, Laos : Luang Prabang : Muong Yon (Type in B.M.N.H.). Syn. by Gupta, 1980.

1985. *Achorocephalus nigricollis nigricollis* Gupta, *Oriental Ins.*, 19:324. n. comb.

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 3 males, 2 females, 12-13.iv. 1966, Colls. J.K. Jonathan, M.K. Kamath, D. Ram, in Gupta Collection.

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Assam, Sikkim. Elsewhere: Bangladesh, Burma, Laos.

45. *Achorocephalus punctulatus punctulatus* (Cameron)

1899. *Eugalta punctulata* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 142. (F). key, des. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1900. *Baliena leptopus* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 44(15):102. F. des. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum). syn. by Morley, 1913.

1985. *Achorocephalus punctulatus punctulatus* Gupta, *Oriental Ins.*, 19:324. n. comb.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Bangladesh, Burma?

Remarks : No material of this species was available from Meghalaya for study. Gupta (1980) gave a detailed description of this species.

46. *Achorocephalus spinosus* (Cameron)

1899. *Eugalta spinosa* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 139. F. des., fig. Type : F, Meghalaya : Khasi Hills (Type in Oxford Museum).

1985. *Achorocephalus spinosus* Gupta, *Oriental Ins.*, 19:324. n. comb.

Material examined : India : Meghalaya : East khasi Hills. 1 female, no other date, in Gupta Collection.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, West Bengal. Elsewhere : Burma.

5. Tribe RHYSSINI

Key to the genera of tribe *Rhyssini*

1.	Areolet present (rarely absent).	2
-	Areolet always absent.	.3

2.	Occipital and hypostomal carinae joining at or very close to the base of mandible, clypeus with a strong median apical tubercle; frontal orbits raised and tumid.	<i>.Lytarmis</i>

Occipital and hypostomal carinae distant from the base of mandible by about 0.3x the basal width of mandible; clypeus with or without a median apical tubercle; frontal orbits not raised. (First Tergite angulate basally with short basal dorso-lateral carinae; radial cell on 4.5 to 5.5 x as long as high).

.Megarhyssa

3. Upper tooth of mandible weakly subdivided so that mandible appears tridentate; second to fourth sternite of female without a pair of tubercles; ovipositor tip sinuate and strongly compressed. *Myllenyxis*
- Upper tooth of mandible not subdivided, mandible appears bidentate; second to fourth sternites of female with a median basal pair of tubercles; tip of ovipositor straight and moderately compressed. 4
4. Apex of upper tooth of mandible a little narrower than apex of lower tooth; hamuli in a basal group of usually three hooks, followed distally by a single widely spaced hooks; front edge of collar with a moderately narrow recurved flange; stigma about 5.0x as long as wide; first tergite about 1.0 to 1.3x as long as wide, with a weak basal dorsolateral carina; first sternite of female with a pair of large flat tubercles *Triancyra*
- Apex of upper tooth of mandible a little wider than apex of lower tooth; hamuli in a basal group of two hooks, followed distally by a single widely spaced hooks; front edge of collar with a narrow, weakly recurved flange; stigma about 5.0 to 10.0 x as long as wide; first tergite about 1.3 to 4.4 x as long as wide; intercubitus basad of second recurrent vein by 0 to 0.5x its length; first tergite angulate basally, with a short basal dorso-lateral carina *Sychnostigma*

17. Genus *Lytarmes* Cameron

1889. *Lytarmes* Cameron, *Mem. Manchester Lit. Phil. Soc.*, 43 (3) : 144.

Type-Species : *Lytarmes maculipennis* Cameron = (*maculipennis hyalinipennis* Cameron).

47. *Lytarmes maculipennis hyalinipennis* Cameron

1899. *Lytarmes maculipennis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 145. F. Name preocc. by Smith, 1958. des., fig. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum) Syn. by Townes & Gupta, 1961.

1899. *Lytarmes hyalinipennis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 146. M. des. Type : M, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1972. *Lytarmes maculipennis hyalinipennis* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:33. M, F. key, des, India : Meghalaya : Khasi Hills.

Diagnostic characters : Female : 16 mm. Body brown and black. Thorax in general brown. Antennae and hind femora reddish-brown; hind coxa and first tergite similarly coloured with yellow markings. Abdomen with first tergite reddish-brown; second and following tergites blackish; median elongate stripes on first two tergites and paramedian slightly elongate spots on third to fifth tergites, yellow.

Male : Length 12 mm. Similar to female. Face yellow, without a black central spot; mesoscutum with a pair of median yellow spots; metascutellum yellow; mesopleurum black, subtegular tubercle, metapleurum and propodeum, yellow.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : The types were examined by Dr. V.K. Gupta in Oxford University Museum.

18. Genus *Megarhyssa* Ashmead

1859. *Thalessa* Holmgren, *Ofvers. Svenska Vetensk. Akad. Forh.*, 16:122; Name preoccupied by Adams, 1853.
Type-species : (*Ichneumon clavatus* Fabricius) = *gigas* Laxmann, designated by Ashmead, 1900.
1900. *Megarhyssa* Ashmead. *Canadian Ent.*, 32:368; New name.

48. *Megarhyssa fulvipennis* (Cameron)

1899. *Rhyssa fulvipennis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 127. F. des. Type : F, India : Meghalaya : Khasi Hills (Type Oxford University Museum).
1972. *Megarhyssa fulvipennis* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:61. M, F. key, des., fig. India : Meghalaya : Khasi Hills.

Diagnostic characters : Female : 4.5 mm. Body black and yellow- brown. Head yellow; mandible, antennal scrobes and a band across vertex including ocellar triangle, black; antenna yellowish- brown; thorax black; pronotum except its median depression dark brown, a spot at base of median lobe, a pair of elongate stripes and another at apicolateral margin of mesoscutum, yellow; Scutellum yellow with a dark brown mark in the center; metascutellum yellow, an oval mark on mesopleurum, propodeum dorsally, yellow. Legs in general yellowish-brown. First abdominal tergite with a pair of diffused yellow spots at apex, second tergite brown with a pair of longitudinal yellow stripes dorso-laterally; third to six tergites yellowish brown with basolateral oblique, rather incomplete yellow stripes; sixth and seventh tergites and apex of eighth tergite laterally, broadly yellow.

Male : Essentially similar to female, body length 36 mm.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is easily distinguished by its large size (45 mm) and the length of ovipositor, which is more than twice the length of its forewing (32 mm.) No material of this species was available for study.

19. Genus *Triancyra* Baltazar

1961. *Triancyra* Baltazar. *Monogr. Natl. Inst. Sci. Technol Manila*, 7:66.
Type-species : *Triancyra scabra* Baltazar Original designation.

This genus is known by two species from Meghalaya, viz., *Triancyra maculicornis* (Cameron) and *T. sarojinae* Kamath and Gupta. These can be distinguished by the following key:

Key to the species of *Triancyra*

1. Distance between pleural carina and propodeal spiracle either equal to or greater than the length of spiracle opening (1.0- 1.5); occipital carina always interrupted medially above; (inter ocellar

distance 1.5-2.0 X ocello-ocular distance; frons without a median groove and carinae; third tergite with dense crowded punctures, face with a shallow median groove. *.maculicornis*

- Distance between pleural carina and propodeal spiracle less than the length of spiracular opening (0.1-0.6); occipital carina present medially; (third tergite strongly punctate laterally fourth and fifth coarsely punctate. Hind first to fourth tarsal segments yellow, third to fifth tergites without a median longitudinal black stripe. *.sarojinae*

49. *Triancyra maculicornis* (Cameron)

1899. *Epirhyssa maculicornis* Cameron, *Mem & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 132. F. des. Type : F, India : Meghalaya : Khasi Hills (Oxford Museum).
1933. *Epirhyssa transversa* Cushman, *Insecta Matsumurana*, 8:33. F. key, des. Type : F, Taiwan : Fengshan (Eberswalde Museum). Syn. by Kamath & Gupta, 1972.
1972. *Triancyra maculicornis* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:100. M, F. n. comb., key, syn., des., fig. India : Meghalaya : Khasi Hills. Burma, Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Burma, Taiwan, Java.

Remarks : No material of this species was available for study from Meghalaya. The species is recognised by having median shallow groove on face; vertex distinctly punctate behind ocellar area; the ovipositor sheath is more than one and half times the length of fore wing.

50. *Triancyra sarojinae* Kamath and Gupta

1971. *Triancyra sarojinae* Kamath and Gupta, *Oriental Ins. Monogr.*, 2:95. Female, key, des, fig. Type : female, India : Meghalaya. : Jaintia Hills, Dawki (Type in Gupta collection). Sikkim.

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 1 female (Type), 13.iv. 1966, M.K. Kamath, Colln. No. K84.

Distribution : India : Meghalaya (Jaintia Hills), Sikkim.

Remarks : This species has first three abdominal tergites smooth and polished, following tergites are coarsely punctate, without tubercles. The propodeum without a dorsomedian furrow, frons finely carinate in the middle.

20. Genus *Sychnostigma* Baltazar

1903. *Hierax* Tosquinet, *Mem. Soc. Ent. Belgique*, 10 : 225; name preoccupied by vigors, 1826 by Morris, 1837. Type-species : *Hierax raptor* Tosquinet.
1961. *Sychnostigma* Baltazar, *Monogr. Natl. Inst. Sci. Technol, Manila*, 7:75; new name.

This is a large genus of the Old World tropics. It is known by five species from India. Of these three are also reported from Meghalaya. These species can be distinguished by the following key.

Key to the species of *Sychnostigma*

1. Propodeum dorsally coarsely punctate, punctures running into striations. Wings hyaline, without preapical brown spot on fore wing. . . . *assamense*
- Propodeum dorsally smooth or coarsely punctate, without trans- striations. Wings hyaline or yellowish hyaline, with a brown preapical spot on fore wing. 2
2. First Tergite about 2x as long as wide at apex. Third to fifth tergites with transverse lateral grooves and the fourth with a conspicuous median lateral hump. Ovipositor sheath about 1.4 x as long as fore wing. . . . *flavobalteatum*
- First tergite about 1.35 x as long as wide. Third to fifth tergite without grooves and fourth without hump. Ovipositor sheath about 2 x as long as fore wing. . . . *anamikae*

51. *Sychnostigma anamikae* Jonathan

1974. *Sychnostigma anamikae* Jonathan. *Oriental Ins.*, 8:307. F. des., fig. Type : F, India : Meghalaya : Garo Hills: Tura, (Type in Z.S.I. Calcutta).

Material examined : India : Meghalaya : West Garo Hills, Tura, 1 female (holotype), 15.viii.-30.viii. 1917, coll. S. Kemp.

Distributions : India : Meghalaya (West Garo Hills).

Remarks : This species is distinguished by having the malar space about 0.5 x the basal width of mandible occipital carina trans- striate, mesopleurum shiny with a few punctures below; mesoscutum with six marks and fore wing with a preapical spot.

52. *Sychnostigma assamense* Kamath & Gupta

1972. *Sychnostigma assamense* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:161. F. key, des. Type : F, India : Meghalaya : Khasi Hills : Cherrapunji, 1485 m. (Type in Gupta collection). Burma : Mt. Victoria, 1400 m.; Kambaiti, 1800 m. (Khasi Hills were formerly in Assam; hence the name.).

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunji, 1485 m, 7.iv. 1966, J.K. Jonathan, coll. No. J125.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : This species is recognised by its striato-punctate second and third tergites. The clypeus is concave at its apical margin and without a median tubercle. The antennal flagellum yellowish-brown; first three abdominal tergites orange with subapical transverse yellow bands, band on third interrupted in the middle.

53. *Sychnostigma flavobalteatum* (Cameron)

1899. *Epirhyssa flavobalteata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 129. F. des. Type : F, India : Meghalaya : Khasi Hills (Type in British Museum).

1933. *Epirhyssa longibasis* Cushman, *Insecta Matsumurana*, 8:31. F. key, des. Type : F, Taiwan : Fengshan (Type in Sapporo Museum). Syn. by Gupta & Kamath, 1972.
1972. *Sychnostigma flavobalteatum* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:181. M, F. key, syn., des. India : Meghalaya : Khasi Hills. Assam : Charduar Forest, near Rangapara. Sikkim. China, Taiwan.

Material examined : India : Meghalaya : East Khasi Hills, 1 female, no date, coll. Rothney (Type is Oxford Museum).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim. Elsewhere : China, Taiwan.

Remarks : This species is recognised by having first tergite 2 X as long as wide at apex, third to fifth tergites with transverse, lateral grooves and the fourth tergite with a conspicuous median lateral hump. The face is yellow without any black or brown mark.

21. Genus *Myllenyx* Baltazar

1961. *Myllenyx* Baltazar, *Monogr. Natl. Inst. Sci. Technol., Manila*, 7:94.
Type-species : *Myllenyx insularis* Baltazar, Original designation.

54. *Myllenyx carinifrons* (Cameron)

1899. *Epirhyssa carinifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):131. M. des. Type : M, India : Meghalaya : Khasi Hills (Type in Oxford Museum).
1972. *Myllenyx carinifrons* Kamath & Gupta, *Oriental Ins. Monogr.*, 2:206. M. key, des India : Meghalaya : Khasi Hills.

Diagnostic characters : Male : 11 mm long. Body black and reddish-brown. Head yellow; base of mandible reddish-brown, frons along the eye margin and median carina, yellow. Thorax largely black, except a dorsal band on pronotum, a stripe on pronotal collar, prescutellar spots, scutellum, metascutellum, a band on propodeum, yellow; four front legs yellowish; hind coxa black with a yellow dorsal marks, trochanter yellow, rest of hind leg yellowish-brown. Fore wing with a brown spot as apex; abdomen dark reddish-brown; first to fourth tergites at apex yellow; second and following tergites with broad black basal bands.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study. This species is based on a single male specimen.

2. Subfamily TRYPHONINAE

This subfamily is represented by two tribes in Meghalaya.

Key to the tribes of subfamily *Tryphoninae*

1. Hind tibia with a single spur, which is longer than apical diameter of the tibia. Middle tibia with two spurs, spiracle of first tergite near its apical 0.4; apex of clypeus with a median blunt tooth.
Sphinctini
- Hind tibia with two spurs; spiracle of first tergite in front of the middle. (Propodeum either without carinae or with a sublateral crest on each side and with transverse striation; prepectal carina present).
Phytodietini

6. Tribe SPHINCTINI

This tribe is represented by a single species under genus *Sphinctus* Gravenhorst.

22. Genus *Sphinctus* Gravenhorst

1829. *Sphinctus* Gravenhorst, *Ichneumonologia europaea*, 2:363.
Type-species : *Sphinctus serotinus* Gravenhorst, Monobasic.
1899. *Eradha* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 213.
Type-species : *Eradha trichiosoma* Cameron, Monobasic.

55. *Sphinctus trichiosoma* (Cameron)

1899. *Eradha trichiosoma* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 214. M. des Type : M, India : Meghalaya : Khasi Hills (Type in British Museum).
1940. *Sphinctus trichiosoma* Uchida, *Insecta Matsumurana*, 14:128. key.

Diagnostic characters : Male : 16-17 mm long. Body with antennae, head, thorax and legs largely or entirely black. The following yellow or deep yellow: two-third of outer orbit and inner orbit entirely; four anterior tibiae and tarsi, and base of hind tibia. The following are reddish-yellow: pronotum with a band, second abdominal tergite entirely and apical two-third of third segment.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by a single male. No material of this species was available for study.

7. Tribe PHYTODIETINI

This tribe is represented by a single genus viz., *Netelia* Gray in Meghalaya.

23. Genus *Netelia* GrayKey to the subgenera of *Netelia*

1. Occipital carina completely absent, lateral carina of scutellum usually extending less than half the length of scutellum. (Areolet present; apical margin of gonoforceps with or without a spine).
Subgenus *Longiterebates*

- ### Subgenus *Toxochiloides*

- .Subgenus *Netelia***

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57. *Netelia (Toxochiloides) latro latro* (Holmgren)

1868. *Paniscus latro* Holmgren, *Kongliga Svenska Fregatten Eugenie's Resa*, 2:412. M. des. Type : M, Micronesia : Guam (Stockholm Museum).
1899. *Paniscus ferrugineus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 107. F. key, des. Type : F. India : Meghalaya : Khasi Hills (British Museum). Syn. by Kaur & Jonathan, 1979
1912. *Paniscus cameroni* Enderlein, *Stettiner Ent. Ztg.*, 73:123. M, F. key, des. Type : M, India: West Bengal : Calcutta (Warsaw). Syn. by Kaur & Jonathan, 1979.
1908. *Paniscus samoanus* Kohl, *Denkschr. Akad. Wiss. Wien*, 81:314. M, F. des., fig. Lectotype (designated by Townes, Townes & Gupta, 1961) : M, Samoa : Upolu (Vienna Museum). Syn. by Morley, 1913.
1908. *Paniscus javanus* Szepligeti, *Notes Leyden Mus.*, 29. 258. M, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961) : M, Indonesia : Java: Semarang (Budapest Museum), Syn. by Townes, Townes & Gupta, 1961.
1979. *Netelia (Toxochiloides) latro latro* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:112. M, F. n. comb. key, syn., des., fig. Micronesia : Guam. India : several localities in Assam; Meghalaya; Sikkim; West Bengal; Bihar; Orissa; Andamans; Himachal Pradesh; Uttar Pradesh; Maharashtra; Karnataka; Tamil Nadu; Kerala. Bangladesh.

Diagnostic characters : *Female* : 12-21 mm long. Body reddish brown to brown. Ocellar triangle brownish-black to black. Temple moderately broad and receding at back; occipital carina interrupted above; malar space about 0.2x the basal width of mandible; frons 0.5x as long as broad; medially depressed and transversely striated; lateral ocellus touching the eye; lateral carina of scutellum complete; metapleurum without striations; pleural carinae fine and weak; propodeum closely coarsely punctate, striate in the middle; hind claw bent at tip; all claws pectinate and with two unequal bristles; nervulus distad of basal vein by about 0.5x its length and usually bent in at its upper 0.4; brachial cell bare, areolet sessile, second recurrent moderately curved, its lower end inner to its upper end; nervellus interrupted at its upper 0.3, first tergite 4.0x as long as broad at apex.

Male : 10-15 mm long. Gonoforceps tapering towards apex, with a sclerome bordering its dorsal margin in the lower half; brace long and narrow and weakly arched, placed transversely on gonoforceps, pad large and somewhat triangularly placed near the middle of dorsal edge of gonoforceps; a sclerotized area present above the brace of gonoforceps and connected with the upper corner of pad; subgenital plate with broad speculum.

Material examined : India : Meghalaya : Jaintia Hills : Dawki., 1 female, 12.iv. 1966. D.T. Tikar, coll. No. T179; East Khasi Hills: Upper Shillong, 1516 m, 1 female, 11.V.1962, Gupta; Cherrapunji, 1360 m, 10 females, 1 male, 4,5,7.IV. 1966, M.K. Kamath, coll. Nos. K75, K76, K77, K78, K79; 9 females, 4-7.iv. 1966, D. Ram, coll. Nos. T169-175; 12 females, 3-7.iv. 1966. J.K. Jonathan, coll. Nos. J121-125.

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Andamans, Assam, Bihar, Himachal Pradesh, Kerala, Karnataka, Maharashtra, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere: Australia, Bangladesh, Japan? Java, Korea? Loyalty Is. Malaya? Micronesia. New

Hemides Is., Ryukyu Is? Samoa Is. Sumatra? Tasmania? Tibet.

Host : *Dendrolimus spectabilis* Btl., *Acronicta ksi*, *Griposia aprilina* L., *Guculia perforata* Brem., *Mamestra brassicae* L., *Argyrogramma agnatum* Stgr., *Mythimna unipuncta* How., *Clavellaris* sp.

5. Subgenus *Netelis* (*Netelia*) Grey

1860. *Netelia* Gray. *Ann. Mag. Nat. Hist.*, (3) 5:341.

Type-species : *Paniscus inquinatus* Gravenhorst.

Key to the species of *Netelia* (*Netelia*)

1. Occipital carina absent; temple weakly convex and sharply receding at back; thorax smooth and polished with fine weak punctures; areolet more or less oblique; second recurrent almost straight. In male gonoforceps with an apicodorsal spine; pad small; penis valve with spatha short; subgenital plate 2.0x as wide as long and produced in the middle posteriorly. *laevis*
- Occipital carina present; temple moderately to strongly convex and receding at back. .2
2. Temple strongly convex and as broad as or broader than the eyes at back; (metapleurum and propodeum closely striated; nervulus distad by 0.3-0.4 its length; areolet oblique. In male, gonoforceps lacking an apicodorsal spine; brace moderately long, supporting a large U-shaped pad at apex. *vinulae*
- Temple moderately convex, seldom as broad as eyes and usually receding well behind the eyes. .3
3. Fore and middle fifth tarsal segments distinctly longer, 1.20- 1.5 x as long as its third, and their claws long; hind fifth tarsal segment almost as long as its third in female. 4
- Fore and middle fifth tarsal segments about as long as its third, sometimes slightly longer, about 1.15x its third; hind fifth tarsal segment distinctly shorter about 0.75-0.8x as long as its third in female. .5
4. Fore fifth tarsal segment 1.5x as long as its third; areolet long and narrow, usually 2.33x as long as broad, petiolated; second recurrent usually distad of second intercubitus at both ends; propodeum beyond the crests and metapleurum in the middle, usually weakly rugulose. In male, gonoforceps rounded at apex; sclerome paralleling its dorsal edge diverging from it towards its middle. . . *siva*
- Fore fifth tarsal segment 1.25x as long as its third; areolet moderately long about 2.0x as long as broad, sessile or subsessile; second recurrent moderately curved; propodeum beyond the crests and metapleurum in the middle smooth and polished. In male, gonoforceps almost straight at its dorsal edge, converging only at its ventro-apical edge; brace long and pad situated near the dorso-apical corner; subgenital plate narrow at sides, its extreme lateral edge 0.2x as long as its length. *intermedia*

5. Mesopleurum finely to coarsely punctate; propodeum usually moderately, regularly, closely striated. In male, pad moderately long and narrow, its end moderately to sharply pointed; gonoforceps with its dorsal edge, bordered by a sclerome in its lower half. *.orientalis*
- Mesopleurum coarsely, closely punctate, the punctures separated by less than their own diameter, dull; propodeum usually coarsely, irregularly striated. *.6*
6. Eyes rather broad, about 2.5x as long as broad; face almost as long as broad; fore fifth tarsal segment 3.5x as long as broad. In male, gonoforceps without apico-dorsal spine, instead the dorsal border slightly extended a little below the apex; brace long and narrow; pad narrow and curved back, above. *corrugata*
- Eyes rather narrow; about 2.6-2.7x as long as broad; face distinctly broader than long; fore fifth tarsal segment 2.5-2.0x as long as broad. In male, gonoforceps with an apico-dorsal spine; brace moderately broad and short; pad large somewhat triangular. Body without black markings, a monochromatic species. *.rimosa*

58. *Netelia (Netelia) corrugata* Kaur & Jonathan

1913. *Paniscus nigriventris* Morely, *Fauna of British India* : Hymenoptera, 3:349. (in part). (2 males from Bengal and Bombay misdet. and belong to *corrugata*, cf. Kaur & Jonathan, 1979:167).
1979. *Netelia (Netelia) corrugata* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:172. M, F. key, des. fig. Type : F, India : Uttar Pradesh : Kumaon Hills : Bhowali, 1700 m. (in Gupta collection) India : Uttar Pradesh : Muradnagar, Mumaon Hills: Garjia, 606 m.; Dibri village, Garjia; Jeolikote; 1212 m.; Bhowali, 1700 m.; Bulandshahar, Delhi.; Bihar: Ranchi Dist.; Namkum; Ambera Bero; Pusa. West Bengal: Kurseonj, 1516 m.; Darjiling, Botanical Garden, 1980 m. Meghalaya: Cherrapunji, 1360 m.; Shillong, 1516 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunji, 1360 m, 4 females, 3,6,7.IV. 1966, J.K. Jonathan, coll Nos., J122-125; 2 females, 1 male, 5,7.IV. 1966, M.K. Kamath, coll. Nos. K77-79; 5 females, 3 males, 3,7.IV. 1966, D.T. Tikar, coll. No. T166 and T174; 4 females, 4-6.IV. 1966, D. Ram, coll. Nos. T169-173 (part material in Gupta colln.). Shillong, 1516 m, 3.V. 1924, Fletcher.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Delhi, Uttar Pradesh and West Bengal.

Remarks : This species is characterized by having broad eyes; face almost as long as broad; all claws in males densely pectinate. Kaur and Jonathan (1979) have provided a detailed description.

59. *Netalia (Netalia) intermedia* (Cameron)

1905. *Paniscus intermedius* Cameron, *Spolia Zeylanica* 3:125. M, F. Lectotype (designated by Townes, Townes & Gupta, 1961) : M, Sri Lanka : Maskeliya (Type in British Museum).
1979. *Netalia (netelia) intermedia* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:163, M, F. key, des., fig. India: Kerala: Walayar forest, 305 m. Tamil Nadu: Kodia Hills: Oothu, 1160 m.; Shevaroy Hills, Yercaud, 1370

m. Karnataka; Mudigere. Meghalaya : Jaintia Hills: Pynursla, 1340 m. West Bengal : Darjiling Dist.: Rangiroon, 1910 m.

Material examined : India : Meghalaya : Jaintia Hills : Pynursla, 1340 m, 1 female, 11.IV. 1966, J.K. Jonathan, coll. No. J127 (in Gupta collection).

Distribution : India : Meghalaya (Jaintia Hills), Kashmir, Himachal Pradesh, Karnataka, Tamil Nadu, West Bengal. Elsewhere : Sri Lanka.

Remarks : This is a small species with moderately broad eyes and punctation; metapleurum smooth; fore fifth tarsal segment 1.25x as long as its third. All claws in males coarsely pectinate.

60. *Netelia (Netelia) laevis* (Cameron)

1905. *Paniscus laevis* Cameron, *Spolia Zeylanica*, 3:127. F. des. Type: F, Sri Lanka: Kandy (Type in British Museum).

1928. *Amebachia baibarana* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, 21:198. M, F. key, des., fig. Type : M, Taiwan : Mei yuan (=Baibara) (Type in Sapporo Museum) Taiwan : Kusunuku. Syn. by Kaur & Jonathan, 1979.

1979. *Netelia (Netelia) laevis* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:134. M, F. key, syn., des., fig. India: Meghalaya : Khasi Hills. Cherrapunji, 1360 m. Sikkim : Gangtok, 1700 m. West Bengal : Rangiroon, 1910 m.; Singla, 455 m.; Darjiling. Bihar. Ranchi Dist. : Namkum; Chapra. Tamil Nadu : Kodai Hills : Oothu, 1160 m.; Palni Hills; Palni, 350 m. Kerala : Kottayam Dist.: Kuttikkanam; Kumily. Malaysia.

Material examined : India : Meghalaya : East Khasi Hills, Cherrapunji, 1360 m, 1 female, 3.IV. 1966, D. Ram, coll. No. T167.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Karnataka, Sikkim, Tamil Nadu, West Bengal.

Remarks : This is a small delicate species with occipital carina absent, temple narrow and hardly extending behind the eyes, thorax smooth and polished with a few weak punctures, metapleurum smooth, nervulus distad by 0.4-0.5x its length, vertical; areolet small, and it can further be distinguished by the characters as given in the key.

61. *Netelia (Netelia) orientalis* (Cameron)

1905. *Paniscus orientalis* Camero, *Spolia Zeylanica*, 3 : 126. F. des. Type : F, Sri Lanka: Pundaluoya (Type in British Museum).

1979. *Netelia (Netelia) orientalis* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:181. M, F. key, syn., fig. India : Karnataka: Londa, 620 m.; Khemmangundi, 1430 m.; Santaverry, 1070 m.; Mercara, 1220 m.; Gunji, Kalda, 1100 m. Kerala : Walayar Forest, 305 m.; Watapara, Walayar Forest. Tamil Nadu : Palni Hills: Palni, 350 m.; Kodai Hills: Oothu, 1160 m.; Nilgiri Hills: Devbetta, 2134 m.; Shevaroy Hills: Yercaud, 1370 m.; Coimbatore, 424 m. Bihar : Ranchi Dist. : Namkum; Ambra Bero. Uttar Pradesh : Kumaon Hills: Almora, 1668 m.; Jeolikote, 1220 m.; Dhunia; Pantnagar, Kotabagh; Pawalgarh; Bhowali, 1700 m.;

Ranman, 1370 m.; Mukteshwar, 2300 m.; Ramgarh, 2133 m.; Chaubattia, 2000 m.; Garhwal Hills; Konari Pass, 2640 m.; Dhak, 2425 m.; Barkot, 1220 m.; Garjia, 620 m.; Dehra Dun, 600 m.; Srinagar, 610 m.; Mohakampur, Herbertpur, Roorkee; Sikndrabad. Orissa : Mayurbhanj Dist.: Jenabil. Manipur: Ukhrul, 1945 m. Meghalaya : Khasi Hills : Shillong, 1454 m.; Happy Valley; Cherrapunji, 1360 m. Assam: Rangapara: Charduar Forest, Sonajuli Tea Estate; Mongaldai, Mazbat. West Bengal : Calcutta; Darjeeling, Botanical Garden; Rangiroon, 1010 m.; Manibhanjang, Kalimpong, 1234 m.; Singla, 455 m.; Kurseong, 1516 m. Sikkim: Gangtok, 1700 m. Himachal Pradesh : Dalhousie, 2132 m.; Ahla, 2285 m.; Khajjiar, 1828 m.; Kalatop, 2438 m.; Kulu Valley: Manali, 1828 m.; Koti, 2438 m.; Rahla, 2743 m.; Marhi, 3640 m.; Kalpa Valley: Nichar, 2500 m.; Dhakuri, 2521 m.; Singla, 2743 m.; Simla Hills : Narkanda, 2700 m.; Kufri, 2500 m. Burma, China.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1465 m., Happy Valley, 1 male, 9.IX. 1975, N. Muraleedharn and party; Cherrapunji, 1360 m., 1 female, 7.IV. 1966, D.T. Tikar, coll. No. T175; 2 females, 3,5.IV. 1966, D. Ram, coll. Nos. T167, T!71; 2 females, 4,5.V. 1966, M.K. Kamath, coll. No. K76, K77; 1 female, 7.IV. 1976, J.K. Jonathan, coll. No. J125.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Manipur, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Remarks : This is a highly variable species showing variation in most of the morphological characters. However, they all have identical genitalia.

62. *Netelia (Netelia) rimosa* (Enderlein)

1912. *Paniscus rimosus* Enderlein, *Stettiner Ent. Ztg.*, 73:128. F. key, des. Type : F, Indonesia : Java : Pengalenga, 4000 ft. (Type in Warsaw Museum).

1979. *Netelia (Netelia) rimosa* Kaur & Jonathan, *Oriental Ins. Monogr.* 9:177. M, F. key, des., fig. Java: Pengalengan, 1213 m. India: West Bengal: Darjeeling Dist.; Rangiroon, 1910 m.; Darjeeling botanical Garden, 1980 m.; Takdah, 1500 m.; Rangpo; nr. Ghoom, 1820-2123 m. Meghalaya : Khasi Hills: Cherrapunji, 1360 m, Himachal Pradesh: Kalpa Valley; Nichar, 2500 m.; Simla Hills: Chail, 2290 m.; Kufri, 2500 m.; Dalhousie Hills: Dalhousie, 2132 m.; Khajjiar, 1828 m. Uttar Pradesh: Mumaon Hills: Bhowali, 1700 m. Tamil Nadu: Kodai Hills: Oothu, 1160 m.; Shevaroy Hills; Yercaud, 1370 m. Kerala : Kottayam Dist.; Edapalayam. Bangladesh: Chittagong Hills tracts : Maini Mukh. Burma: N. Shan States: Kawngmu, 849 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1360 m, 2 males (genitalia of one mounted), 3-4.IV. 1966, D. Ram, coll. Nos. T167, T196; 1 male, 3.IV. 1966. J.K. Jonathan coll. No. J121.

Distribution : India : Meghalaya (East khasi Hills), Himachal Pradesh, Kerala, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Bangladesh, Burma, Java.

Remarks : This is a monochromatic reddish-brown species.

63. *Netelia (Netelia) siva* Kaur and Jonathan

1979. *Netalia (Netelia) siva* Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:161. M, F. key, des, fig. Type: F, India : Uttar Pradesh: Kumaon Hills: Chaubattia, 2000 m. (Type in Gupta collection). India : Uttar Pradesh : Dehra Dun : New Forest; Kumaon Hills:Bhowali, 1700 m.; Garjia, 600 m.; Dibri Village near Garjia; Garhwal Hills: Phata, 1624 m.; Mohkampur. Himachal Pradesh: Kulu Valley: Manali, 1828 m.; Dalhousie Hills: Khajjiar, 1828 m. Meghalaya : Jaintia Hills : Jowai.

Material examined : India : Meghalaya : Jaintia Hills, Jowai, 1 male, 31.iii. 1966, M.K. Kamath, coll. No. K.72.

Distribution : India : Meghalaya (Jaintia Hills), Himachal Pradesh, Uttar Pradesh.

Remarks : This is a small species with moderately broad eyes; coarsely punctate mesopleurum; metapleurum weakly trans-strigose in the middle; areolet longish; gonoforceps rounded apically.

64. *Netalia (Netelia) vinulae* (Scopoli)

1763. *Ichneumon vinulae* Scopoli, *Entomologia Carniolica*, : 286. F. des. Type : F, Yugoslavia: Carniola (Destroyed). Host *Cerura vinula*.
1858. *Paniscus cephalotes* Holmgren, *Svenska Vetensk.-Akad.Hindi.*, (N.F.) 2 (8) : 31. M, F. des. Lectotype (labelled by Hinz, 1963): F, Sweden; Stockholm (Type in Stockholm Museum) Sweden: Anneberg. Host: *Cerura vinula*. Syn. by Townes, Monoi & Townes, 1965.
1979. *Netelia (Netelia) Vinulae*-Kaur & Jonathan, *Oriental Ins. Monogr.*, 9:136. M, F. key, des., fig., full fer., distr. & hosts in Europe and Japan. Sweden : Stockholm. India : Uttar Pradesh: Kumaon Hills: Bhowali, 1700 m.; Pawalgarh.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh. Elsewhere : Eurasia, Iran.

Remarks : This species is readily recognised by having very broad and enlarged temples; metapleurum and propodeum finely, closely striated; nervulus distad by 0.3.0.4 and areolet oblique.

Hosts : *Dendrolimus albolineatus*, *Poecillocampa populi* L., *Dasychira pudibunda* (L), *Lymantria monacha* (L), *L. dispar* (L), *Apatele ineretate*, *A. tridens* Schiff., *Cucullia argentea* Hunfn., *C. asteris* Schiff., *C. balsamitae*, *C. scropulariae* Schiff., *C. thapsiphaga* Tr., *Mythimna unipuncta* (Haw), *Subacronicta megacephala* Schiff., *Cerura furcula* L., *Dicranura erminea* Esp., *D. himalayana* (Moore), *D. vinula* L., *Hoplitis milhauseri* F., *Herse convolvuli* (L), *Laothoe amurensis* Stgr., *L. populi* L., *Smerinthus ocellata* L.

This subfamily is represented by a single genus in Meghalaya.

This genus is represented by two subgenera in the state of Meghalaya.

1. Second trochanter of fore and middle legs with a tooth at apex on front side.
 .subgenus *Epixorides*

- Second trochanter of fore and middle legs without a tooth at apex on front side
 .subgenus *Cyanoxorides*

1862. *Epixorides* Smith. *J. Proc., Linn. Soc. London, Zool.*, 6:64.
Type-species : *Epixorides cholybeator* Smith.

1919. *Ahyborhyssa* Enderlein, *Sitzber. Gesell. f. Naturf. Freunde*, 1919 : 152. syn. by townes & Townes, 1960.
Type-species : (*Epirhyssa annulicornis* Cameron) = *elizabethae* Bingham, Original designation.

1898. *Xylonomus elizabethae* Bingham, *J. Bombay Nat. Hist. Soc.*, 12:116. F. des., fig. Type : F, India : Sikkim, 1000-4000 ft. (Type in Berlin Museum).

1899. *Epirhyssa annulicornis* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 43(3) : 133. F. des. Lectotype (designated by townes, & Gupta, 1961): F, India: Meghalaya : Khasi Hills (Type in British Museum) Syn. by Townes & Townes, 1960.

1903. *Xylonomus blanditor* Tosquinet, *Mem. Soc. Ent. Belgique*, 10:53. F. des. Type: F, Indonesia : Java: Mt. Tengger, 400 ft. (Type in Brussels Museum) Syn. by Townes & Townes, 1960.

1912. *Cyanoxorides albolineatus* Cameron, *Soc. Ent.*, 27:94. F. des. Type : F, Malaysia : Sarawak : Kunching (Type in British Museum) Syn. by Morley, 1914.

1914. *Cyanoxorides javanus* Szepligeti, *Ann. Mus. Natl. Hungarici*, 12:419. F. key, des. Type: F, Indonesia : Java (Type in Budapest Museum) Syn. by Townes, Townes & Gupta, 1961.

1961. *Xorides (Epixorides) elizabethae* Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1:109 Lectotype design. India. Burma. Vietnam. Java. Sarawak.

Diagnostic characters : Female : 17-19 mm long. Body somewhat metallic blue-green with dark yellow markings. Apical half of flagellum white; malar space, frontal and outer orbits and clypeus laterally, yellowish; face in the middle and apically black. Thorax metallic green, immaculate; abdomen shiny blue or green, with a transverse band on first, and second and the extreme apical discal

margins of the three or five following segments, yellow. Legs yellow, its anterior pairs sometimes darker, hind pair with apices of coxa femur and tibia blackish; hind tarsus yellowish. Wings hyaline, slightly infumate below the apex.

Material examined : No material of this species was available for study from Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Nagaland. Elsewhere : Burma, Thailand, Vietnam, Malaysia, Indonesia.

Remarks : Cameron (1899) described *Episyssa annulicornis*, a junior synonym of *X.(E.) elizabethae* (Bingham), from Khasi Hills in Meghalaya.

7. Subgenus *Xorides* (*Cyanoxorides*) Cameron

1903. *Cyanoxorides* Cameron, *J. Straits Branch Roy, Asiatic Soc.*, 39:141.

Type-species : *Cyanoxorides brookei* Cameron.

66. *Xorides* (*Cyanoxorides*) *abaddon* (Morley)

1913. *Xylonomus abaddon* Morley, *Fauna of British India*, Hymenoptera, 3:79. F. key, des, Type: F, India: Meghalaya : Khasi Hills (Type in British Museum).

1961. *Xorides* (*Cyanoxorides*) *abaddon* Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1:107. India.

Diagnostic characters : Female : 12 mm long. Dull black species, with the body profusely marked with yellow. Frontal and outer orbits, malar space and face, white; antennal flagellum with 9th-13th segments pure white; pro- and mesopleurae, apical half of metathorax, dark yellow; scutellum and postscutellum yellowish; abdomen black with apices of all the segment yellow and the basal half of the first segment dark yellow. Legs in general yellow; hind trochanter, extreme apices of femur and tibia broadly infusate, tarsi pure white. Wings clear hyaline.

Material examined : No material of this species was available for study.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is restricted to Khasi Hills in Meghalaya.

4. Subfamily BANCHINAE

This subfamily is known by three tribes in the state of Meghalaya. These tribes can be distinguished by the following key.

Key to the tribes of subfamily Banchinae

1. Tergite 2-4 each with a pair of deep oblique groove that converge anteriorly and diverge posteriorly. Glyptini
- Tergite 2-4 without deep groove. .2

2. Nervellus intercepted at or below the middle, abdomen subcylindric. .Lissonotini
- Nervellus intercepted above the middle, abdomen compressed. Banchini

Tribe GLYPTINI

This tribe is known by a single genus viz., *Apophua* Morley from Meghalaya.

25. Genus *Apophua* Morley

1913. *Apophua* Morley, *Fauna of British India*, Hymenoptera, 3:213.
Type-species : *Apophua carinata* Morley.

67. *Apophua carinata* Morley

1913. *Apophua carinata* Morley, *Fauna of British India*, Hymenoptera, 3:215. F. key, des. Type : F, India : Meghalaya : Khasi Hills, 1000-3000 ft. (LONDON). Sri Lanka : Maskeliya.
1961. *Apophua carinata* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:203. India. Sri Lanka.

Diagnostic characters : Female : 8.5 mm long. Dull black species; clypeus and mandible, yellowish; pronotum in the middle, scutellum, yellow; apices of all the abdominal segments deep yellow. Legs in general deep yellow, coxae red.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Sri Lanka.

9. Tribe LISSONOTINI

This tribe is represented by 3 genera from Meghalaya. The key to the genera is as follows:

1. First tergite slender, without a glymma, its spiracle at or behind the middle; hind margin of metasternum with a pair of long convergent teeth; propodeum always without carinae. . *Leptobatopsis*

First tergite moderately slender to stout, always with a glymma; its spiracle before the middle; hind margin of metasternum without convergent teeth; propodeum with or without carinae. .2

2. Occipital carina reaching directly to the base of mandible; propodeal spiracle elliptic; epomia present; areolet always present, its petiole nearly as long as the height of the areolet . *Syzeuctus*

Occipital carina joining the hypostomal carina above the base of mandible; propodeal spiracle round or oval; epomia absent or very weak; areolet present or absent (Median dorsal carinae of first tergite entirely absent . . . *Lissonota*

26. Genus *Lissonota* Gravenhorst

1829. *Lissonota* Gravenhorst, *Ichneumonologia Europaea*, 3:30.
Type-species: *Lissonota sulphurifera* Gravenhorst.

Key to the species of *Lissonota*

1. Areolet present. (First tergite black, its apical margin red; hind cox red with a yellow spot above basally). *nigrominiata*
- Areolet absent. 2
2. Hind coxa and femur blackish-brown, except yellow spot at the base; ovipositor sheath long about 3.75x as long as hind tibia, compressed apically. *. xuthosoma*
- Hind coxa red or yellow and hind femur red; ovipositor sheath about 2.8-3.5x as long as hind tibia. 3
3. Hind coxa yellow, except black at base; scutellum with a pair of yellow spots; first tergite about 2.0-2.4x as long as wide at apex *albomaculata*
- Hind coxa red; scutellum without a pair of yellow spots; first tergite about 1.3-1.5x as long as wide at apex *.castaneae*

68. *Lissonota albomaculata* (Cameron)

1899. *Ctenopimpla albomaculata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):190. F. des. Type: F, India : Meghalaya: Khasi Hills (Type in Oxford Museum).
1977. *Lissonota albomaculata* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:83. F. key, des., fig. India: Uttar Pradesh.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh.

Remarks : No material of this species was available from the state of Meghalaya for study. Chandra and Gupta (1977) gave a detailed description of this species.

69. *Lissonota castaneae* Chandra and Gupta

1977. *Lissonota castaneae* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:66. M, F. key, des., fig. Type: F, India: Meghalaya : Shillong, 1465 m. (Type in Gupta Colln.) Hosts : *Dioryctria castanea*; *Petrova cristata*.

Material examined : India : Meghalaya : East Khasi Hills: Shillong, 1465 m.; 1 female, iv. 1970, ex. *Dioryctria castanea* Bradley; 2 males and 4 females, same data except iii. 1970.

Distribution : India : Meghalaya (East Khasi Hills).

Host : *Dioryctria castanea* Bradley and *Petrova cristata* (Walsingham).

Remarks : This species is readily distinguished by having ovipositor sheath 3.2-3.5x as long as hind tibia; first three tergites densely punctate; first tergite 1.3-1.5X as long as wide at apex; fore and middle coxae and trochanters yellow and hind coxa and femur, red.

70. *Lissonota nigrominiata* Chandra and Gupta

1977. *Lissonota nigrominiata* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:31. F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Shillong, Botanical Garden, 1463 m. (Type in Gupta collection) Burma: Kambaiti, 2000 m.

Material examined : India : Meghalaya : East Khasi Hills: Shillong, Botanical Gardens, 1463 m, 3 females, 27.iii.1966, M.K. Kamath, J.K. Jonathan.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : This species is readily identified by the absence of areolet in the fore wing; first tergite black with reddish apical margin, thorax densely punctate and hind coxa red with a yellow spot above at base.

71. *Lissonota xuthosoma* Chandra and Gupta

1977. *Lissonota xuthosoma* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:47. F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1358 m. (Type in Gupta collection).

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunji, 1358 m, 3.iv. 1966, Dauli Ram, coll. No. T167.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is readily distinguished by having yellowish-brown body and long ovipositor.

27. Genus *Syzeuctus* Forester

1868. *Diceratops* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25:167.

Type-species : *Pimpla bicornis* Gravenhorst.

1868. *Syzeuctus* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25:167.

Type-species : *Ichneumon maculatorius* Fabricius.

72. *Syzeuctus villosus* (Cameron)

1899. *Meyva villosa* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3):192. M. des. fig. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1977. *Syzeuctus villosus* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:141. M, F. key, des., fig. India : Himachal Pradesh: Dalhousie Hills, Khajjiar, 1920 m. West Bengal: Darjiling Hills: Rangiroon, 1904 m.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, West Bengal.

Remarks : This species can be identified by having body covered with long dense hairs, abdomen red; apical transverse carina of propodeum complete, ovipositor shorter than the abdomen.

28. Genus *Leptobatopsis* Ashmead

1900. *Leptobatopsis* Ashmead, *Proc. U.S. Natl. Mus.*, 23:47.

Type-species : (*Leptobatopsis australiensis*) = *indica* Cameron; Original designation.

This genus is known by 2 species from the state of Meghalaya.

Key to the species of *Leptobatopsis*

1. First tergite about 3-7x and second 1.5x as long as their respective apical widths; nervulus distinctly basad of basal vein; third tergite in both sexes and fourth in males black with yellow basal and apical bands; first flagellar segment about 6.0x as long as its apical width; hind tarsus black, basal half of basitarsus, yellow *.indica*
- First tergite about 5.0x and second 2.5x as long as their respective apical widths; nervulus opposite or slightly distad of basal vein; third tergite of female yellow, with an apical transverse black spot, fourth tergite of male entirely yellow; first flagellar segment about 11.0x as long as its apical width; hind tarsus yellow, apical three segments entirely and base of first black. *.bicolor*

73. *Leptobatopsis indica* (Cameron)

1897. *Cryptus indicus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 41 (4):15. M. des. Type: M, India: Uttar Pradesh: Mussoorie (Type of Oxford Museum).
1900. *Mesoleptus annulipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 44(15):103. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in British Museum) Syn. by Morley, 1915.
1900. *Leptobatopsis australiensis* Ashmead, *Proc. U.S. Natl. Mus.* 23:47. (F). des. in key. Type: F, Australia (Washington Museum) Syn. by Cushman, 1933.
1900. *Leptobatopsis australiensis* Ashmead, *Proc. Linn. Soc. N.S. Wales*, 1900:349. F. des. Type: F (same specimen as above), Australia Syn. by Cushman, 1933.
1903. *Nemeritis albovaria* Tosquinet, 1903. *Mem. Soc. Ent. Belgique*, 10:9. M, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, Indonesia. (Genoa Museum) Syn. by Townes, Townes & Gupta, 1961.
1904. *Atropha clypearia* Ashmead, *Proc. U.S. Natl. Mus.*, 28:143. M, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, Philippines: Luzon: Manila (Washington Museum) Syn. by Cushman, 1933.
1905. *Tanera annulipes* Cameron, *Spilia Zeylanica* 3:141. F. des., fig. Type: F, Sri Lanka: Hatton (British Museum). Syn. by Morley, 1915.
1907. *Syzeuctus javanicus* Schmiedeknecht, *Genera Insectorum*, 62:82. M, F. des. Type: F, Indonesia: Java (Berlin Museum). Syn. by Cushman, 1933.
1910. *Atropha(?) apicalis* Szepligeti, *Notes Leyden Mus.*, 32:101, M, F. des. Tye: F, Indonesia: Java: Jakarta (Budapest). Syn. by Cushman, 1933.

1913. *Syzeuctus annulipes* Morley, *Fauna of British India, Hymenoptera*, 3:236. M, F. n. comb., key, des., fig. India: Meghalaya: Khasi Hills. Bihar: Pusa; Chapra; Adra; Monghyr; Karmatar; Bhogaon. West Bengal : Calcutta. Karnataka: Mysore. Kerala: Tenmalai. Sri Lanka: Pundaluoya; Colombo; Peradiniya; Madulsima. Australia: Queensland.

1977. *Leptobatopsis indica* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:171. M, F. key, des., fig. Several localities in Burma; India; China; Indonesia; Malaysia; and Philippines. Widely distributed.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1358 m, 2 females, 5.iv. 1966, D.T. Tikar, T170; Jaintia Hills: Dawbi, 1 female, 10.iv. 1966. J.K. Jonathan, coll, No. J126 Jowai, 1 male, 3.iv. 1966, D.T. Tikar Coll. No. T160; East Khasi Hills, Shillong, 1463 m, 1 female, 6 males, 30.iii. 1966, D. Ram, J.K. Jonathan and M.K. Kamath, Coll. Nos. T159, J117 and K71.

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Andhra Pradesh, Arunachal Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Rajasthan, Tamil Nadu, Uttar Pradesh and West Bengal. Elsewhere: Australia, Burma, China, Indonesia, Malaysia, Philippines, Singapore, Sri Lanka and Taiwan.

Remarks : This is one of the most abundant species in the Oriental Region, widely distributed in India. This is closely related to *Leptobatopsis bicolor* and can be distinguished by the characters as mentioned in the key.

74. *Leptobatopsis bicolor* Cushman

1933. *Leptobatopsis bicolor* Cushman, *Insecta Matsumurana*, 8:18, M, F. key, des, Type: F, Taiwan: Shuisheliao (=Suicharyo). (Type in Eberswalde Museum).

1977. *Leptobatopsis bicolor* Chandra & Gupta, *Oriental Ins. Monogr.*, 7:170. M, key des., fig. India: Meghalaya: Khasi Hills: Cherrapunji, 1358 m. Indonesia.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1358m, 1 male, 6.iv. 1966. M.K. Kamath, Coll. No. K78.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Indonesia, Taiwan.

Remarks : This species is closely related to *Leptobatopsis indica* in having similar colour of head, thorax and hind leg. However, it can be differentiated by the elongated tergites, colour of third tergite of female and fourth tergite of male, elongated first flagellar segment and nervulus being opposite or slightly distad of basal vein.

29. Genus *Banchus* Fabricius

1798. *Banchus* Fabricius, *Supplementum entomologiae systematicae*, p. 209, 233.
Type-species : *Banchus pictus* Fabricius; designated by Curtis, 1836.

75. *Banchus nox* Morley

1913. *Banchus nox* Morley, *Fauna of British India, Hymenoptera*, 3:255. M. key, des., fig. Type: M, India: Meghalaya: Shillong, 6000 ft. (Type in British Museum).

1985. *Banchus nox* : Fitton, *Bull. Brit. Mus. Nat. Hist. (Ent.)*, 51:30. M, F. key, syn., des., fig. India : Assam : Mishmi Hills: Delai Valley: Cha Che, 2200-2400 m. Meghalaya: Khasi Hills: Shillong, 1800 m.

Diagnostic characters : Body black, marked with yellow and reddish tinge on the abdomen and legs; interocellar distance 1.5-1.6x the ocello-ocular distance; flagellum 51-segmented; thorax 2.4-2.6x as long as its width between tegulae, its punctures wide and moderate to dense; propodeum with a yellow band running over the apical transverse carina, leaving the petiolar area black in the middle; areolet large; hind leg largely reddish-brown; abdomen in female reddish with bases of all tergites black and apices of first and second yellowish.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh. Elsewhere: Burma.

5. Subfamily CTENOPELMATINAE

This subfamily is represented by a single species under genus *Perispuda* Foerster from Meghalaya.

30. Genus *Perispuda* Foerster

1869. *Perispuda* Foerster, *Verh. Naturh. ver. Rheinlande*, 25:205.

Type-species : *Mesoleptus facialis* Gravenhorst

76. *Perispuda khasiana* (Cameron)

1900. *Mesoleptus khasianus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 44(15)104. "M"=F. des. Type: F, India: Meghalaya: Khasi Hills (type in Oxford Museum).

1961. *Genarches khasianus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:217. n. comb. India.

1973. *Perispuda khasiana* Townes & Townes. *Mem. Amer. Ent. Inst.*, 19:371. n. comb.

Distribution : India : Meghalaya (East Khasi Hills).

6. Subfamily PORIZONTINAE

Key to the tribes of subfamily Porizontinae

1. Labial palps 3-segmented. Maxillary palpa 4-segmented or sometimes 5-segmented. .Nesomesochorini
- Labial palps 4-segmented. Maxillary palps 5-segmented. .2
2. Cross section of first abdominal segment near its basal 0.3 circular or depressed-oval; suture separating first abdominal sternite from its tergite tending to be lateral or subdorsal, at 0.3 the distance from base of the tergite lying at or above the mid height of the segment; first tergite never with a lateral pit in front of the spiracle. Porizontini
- Cross section of first abdominal segment near its basal 0.3 somewhat quadrate, trapezoidal, or triangular; suture separating first abdominal sternite from its tergite tending to be subventral, at

the basal 0.3 of the segment lying below the mid height of the segment; first tergite with or without a lateral pit in front of its spiracle. 3

3. Spiracle of the first abdominal tergite basad or much basad of the apex of first sternite; petiole long, slender, cylindric to subcylindric or nearly so with dorso-lateral carina absent, usually without a glymma and with the suture present or absent, when present it is usually ventral to subventral in position. Cymoducini

Spiracle of first abdominal tergite distad to far distad of the apex of first sternite; petiole usually quadrate, usually short and stout, dorso-lateral carina nearly always present, usually with a distinct glymma and with the suture separating its tergite from sternite always distinctly present below the mid height to ventro-lateral in position. .Macrini

10. Tribe NESOMESOCHORINI

This tribe is represented by a single species under genus *Klutiana* Betrem from the state of Meghalaya.

31. Genus *Klutiana* Betrem

1933. *Klutiana* Betrem. *Tijdschr. V. Ent.*, 75:89.

Type-species : *Klutiana compressa* Betrem; monobasic.

77. *Klutiana khasiana* Gupta

1980. *Klutiana khasiana* Gupta. *Oriental Ins.*, 13(1979) : 331. F. key, des. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1358 m. (Type in Gupta collection).

Diagnostic characters : Female : 7.5 mm long. Body black; mandible, palpus, scape and pedicel yellowish-brown; 17-19 flagellar segments whitish-yellow; fore and middle legs yellowish-brown with coxa and trochanters lighter; hind coxa and trochanter dark brown; femur, tibia and tarsus yellowish-brown; abdomen blackish-brown with third tergite basally and laterally yellow.

Eyes hairy; frons smooth; vertex mat; pronotum and scutellum smooth, mesoscutum with median lobe mat; mesopleurum minutely sparsely punctate, speculum smooth; juxta coxal carina strong and complete; areola hexagonal petiolar area of propodeum trans-striate; first abdominal tergite with glymma; ovipositor about 1.4x the length of hind femur and 0.7x of hind tibia.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1358 m, 1 female (Type), 4.iv. 1966, J.K. Jonathan, coll. No. J122.

Distribution : India : Meghalaya (East Khasi Hills).

11. tribe PORIZONTINI

Key to the genera of tribe Porizontini

1. Pronotum broad with a shallow groove in the middle, epomia short; ovipositor long, 2.4x the apical depth of abdomen; eyes weakly or not at all emerginate opposite antennal sockets. 2

Pronotum narrow with a deep groove; epomia long usually strong all along its length and flange-like; ovipositor short, about equal to the apical depth of abdomen in length; eyes strongly emarginate opposite antennal sockets. .3

2. Apex of male clasper rounder or with a shallow emarginations; propodeum usually depressed in the middle with weak to moderately deep groove longitudinally in the middle; first tergite usually with a weak lateral longitudinal groove between its base and the spiracle; apex of propodeum not reaching middle of hind coxa. *.Campoplex*

Apex of male clasper with a semicircular notch above, or strongly pointed; propodeum weakly convex in the middle, without a median longitudinal depression first tergite without lateral groove; apex of propodeum usually reaching beyond middle of hind cox. *.Venturia*

3. Central 0.3 or more of mesopleural suture impressed as a sharp groove; extreme basal part of first abdominal segment with sternite not occupying quite its entire depth, so that in side view the lateral suture is a little below upper edge of petiole; areolet present; lower outer angle of second discoidal cell usually acute. *.Casinaria*

- Central 0.3 or more of mesopleural suture not impressed; extreme basal part of first abdominal segment with sternite occupying its entire depth, so that in side view its lateral suture runs along the upper margin of petiole; areolet absent; lower outer angle of second discoidal cell at right angle. *Charops*

32. Genus *Campoplex* Gravenhorst

1829. *Campoplex* Gravenhorst, *Inchneumonologia europaea*, 3:453.

Type-species : (*Campoplex difformis* Gravenhorst)=*Ichneumon difformis* Gmelin.

Key to the species of *Campoplex*

1. Median propodeal carinae widely diverging posteriorly and often weak to indistinct; areola not well formed. (Hind femur and trochanters orange-yellow; ovipositor long; basal area of propodeum triangular) *.oviens*

Median propodeal carinae distinct and not widely diverging posteriorly; areola well formed. .2

2. Middle femur with basal black ring; metapleurum and propodeum coarsely granulose; propodeum and metapleurum densely hairy; malar space 0.8x the basal width of mandible. *.maximalis*

Middle femur yellowish-brown, except sometimes dark in the lower side, metapleurum and propodeum dark in the lower side, metapleurum and propodeum weakly hairy, with normal granulation; hind femur and first tarsal segment black. *septentrionalis septentrionalis*

78. *Campoplex oriens* Gupta and Maheshwary

1977. *Campoplex oriens* Gupta & Maheshwary, *Oriental Ins. Monogr.*, 5:55. M, F. key, des. fig. Type: F, India: Himachal Pradesh: Dalhousie Hills: Upper Bakrota (Gupta collection). India: Himachal Pradesh: Kangra Valley: Palampur, 1220 m.; Kulu Valley: Manali, 1828 m.; Simla Hills: Kufri, 2438 m.; Chail, 2286 m. Uttar Pradesh: Kumaon Hills: Jeolikote, 1220 m.; Kainchi, 1372 m.; Ramgarh, 2100 m.; Chaubattia, 2072 m. Bhowali, 1700 m. West Bengal: Darjeeling Hills: Rangiroon, 1904 m. Meghalaya: Khasi Hills: Shillong, 1463 m. Burma, Sri Lanka, Taiwan, China, Malaysia.

Material examined : India : Meghalaya : East Khasi Hills, 1463 m. 1 female, 1.iv. 1966. J.K. Jonathan, coll. No. J120, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh, West Bengal, Elsewhere : Burma, China, Malaysia, Sri Lanka, Taiwan.

Remarks : This species can be recognised by having combined areola and patellar area slightly grooved in the middle and trans-striate; hind femur and tibia orange-yellow.

79. *Campoplex maximalus* Gupta and Maheshwary

1977. *Campoplex maximalus* Gupta & Maheshwary, *Oriental Ins. Monogr.*, 5: 62. M, f. key, des. fig. Type: F, India : Himachal Pradesh : Dalhousie, 2132 m. (Type in Gupta colln.) India : Himachal Pradesh: Manali, 1828m.; Simla Hills: Narkanda, 2743.; Kalpa Valley : Between Nichar and Sungra, 2400 m.; Nichar Forest Rest House, 2500 m. Uttar Pradesh; Mussorie, 2140 m.; Garhwal Hills: Bhyundar, 2743 m.; Ghangaria, 3048 m. West Bengal: Darjeeling Hills., Rangiroon, 1904 m. Meghalaya: Jaintia Hills: Jowai. Sikkim: Gangtok, 1677 m. Nepal, Taiwan.

Material examined : India : Meghalaya : Jaintia Hills : Jowai, 1 male, 31.iii. 1966, M.K.Kamath, coll. No. K72.

Distribution : India : Meghalaya (Jaintia Hills), Himachal Pradesh, Uttar Pradesh, Sikkim, West Bengal. Elsewhere: Nepal, Taiwan.

80. *Campoplex septentrionalis septentrionalis* Gupta and Maheshwary

1977. *Campoplex septentrionalis septentrionalis* Gupta & Maheshwary, *Oriental Ins. Monogr.*, 5:64. M, F. key, des., fig. Type: F. India: Himachal Pradesh: Kulu Valley: Koti, 2438 m. (Type in Gupta collection). India: Himachal Pradesh: Kulu Valley: Rahla ear Koti, 2473 m. Meghalaya: Khasi Hills: Elephant Falls near Shillong, 1463 m. West Bengal : Darjeeling Hills: Rangiroon, 1905 m.; Botanical Garden, 1981 m. Sikkim: Gangtok, 1676 m. Pakistan, Taiwan.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, Elephant fall, 1 male, 1463 m, 30.iii. 1966, J.K.Jonathan, coll: No. j117.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim, West Bengal. Elsewhere : Pakistan, Taiwan.

Host : Larve feeding on *Q. dilatata*.

33. Genus *Venturia* Schrottky

1868. *Idechthis* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25:154. Name preoccupied by Huebner, 1821. Type-species : (*Idechthis oahuensis* Ashmead)=*Ranesceus* Gravenhorst.
1902. *Venturia* Schrottky, *Ann. Mus. Nac. Buenos Aires*, 8 : (ser. 4 vol. 1) : 102. Type-species : *Venturia argentina* Schrottky. Syn. by Townes & Townes, 1966.

Key to the species of *Venturia*

1. Mesopleurum closely to densely punctate, dull; interocellar distance 2.7x the ocello-ocular distance; ocellur triangle large and temple weakly swollen; tegula yellow. *assamensis*
- Mesopleurum with sparse and shallow punctures, shiny; interocellar distance 0.93x the ocelloocular distance; ocellar triangle small; temple strongly swollen; metapleurum shiny; tegula black. *inquinata*

81. *Venturia assamensis* Maheshwary

1977. *Venturia assamensis* Maheshwary, *Oriental Ins. Monogr.*, 5:105. M, F. key, des., fig. Type : F, India: Meghalaya : Shillong (Gupta colln.).

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 3 females, 2 males, CIBC collection, v. 1970 (in Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills).

Remarks: This species is recognized by having hind trochanter and femur black; areolet large; interocellar distance 2.7-3.0 the ocello-ocular distance.

Host : *Dioryetria castanea*.

82. *Venturia inquinata* (Morley)

1913. *Campoplex inquinata* Morley, *Fauna of British India, Hymenoptera* 3:454. "F"=M. Key, des., fig. Type: M, India : Meghalaya: Shillong, 6000 ft. (Type in British Museum).
1913. *Campoplex binghami* Morley, *Fauna of British India, Hymenoptera*, 3:456. Key, des. Type: F, India: Himachal Pradesh : Simla (Type in British Museum). Syn. by Townes & Gupta, 1961.
1913. *Rhimphoctona pluto* Morley. *Fauna of British India, Hymenoptera*, 3:467. M, F. des., fig. Lectotype (designated by Townes, Townes & Gupta, 1961): M, India; Meghalaya: Shillong (Type in British Museum). Syn. by Townes, Townes & Gupta 1961.
1977. *Venturia inquinata* Maheshwary, *Oriental Ins. Monogr.*, 5:86 M, F. n. comb., key, des., fig. India: Himachal Pradesh : Dalhousie, 2132 m. Uttar Pradesh: Mussoorie, 2100 m.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh and Uttar Pradesh.

Remarks : Morley (1913) described this species from Shillong in Meghalaya. This species is distinguished by having tegula and the hind leg completely black and the fore and middle femora blackish-brown.

34. Genus *Casinaria* Holmgren

1859. *Casinaria* Holmgren, *Ofvers. Svensk Ventensk. Akad. Forh.*, 15 : 325.
Type-species : *Campoplex tenuiventris* Gravenhorst; original designation.

Key to the species of *Casinaria*

1. Propodeum trans-aciculate; hind tibia conspicuously white at base. *minima*
2. Propodeum reticulate; hind tibia black. *. pendunculata pendunculata*

83. *Casinaria minima* (Morley)

1913. *Campoplex minimus* Morley, *Fauna of British India, Hymenoptera* 3 : 453. M, F. Key, des. Type: F, India: West Bengal: Calcutta (Type in Z.S.I., Calcutta). India : Meghalaya : Shillong, 6000 ft.. (M, paratype in BM(NH) apparently a different species resembling *C. formosana bharata*).
1977. *Casinaria minima* Maheshwary & Gupta, *Oriental Ins. Monogr.*, 5 : 172. notes on Type, des.

Material examined : India : Meghalaya : East Khasi Hills: Shillong, 1 female (Type), coll. Rowland Turner.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal. Elsewhere : Taiwan.

Remarks : This species is readily recognised by having hind tibia conspicuously white at base.

84. *Casinaria pedunculata pedunculata* (Szepligeti)

1908. *Campoplex pedunculatus* Szepligeti, *Notes Leyden Mus.*, 29 : 232. F. des. Type : F, Indonesia : Java Semarang (Budapest Museum).
1939. *Casinaria colacae* Sonan, *Zool. Soc. Japan. Tokyo, Dubutugaku Zasshi*, 51 : 429, 431. M. des. Type: M, Taiwan: Pingtung (Taipei mus.) Syn. by Maheshwary & Gupta, 1977. Host : *Pelopides colaca*.
1977. *Casinaria pedunculata pedunculata* Maheshwary & Gupta, *Oriental Ins. Monogr.*, 5 : 132, M. F. Key. des., fig. India : Karnataka: Kottegechar, 640 m.; Mudigere, 610 m.; Bhagmandla, 853 m.; Gunji, 610 m. Meghalaya : Shillong: Polo ground; Jaintia Hills: Jowai. Assam: Rangapara: Sonajuli Tea Estate, 6 miles North of Tinsukia. Taiwan, China. Host: *Pelopidas mathias*; *Pelopidas cinara*; *Pelopidas colaca*.

Material examined: India : Meghalaya; East Khasi Hills, 1 female, 9.ix. 1962; 1 male, 5.viii. 1963, in Gupta collection. Jaintia Hills: Jowai, 1 female, 31.iii. 1966, J.K. Jonathan, coll. No. J118.

Distribution : India : Meghalaya (East Khasi and Jaintia Hills), Assam, Karnataka. Elsewhere : China, Taiwan.

Remarks : This is a variable subspecies; distinguished mainly by reticulate propodeum and hind tibia mainly black.

35. Genus *Charops* Holmgren

1859. *Charops* Holmgren, *Ofvers. Svenska Velensk. Akad. Forh.*, 15 : 324.

Type-species : (*Campoplex decipiens* Gravenhorst) = *cantator* De Gear, monobasic.

Key to the species of *Charops*

1. Median propodeal carina absent or very weakly present. Male claspers distinctly projecting beyond the tip of abdomen; claspers conspicuously long and rod-like at apex. Middle femur wholly yellow. *The Brachypterum Group.* Median propodeal carinae faintly indicated; hind femur and tibia yellowish-brown. *bicolor*
- Median propodeal carina distinct. Male claspers not projecting out; claspers not long and rod-like apically. Middle femur blackish in the middle. *The obtusus Group.* Tegula yellow, face evenly rugulose, mesopleurum rugoso-reticulate. *obtusius obtusus*

85. *Charops bicolor* (Szepligeti)

1906. *Agrypon bicolor* Szepligeti, *Ann. Mus. Natl. Hungarici*, 4 : 124. F. des. Type : F, Sri Lanka: Colombo (Budapest Musseum).

1921. *Gongroplema formosanum* Enderlein, *Stettiner Ent. Ztg.*, 82 : 13. F. des. Type: F, Taiwan: Kaohsiung (Warsaw Museum). Syn. by Townes, Townes & Gupta, 1961.

1922. *Zacharops narangae* Cushman, *Philippine J. Sci.*, 20 : 593. M. F. des., biol. Type : F, Taiwan: (Washington Museum). Host : *Naranga aenescens*. Syn. by Townes Townes & Gupta, 1961.

1971. *Charops bicolor* Gupta & Maheshwary, *Oriental Ins.*, 4 (1970): 469. M, F. key, des. fig. India : Himachal Pradesh: Manali, 1828m. Uttar Pradesh: Ramnagar Forest Division: Garjia, 600 m.; Meerut: Bagpat Road. Andhra Pradesh: Samalkot; Rajamundry: Nagram; Sirpur; Nathpur. Bihar: Ranchi Dist.; Horhap Forest; Namkum. Tamil Nadu: Coimbatore, 425 m.; Karikal. West Bengal: Calcutta. Meghalaya : Khasi Hills: Shillong; Botanical Garden, 1465 m.; Cherrapunji. Bangalapurkuri. Assam: Rangapara: Sonajuli Tea Estate. Kerala: Cananore.

Material examined : No material of this species was available for study. However, Gupta and Maheshwary (1970) reported one female from Botanical garden in Shillong.

Distribution : India : Meghalaya (East Khasi Hills), Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Kerala, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Australia, China, Japan, Korea, Malaysia, Pakistan, Thailand, Sri Lanka.

Remarks : This species is identified by the faint propodeal carinae; hind leg yellowish-brown; male claspers rod-like.

Hosts: *Narang aenesens*; *Anomis flava*; *Pelopidas mathias*; *Psalis pennuatula*; *Mythimna loreyi*; *Spodoptera mauritia*; *Naranga diffusa*; *Scirpophaga incertulas*. Secondary parasites: *brachymeria* sp.; *Trichomalopsis apanteloctenus*; *Eupteromalus* sp.

86. *Charops obtusus obtusus* Morley

1913. *Charops obtusa* Morley, *Fauna of British India, Hymenoptera*, 3 : 436. M, F. key. des., fig., biol. Type: F, India : Gujrat: Surat = (Type in British Museum). India : Uttar Pradesh; Maharashtra: Pune. Tamil Nadu. Sri Lanka, Burma; Karen Hills: Pegu, 3000-37000 ft.

1977. *Charops obtusa obtusa* Maheshwary, *Oriental Ins. Monogr.*, 5 : 181. Key, fig. India, Tamil Nadu: Coimbatore. West Bangal: Kurseong.

Material examined : No material of this species was available for study. However, Morley (1913) reported one specimen from Shillong in Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Gujrat, Karnataka, Maharashtra, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere : Burma, Indonesia, Sri Lanka.

Remarks : This species is mainly recognised by having distinct carinae on propodeum and claspers in male not rod-like.

Host : *Virachola* sp.; *Ectropis blurmitra*; *Euproctis scintillans*; *Terias silhetana*; *Orgyia postica*.

12. Tribe CYMODUSINI

This tribe is represented by four genera in India. Only two genera are recorded from Meghalaya. These can be identified by the following key.

Key to the genera of Cymodusini

1. Ovipositor very long and slender, its sheath 1.5-2.0x as long as fore wing; second abdominal tergite longest; tarsal claws simple; first abdominal segment short, stout and quadrate. . *Menaka*

Ovipositor short and stout, its sheath 0.1-0.4 x as long as fore wing; second adominal tergite shorter or nearly equal to the first; tarsal claws pectinate; first abdominal segment long, cylindric to subcylindrical but never quadrate. (Transverse carina of prepectus sharp and complete; lateral part of prepectal carina absent or short; nervellus always distad of basal vein by 0.25-0.8x its length. . *Delopia*

36. Genus *Menaka* Gupta and Gupta

1971. *Menaka* Gupta and Gupta, *Oriental Ins.*, 5(1) : 111.
Type-species : *Menaka nigrita* Gupta and Gupta.

87. *Menaka brunnea* Gupta and Gupta

1971. *Menaka brunnea* Gupta & Gupta, *Oriental Ins.*, 5 : 115. F. key. des., fig. Types: F, India : Meghalaya: Khasi Hills: Cherrapunji 1360 m. (Type in Gupta collection). India : Uttar Pradesh: Garhwal Hills: Ghangaria, 3050 m.

Diagnostic characters : Female : 8.5 mm long. Body black, fore and middle legs reddish-yellow; hind leg largely yellowish-brown, except tibia at apex and tarsus wholly blackish; second abdominal sternite and its tergite apically, sides of third tergite and apical margins of fifth and following tergites yellowish-brown.

This species is distinguished by having strongly arched occipital carina, short petiolated aerolet, temple swollen, second tergite almost equal to first tergite.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1360 m., 1 female (Type), 3.iv. 1966, J.K. Jonathan, coll. No. J121.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh.

37. Genus *Delopia* Cameron

1903. *Delopia* Cameron, *Zischr. System. Hymen. Dipt.*, 3:304, 337.

Type-species: *Delopia cariniscutis* Cameron.

Key to the species of *Delopia*

1.	Glymma absent; median longitudinal carinae of propodeum absent.	2
-	Glymma present in the form of a pit; median longitudinal carinae of propodeum medially present.	.. .6
2.	Longer middle tibial spur 1.3-1.6x as long as the smaller spur; head swollen behind the eyes and almost quadrate; temple moderately to strongly swollen, weakly to not at all receding; face without a transverse carina below antennal sockets, there may be a median protuberance. Legs almost black in female.	3
-	Longer middle tibial spur 2.0-2.5x as long as the smaller spur; head thin behind the eyes; temple strongly receding; face with a transverse carina. Legs mainly red and black in both sexes.	4
3.	Occipital carina joining hypostomal carina at a distance of 0.6x the basal width of mandible; scutellum laterally bounded by a carina; ovipositor sheath 0.44x as long as hind femur; hind first tarsal segment 2.0x the longer hind tibial spur; first sternite extending to the midpoint between spiracle and apex of its tergite; epomia short.	<i>.brevisocrea</i>

Occipital carina joining hypostomal carina at a distance of 0.25x the basal width of mandible; scutellum not bounded by a carina; ovipositor sheath 0.44x as long as hind femur; hind first tarsal segment 1.7x the longer hind tibial spur; first sternite extending distinctly beyond the mid point between spiracle and apex of its tergite; epomia short. *sumptusa*

4. Nervellus vertical, sometimes inclivous. Occipital carina joining hypostomal carina before the base of mandible at a distance of 0.55x the basal width of mandible. (Abdominal tergites from third onward dorsally black) . *pyrtanes*

Nervellus strongly reclivous; occipital carina joining directly at the base of mandible. 5

5. Apical 3 segments of abdomen wholly black; temple medially strongly indented due to outbulging of occipital carina. . *simlaensis*

- Apical 3 segments of abdomen wholly red; temple weakly indented. (Scutellum laterally not bounded by a carina). . *femoralis*

6. Hind femur blackish up to its 0.7; scutellum medially weakly convex, laterally carinate; acrolet sessile; in female, all the abdominal tergites from third onward black dorsally. . *himalayensis*

Hind femur wholly red; scutellum convex medially, laterally not carinate; acrolet short petiolate; in female, all abdominal tergites from third onward completely red; (Occipital carina dipped medially above; first tergite 4.2x as long as wide). . *cameronii*

(Note : *Delopia tyrannus* (Cameron) could not be included in the key, due to non-availability of information and material).

88. *Delopia brevisocrea* (Gupta & Gupta)

1978. *Dusona brevisocrea* Gupta & Gupta, *Oriental Ins. Monogr.*, 8 : 65. F. key, des. fig., Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1365 m. (in Gupta collection). India : Meghalaya: Khasi Hills Shillong Botanical Garden, 1465 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 1365 m, 1 female (Type), 3.iv. 1966, M.K. Kamath, coll, No. J119 (in Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is recognised by having occipital carina joining hypostomal carina at a distance of 0.6x the basal width of mandible; scutellum laterally bounded by a carina; nervellus entire.

89. *Delopia cameronii* (Dalla-Torre)

1899. *Campoplex carinifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 119. (M) Name preocc. by Holmgren, 1858. des. Type : M, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1901. *Campoplex cameronii* Dalla Torre, *Catalogus Hymenoptera*, 3 : 459. M, new name.

1913. *Campoplex infumatus* Morley, *Fauna of British India, Hymenoptera*, 3 : 459, M. new name, Key, des. India : Meghalaya : Khasi Hills. Syn. by Townes, Townes & Gupta, 1961.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh.

Remarks : This species is readily distinguished by having short petiolated aerolet, scutellum strongly convex, its lateral carina absent; third and following tergites red in female.

90. *Delopia femoralis* (Gupta & Gupta)

1978. *Dusona femoralis* Gupta & Gupta, *Orientalis Ins. Monogr.*, 8 : 83. M, F. key, des., fig. Type: F, India : Sikkim; Gangtok, 1700 m. (in Gupta collection). India: Meghalaya: khasi Hills: Shillong, 1465 m.; Cherrapunji, 1365 m.; Jaintia Hills: Jowai, Nepal: Godavari.

Material examined : India : Meghalaya: East Khasi Hills: Shillong, 1465 m, 3 females, 27-28.iii. 1966, M.K. Kamath; 2 females, 3 males, 1.iv. 1966, J.K. Jonathan; 4 females, 6 males, 28.iii-1.iv. 1966, D.T. Tikar and D. Ram. Cherrapunji, 1365, 1 female, 6.iv. 1966, D.T. Tikar. Jaintia Hills, Jowai, 1 ex (abdomen-broken), 31.iii. 1966. M.K.Kamath (material in Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills, Jaintia Hills) Sikkim. Else where : Nepal.

Remarks : This species is distinguished by having 3 apical abdominal segments red; temple weakly indented and scutellum laterally not bounded by a carina.

91. *Delopia himalayensis* (Cameron)

1899. *Campoplex himalayensis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 117 (M.) des. Lectotype (designated by Townes, Townes & Gupta, 1961). M, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Dusona himalayensis* : Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1 : 231. lectotype design., n. comb. India.

Distribution : India : Meghalaya (Khasi Hills), Himachal Pradesh.

Remarks : This species is very close to *D. cameronii* (Dalla Torre) in structure, but can be distinguished by the characters as mentioned in the key.

92. *Delopia pyrtanes* (Cameron)

1903. *Campoplex pyrtanes* Cameron, *Ztschr. System. Hymen. Dipt.*, 3 : 339. F, des. Type : F, India: West Bengal: Darjeeling (Type in British Museum).

1961. *Dusona pyrtanes* : Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1 : 232. n comb. India.

Material examined : India : Meghalaya : East Khasi Hills, Cherrapunji, 1360 m, 2 females, 7.iii. 1968, J.K. Jonathan. J113; 3 females, 2 males, 27.iii. 1968, D.T. Tikar, T153, 155, 164.

Distribution : India : Meghalaya (East Khasi Hills), Karnataka, Sikkim, Tamil Nadu, Uttar Pradesh, West Bengal.

Remarks : This species is characterized by having the speculum finely striate; aerolet petiolate; abdominal tergites from third onward red.

93. *Delopia simlaensis* (Cameron)

1905. *Campoplex simlaensis* Cameron, *Ztschr. System. Hymen. Dipt.*, 5 : 282. F. des. Type : F, India : Himachal Pradesh: Simla (Type in British Museum).
1961. *Dusona simlaensis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 232 n. comb. India.
1978. *Dusona simlaensis* Gupta & Gupta, *Orientalis Ins. Monogr.*, 8 : 79. M, F. key, des., fig. India : Himachal Pradesh: Dalhousie Hills: Ahla, 2286 m.; Dhenkund, 2743 m.; Kalatop, 2438 m.; Upper Bakrota, 2438 m.; Chini Bungalow, 2620 m.; Kufri, 2498 m.; Narkanda, 2750 m.; Shilaru, 2600 m.; Kalpa Valley: Nichar 2500 m.; Kulu Valley: Manali, 1828 m.; Bajaura; Rahla. Uttar Pradesh: Garhwal Hills: Barkot, 1220 m.; Bhyundar, 2450 m.; Govind Ghat, 1830 m.; Pipalkoti, 1310 m.; Mussoorie, 2100 m.; Dehra Dun, 610m.; Uttar Kashi, Ranajeet; Kumaon Hills: Bhowali, 1700 m.; Garjia, 610m.; Ranikhet, 2000 m.; Naini Tal, 2100 m.; Kausani, 1800 m.; Chaubattia, 2000 m.; Mukteshwar, 2300 m.; Ranikhet, 2000 m.; Herbertpur; Mohakampur; Roorkee. Bihar: Ranchi Dist.; Namkum, Ambera-Bero. West Bengal: Darjeeling, 1980 m. Meghalaya: Kashi Hills: Shillong Botanical Garden, 1980 m. Jaintia Hills, Jowai, Sikkim. Gangtok, 1700 m. Nepal.
1987. *Delopia simlaensis*: Gupta, *Mem. Amer. Ent. Soc.*, 41 (Part 1) : 416 n. comb.

Material examined : India : Meghalaya : East Khasi Hills, Shillong, Botanical Garden, 1980 m. 1 female, 1 male, 28.iii-1.iv. 1966. M.K. Kamath; 3 females, 3 males 28.iii-1.iv.. 1966. J.K. Jonathan. Jaintia Hills: Jowai, 2 males, 31.iii. 1966. J.K. Jonathan, 2 males, 31.iii. 1966, D.T. Tikar.

Distribution : India : Meghalaya (East Khasi Hills and Jaintia Hills), Bihar, Himachal Pradesh, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Nepal.

Remarks : This species is distinguished by having the temple strongly indented medially; tegula black; apical segments of abdomen black with interocellar distance 1.25x the ocello-ocular distance.

94. *Delopia sumptuosa* (Cameron)

1897. *Campoplex sumptuosus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 41(4) : 28 (F), des. Type : F, Sri Lanka (Type in Oxford Museum).
1899. *Campoplex fuscipalpus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 115. "F"=M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Doubtfully syn. by Townes, Townes & Gupta, 1961.
1961. *Dusona sumptuosa* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:233. n. comb. syn. India. Sri Lanka.

Distribution : India : Meghalaya (Khasi Hills), Himachal Pradesh, Uttar Pradesh. Elsewhere: Sri Lanka.

Remarks : No material of this species was available for study from Meghalaya. This species is recognised by having occipital carina joining hypostomal carina at a distance of 0.25x the basal width of mandible; legs black, fifth tergite almost wholly black.

95. *Delopia tyrannus* (Cameron)

1899. *Campoplex tyrannus* Cameron, *Mém. & Proc. manchester Lit. Phil. Soc.*, 43(3) : 116. M. des. Type : M, India : Meghalaya: Khasi Hills (Type is oxford Museum.).

1978. *Dusona tyranna* Gupta & Gupta, *Oriental Ins. Monogr.*, 8 : 128. M, F. des., distr.

Distribution : India : Meghalaya (Khasi Hills), Assam. Elsewhere : Sri Lanka.

Remarks : Very little is known about this species. No material was available for study. Available published information is also not sufficient to provide enough characters to include this species in the key.

13. Tribe MACRINI

Key of the genera of Macrini

1. Apical margin of clypeus with a weak median tooth; areolet present and receiving the second recurrent vein basad of the middle. *.campoletis*
- Apical margin of clypeus without a median tooth; areolet present or absent, if present receiving second recurrent vein apicad of the middle. . . 2
2. Areolet present. . . 3
- Aerolet absent. 4
3. Ovipositor extending well beyond apex of abdomen; apical margin of clypeus usually strongly convex; temple long and much swollen. . . . *.Diadegma* (in part)
- Ovipositor not extending distinctly beyond apex of abdomen; apical margin of clypeus subtruncate or the central part weakly rounded; temple short and less swollen. *.Hyposoter*
4. Areola confluent with petiolar area and separated from first lateral area, not separated from petiolar area by either a carina or a strong constriction. *.Diadegma* (in part)
- Areola distinctly separated from petiolar area, either by a carina or by a strong constriction; areola usually longer than wide. (Ovipositor distinctly surpassing tip of abdomen; scutellum moderately convex). *Eriborus*

38. Genus *Campoletis* Foerster

1869. *Campoletis* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 157.
Type-species : *Mesoleptus tibiator* Cresson.

96. *Campoletis chlorideae* Uchida

1957. *Campoletis chlorideae* Uchida, *Mushi*, 30:29. M, F. des. Type: F, Japan : Okayama (Type in Sapporo Museum). China. Manchuria: Kaiyuan. Japan: Chiba; Hiroshima; Kagoshima. Hosts : *Heliothis assulta*;

Phthorimaea operculella.

1974. *Campoletis chlorideae* Gupta, *Oriental Ins.*, 8:112. M, F. syn., des. India : Widely distributed in Himachal Pradesh; Uttar Pradesh; Haryana; Delhi; Bihar; Madhya Pradesh; Andhra Pradesh; West Bengal; Sikkim; Assam; Meghalaya; Maharashtra; Rajasthan; Gujarat; Tamil Nadu; Karnataka. Nepal.

Diagnostic characters : Face 0.8x as long as wide; face and clypeus granulose; malar space equal to the basal width of mandible; frons and vertex granulose; interocellar distance 2.0x the ocello-ocular distance, mesopleurum finely granulose with a few minute punctures; prepectal carina arcuate in profile; metapleurum and propodeum granulose, propodeal carinae strong, areola elongate, pentagonal, petiolar area shallow. Nervellus distad; nervellus intercepted at its lower 0.2. Postpetiole and second abdominal tergite granulose; thyridium distinct from base of second tergite by 1.25 to 1.33x its diameters. Ovipositor long, upcurved.

Body black, variously marked, its hind leg with coxa black, trochanter dark brown, femur yellowish-brown, tibia with a band, tarsus largely blackish.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, 1 female, 26.ix. 1962 in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Andhra Pradesh, Madhya Pradesh, Tamil Nadu, Uttar Pradesh, West Bengal. Elsewhere: Nepal, China, Taiwan, Japan.

Remarks : This species is widely distributed in India.

Host : *Heliothis armigera*, *H. assulta*, *Phthorimaea operculella*.

39. Genus *Diadegma* Foerster

1869. *Diadegma* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 153.

Type-species : *Campoplex crassicornis* Gravenhorst.

97. *Diadegma albicalcar* (Morley)

1913. *Diocles albicalcar* Morley, *Fauna of British India, Hymenoptera*, 3 : 474. M, F. Key, des., fig. Type: F, India : Meghalaya: Shillong (Type in British Museum). India : Bihar : Pusa.

1961. *Diadegma albicalcar* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:234. n. comb. India.

Diagnostic characters : Male and female : 6 mm long. Small black species with dense silvery pubescence, the leg and abdomen apically reddish. Transverse areola confluent with the elongate petiolar area; second abdominal segment not acciculated; all the coxae and trochanters black.

Distribution : India : Meghalaya (East Khasi Hills), Bihar.

Remarks : No material of this species was available for study from Meghalaya.

40. Genus *Hyposoter* Foerster

1868. *Hyposoter* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 152. -

Type-species : *Limnerium (Hyposoter) parorgyiae* Viereck.

Key to the species of *Hyposoter*

1. Fore and middle coxae black, except at the apex; areolet with a short petiolate; abdomen largely ferruginous, except petiole partly blackish. *indicus*
- Fore and middle coxae yellow; areolet petiolated; abdomen largely reddish, sometimes first and second segments partly blackish or abdomen entirely black. 2
2. Legs largely red, except basally; abdomen entirely black. *ebenius*
- Legs largely yellowish; abdomen red, its first and second segments partly black. *volens*

98. *Hyposoter ebenius* Gravenhorst

1829. *Campoplex ebenius* Gravenhorst, *Ichneumonologica Europaea*, 3 : 480, M, F. des. Types: M, F, from thirteen localities in Europe (Type in Wroclaw Museum).

1953. *Neoarthula pierisae* Rao, *Indian Forest Rec. (N.S.) Ent.*, 8 : 179. M, F. des., fig Type: F, India : Uttar Pradesh: Dehra Dun: New Forest (Type F.R.I Dehradun). Host: *Pieris brassicae*. Syn. after Horstman (unpublished).

1955. *Hyposoter ebenina* Mani, Singh, Gupta & Baijal, *Agar. Univ. J. Res. (Sci.)*, 4 : 502. n. comb.

Distribution : India : Meghalaya (East Khasi Hills), Kashmir, Uttar Pradesh. Elsewhere : Europe.

Remarks : This is a small pilose, black species. Legs largely reddish. Morley (1913) redescribed this species based on a male and female from Meghalaya.

99. *Hyposoter indicus* (Cameron)

1899. *Limneria indica* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 125. F. des. Type : F, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Hyposoter indicus* Townes : Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 241. n. comb. India.

Distribution : India : Meghalaya (Khasi Hills).

Remarks : No material of this species was available for study. Cameron (1899) described this species on a single female specimen. This species is very close to *Hyposoter volens* (Cameron), but can be identified by having fore and middle coxae largely black and abdomen largely ferruginous.

100. *Hyposoter volens* (Cameron)

1889. *Limneria volens* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 126. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum.).

1961. *Hyposoter volens* : Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1 : 242. n. comb. India.

Distribution : India : Meghalaya : East Khasi Hills.

Remarks : This species is related to *Hyposoter indicus* (Cameron), but can be distinguished by the characters given in the key.

41. Genus *Eriborus* Foerster

1868. *Zaporus* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 152. Syn. by townes, Townes and Gupta, 1961. Type-species : *Campoplex dorsalis* Gravenhorst.

1868. *Eriborus* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 153. Type-species : *Campoplex perfidus* Gravenhorst.

Key to the species of *Eriborus*

1. Coxae and femora covered with short white hairs; tibiae and tarsi strongly spinose; petiole black, except at apex reddish. spinipes
- Coxae and femora not covered with white hairs; tibiae and tarsi not spinose; petiole entirely black. buddha

101. *Eriborus buddha* (Cameron)

1899. *Limneria buddha* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 124. F. des. type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1961. *Eriborus buddha* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 244. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *E. buddha* (Cameron) but can be distinguished by the characters as mentioned in the key.

102. *Eriborus spinipes* (Cameron)

1899. *Bosmina spinipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 121. F. des., fig. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Eriborus spinipes* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 246. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *E. buddha* (Cameron) but can be distinguished by the characters as mentioned in the key.

7. Subfamily CREMASTINAE

Key to the genera of subfamily Cremastinae

1. Second tergite with a distinct pair of thyridia near the base; hind femur usually with a tooth beneath; tip of ovipositor sinuate *Pristomerus*
- Second tergite without a pair of thyridia; hind femur without a tooth beneath; tip of ovipositor straight, sometimes sinuate; (ventral margin of first tergite parallel, well separated, not fused with the tergite). *Trathala*

42. Genus *Pristomerus* Curtis

1836. *Pristomerus* Curtis. *British Entomology*, 13 : 624.

Type-species : *Ichneumon vulnerator* Panzer.

103. *Pristomerus marginicollis* (Cameron)

1907. *Pristomerus marginicollis* Cameron, *Tijdschr. V. Ent.*, 50 : 110. F. des. Type: F, India: Sikkim (Type in British Museum).

1970. *Pristomerus marginicollis* : Morley, *Fauna of British India, Hymenoptera*, 3(1): 508. M, F. key, des., fig. India : Mt. Abu in Rajasthan; Mussoorie in U.P.; Calcutta; Margherita and Shillong in Assam; Sikkim, Burma: Mergui in Tenasserim. Sri Lanka.

Diagnostic characters : This black species has various yellow spots on the body. Head with inner orbits narrowly, clypeus, scape and two basal antennal segments, pronotum with a line, yellow. Abdomen reddish, with the two basal segments apically and ventrally and the basal half of the first, yellowish. Legs yellowish, with hind coxae, except apically black; hind femur reddish, tibia and tarsus darker in shade. Body largely punctate, 6-9 mm.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Maharashtra, Sikkim, Uttar Pradesh, West Bengal. Elsewhere : Burma, Sri Lanka.

Remarks : Morley (1913) reported this species from Shillong in Meghalaya.

43. Genus *Trathala* Cameron

1899. *Trathala* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 : 122.

Type-species : *Trathala striata* Cameron.

104. *Trathala striata* Cameron

1899. *Trathala striata* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 43(3) : 122. F. des., fig. Type: F, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Trathala striata* : Townes, Townes & Gupta, Mem. Amer. Ent. Inst., 1 : 256. India.

Diagnostic characters : Female : 15 mm long. Body black. Scape, frontal orbit, face, clypeus, palpi and mandible yellow; a mark in middle of face black; abdomen red, its petiole entirely, second segment above and the base of third, black; anterior coxae and trochanter, yellow.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Cameron (1899) described this species from Shillong in Meghalaya.

8. Subfamily TERSILOCHINAE

This subfamily is represented by a single species under genus *Diaparsis* Foerster, in Meghalaya.

44. Genus *Diaparsis* Foerster

1913. *Diaparsis caudata* Morley, *Fauna of British India*, *Hymenoptera*, 3 : 51. F. des., fig. Type: F, India : Meghalaya : Shillong, 6000 ft. (Type in British Museum).

1961. *Diaparsis caudata* : Townes, Townes & Gupta, Mem. Amer. Ent. Inst., 1 : 259. India.

Diagnostic characters: Female : 5 mm. long. Body black. scape reddish beneath; abdomen bright red, first segment and base and apex of second segment, black; legs red, with hind coxa, femur and tibia, black.

Thorax dull, hairy, sternaulus deep and long, petiolar area slightly longer than half the matathorax and basally strongly carinate; scutellum convex; ovipositor as long as body length; nervellus nearly straight and geniculate.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Morley (1913) described this species from Meghalaya on the basis of a single female.

9. Subfamily OPHIONINAE

This subfamily is known by 4 genera from Meghalaya. The key to the genera is as follows:

Key to the genera of subfamily Ophioninae

1. Posterior transverse carina of mesosternum not complete, broadly interrupted in front of each middle coxa. (Fore tibial spur with a membranous flange behind the macrotrachial comb, the flange extending at least 0.7 the length of the comb; fore wing with Rs.+2r proximally almost straight, usually either narrow or only weakly broadened before, joining pterostigma). *Ophion*

Posterior transverse carina of mesosternum complete or subcomplete, not interrupted in front of each middle coxa.

2. Pecten of hind tarsal claws extending beyond the true apex of claw so that there is a small black tooth distad of the large apical brown tooth; penultimate hamulus enlarged and of a different shape than the rest of the series; apex of mandible broad, not twisted. . . . *Leptophion*
- Pecten of hind tarsal claws normal, not extending beyond true apex of claw; penultimate hamulus normal, similar to the rest of the series. 3
3. Mandible not strongly narrowed, nor apically twisted; medially about 0.65x as wide as it is basally; base of radius usually separated from the base of stigma by 0.2x the width of stigma. *Dicamptus*
- Mandible strongly narrowed and twisted apically, medially about 0.35x as wide as it is basally; base of radius usually separated from base of stigma by about 1.5x the width of stigma. . . . *Enicospilus*

45. Genus *Ophion* Fabricius

1798. *Ophion* Fabricius, *Entomologia Systematica.. descriptionibus*, (Suppl.): 210, 235.

Type-species : *Ichneumon luteus* Linnaeus.

Key to the species of *Ophion*

1. Occipital carina absent on upper part of head; Ovipositor sheath usually broad, lower face subquadrate, about 0.9 to 1.0x as broad as long; anterior transverse carina of propodeum incomplete; notauli not so deep on mesoscutum. . *fuscumaculatus*
- Occipital carina complete on head above; ovipositor sheath not broad, longish; lower face longish, elongated; anterior transverse carina of propodeum complete; notauli deep and long on mesoscutum. . . *areolatus*

106. *Ophion areolatus* Cameron

1899. *Ophion areolatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 101. (M). key, des. Lectotype (designed by Gauld & Mitchell, 1981): M, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1981. *Ophion areolatus* Gauld & Mitchell, *Taxonomy, Distribution Ophioninae*, p. 52. M. F. key, des., lectotype design. India.: Meghalaya: Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is recognised by having deep long notauli on mesoscutum; occipital carina complete on head above. Gauld and Mitchell (1981) gave a detailed description of this species.

107. *Ophion fuscumaculatus* Cameron

1899. *Ophion fuscumaculatus* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, 43 (3) : 99. (F). key. des. Type : F, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1928. *Ophion orientalis* Uchida, *J. Fac. Agri. Hakkaido Imp. Univ.*, 21 : 208. M, F. key. des., fig. Lectotype: F (designed by Townes, Momoi & Townes, 1965:320), Japan : Sakhalin : Ichinosawa (Type in Sapporo Museum) Japan: Kokkaido, Korea: Mt. Keum-kang, Suk-wang-sa. Sakhalin: Furumaki. Syn. by Gauld, 1979.
1981. *Ophion fuscomalatus* Gauld & Mitchell. *Taxonomy, Distribution Ophioninae*, p. 33. M. F. key, syn., des. fig. India : Meghalaya: Khasi Hills. Himachal Pradesh: Dalhousie Hills: Khajjiar, 1828 m.; Upper Bakrota. Sikkim. Lachen, 2700 m.; West Bengal: Darjeeling Dist.: Sukia Pokri, Uttar Pradesh. Nepal. Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh, West Bengal. Elsewhere : Japan, Korea, Nepal, Taiwan.

Remarks : This species is mainly recognised by the absence of occipital carinal on head; ovipositor sheath broad; apical transverse carina of propodeum incomplete. Gauld and Mitchell (1981) gave a detailed description of this species.

46. Genus *Leptophion* Cameron

1901. *Leptophion* Cameron, *Proc. Zool. Soc. London*, 1901 : 227.
Type-species : *Leptophion longiventris* Cameron; monobasic.

Key to the species of *Leptophion*

1. Hind wing with 1st abscissa of Rs. virtually straight, without a submedian swelling; 2nd subdiscal cell with postero-proximal corner infumate; Hind wing with all hamuli or R_1 of similar shape and size . . . *radiatus*
- Hind wing with 1st abscissa of Rs strongly bowed, without a submedian swelling; 2nd subdiscal cell at postero-proximal corner not infumate; hind wing with penultimate hamulus on R_1 longer and more curved than its fellows. . . *maculipennis*

108. *Leptophion maculipennis* (Cameron)

1905. *Spilophion maculipennis* Cameron, *Spolia Zeylanica*, 3 : 125. F. des., fig. Lectotype (designated by Gauld, 1977) : F, Sri Lanka (Type in British Museum).
1912. *Stauropodoctonus orientalis* Morley, *Revision of the Ichneumonidae in the British Museum*, 1 : 18. F. n.name. key, des. Sri Lanka: Peradeniya. Taiwan: Tainan (Unnecessary replacement name).
1923. *Stauropodoctonus orientalis* : Dutt, *Mem. Dept. Agri. India (Ent. Ser.)* 8 : 17. India : Meghalaya: Shillong, 5000 ft.; Madhya Pradesh : Nagpur. (in part).
1961. *Leptophion maculipennis* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 265. n. comb.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Madhya Pradesh, Maharashtra, Uttar Pradesh. Elsewhere : Australia, Burma, China, Hainan, Malaysia, Sri Lanka, Taiwan, Thailand.

Remarks : This species can be recognised by the characters mentioned in the key. No material was available for study. Gauld & Mitchell (1981) gave a detailed description of this species.

109. *Leptophion radiatus* (Uchida)

1913. *Stauropodoctonus orientalis* Morley: Dutta, *Mem. Dept. Agri. India (Ent. Ser.)* 8 : 17. (in part). misdet. (cf. gauld & Mitchell, 1981:72).
1956. *Spilophion radiatus* Uchida, *Insecta Matsumurana*, 20 : 18. F. key, des. Type: F, Taiwan: Tamaho (Type in Sapporo Museum). Taiwan.
1981. *Leptophion radiatus* : Gauld & Mitchell, *Taxonomy, Distribution Ophioninae*, p. 72. M, F. key, syn., des., fig. India : Meghalaya: Shillong, Sikkim: Gangtok, 1800 m. Uttar Pradesh: Bhowali, 1700 m.; Tehri Dist.: Ompatra. Malaysia: Malaya: Pahang. Cameron Highlands, 1600 m.; Fraser's Hill, 1300 m. Nepal: Kathmandu Valley : Godavari, 2000 m. : Phulchowki, 2200 m. Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Uttar Pradesh. Elsewhere: Malaysia, Nepal, Taiwan.

Remarks : This species is mainly identified by having *Rs* in hind wing almost straight, 2nd subdiscal cell infumate, hamuli on *R*₁ of same type.

47. Genus *Dicamptus* Szepligeti

1905. *Dicamptus* Szepligeti, *Genera Insectorum*, 34 : 21, 28.
Type-species : *Dicamptus giganteus* Szepligeti; monobasic.

Key to the species of *Dicamptus*

1. Mandible with a pronounced proximal concavity margined distally by an angular raised ridge; clypeus in profile convex. . *reticulatus*
- Mandible flat or with a weak proximal concavity and never with such a concavity margined by a raised ridge; clypeus flat; (head in dorsal view with temple swollen in male, sternites 6-8 with fine short pubescence). .. *cantoni*

110. *Dicamptus cantoni* Gauld & Mitchell

1981. *Dicamptus cantoni* Gauld & Mitchell, *Taxonomy, Distribution.. Ophioninae*, p.106. M. f. key, syn. des., fig. Type: M, China: Guangdong (=Kwangtung): Canton (type in British Museum). India : Meghalaya: Khasi Hills. Uttar Pradesh: Garhwal District: Ghat. Indonesia, Thailand.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh. Elsewhere : China, Indonesia, Thailand.

Remarks : Gauld & Mitchell (1981) gave a detailed description of this species.

111. *Dicamptus reticulatus* (Cameron)

1899. *Enicospilus reticulatus* Cameron, *Mem. & Proc. Manchester Lit., Phil. Soc.*, 43 (3) : 102. "F"=M. key, des.
Type: F, India : Meghalaya: Khasi Hills (Type in Oxford Museum).

1981. *Dicamptus reticulatus* Gauld & Mitchell. *Taxonomy, Distribution .. Ophioninae*, p. 101. M, F. key, syn.,
des., fig. Burma, China. India: Meghalaya: Khasi Hills. Sikkim. Bhatang; Munashi Thang; Tin Milas.
Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere : Bangladesh, Burma,
China, Taiwan, Sri Lanka.

Remarks : No material of this species was available for study from Meghalaya. This species can
be recognised by the characters given in the key.

48. Genus *Enicospilus* Stephens

1835. *Enicospilus* Stephens, *Illustrations of British Entomology*, 7 : 126.

Type-species : (*Ophion mardarius* Gravenhorst *sensu* Stephens) = *Ichneumon ramidulus* Linnaeus.

Key to the species of *Enicospilus*

1. Fore wing with SDT=1.07 or less. (Wings with AI less than 0.9; clypeus in profile strongly
convex with apical margin impressed, acute; apical mandibular teeth strongly divergent. . .
heliothidis (in part)
- Fore wing with SDT=1.08 or more. .2
2. Proximal and distal sclerites, if both present, narrow, linear, often confluent and bordering
margin of fenestra, occasionally with one or other vestigial, sometimes with proximal one
entirely absent and distal one slightly broadened but still indistinctly delineated; central sclerite
never present. .3
- Proximal sclerite generally strong and quite broad, if rarely narrow or weak or absent then
either one or more central sclerites are present or distal sclerite is strong and broad and clearly
delineated; central sclerite otherwise present or absent. .4
3. Alar sclerite weakly to quite strongly sclerotized proximally. (Fore wing with ICI=0.57-0.85;
AI=1.1 to 1.5; 2nd discal cell very long. SDI=1.5-1.8; *Rs*+2r not exceptionally incrassate.
hedilis
- Alar sclerite not sclerotized proximally, only distally. (Distal sclerite narrow with anterior side
shorter than the proximal side, bordering margin of fenestra distally; *Rs*+2r weakly to
moderately sinuous; pterostigma usually reddish to orange. . . *lineolatus*
4. Central sclerite entirely absent. .5
- Central sclerite present, usually strongly pigmented. 6

5. Outer surface of mandible with a diagonal groove, extending from upper proximal corner to between bases of teeth. (Fenestra about 2x the area of proximal sclerite; distal sclerite stout and strong). . . *fittoni*
- Outer surface of mandible without a diagonal groove (clypeal margin impressed and clypeus in profile strongly convex; mandible weakly tapered, teeth slightly apically divergent). *heliothidis* (in part)
6. Proximal and distal sclerites confluent, central sclerite either strongly pigmented and circular to oval or narrow and crescentic. (Central sclerite positioned towards distal edge of fenestra; distal side of proximal sclerite and margin of distal sclerite more or less forming an even curve; metapleurum usually puncto-striate). *melanocarpus*
- Proximal sclerite not confluent with distal sclerite, sometimes the latter almost absent; central sclerite often oval and weakly pigmented. (Central sclerite small, circular to oval, separated from proximal sclerite by more than 2.4x its own maximum diameter and separated from *Rs.* +2r by a distance greater than its own minimum diameter). *bharatensis*

112. *Enicospilus bharatensis* Nikam

1969. *Enicospilus indicus* Rao & Nikam, *Bull. Ent.*, 10 : 143. M, F. Name preocc. by *indicus* Rao & Grover, 1960. des. fig. Type: F, India : Maharashtra : Aurangabad: Himayabagh (Type in Z.S.I., Calcutta; see Nikam, 1980).
1980. *Enicospilus bharatensis* Nikam, *Orientalis Ins.*, 14 : 182. M, F. new name, key, des., fig. India : Meghalaya : Khasi Hills: Cherrapunji, 4455 ft. Assam: Gauhati; Rangapara: Sonajuli Tea Estate. Bihar: Ranchi Dist.: Namkum. Delhi. Himachal Pradesh: Dalhousie Hills: Khajjiar, 6300 ft. Karnataka: Bangalore, 916 m. Maharashtra: Aurangabad, Rajasthan: Dholpur. Uttar Pradesh: Kumaon Hills: Chaubattia, 6800 ft.; Bhowali, 1700 m.; Lucknow; Pilibhit; Tanakpur: Garhwal Hills: Sri Nagar, 2000 ft.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, iv. 1966, M.K. Kamath, Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Himachal Pradesh, Karnataka, Maharashtra, Rajasthan, Uttar Pradesh. Elsewhere : China, New Caledonia, New Guinea, New Hebrides, New Ireland, Philippines, Sri Lanka, Vietnam.

Remarks : This is a highly variable species, but can be recognised by the characters given in the key. Gauld & Mitchell (1981) gave a detailed description of this species.

113. *Enicospilus fittoni* Nikam

1980. *Enicospilus fittoni* Nikam. *Oriental Ins.*, 14 : 155. F. key, des., fig. Type: F, India: Meghalaya : Khasi Hills: Cherrapunji, 1360 m. (Type in Gupta collection).

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunji, 2 females, IV. 1966, J.K. Jonathan and D.T. Tikar, Gupta colln.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Laos.

Remarks : This species is without central scleite and the abruptly broadened submetapleural carina.

114. *Enicospilus hedilis* Gauld & Mitchell

1981. *Enicospilus hedilis* Gauld & Mitchell, *Taxonomy, distribution .. Ophioninae.*, p. 301.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: China, Java and Sri Lanka.

Remarks : This species can be identified by the characters as given in the key. Gauld & Mitchell (1981) gave a detailed description of this species.

115. *Enicospilus heliothidis* Viereck

1846. *Ophion rufus* Brulle, In Lepeletier : *Histoire Naturelle des Insectes. Hymenopteres*, 4 : 149. misdet. (India specimens). India: Bengal: Malabar. (The lectotype is from Mauritius and not the same species as the specimens from the Oriental Region).

1913. *Enicospilus heliothidis* Viereck, *Proc. U.S. Natl. Mus.*, 44:565. M, F. des. Type: F, Indonesia: Sumatra: Sumatra: Dali (Type in U.S. N.H.Museum). Host : *Heliothis zea*.

1921. *Amesospilus javanus* Enderlein, *Stettiner Ent. Ztg.*, 82 : 18. Name Preocc. in *Enicospilus* by Szepligeti, 1910. des. Type: F, Indonesia: Java: mt. Gede, 4000 ft., (Type in Warsaw Museum), Syn. by Gauld & Mitchell, 1981.

1921. *Amesospilus interruptus* Enderlein, *Stettiner Ent. Ztg.*, 82 : 18. Name preocc. in *Enicospilus* by Szepligeti, 1906. des. Type : F, India : Shembaganur (Type is Warsaw Museum). Syn. by Gauld & Mitchell, 1981. (Townes, Townes & Gupta synonymized it under *javanus* Enderlein).

1936. *Henicospilus rhoedae* Cheesman, *Trans. R. Ent. Soc. London*, 85 : 183. F. key, des., fig. Type: F, Fiji : Nadovi (Type in British Museum). New Hebrides: Malekula : Ounua.

1961. *Enicospilus biconatus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 270. new name for *javanus* Enderlein. India. Java.

1969. *Enicospilus neorufus* Rao & Nikam, *Marathwada Univ. J. Sci.*, 8 : 124. taxon., des. Lectotype (designated by Gauld & Mitchell, 1981): M, India: Meghalaya: Khasi Hills (Type in British Museum). Syn. by Gauld & Mitchell, 1981).

1981. *Enicospilus heliothidis* Gauld & Mitchell, *Taxonomy, Distribution .. Ophioninae*, p. 347. M, F. key, syn., des., fig. Indonesia, Fiji, India : Meghalaya : Khasi Hills. Andhra Pradesh: Patancheru. Assam: Rangapara. Karnataka: Bangalore, Tamil Nadu: Chikkaballapure; Anamalai Hills: Cinchona; Coimbatore; Kankai; Nilgiri Hills: Naduvattam. Uttar Pradesh: Garjia; Haldwani. Sri Lanka.

Distribution : India Meghalaya (East Khasi Hills), Andhra Pradesh, Assam, Karnataka, Tamil Nadu, Uttar Pradesh. Elsewhere: Indonesia, Fiji, Papua New Guinea, Sri Lanka, West Irian.

Remarks : This is one of the most common species, widely distributed in India. This species can be recognised by not having diagonal groove on the outer surface of mandible, clypeus strongly convex and its apical margin impressed.

116. *Enicospilus lineolatus* (Roman)

1899. *Enicospilus striatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 103. (F). Name Preocc. in *Enicospilus* by Brulle, 1846. key des., Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).
1913. *Henicospilus lineolatus* Roman, *Arkiv for Zool.*, 8 (15) : 30. M. key, des. Type : Philippines (Type in Stockholm Museum). Syn. by Gauld & Mitchell, 1981.
1954. *Enicospilus uniformis* Chiu, *Taiwan Agri. Res. Inst.*, 13 : 25. M. key, des., fig. Type : F, Taipei (Wufeng). Taiwan: Ali Shan; Shunan; Kiayi; Sintein; Taitung; Wufai; Daiton; Funkiko; Hokuto. Hungtow Is. Japan: Honshu : Kyoto and Ueda. Syn. by Gauld & Mitchell, 1981.
1961. *Enicospilus striolatus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 290. new name for *striatus* Cameron. China. India. Taiwan. Philippines. Ryukyus. Sarawak. Singapore. Syn. by Gauld & Mitchell, 1981.
1970. *Enicospilus unicornis* Rao & Nikam, *Marathwada Univ. J. Sci.*, 9 : 103. F. des., fig. Type: F, India: Maharashtra: Aurangabad : Himayatbagh (Nikam). Syn by Gauld & Mitchell, 1981.
1981. *Enicospilus lineolatus* : Gauld & Mitchell, *Taxonomy Distribution .. Ophiononae*, p. 8, 304. M, F. key, syn., des., fig. Several localities in Burma; India; China; Malaysia; Sri Lanka; Indonesia; Brunei; New Guinea; Philippines; New Caledonia; Loyalty Is.; Solomon Is.; Taiwan.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Sikkim, Tamil Nadu, Pondicherry, Uttar Pradesh. Elsewhere : Burma, China, Malaysia? Indonesia, Brunei, New Guinea, Philippines, New Caledonia, Solomon Is., Taiwan.

Remarks : It is one of the most common species found in Indian region.

Hosts: *Dasychira mendosa*; *Pseudodura dudgeoni*; *Orgyia postica*.

117. *Enicospilus melanocarpus* Cameron

1902. *Enicospilus reticulatus* Cameron, *Fauna Maldive et Laccadive Arch.*, 1(1): 52. "F"=M. Name Preocc. by Cameron, 1899. des. Type: M, Maldive Is. : Hulule (Type in British Museum). Syn. with *uncivena* by Townes, Townes & Gupta, 1961, and *melanocarpus* by Gauld & Mitchell, 1981.
1905. *Enicospilus* (!) *melanocarpus* Cameron, *Spolia Zeylanica*, 3 : 122. F. des. Type: F, Sri Lanka: Kandy (Type in British Museum).
1906. *Henicospilus nigrinervis* Szepliget, *Ann. Mus. natl. Hungarici*, 4 : 142. F. Name Preocc. by Cameron, 1901, key, des. Type : F, Papua New Guinea: Erima (Type in Budapest Museum). Syn. with *uncivena* by Townes, Townes & Gupta, and under *melanocarpus* by Gauld & Mitchell, 1981.

1908. *Ophion (Henicospilus) nocturnus* Kohl, *Denkschr. Akad. Wiss.* 81 : 315. F. des., fig. Type : F, Samoa: Upolu (Type in Vienna Museum). Syn. by Gauld & Mitchell, 1981.
1910. *Henicospilus batvianus* Szepligeti, *Notes. Leydon. Mus.*, 32 : 92. F. des. Type : F, Java: Jakarta (Type in Budapest Museum). Syn. with *nocturnus* by Townes, Townes & Gupta, 1961, and *melanocarpus* by Gauld & Mitchell, 1981.
1912. *Henicospilus turneri* Morley, *Revision of the Ichneumonidae in the British Museum*, 1 : 51. M, F. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961). F, Australia: queensland: Mackay (Type in British Museum). Syn. by Gauld & Mitchell, 1981.
1921. *Henicospilus uncivena* Enderlein, *Stettiner Ent. Ztg.*, 82:23. F. des. Type: F, India : West Bengal: Calcutta (Type in Warsaw Museum). Syn. by Gauld & Mitchell, 1981.
1921. *Enicospilus crassivena* Enderlein, *Stettiner Ent. Ztg.*, 82:24. F. des. Type: F, Sumatra: Liangagas (Type in Warsaw Museum). Syn. by Townes, Townes & Gupta, 1961.
1937. *Enicospilus nigrivenalis* Cushman, *Arb. uber Morph. u. Taxonom. Ent.*, 4 : 307. M, F. des., fig. Type: F, Taiwan: Kankau (Hengehun). Taiwan: Talin (=Taihorin). Syn. with *uncivena* by Townes, Townes & Gupta, 1961, and under *melanocarpus* by Gauld & Mitchell, 1981.
1980. *Enicospilus nocturnus* Nikam, *Oriental Ins.*, 14 : 177. M, F. key, des., fig. India: Several localities in Assam: Meghalaya: Bihar; Delhi; Himachal Pradesh; Karnataka; Kerela; Maharashtra; Rajasthan; Uttar Pradesh; West Bengal; Tripura.
1981. *Enicospilus melanocarpus* : Gauld & Mitchell, *Taxonomy, Distribution .. Ophioninae*, p. 377. M, F. key, syn. (in part), des., fig. (Townes, 1984, considers *E. quintuplex* Chiu different). recorded from several countries and localities throughout the Indo-Australian Area.
- Material examined* : India : Meghalaya : East Khasi Hills : Cherrapunji, 3 females, 2 males, iv. 1966, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Andhra Pradesh, Assam, Bihar, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Rajasthan, Sikkim, Tamil Nadu, Uttar Pradesh. Elsewhere : Widely distributed from Pakistan to the Society Islands, Szechwan, China South to Queensland, Australia.

Remarks : This species can be recognised by the characters given in the key. Gauld and Mitchell (1981) gave a detailed description of this species.

Hosts : *Heliothis armigera*; *Streblote siva*; *Euproctis fraterna*.

10. Subfamily MESOCHORINAE

This subfamily is represented by a single species under genus *Mesochorus* Gravenhorst in the state of Meghalaya.

49. Genus *Mesochorus* Gravenhorst

1858. *Mesochorus confuscus* Holmgren, *Svenska Vetensk. Akad. Handl.*, (4) 2 (8): 129. M, F. des Types: M, F, Sweden (Type in Stockholm).

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Europe.

118. *Mesochrus confusus* Holmgren

1858. *Mesochrus confusus* Holmgren, *Svenska Vetensk. Akad. Handl.*, (4) 2 (8): 129. M, F. des. Types : M, F, Sweden (Type in Stockholm).

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Europe.

11. Subfamily METOPINAE

Key to the genera of Subfamily Metopinae

1. Face occupied largely by a flat or concave escutcheon-shaped area bounded by a carina; middle tibia with one spur. *Metopius*
- Face entirely convex; middle tibia with two spurs. .2
2. Antennal sockets separated by a high lamella, the lamella with a deep median groove dorsally. (First abdominal segment narrow basally, its spiracle near its basal 0.35-0.5; head lenticular; edge of inter-antennal lamella angulate in profile) *Coloptrochia*
- Antennal sockets not separated by a lamella, or when a lamella is present it does not have a median groove. .3
3. Back of head not sloping, evenly arched, spurs of middle tibia equal in length *Macromalon*
- Back of head vertical behind posterior ocelli or sloping from posterior ocelli to level of occipital carina, hence approximately vertical to the foramen magnum 4
4. Spur of middle tibia of approximately equal length. . *Hypsicera*
- Spur of middle tibia very unequal in length, the front spur shorter. *Exochus*

50. Genus *Metopius* Panzer8. Subgenus *Metopius* (*Metopius*) Panzer

1806. *Metopius* Panzer. *Kritische Revision der Insektenfauna Deutschlands*, 2 : 78.

Type-species : *Sphex vespoideus* Scopoli; designated by Viereck, 1912.

199. *Metopius* (*Metopius*) *rufus rufus* Cameron

1905. *Metopius rufus* Cameron, *Ztschr. System. Hymen. Dipt.*, 5 : 281. F. des. Type: F, India: Rajasthan: Mt. Abu (Type in British Museum).

1907. *Metopius pulchripes* Cameron, *J. Bombay Nat. Hist. Soc.* 17 : 586. M. des. Type: M, India: Rajasthan: Mt. Abu (Type in British Museum). Syn. by Uchida, 1940.

1961. *Metopius* (*Metopius*) *rufus rufus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 300. Burma. India. Hong Kong.

Diagnostic characters : *Female* : 12 mm long. A reddish species with abdomen black and yellow. Head covered with white fine hairs. Face and palpi yellowish; ocellar triangle black; frontal orbits yellowish. Thorax covered with fine white hairs; abdomen blackish with four basal segments at their apical half dark yellow; legs deep red with dense hairs. Wings hyaline with tegulae, stigma and costa red, apex of forewing with a large and subapical brownish spot.

Distribution : India : Meghalaya (East Khasi Hills), Rajasthan. Elsewhere : Burma, Hong Kong.

51. Genus *Colpotrochia* HolmgrenKey to the subgenera of *Colpotrochia*

1. Nervellus vertical or postfurcal (its front end further from the wing base than its hind end); areolet present or absent. .Subgenus *Colpotrochia*
- Nervellus antefurcal (its front end nearer the wing base than its hind end); areolet present Subgenus *Scallama*

9. Subgenus *Colpotrochia* (*Colpotrochia*) Holmgren

1855. *Colpotrochia* Holmgren *Svenska Vetensk. Akad. Handl.* (3) 42 : 80.

Type-species : *Ichneumon elegantulus* Schrank; monobasic.

Key to the species of *Colpotrochia* (*Colpotrochia*)

1. Scutellum and postscutellum yellow; body size about 7 mm *coenuta*
- Scutellum and postscutellum. red; body size about 11-14 mm long .2
2. Antennae reddish; abdomen deep red, its basal two-thirds of petiole, second and third segments wholly, black; leg in general red. *assamensis*

- Antennae black; abdomen black, its first and second segments in apical half and third wholly, red; legs in general black . . . *.melanosoma*

120. *Colpotrochia (Colpotrochia) assamensis* Townes et al.

- 1899.** *Scallama crassipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43**(3) : 219. M. Name preocc. in *Colpotrochia* by Provancher, 1886. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
- 1961.** *Colpotrochia (Colpotrochia) assamensis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 304. new name. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This is a large sized species, known by a male from Khasi Hills.

121. *Colpotrochia (Colpotrochia) coenuta* Cameron

- 1900.** *Aithris coentus* Camero., *Mem. & Proc. Manchester Lit. Phil. Soc.*, **44** (15): 107. "M" = F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
- 1961.** *Colpotrochia (Colpotrochia) coenuta* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1** : 304. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This is a small sized species, known by a single female type from Khasi Hills in Meghalaya.

122. *Colpotrochia (Colpotrochia) melanosoma* Morley

- 1913.** *Colpotrochia melanosoma* Morley, *Fauna of British India, Hymenoptera*, **3** : 306. F. key, des., fig, Type: F, India: Meghalaya: Shillong, 6000 ft. (Type in British Museum).
- 1986.** *Colpotrochia (Colpotrochia) melanosoma* He, *Acta Agri. Univ. Zhejiangensis*, **12** : 96. M. China: Guangxi: Tianlin.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: China.

Remarks : This is a moderately long species, body black with red markings. This species is also known from China.

10. Subgenus *Colpotrochia (Scallama)* Cameron

- 1899.** *Scallama* Cameron, *Mem. & Proc. Manch. Lit. Phil. Soc.* **43**(3): 216.
Type-species : *Scallama trilineata* Cameron; designated by Morley, 1913.

123. *Colpotrochia (Scallama) trilineata* (Cameron)

- 1899.** *Scallama trilineata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43** (3): 217. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Colpotrochia (Scallama) trilineata* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:303. "Burma". India.

Diagnostic characters : Male : 11-12 mm long. Body yellow with black markings. Head largely black with clypeus, mandible and palpi, deep yellow; frons and vertex with dense brown hairs; thorax black and broadly reddish above; scutellum basally black; mesoscutum reddish with a broad central longitudinal stripe and lateral lobes at apex, black. Abdomen above and below yellowish. Legs with femora usually black, tibiae and tarsi yellowish. Wings yellowish hyaline.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Burma.

52. Genus *Hypsicera* Latreille

1928. *Hypsicera* Latreille. In Cuvier : Regne animal .. nouvelle edition, 5:288.

Type-species : (*Alomya (Hypsicera)* sp. near *femoralis* Gravenhorst) = *femoralis* Fourcroy. Monobasic.

124. *Hypsicera parca* (Morley)

1913. *Exochus parca* Morley, *Fauna of British India, Hymenoptera*, 3:296. M, F. key, des. Type: M, India: Meghalaya: Shillong, 6000 ft. (Type in British Museum). India : Himachal Pradesh: Kangra Valley, 4500 ft. Sri Lanka.

1961. *Hypsicera parca* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:306. n. comb. India. Sri Lanka.

Diagnostic characters : Male, Female: 5.5 mm long. a black and shiny species, without yellow markings. Legs reddish, only the claws black. Wings hyaline. Frons and face finely punctate; mesoscutum dull, closely punctate; areola parallel sided. Scutellum, metapleurum and abdomen also finely punctate.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh. Elsewhere : Sri Lanka.

53. Genus *Macromelon* Townes

1959. *Macromelon* Townes, *Bull. U.S. Natl. Mus.*, 216(1): 158.

Type-species : *Macromelon montanum* Townes; original designation.

125. *Macromelon orientale* Kerrich

1968. *Macromelon orientale* Kerrich, *Oriental Ins.*, 1 (1957): 194. M. F. des., fig. Type: F, India: Meghalaya: Upper Shillong (Type in British Museum). India: West Bengal: Kalimpong, Darjeeling Botanical Garden. Sikkim: Gangtok. Host : *Plutella xylostella*.

Diagnostic characters : Female: Palpi pale yellow; tegula dull ivory, with infusion of dark marking; wing bases whitish-yellow, stigma and veins piceous. Fore and middle legs dirty yellow; hind coxa blackish, pale at apex; tibia dark yellow, with a broad ivory-white band, spurs ivory white, tarsi infuscate, the segments paler at base. Tergite 2-5 brownish at apices.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, West Bengal.

Host : Plutella xylostella.

54. Genus *Exochus* Gravenhorst

1829. *Exochus* Gravenhorst, *Ichneumonologia Europaea*, 3 : 328.

Type-species : *Ichneumon gravipes* Gravenhorst.

126. *Exochus coronellus* Morley

1913. *Exochus coronellus* Morley, *Fauna of British India, Hymenoptera*, 3:296 m. key, des., fig. Type: M, India: Meghalaya: shillong 6000 ft. (Type in British Museum).

Diagnostic characters : *Male* : 5 mm long. Body black, marked with yellow. Head yellow with only the occiput, ocellar region to scrobes, black. Antennae black with scape below yellow; mesopleurum yellow with a broad black mark; scutellum and postscutellum yellow. abdomen black with apices of all the segments red. Legs in general bright yellow, with hind trochanter blackish, hind coxae and tarsi reddish. Wings hyaline.

Distribution : India : Meghalaya (East Khasi Hills).

12. Subfamily GRAVENHORSTINAE

Key to the genera of subfamily Gravenhorstinae

1. Lower front corner of pronotum without projecting tooth; first recurrent vein joining discocubital cell usually basad of its midlength .2
- Lower front corner of pronotum with a acute projecting tooth; first recurrent vein joining discocubital cell usually at its midlength. 5
2. Eye with conspicuous long hairs, convergent ventrally; ovipositor about 3.5x as long as apical depth of abdomen. *Trichomma*
- Eye bare, parallel or less convergent; ovipositor about 1.5x as long as apical depth of abdomen. 3
3. Subdiscoideus arising near or below center of brachial cell. (Mesoscutum in profile with a distinct concavity just before its front end, so that its front end is like a small shelf; frons often with a median compressed tooth; tarsal claws pectinate to the apex. *Aphanistes*
- Subdiscoideus arising well above center of brachial cell. 4
4. Front coxa without a carina on its lower side; scutellum without a transverse carina across its base (Nervellus intercepted; epomia present).. *Barylypa*
- Front caxa with a carina on its lower side; scutellum with a transverse carina across its base. Apex of clypeus with a single pointed median tooth. . *Agrypon*

5. Frons with a rather strong carina between antennal sockets but not a high, compressed tooth or lamella; second segment of hind tarsus of male without an impressed area beneath; first segment of hind tarsus always shorter than the rest of the tarsus. *.Therion*

Frons with a high, compressed tooth or lamella between the antennal sockets; first segment of hind tarsus often longer than the rest of the tarsus. (Apical margin of clypeus rounded or truncate). .. *.Heteropelma*

55. Genus *Aphanistes* Foerster

1869. *Aphanister*, Foerster. *Verh. Naturh. Ver. Rheinlande*, 25:145.

Type-species: *Anomalon bellicosum* Wesmael; designated by Viereck, 1914.

127. *Aphanistes carinifrons* (Cameron)

1899. *Anomalon carinifrons carinifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3) : 113. F. des.

Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Aphanister carinifrons* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:311. n. comb. India.

Diagnostic characters : Female : 16 mm long. Body black. Antenna reddish with under side yellowish; head black with face, clypeus, mandible, palpi, outer orbits, yellow. Thorax black, with pronotum basally, apical half of metanotum and metapleurum, red. Abdomen reddish-yellow; with the second segment above black. Legs: anterior four legs largely yellow, hind legs red with their tarsi flavous and the apices of the tibiae broadly black, their coxae and trochanters sometimes slightly blackish. Wings yellowish-hyaline.

Frons and vertex rugose; frons with a stout and apically dilated inter-antennal carina; mesoscutum uniformly closely punctate; propodeum at base rugose, rest reticulate.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Very little is known about this species. It is known from Khasi Hills in Meghalaya.

56. Genus *Barylypa* Foerster

1869. *Barylypa* Foerster, *Verh. Naturh. Rheinlande*, 25:146.

Type-species : *Anomalon (Barylypa) genalis* Thomson; designated, by Viereck 1914.

128. *Barylypa apicate* (Cameron)

1905. *Anomalon apicate* Cameron, *Entomologist*, 38:106. M. des. Type: M, India: Himachal Pradesh: Simla (Type in British Museum).

1976. *Barylypa apicate* Gauld. *Bull. Brit. Mus. Nat. Hist. (Ent.)*, 33:46.

Diagnostic characters : Male, female: 11-16 mm long. Body black with face, clypeus, yellow. antennae deep yellow, infusate towards the apices, first flagellar segment black. Thorax black with

scutellum and postscutellum yellow. Abdomen red, with second and third tergites blackish and seventh and eighth tergites black. Legs red, with their coxae and trochanters dark yellow. Wings somewhat yellowish-hyaline.

Body largely punctate; vertex in the middle aciculate transversely; mesopleurum longitudinally striate above and closely punctate below; metapleurum reticulate.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh.

Remarks : Morely (1913) reported this species from Shillong in Meghalaya and Mussoorie in Uttar Pradesh.

57. Genus *Therion* Curtis

1820-30. *Therion* Curtis. Guide to an Arrangement of British Insects, p-101.

Type-species : *Ichneumon circumflexus* Linnaeus; designated by Curtis, 1839

This genus is known by two species from the state of Meghalaya. No material of these species was available for study. They are listed below:

129. *Therion circumflexum* (Linnaeus)

1758. *Ichneumon circumflexus* Linnaeus, *Systema Naturae. Regnum Animale Edition 10*, p. 566. (F). des. Type: F, Europe (Linnaean Soc., in London).

1913. *Exochilum circumflexum* Morley, *Fauna of British India, Hymenoptera*, 3:410. M, F. key, des. India: Himachal Pradesh: Simla, 7000 ft.; Uttar Pradesh: Mussoorie; Meghalaya: Shillong, 6000 ft. Europe. (in part).

1961. *Therion circumflexum* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:319. Canada. Europe. Taiwan. India? Japan. North America.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh. Elsewhere: Eurasia, China, Taiwan, North America, North Africa.

Remarks : This species is recognised by having antennae longer than thorax; wings yellowish-hyaline; propodeum reticulate; frons with a short ridge; scutellum convex; outer orbits not yellow.

Host : *Hyloicus ligustri*; *Mythimna separata*.

130. *Therion missouriensis* (Cameron)

1897. *Anomalon missouriense* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 41(4): 26. F. des. Type: F, India: Uttar Pradesh: Mussoorie (Type in Oxford Museum).

1961. *Therion missouriense* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:320. n. comb., syn. India.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh.

Remarks : The identity of this species is doubtful.

58. Genus *Heteropelma* Wesmael

1849. *Heteropelma* Wesmael, *Bull. Acad. Roy. Sci. Lett. et Beaux-Arts de Belgique*, 16(2): 119, 120.

Type-species : *Anomalon (Heteropelma) calcator* Wesmael; monobasic.

Key to the species of *Heteropelma*

1. Antennae yellow with dense pale yellow hairs; abdomen red with basal two segments black ..
.amictum
- Antennae red or yellow without dense hairs; abdomen entirely red. 2
2. Thorax immaculate black with dense dark hairs; antennae red; hind tibia in apical 0.25 black
.fulvitarso
- Thorax black with tegulae and scutellum yellow, without hairs; antennae yellow; hind tibia without black in its apical 0.25.
.orbitale

131. *Heteropelma amictus* (Fabricius)

1775. *Ichneumon amictus* Fabricius, *Systema Entomologiae*, p. 341. England. Type : F (lacks abdomen), England (Type in British Museum).

1856. *Anomalon capitatum* Desvignes, *Catalogue of British Ichneumonidae in the Collection the British Museum*, p. 104. M. des, Lectotype (designated by Fitton, 1976): M, England (Type in British Museum) Syn. by Gauld, 1976.

1898. *Schizoloma bucephalum* Brans, *Arch. Ver. Freunde Natur. Mecklenb.*, 43:71. M. des. Type: M, (no further data) (Lost). Syn by Schmiedeknecht, 1908.

1899. *Schizoloma fulvicorne* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 104. M, F. des. Lectotype (designated by Gauld, 1976): M (abdomen missing), India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Gauld, 1976.

1899. *Anomalon tinctipenne* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 112. F. des. Lectotype (designated by Gauld, 1976): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Gauld, 1976.

1913. *Exochilum acheron* Morley, *Revision of the Ichneumonidae in the British Museum*, 2:79. M, F. key, des. Lectotype (designated by Gauld, 1976): F, India (Type in British Museum). Syn. by Gauld, 1976.

1913. *Exochilum acheron* var. *scutellatum* Morley, *Fauna of British India, Hymenoptera*, 3:412. M, F. des. Types: M, F, India: Assam: Sadiya (Z.S.I. Calcutta). Syn. by Gauld, 1976.

1921. *Schizoloma crassicalx* Enderlein, *Stettiner Ent. Ztg.*, **82**:11. M. des. Type: M, Indonesia: Sumatra: Bekantiang (Warsaw). Syn. by Gauld, 1976.
1976. *Heteropelma amictum* Gauld, *Bull. Brit. Mus. Nat. Hist. (Ent.)*, **34**:188. M, F. key, des., fig. hosts, distr. Northern Europe USSR, Japan and Far East, Taiwan, India, Burma, China, Indonesia, Nepal, Philippines Sulawesi.

Material examined : No material of this species from Meghalaya was available for study, however, the type of *acheron* var *scutellatum* Morley is present in Z.S.I. collection.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh. Elsewhere : Eurasia, Nepal, Burma, Indonesia, China, Taiwan, Philippines.

132. *Heteropelma fulvitarso* Cameron

1899. *Heteropelma fulvitarso* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43**(3) : 111. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1899. *Heteropelma reticulatum* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43**(3) : 110. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Gauld, 1976.
1907. *Anomalon binghami* Cameron, *Ann. & Mag. Nat. Hist.*, (7) **20**:14. M. des. Type: M, India: Sikkim (Type in British Museum). Syn. by Gauld, 1976.
1976. *Heteropelma fulvitarso* Gauld, *Bull. Brit. Mus. Nat. Hist. (Ent.)* **34**:167. M, F. key, syn., des., fig. India: Himachal Pradesh: Simla; Meghalaya: Khasi Hills; Sikkim; Assam: Mishmi Hills. Burma: Maymajo; Mt. Victoria. China: Fujian: Shaowu Hsien; Tibet: Yatung. Laos: Muong Pek. Nepal: Taplejung. Taiwan: Taipingshan (=Taiheizan); Wushe (=Musha); Alishan (=Arizan). (*Heteropelma grossator* Shestakov, 1923 and *H. panargis* Heinrich, 1953 from USSR and Germany also synonymized).

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim. Elsewhere: Burma, China, Nepal, Taiwan, Tibet.

133. *Heteropelma orbitale* (Morley)

1913. *Exochilum orbitale* Morley, *Revision of the Ichneumonidae in the British Museum*, **2**:78. M, F. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, Burma: Karen Hills (Type in Genoa Museum).
1976. *Heteropelma orbitale* Gauld, *Bull. Brit. Mus. Nat. Hist. (Ent.)*, **34**:157. "nomen inquirendum". "Possibly a syn. of *H. fulvitarso*".

Distribution : India: Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : No material of this species was available for study. Morley (1913) reported this species from Shillong in Meghalaya.

59. Genus *Trichomma* Wasmal

1849. *Trichomma* Wasmal, *Bull. Acad. Roy. Sci. Lett. et Beaux-Art de Belgique*, 16 (2): 119, 139.

Type-species : *Anomalon (Trichomma) fulvidens* Wesmael; monobasic.

133. *Trichomma nigricans* Cameron

1905. *Trichomma nigricans* Cameron, *Spolia Zeylanica*, 3:130. F. des. Lectotype (designated by Gauld, 1976): F, Sri Lanka: Kandy (Type in British Museum).

1913. *Trichomma nigricans* Morley, *Revision of the Ichneumonidae in the British Museum*, 2:65. M, F. key, des. India: Uttar Pradesh: Dehra Dun. Meghalaya. Khasi Hills. Sri Lanka. Host: *Tineid moth*.

Diagnostic characters : *Male, Female:* 10-17 mm long. Body black; face, clypeus, orbits, mandibles, yellow. Antennae black with scape below yellow. Thorax with dense silvery hairs, black; with a yellow mark on either side; scutellum yellow; abdomen immaculate. Legs black, with anterior coxae and trochanters dark yellow; hind coxae basally yellow. Wings hyaline.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Manipur, Uttar Pradesh. Elsewhere: Malaysia, Indonesia, Thailand; Taiwan, Philipines, Sri Lanka.

60. Genus *Agrypon* Foerster

1860. *Agrypon* Foerster, *Verh. Naturh. Ver. Rheinlande*, 17:151.

Type-species : *Ophion flaveolatus* Gravenhorst; designated by Morley 1913.

135. *Agrypon nox* Morley

1913. *Agrypon nox* Morley, *Revision of the Ichneumonidae in the British Museum*. 2:91. M. key, des. Type: M, India (Type in Oxford Museum). India: Uttar Pradesh: Mussoorie; Meghalaya: Shillong. Southern Burma.

1953. *Dioborus indica* Rao, *India Forest Rec. (N.S.) Ent.* 8:204, M, F. des., fig. Type: F, India: Dehra Dun: New Forest (Type in F.R.I. Dehradun). Host: *Digama hearseyana*; noctuid. Syn. by Gupta, 1964. (Type-series mixed. The male allotype belongs to *Aphanistes euplerotes* Cushman.)

1976. *Agrypon nox*: Gauld, *Bull. Brit. Mus. Nat. Hist. (Ent.)*, 33:66. syn. notes.

Diagnostic characters : *Male, Female:* 16-20 mm long. Head black, with face, clypeus, frontal and outer orbits, whole of malar space and scape, yellow. Thorax black, abdomen red, its second segment discally black and last segment darkened. Legs in general, with only the hind tibia broadly black at their apices.

Frons with a median horn or carina; mesoscutum rugosely punctate, with obsolete notauli; propodeum coarsely reticulate; scutellum with distinct lateral carinae; legs slender.

Material examined : India : Meghalaya : East Khasi Hills: Shillong, 1 female, La Touche in Z.S.I. Calcutta, collection.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh. Elsewhere: Burma.

Host : *Digama hearseyana*

61. Genus *Brachynervus* Uchida

1955. *Brachynervus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, 50:123.

Type-species: *Brachynervus tsuneki* Uchida; original designation.

136. *Brachynervus confusus* Gauld

1976. *Brachynervus confusus* Gauld, *Bull. Brit. Mus. Nat. Hist. (Ent.)*, 33:79. F. des., fig. type: F, China: Chantung: Ching-tao (Tsingtao) (Type in British Museum). India: Meghalaya: Khasi Hills.

Diagnostic characters : *Female*: 22 mm long. Head black, with clypeus, face, frons along the orbit, outer orbits, mandibles and palpi, yellow. Antennae red with basal half darker, scape with dense long yellow hairs. Thorax immaculate, scutellum yellow. Abdomen red, with second dorsally black and the first segment centrally brownish. Legs pale yellow, with anterior trochanters dirty yellow; hind legs deep red, apices of tibiae broadly black and tarsi dirty yellow. Wings yellowish hyaline.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: China.

Remarks : *Anomalon tinctipennae* Cameron (female) misdetermined by Morley (1913:422) belong to *Brachynervus confusus* Gauld.

13. Subfamily ACAENITINAE

Key to the genera of subfamily Acaenitinae

1. Vertical swelling of first sternite without hairs, or rarely with a few hairs; intercubitus at or little basad of second recurrent vein; apex of clypeus approximately truncate. *.Yezceryx*

Vertical swelling of first sternite with numerous long erect hairs; intercubitus at or little distad of second recurrent vein; clypeus with a strong, transverse, preapical ridge; (propodeal spiracle encircled by a carina that encloses a shallow basin). . . *.Siphimedia*

62. Genus *Siphimedia* Cameron

1902. *Siphimedia* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, 37:43.

Type-species : *Siphimedia bifasciata* Cameron; monobasic.

137. *Siphimedia varipes* (Cameron)

1899. *Macrogaster varipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 196. F. key, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Siphimedia varipes* Townes, Townes & Gupta. *Mem. Amer. Ent. Inst.*, 1:324. India.

Diagnostic characters : Female : 12 mm long. Body black. Head covered with sparse white hairs; face, clypeus, outer and inner orbits, deep yellow; antennae black with a broad band on 12th and following segments, scape and basal flagellar segments, white. Thorax black, scutellum apically white. All the abdominal tergites with apical yellow bands. Legs with anterior four yellow; hind legs also yellow with coxa, apex of trochanter, femora at base and broadly at apex and tibia at apex, black; hind coxa apically white. Wings subhyaline, infumate at apices.

Distribution : India : Meghalaya (East Khasi Hills).

63. Genus *Yezoceryx* Uchida

1928. *Yezoceryx* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, 25:36.

Type-species : *Yezoceryx scutellaris* Uchida; original designation.

Key to the species of *Yezoceryx*

1. Middle lobe of mesoscutum not higher than the lateral lobes; propodeum not reticulate or trans-strigose. *.luteus* (Cameron)

Middle lobe of mesoscutum higher than the lateral lobes; propodeum more or less transversely strigose or reticulate. .2

2. Abdomen and anterior legs red, hind legs black *ferrugineus*
Body in general black; antennae without a white band *nigricans*

138. *Yezoceryx ferrugineus* (Cameron)

1899. *Macrogaster ferrugineus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 198. M. key, des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Yezoceryx ferrugineus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:325. n. comb. Burma? India.

Material examined : India : Meghalaya: East Khasi Hills. 1 female, badly damaged, no other data.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Burma.

Remarks : Very little is known about this species. This species very close to *Y. nigricans*, but differs in having abdomen and anterior legs red, and hind legs black.

139. *Yezoceryx luteus* (Cameron)

1899. *Macrogaster luteus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.* 43(3):199. M. key, des. Lectotype (designated by Townes et al, 1961): M, India: Meghalaya: Khasi Hills (Type in British Museum).

1961. *Yezoceryx luteus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:326. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills), Assam.

Remarks : No material of this species was available for study. This species is known by its male type in British Museum.

140. *Yezoceryx nigricans* (Cameron)

1899. *Macrogaster nigricans* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43(3): 194. F. key, des. Lectotype (designated by Townes, townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in British Museum).
1933. *Siphimedia nigra* Cushman, *Insecta matsumurana*, 8:13. F. key, des. Type: F, Taiwan: Fengshan (=Hozan) (Type in Eberswalde Museum). Syn. by Chiu, 1971.
1971. *Yezoceryx nigricans* Chiu, *Bull. Taiwan Agri. Res. Inst.*, 29:9. F. key, syn. des., fig. Taiwan.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Malaya, Taiwan.

14. Subfamily DIPLAZONTINAE

Key to the genera of subfamily Diplaxontinae

1. Second and third abdominal tergites with a post-median transverse groove; (notauli present; propodeum with strong carinae. *Diplazon*
- Second and third abdominal tergites without transverse groove; (face polished; spiracle of third abdominal segment in the epipleurum). *Sussafa*

64. Genus *Diplazon* Viereck

1914. *Diplazon* Viereck, *Bull. U.S. Natl. Mus.*, 83:46.
Type-species : *Ichneumon laetatorius* Fabricius; original designation.

141. *Diplazon orientalis* (Cameron)

1905. *Bassus orientalis* Cameron, *Spolia Zeylanica*, 3:131. "M"=F. des. Type: F, Peradeniya (Type in British Museum). Host: Syrphid larva feeding on tea aphids.
1913. *Bassus clotho* Morley, *Fauna of British India, Hymenoptera*, 3 : 281. M, F. Key, des. Type: M, India : Maharashtra : Poona (Type in British Museum). India: Kashmir, 6000-7000 ft. Bihar: Pusa. Maharashtra: Nagpur. Gujrat : Surat. Hosts: ? *Athalia proxima*; *Ischidon aegyptius*. Syn. by Townes, Townes & Gupta, 1961.
1961. *Diplazon orientalis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 333. syn. India. Sri Lanka. Taiwan.

Diagnostic characters : Male : 5 mm long. Body black with yellow markings. Face with white hairs, clypeus, mandibles, palpi and frontal orbits deep yellow. Antennal with scape yellow and its flagellum brownish below. Scutellum and postscutellum deep yellow. Abdomen black, its first, second and third segments with narrow apical yellow bands, bands on second and third interrupted in the

middle. Legs with anterior pairs, yellow, their femora and the hind coxae yellowish; apex of hind tarsi black. Wings hyaline.

Female : 6mm long. Similar to male.

Material examined : India: Meghalaya : East Khasi Hills: Shillong, vi. 1903, Rowland Turner.

Distribution : India: Meghalaya : East Khasi Hills : Assam, Bihar, Gujrat, Karnataka, Kashmir, Kerala, Madhya Pradesh, Maharashtra, Tamil Nadu.

Elsewhere : Sri Lanka, Taiwan.

65. Genus *Sussaba* Cameron

1909. *Sussaba* Cameron, *J. Bombay Natl. Hist. Soc.*, 19:729.

Type-species : *Sussaba bicarinata* Cameron.

142. *Sussaba cognata albicoxa* (Thomson)

1890. *Promethus albicoxa* Thomso, *Opuscula Entomologica*, 14: 1479. M, F. des. Lectotype: M, (labelled by Townes, 1964), Sweden : (Palsjo), Skane (Type in Lund Museum).

1968. *Sussaba cognata albicoxa* Momoi, Kusigemati & Nakanishi. *Mushi*, 41 : 213. M, F. India: Meghalaya : Shillong. Europe. Japan. Kuriles

Distribution : India: Meghalaya: East Khasi Hills.

Elsewhere : Eurasia

15. SUBFAMILY PHYGADEUONTINAE

Key To The Tribes Of Subfamily PHYGADEUONTINAE

1. Mesopleural impression that is just below speculum consisting of an isolated pit which is some distance in front of mesopleural suture. Postpectal carina usually complete. Tribe Chiroticini
 Mesopleural impression that is just below speculum consisting of a short horizontal groove that joins mesopleural suture. Postpectal carina not complete . . . 2
2. Outer face of mandible with a strong sub-basal swelling at the extreme base with a transverse groove, this emphasize the swelling. Tribe Gelini
 Outer face of mandible with a weak sub-basal swelling, or without a swelling .3
3. Scutellum with a lateral carina extending more than 0.5 its length. (Second recurrent vein with one bulla). .Tribe Rothneyiini

Scutellum without a lateral carina, except at its extreme base (Apical truncation of scape strongly oblique, 50 to 70 degree from the transverse. (Apex of clypeus usually with a median angulation, or a tooth, or a pair of teeth. Tribe Mastrini

14. Tribe CHIROTICINI

This tribe is represented by a single species under genus *Caenopimpla* Cameron.

66. Genus *Caenopimpla* Cameron

1900. *Caenopimpla* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **44** (15) : 99.

Type-species : *Caenopimpla ruficollis* Cameron; monobasic

143. *Caenopimpla ruficollis* Cameron.

1900. *Caenopimpla ruficollis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **44** (15) : 99. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

Diagnostic characters : *Male* : 5 mm long. Body largely black, with the thorax partly red, antetior legs deep yellow and wings with apical spots. Head without any mark with white fine hairs; mandibles dark brown, palpi yellowish. antennae black, densely covered with short, black hairs; scape brownish. Thorax red, with its under side and propodeum, black. Abdomen black, with the apices of the two basal segments yellow, and anal dense hairs white. Legs black, anterior legs deep yellow, except the coxal base; hind trochanters and base of tibiae white. Wings hyaline, with a band extending across from the base of the basal vein and a second, broad near the base of stigma, brownish.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species was described on a single male specimen from Khasi Hills.

15. Tribe GELINI

This tribe is represented by three species under genus *Formocryptus* Uchida. These can be identified by the key given below.

67. Genus *Formocryptus* Uchida

1903. *Odontocryptus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.* **47** (14) : 40. Name preocc. by Saussure, 1890. Syn. by Townes et. al, 1961.

Type-species : *Odontocryptus bidentatus* Cameron; designated by Viereck 1914.

1931. *Formocryptus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, **30** : 192.

Type-species : (*Formocryptus tenuicornis* Uchida) = *bidentatus* Cameron; original designation.

Key to the species of *Formocryptus*

1. Body colour ferruginous. Body about 8 mm long. Abdomen reddish-brown without clear apical bands; 2nd and 3rd tergites at sides black; apical segment of abdomen yellow, 4th and 5th segments reddish-brown four anterior coxae and trochanters reddish-brown *pulcherrimus*

- Body colour black, 6 mm or less long. abdomen black with yellow or reddish-brown bands; four anterior coxae and trochanters, yellow. .2
- 2. Thorax red. abdomen with reddish-yellow bands on all tergites. Face with thick short pale hairs. Vertex covered with thick brown hairs. *Khasianus*
- Thorax black. Abdomen with yellow apical bands on all the tergites. Face and vertex without hairs. *bidentatus*

-144. *Formocryptus bidentatus* (Cameron)

1903. *Odontocryptus bidentatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 40. F. des. Type : F, India: Meghalaya : Khasi Hills (Type in Oxford Museum).
1903. *Odontocryptus sulcatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 42. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum) Syn. by Townes, Townes & Gupta, 1961.
1931. *Formocryptus tenuicornis* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.* **30**:192. F. des., fig. Types: F, Taiwan: Fenchifu (=Funkiko); Kuyania (Type in Sapporo Museum). Syn. by Townes et al., 1961.
1961. *Formocryptus bidentatus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**:120. n. comb., syn. India. Taiwan.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Taiwan.

145. *Formocryptus? khasianus* (Cameron)

1903. *Hemiteles khasianus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 44. M, des, Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1961. *Formocryptus? khasianus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**:121. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type male in Oxford Museum.

146. *Formocryptus? pulcherrimus* (Cameron)

1904. *Hemiteles pulcherrimus* Cameron, *Trans. Ent. Soc. London*, 1904 111. F. des, Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1961. *Formocryptus pulcherrimus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**:121. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills),

Remarks : This species is known by its type female in Oxford Museum.

16. Tribe MASTRINI

This tribe is represented by a single species under genus *Charitopes* Foerster.

68. Genus *Charitopes* Foerster

1869. *Charitopes* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25:181.

Type-species : (*Hemiteles chrysopae* Brischke) = *gastricus* Holmgren; included by Brischke, 1880.

147. *Charitopes densus* Townes

1983. *Charitopes densus* Townes, *Mem. Amer. ent. Inst.*, 35:65. M, F. key, des. Type; M, India: Himachal Pradesh: Kalpa Valley: Nichar, 2500 m.; (Type in Gupta collection). India : Himachal Pradesh: Dalhousie Hills; Ahla, 2286 m.; Dalhousie, 2132 m.; Kulu Valley: Manali, 1828 m.; Simla Hills : Narkanka, 2700 m. Kashmir: Ladakh: Batalik, 2743 m. Uttar Pradesh: Harsil, 2550 m.; Kopang, 2500 m.; Mussoorie, 2100 m. West Bengal: Jore Bungalow, Ghoom, 2352 m. Meghalaya: Shillong, 4800 m.

Diagnostic characters : Female : Third flageller segment 3.7x as long as wide, with about 10 sensilla. Mesopleurum weakly wrinkled, largely smooth. areola 0.9x as long as wide, receiving costula a little in front of middle, second tergite mat and third tergite polished, hairs on both sparse.

Body black. Scape and pedicel brown with under side, flagellum dark brown; abdominal tergites 2-7 pale brown.

Male : First flagellar 3.8x as long as wide, with dense sensilla. Tyloids absent. Mesopleurum largely polished. Areola 1x as long as wide receiving costula a little in front of middle. Tergites 2 and 3 moderately densely hairy.

Body black. Scape below, mandible, palpi, tegula, hind corner of pronotum, front and middle coxae, trochanters and hind trochanter, whitish; Pedicel brown, rest of front and middle legs pale yellow and tarsi towards apex brownish. Hind coxa and trochanter dark brown, whitish at apex; femur light yellow, its upper edge brownish; tibia brown pale at base, tarsus dark brown. Wings hyaline.

Distribution : India : Meghalaya (East Khasi Hills), Kashmir, Himachal Pradesh, Uttar Pradesh, West Bengal.

17. Tribe ROTHNEYIINI

This tribe is represented by a single species under genus *rothneyia* Cameron.

69. Genus *Rothneyia* Cameron

1897. *Rothneyia* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 41 (4) :.

Type-species : *Rothneyia wroughtoni* Cameron; monobasic.

148. *Rothneyia annulicornis* Cameron

1899. *Rothneyia annulicornis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 43 (3) : 207. F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

Diagnostic characters : Female : 8 mm long. Body black. Antennae 23 jointed, sixth to tenth joints white. Face coners with dense short pale hairs. Legs black tending to be dark brown.

Face strongly and closely, clypeus sparsely, mesoscutum closely, punctate; scutellum strongly longitudinally striato-punctate; mesospleurum above finely punctate; metapleurum finely striated. Areolet in fore wing narrowed above. Second and third abdominal tergites fused.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type female only.

16. Subfamily HEMIGASTERINAE

Key to the genera of subfamily Hemigasterinae

1. Upper valve of ovipositor tip with strong oblique or transverse teeth. Propodeum very short, its median apical area 0.65 to 0.75x as long as the areola plus median basal area. Lower tooth of mandible shorter than upper tooth. Propodeal spiracle elongate. 2
 Upper valve of ovipositor tip smooth, rarely with faint teeth along its dorsal edge. Propodeum usually longer, with its median apical area usually less than 0.65x as long as areola plus median basal area. Mandible more slender. Lower tooth of mandible as long as or longer than upper tooth; except in *Platymystax*. Propodeal spiracle circular to elongate. .3
2. Abdominal tergites 2 and 3 fused together to form a crapace- like structure. Second intercubital vein lacking. . *Hemigaster*
 Abdominal tergites 2 and 3 not fused; second intercubital vein present. (Notaulus absent. Temple narrow. Areola indistinct or not defined. *Mansa*
3. Lower tooth of mandible much shorter than upper tooth. (Arolet recieving second recurrent vein near its basal 0.4. Clypeus without a apical tooth). . *Platymystax*
 Lower tooth of mandible as long or longer than the upper tooth .4
4. Male .5
 Female . . .6
5. Flagellum slender, its second segment 2.7 to 4.0x as long as wide. clypeus about 2.1x as wide as long. Areolet quadrangular or pentagonal. (First tergite slender, about 3.5x as long as wide).. . *Javra*
 Not as above. (Median 0.2 and more of apical margin of clypeus sharp, usually narrowly reflexed. Areolet higher than wide). . . . *Aptesis*
6. Front side of areolet a little longer than mesal side; basel flageller segments elongate; tergite 2 and 3 usually mat. . . . *Javra*

- Front side of areolet shorter than mesal side; basal flagellar segments rather short; tergite 2-3 polished. *Aptesis*

70. Genus *Mansa* Tosquinet

1896. *Mansa* Tosquinet, *Mem.Soc.Ent. Belgique*, 5 : 209.

Type - species : *Mansa singularis* Tosquinet; Monobasic

Key to the Species of *Mansa*

1. Areolet in the fore wing not distinctly narrowed below, intercubiti straight. Body about 12 mm, ovipositor 2 mm. *tuberculata*
- Areolet in the fore wing narrowed below; intercubiti oblique .2
2. Hind tarsi not black at most only slightly annulated with black or with apical joints only black. 3
- .. 3
- Hind tarsi black .5
3. Wings dark violaceous; antennae blackish with dark fulvous band. Body 16 mm long in male only. .. . *fulgidipennis*
- Wings clear hyaline or yellowish hyaline, rarely with a fuscous spot behind stigma or at apex. .4
4. Antennae yellow or orange at base, scutellum narrowed at apex with gradual slope; wings without a dark spot. Body 12 mm long; ovipositor 4 mm. *fulvipennis*
- Antennae variously coloured with whitish band. (Apical half of wing infumate. Body 17 mm long. *pulchricornis*
5. Tibia black; body 12 mm long; male only *tibialis*
- Tibia at most black at apex; wings clear, not infumate apically; body 12 mm long, male only. .. *tarsalis*

149. *Mansa fulgidipennis* (Cameron)

1902. *Colganta fulgidepennis* Cameron, *Entomologist*, 35 : 22. M. des. in key. Type : M, India : Meghalaya : Khasi Hills (B.M.N.H.)

1961. *Mansa fulgidipennis* Townes, Townes & Gupta, *Mem.Amer. Ent. Inst.*, 1 : 134. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type male only from Khasi Hills in Meghalaya. There is no further record of this species from Meghalaya or elsewhere.

150. *Mansa fulvipennis* (Cameron)

1902. *Colganta fulvipennis* Cameron, *Entomologist*, 35; 22. F. des. in key. Type: F, India: Meghalaya : Khasi Hills (B.M.N.H.).

1961. *Mansa fulvipennis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.* 1 : 134. India.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim, West Bengal. Utter Pradesh.

Remarks : No material of this species was available from Meghalaya. This species is easily recognised by its yellowish-orange colour of body. Hind tarsus slightly annulated with black. Wings yellowish hyaline. Antennae deep yellow at base.

151. *Mansa pulchricornis* Tosquinet

1903. *Mansa pulchricornis* Tosquinet, (*Mem. Soc. Ent. Belgique*, 10 :266. M. F. des. Lectotype (designated by Townes, Townes & Gupta, 1961). F. Indinesia : Java: Mt. Gede, 4000 ft. (Brussels Mus.) India : Meghalaya ; Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills).

Elsewhere : Indonesia

Remarks : This species is very close to *M. fulvipennis*, but can be differentiated by having a white band on antennae and apical half of fore wing infumate.

152. *Mansa tarsalis* (Cameron)

1902. *Colganta tarsalis* Cameron, *Entomologist*, 35: 22. M. des. in key. Type : M, India : Meghalaya : Khasi Hills (B.M.N.H.)

1907. *Colganta latiscutis* Ann.& Mag. *Nat. Hist.* (7)20 : 26. (f).des. Type : F, India : Sikkim (Oxford Museum). Syn. by Cushman, 1937.

1961. *Mansa tarsalis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1: 136 .China. India, Hainan Is.

Distribution : India : Meghalaya (East Khasi hills), Sikkim, Utter Pradesh.

Elsewhere : China, Hainan Is.

Remarks : No material of this species was available for study. This species is recognised by having tibia black at apex, wings not infumate at apex.

153. *Mansa tibialis* (Cameron)

1902. *Colganta tibialis* Cameron, *Entomologist*, 35 : 22. M. des.in key. Type : M, India : Meghalaya : Khasi Hills (Oxford Museum).

1961. *Mansa tibialis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1 : 136. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type male only from Khasi Hills in Meghalaya. This species is recognised by having hind tibia and tarsus entirely black ; body about 12 mm long.

154. *Mansa tuberculata* (Cameron)

1902. *Colganta tuberculata* Cameron, *Entomologist*, 35: 22. (F)des.in key. Type : F, India : Meghalaya : Khasi Hills (B.M.N.H.).

1961. *Mansa tuberculata* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1: 136. India.

Distribution : India : Meghalaya (East Khasi Hills.)

Remarks : This species is known by its type female only from Khasi Hills in Meghalaya. This species is easily distinguished by having areolet in fore wing not distinctly narrowed below and intercubiti straight.

71. Genus *Hemigaster* Brulle

1846. *Hemigaster* Brulle, *In* Lapeletier : Histoire Naturelle des Insects. Hymenopteres, 4 : 266.

Type- species : *Hemigaster fasciata* Brulle ; designated by Viereck, 1914

Key to the species of *Hemigaster*

1.	Body black with various markings; coxae and antennal base, black	<i>fulvipes</i>
-	Body largely red	.2
2.	Hind tibia yellowish; apical 0.85 of hind femur black	<i>.carinifrons</i>
-	Hind tibia black; apical 0.15 of hind femur black	<i>.malayensis</i>

155. *Hemigaster carinifrons* Cameron

1899. *Hemigaster carinifrons* Cameron. *Mem. & Oroc. Manchester Lit. Phil. Soc.* 43 (3): 201. M.F. des. Lectotype (designated by Townes, Townes & G Gupta, 1961): M, India : Meghalaya : Khasi Hills (B.M.N.H.)

Distribution : India : Meghalaya (East Khasi Hills)

Remarks: This species is known by its type male and female from Meghalaya, in British Museum.

156. *Hemigaster fulvipes* (Cameron)

1899. *Chreusa fulvipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **43** (3): 210. F. des. Type : F, India: Meghalaya: Khasi Hills (Oxford Museum)
1903. *Charmis limbatus* Tosquinet, *Mem.Soc. Ent. Belgique*, **10**: 274.F,des. Type: F, Indonesia: Java: Mt. Gede (Brussels Museum).Syn. by Townes,Townes & Gupta, 1961.
1913. *Cryptodema anormis* Morley, *Fauna of British India, Hymenoptera*, **3**: 313.M.des.fig. Type :M, India: West Bengal : Buxar Duar (B.M.N.H.). Syn. by Townes & Gupta. *Mem. Amer. Ent. Inst.*,**1**: 133. India. Java.

Distribution: India : Meghalaya (East Khasi Hills), West Bengal.

Elsewhere : Indonesia.

157. *Hemigaster malayensis* Cushman

1899. *Chreusa lutea* Cameron, *mem & Proc. Manchester lit. Phil. Soc.*,**43** (3) : 212 F. Name Preocc. in *Hemigaster* by Brulle, 1846. des. Type : F, India: Meghalaya: Khasi Hills (Oxford Museum).
1922. *Hemigaster malayensis* Cushman, *Philippine J. Sci.*, **20**: 576. M, F. Key, des. Type : F, Singapore (U.S.N.M.). Syn. by Uchida, 1940.
1961. *Hemigaster malayensis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**: 133. India. Singapore.

Distribution : India: Meghalaya (East Khasi Hills).

Elsewhere : Singapore.

Remarks : This species is close to *H. carinifrons* Cam.in having body largely reddish, but can be distinguished by having hind tibia wholly and femur only narrowly at apex, black.

72. Genus *Platymystax* Townes

1970. *Platymystax* Townes, *Mem. Amer. Ent. Inst.*, **12** :122.
Type-species : *Giraudia rangunensis* Uchida; Original designation.

158. *Platymystax straitifrons* (Cameron)

1904. *Phgadeuon straitifrons* Cameron, *Trans. Ent. Soc. London*, 1904: 120. F. des. Type: F, India: Meghalaya: Khasi Hills (Oxford Museum).
1970. *Platymystax straitifrons* Townes, *Mem. Amer. Ent. Inst.*, **12**:122. n. comb.

Diagnostic characters : Female : Body 9 mm long. Black, palpi, tegulae, subtegular ridge, basal third and a mark in the center of the 1st abdominal segment, apical half of second segment and seventh and eighth segment wholly, white. Legs in general yellowish, coxae and trochanters white, except hind coxae black, yellowish on outer side, hind femora and tibiae dark brown, tarsi white, its basal two-thirds of 1st and last segment wholly, blackish. Scape and 8th to 13th antennal segments white.

Wings clear hyaline.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its female type in Oxford Museum.

73. Genus *Javra* Cameron

1903. *Javra* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 47.

Type-species : *Javra parviceps* Cameron; monobasic.

Key to the species of *Javra*

1. Orbit along the frons and vertex, yellow. Propodeum with two oblique white marks. Apices of all the abdominal segments, white. Metapleurum coarsely aciculated. *longicornis*
- Orbit along the frons and vertex, black. Propodeum black, without marks. Apices of first segment narrowly, second and third segments and eighth segment almost wholly, white (fourth and seventh segments, black). Metapleurum largely closely punctate *.parviceps*

159. *Javra? longicornis* Cameron

1903. *Javra longicornis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 49. M. des. Type : M, India : Meghalaya : Khasi Hills (Oxford Museum).

1961. *Javra? longicornis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, **1**:139. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study. This species is known by its type male from Khasi Hills, Meghalaya, in Oxford museum.

160. *Javra parviceps* Cameron

1903. *Javra parviceps* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 48. M. des. Type : M, India: Meghalaya : Khasi Hills (Oxford Museum).

1903. *Cnemocryptus validicornis* Cameron, *Mem. & Proc. manchester Lit. Phil. Soc.*, **47** (14) : 38. F. des. Type : F, India : Meghalaya : Khasi Hills (Oxford Museum). Syn. by Townes, Townes and Gupta, 1961.

Distribution : India : Meghalaya (East Khasi Hills).

74. Genus *Aptesis* Foerster

1850. *Aptesis* Foerster. *Arch. f. Naturgesch.*, **16** (1) : 71, 82.

Type-species : (*Ichneumon sudeticus* Gravenhorst) = nigrocinetus Gravenhorst; designated by Viereck, 1914.

Key to the species of *Aptesis*

1. Legs in general reddish; apex of hind tibia and tarsi wholly, black *.pallidinervis*
 Legs in general black with various markings .2
2. Antennae with 10-16 segments white. Abdomen with 0.25 of first segment, apical half of second and a mark in the center of third segment, reddish. *latiannulata*
 Antennae with 13-16 segments white. Abdomen with apices of first segment, second and third segments largely reddish. *.pulchripes*

161. *Aptesis? latiannulata* (Cameron)

1904. *Phygadeuon latiannulatum* Cameron, *Trans. Ent. Soc. London*, 1904 : 119. M. des. Type : M, India : Meghalaya : Khasi Hills (Oxford Museum).

1961. *Aptesis? latiannulata* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:138. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its male type only from Meghalaya.

162. *Aptesis? pallidinervis* (Cameron)

1904. *Phygadeuon pallidinervis* Cameron, *Trans. Ent. Soc. London*, 1904: 121. F. des. Type: F, India : Meghalaya : Khasi Hills (Oxford Museum).

1961. *Aptesis? pallidinervis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:138. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : The type female of this species was described from Khasi Hills in Meghalaya.

163. *Aptesis pulchripes* (Cameron)

1903. *Phygadeuon (!) Pulchripes* Camcron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 46. M. des., Type: M, India : Meghalaya : Khasi Hills (Oxford Museum).

1904. *Phygadeuon labiale* Camcron, *Trans. Ent. Soc. London*, 1904: 121. M. des. Type: M, India: Meghalaya Khasi Hills (Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.

1961. *Aptesis? pulchripes* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:138. n. comb., syn.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya.

17. Subfamily MESOSTENINAE

Key to the tribes of subfamily Mesosteninae

1. Mandible about 4.5x as long as its width at the middle, upper tooth much longer than lower tooth, the lower tooth sometimes indistinct; clypeus broadly truncate, without a median tooth or lobe. Tergite 1 slender. Tribe Nematopodini
Mandible 1.2 to 3.5x as long as its width in the middle, upper tooth not at all or a little longer than lower tooth. Tergite 1 various. .2
2. Wings shorter than thorax (Females only), apex of clypeus weakly convex; ovipositor reaching far beyond apex of abdomen. .Tribe Agrothereutini (some females of *Agrothereutes*)
- Wings of normal size, longer than thorax .3
3. Postpectal carina complete, or if there is an interruption in front of each middle coxa these gaps are narrower than the width of middle basitarsus. (Lower tooth of mandible equal to upper tooth or a little shorter. Nervellus a little basad of basal vein. Tribe Agrothereutini (in part)
- Postpectal carina incomplete, present only laterally or with a wide gap in front of each middle coxa. .4
4. Spiracle of tergite 1 at or close to the midlength, not behind apical 0.4. Tip of lower valve of ovipositor with a dorsal lobe that partly encloses tip of upper tooth Tribe Gabuniini
Spiracle of tergite 1 at or behind apical 0.47 of the tergite, or other characters not entirely as above .5
5. Upper valve of ovipositor tip with a series of teeth or transverse or oblique ridges, the ovipositor tip approximately cylindric; lower tooth of mandible distinctly shorter than the upper tooth. .Tribe Baryceratini
Upper valve of ovipositor tip without a series of teeth or transverse or oblique ridges, except in a few cases in which the ovipositor tip is strongly compressed. Mandible not as above .6
6. Apical 0.7 of mediella vein weakly to strongly arched 7
Apical 0.6 of mediella vein approximately straight. . . 11
7. Hind rim of metanotum without a small angular or tooth-like widening just laterad of each side of postscutellum, or sometimes with a very small, faint tooth or widening. Transverse furrow at base of propodeum very shallow to moderately deep. 8
Hind rim of metanotum with a small angular or tooth-like widening just laterad of each side of postscutellum.. 9

8. Propodeum with both apical and basal transverse carinae strong and complete, between the carinae with a median pair of longitudinal swellings. Tribe Coesulini

Propodeum not as above. (Areolet rectangular or some what trapezoidal, usually much wider than high, sometimes its outer side open, or rarely the areolet represented only by the very short first intercubitus which is approximately interstitial with second recurrent vein. Petiole with a basal lateral tooth. Notaulus extending beyond middle of mesoscutum. .Tribe Ceratocryptini

9. Areolet usually about 1.5 as wide as high, or areolet sometimes lacking and first intercubitus almost opposite second recurrent vein and almost obliterated by approximation of radius and cubitus. First tergite without median dorsal carinae or with traces of them (as in *Gotra*). Notaulus reaching to behind center of mesoscutum; thyridium nearly always wider than long. Tribe Mesostenini

Areolet less than 1.4x as wide as high. First tergite usually with at least a trace of the median dorsal carinae. Thyridium usually longer than wide. 10

10. Front side of hind coxa with a basal short horizontal groove. Mesopleural impression that is just below speculum in the form of a short horizontal groove. .Tribe Ischnini (in part)

- Front side of hind coxa without a basal short horizontal groove. Mesopleural impression is in the form of a pit, that may or may not be connected with mesopleural suture by a short horizontal groove. .. .Tribe Goryphini

11. Mesosternum with median portion of postpectal carina present, moderately long and straight, sternaulus 0.6 the distance to middle coxa, weakly up curved or almost straight ..
Tribe Agrothereutini

- Mesosternum without the median section of postpectal carina, or if present it is short and V-shaped, or like a tubercle in the center of the median longitudinal groove of mesosternum. sternaulus usually reaching almost or quite to middle coxa, and sinuate. Tribe Ischnini

18. Tribe GABUNINI

Key to the genera of Tribe Gabunini

1. Face just below antennal sockets with a median horn-like protuberance *Hadryptus*
Face without any protuberance .2
2. Fore wing with large areolet, about 0.65x as high as the length of second recurrent vein. Clypeus with a pair of weak tubercles along its apical margin. *Apocryptus*
Fore wing with small areolet, less than half as high as the second recurrent vein. Clypeus with a single median apical tooth. .3
3. Propodeum with pleural carina between basal transverse carina and the hind coxa. .4

Propodeum without pleural carina between basal transverse carina and the hind coxa .5

4. First tergite without subbasal lateral triangular tooth in female. Clypeus with a strong transverse ridge just below its centre, the ridge with a median transverse tubercle or pair of transverse teeth. Basal transverse carina of propodeum faint; apical transverse carina forming lateral crests. *Dinocryptus*

First tergite with subbasal lateral triangular tooth in female. Clypeus without a transverse post-median ridge. Basal transverse carina of propodeum always present and stout; apical transverse carina complete or incomplete, usually without sublateral crests. *Xoridesopus*

5. First tergite without subbasal triangular tooth. Clypeus with a strong transverse ridge near its apical 0.35. Sternaulus weak. *Torbda*

First tergite with a subbasal triangular tooth. Clypeus without a transverse ridge. Sternaulus moderately strong. . . 6

6. Nervellus intercepted above the middle; axillus vein of hind wing not bent apically; notaulus shallow. *Arhytis*

Nervellus intercepted below the middle; axillus vein straight; notaulus distinct. (Sternaulus extending 0.5 the length of mesopleurum. Arcolet large, with second recurrent vein received near its apical corner). *Dagthia*

75. Genus *Apocryptus* Uchida

1932. *Apocryptus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, 33:170.

Type-species : *Apocryptus issiki* Uchida

Key to the species of *Apocryptus*

1. Apical transverse carina of propodeum completely absent, with faint crests; prepectal carina reaching the base of subtegular ridge; first tergite sparsely to shallowly punctate in the middle. Thorax and propodeum brownish on sides. Scutellum and metascutellum yellow; face with two black lines. . . *tikari*

Apical transverse carina of propodeum complete or absent in the middle. Thorax colour various .2

2. Apical transverse carina of propodeum absent medially. Prepectal carina 0.75 the height of mesopleurum. Mesopleurum wholly black. First abdominal tergite smooth and shiny *plumbeus*

Apical transverse carina of propodeum present in the middle, or sometimes interrupted submedially. .3

3. Speculum on mesopleurum always completely black; apical transverse carina of propodeum transverse dorsally in the middle and arched at sides. 4

Speculum on mesopleurum yellow in the middle; apical transverse carina of propodeum evenly arched dorsally and abruptly sloping on sides. 5

4. Face rugulose, convex in the middle; mesopleurum striate in front of speculum. Propodeum basad of basal carina minutely sparsely granulose. Mesopleurum black. .*laevifrons*

Face faintly punctate, weakly convex in the middle; mesopleurum not striate in front of speculum. Propodeum basad of basal carina more polished and shiny. Mesopleurum with a oblong yellow mark. .*nitidus*

5. Fourth to sixth abdominal tergites completely black. Malar space, temple below, mandible and clypeus at apex, black. Teeth on ovipositor tip in two distinct groups. .*biserratus*

Fourth to sixth abdominal tergites either with usual yellow bands, or bands narrow and faint. Malar space, temple, mandible and clypeus, yellow. Upper margin of pronotum yellow; nervellus intercepted near its lower 0.4. Body largely smooth and shiny. .*fusciventris*

164. *Apocryptus biserratus* Gupta & Gupta

1983. *Apocryptus biserratus* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:27. M, F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Shillong, Botanical Garden, 1465 m. (Type in Gupta collection). India : West Bengal : Darjeeling. Sikkim: Gangtok, 1675 m.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, Botanical Garden, 1465 m, 1 female, 1 male (Types), 1.iv. 1968, J.K. Jonathan and M.K. Kamath; Cherrapunjee, 1360 m, 1 female, 5.iv. 1966, M.K. Kamath, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, West Bengal.

Remarks : This species is distinguished by having the fourth to sixth abdominal tergites wholly black. The malar space 0.9 the basal width of mandible, prepectal carina extended up to the base of subtegular ridge; teeth on ovipositor in two groups.

165. *Apocryptus fusciventris* (Cameron)

1903. *Etha fusciventris* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 22, F. des, Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1904. *Etha khasiana* Cameron, *Trans. Ent. Soc. London*, 1904:103. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.

1983. *Apocryptus fusciventris* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:28. M, F. key, des. India: Meghalaya: Khasi Hills: Cherrapunji, 1360 m. Sikkim: Gangtok, 1700 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1360 m, 1 male, 1 female, 3-7.iv. 1966, D.T. Tikar, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : This species can be identified by having fourth to sixth tergites with apical bands, nervellus intercepted near its lower 0.4 and body largely smooth and shiny.

166. *Apocryptus laevifrons* (Cameron)

1903. *Etha laevifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14): 20. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1983. *Apocryptus laevifrons* Gupta & Gupta, *Oriental Ins. Monogr.*, **10**:24. F. key, des., fig. India: Sikkim: Gangtok, 1975 m.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : This species is close to *A. nitidus* in having the apical transverse carina of propodeum complete and straight in the middle. It can be easily recognised by the characters given in the key.

167. *Apocryptus nitidus* Gupta & Gupta

1983. *Apocryptus nitidus* Gupta & Gupta, *Oriental Ins. Monogr.* **10**:25. M, F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills; Cherrapunji, 1360 m. (Type in Gupta collection).

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1 female (Type), 3.v. 1966, D. Ram; 1 male, 6.iv. 1966, J.K. Jonathan.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is close to *A. laevifrons* (Cameron), however, it differs in having mesopleurum striate in front of speculum and mesopleurum black.

168. *Apocryptus plumbeus* (Cameron)

1903. *Etha plumbea* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, **47** (14) : 21. M. des. Type : M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1983. *Apocryptus plumbeus* : Gupta & Gupta, *Oriental Ins. Monogr.*, **10**:21. M, F. key, des. India: Meghalaya: Khasi Hills: Cherrapunji, 1360 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1 female, 2 males, 3-5.iv. 1966, D. Ram and M.K. Kamath.

Distribution : India : Meghalaya (East Khasi Hills).

169. *Apocryptus tikari* Gupta & Gupta

1983. *Apocryptus tikari* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:20. F. key des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1360 m. (Type in Gupta collection).

Material examined : India : Meghalaya: East Khasi Hills: Cherrapunjee, 1366 m, 1 female (Type), 6.iv. 1966. D.T. Tikar.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This is a very distinct species by having apical carina of propodeum entirely absent; prepectal carina reaching the base of subtegular ridge. Thorax and propodeum brownish at sides.

76. Genus *Dinocryptus* Cameron

1905. *Dinocryptus* Cameron, *J. Straits Branch Roy Asiatic Soc.*, 44:146.

Type-species : *Dinocryptus niger* Cameron; monobasic

Key to the species of *Dinocryptus*

1. Abdomen black with yellow stripes. First tergite black. except apically and basally yellow. Hind coxa black with yellow spots. Hind femur black. Propodeum rugoso-reticulate centrally. Basal transverse carina of propodeum complete. . *femoratus*

Abdomen brownish with black stripes or blackish in the middle. First tergite usually brown with a small blackish spot in the middle. Hind coxa brown or with a small blackish spot. Hind femur brownish-yellow. Propodeum variously sculptured. Basal transverse carina present or absent. .2

2. Face smooth in the middle; nervellus intercepted at its upper 0.37. Abdominal tergites 4-8 wholly black; first to third tergites brownish with basal black mark on second and third tergites; abdomen beyond third tergite black. . . *apicalis*

Face trans-rugose in the middle; nervellus intercepted at its middle; abdominal tergites first to third and sixth at bases black, rest brown. (Apical tergite with a small triangular depression in the middle. . . . *fulgidipennis*

170. *Dinocryptus apicalis* (Cameron)

1902. *Torbda apicalis* Cameron, *entomologist*, 35:19. F. key, des. Lectotype (designated by townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1983. *Dinocryptus apicalis* : Gupta & Gupta, *Oriental Ins. Monogr.*, 10:66. F. key, des., fig. India: Meghalaya: Khasi Hills: Cherrapunji, 1360 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1 female, 4.iv. 1966, D. Ram, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is very close to *D. fulgidipennis* Cameron, but differs in having the face largely smooth medially, nervellus intercepted at its upper 0.37 and abdomen beyond third tergite, black.

171. *Dinocryptus femoratus* (Cameron)

1902. *Torbda femorata* Cameron, *Entomologist*, 35:20. M. key, des. Lectotype: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1983. *Dinocryptus femoratus* Gupta & Gupta, *oriental Ins. Monogr*, 10:61. M, F. key, des., fig. Indonesia : Sumatra: Sungei Kumbang, Korinchi, 1372 m. India: Meghalaya: Khasi Hills.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Indonesia.

Remarks : This species is identified by its largely black abdomen, with its first to sixth tergites narrowly at apex and seventh and eighth broadly, yellow.

172. *Dinocryptus fulgidipennis* (Cameron)

1902. *Torbada fulgidipennis* Cameron, *Entomologist*, 35:19. F. key, des, Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1983. *Dinocryptus fulgidipennis* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:70. F. key, des. India: Meghalaya: Khasi Hills.

Distribution : India: Meghalaya: East Khasi Hills.

Remarks : This species is very close to *D. apicalis* (Cameron), but can be identified by the characters given in the key.

77. Genus *Xoridesopus* Cameron

1907. *Xoridesopus* Cameron, *J. Straits Branch Roy. Asiat. Soc.*, 48:18.
Type-species: *xoridesopus annulicornis* Cameron; monobasic.

Key to the species of *Xoridesopus*

1. Lateral carina of scutellum marked yellow; scutellum usually flat, densely punctate, punctures running into striations; clypeus with post-median transverse ridge.. 2
- Lateral carina of scutellum black; scutellum roundish, smooth or shallowly punctate, puncture not running in. 3
2. Face, upper margin of pronotum, and base of propodeum without any yellow mark. Speculum partly yellow. propodeum apically striate. *xanthosema*

Face with two sublateral longitudinal black or brownish lines; pronotum narrowly yellow along its upper margin; base of propodeum with two lateral yellow marks; speculum wholly yellow. Propodeum apically rugose. *.flavispeculum*

3. Speculum on mesopleurum black. (Face wholly yellow; mesopleurum without any yellow line or spot below sternaulus). *.orientalis*

Speculum on mesopleurum black, marked with yellow. (Thorax normal in shape; metapleurum striate below; upper margin of pronotum moderately strongly punctate). *.kamathi*

173. *Xoridesopus flavispeculum* Gupta & Gupta

1983. *Xoridesopus flavispeculum* Gupta & Gupta. *Oriental Ins. Monogr.*, 10:94. F. key, des., fig. Type: F, India: West Bengal: Darjeeling, 1980 m. (Type in Gupta collection). India: West Bengal: Darjeeling Botanical Gardens, 1980 m.; Rangiroon, 1910 m. Meghalaya: Cherrapunji, Sikkim: Gangtok. Uttar Pradesh: Garhwal Hills: Phata, 1590 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 4 females, iv. 1966, M.K. Kamath, J.K. Jonathan, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, Uttar Pradesh, West Bengal.

Remarks : This species is close to *X. xanthosema*, but differs in having facial and propodeal yellow marks.

174. *Xoridesopus kamathi* Gupta & Gupta

1983. *Xoridesopus kamathi* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:125. M, F. key, des. Type: F, India: Assam: Rangapara: Charduar Forest (Type in Gupta collection). India: Meghalaya: Jaintia Hills: Dawki. Uttar Pradesh: Dehradun. Sikkim: Gangtok, 1670 m.

Material examined : India : Meghalaya : Jaintia Hills: dawki, 2 females, 11-12.iv. 1966, M. K. Kamath and D. Ram.

Distribution : India : Meghalaya (Jaintia Hills), Assam, Sikkim, Uttar Pradesh.

Remarks : This species is close to *X. orientalis*, but differs in having speculum black, marked with yellow.

175. *Xoridesopus orientalis* Gupta & Gupta

1983. *Xoridesopus orientalis* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:114. M, F. key, des., fig. Type: F, India: Uttar Pradesh: Garjia (Type in Gupta collection). India: West Bengal: Tista-Kalimpong route. Assam: Rangapara, Charduar Forest. Meghalaya: Khasi Hills: Burnihat; Shillong Botanical Garden, 4800 ft. Kerala: Walayar Forest: Watapara. Karnataka: Mysore: Santaverri; Ammathiam, 945 m. Tamil Nadu: Shevaroy Hills: Yercaud, 1370 m. Burma: Mt. Popa, 600-1000 ft. Philippines: Mindoro : Calapan : San Luis.

Material examined : India : Meghalaya : East Khasi Hills : Shillong, Botanical Garden, 1 female, 22.iii. 1966, M.K. Kamath; Burnihat, 1 female, v. 1962, CIBC, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Karnataka, Kerala, Tamil Nadu, Uttar Pradesh. Elsewhere : Burma, Philippines.

176. *Xoridesopus xanthosema* Gupta & Gupta

1983. *Xoridesopus xanthosema* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:93. F. key, des., fig. Type: F, India: Meghalaya: Cherrapunji, 1365 m. (Type in Gupta collection). Burma: Mt. Popa, 600-1000 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1365 m, 1 female, 7.iv. 1966, J.K. Jonathan, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Burma.

Remarks : This species is close to *X. flavispeculum*, but differs in having speculum partly, yellow; face and propodeum black.

78. Genus *Hadrocryptus* Cameron

1903. *Hadrocryptus* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 11.
Type-species : (*Hadrocryptus nasutus* Cameron) = *H. ditissimus* (Tosquinet); monobasic.

This genus is represented by a single species in Meghalaya.

177. *Hadrocryptus ditissimus* (Tosquinet)

1903. *Echthrus ditissimus* Tosquinet, *Mem. Soc. Ent. Belgique*, 10:252. F. des. Type: F, Indonesia: Java: Mt. Gede, 4000 ft. (Type in Brussels Museum). Indonesia :Java :Sukabumi, 2000 ft. Sulawesi: Tolitoli, 4000ft.

1903. *Hadrocryptus nasutus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 12. "F" = M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Gupta & Gupta, 1983.

1907. *Hadrocryptus tuberculatus* Cameron, *Entomologist*, 40 : 5. F. des. Type: F, Bhutan: Buxa (Type in British Museum). Syn. by Gupta & Gupta, 1983.

1907. *Hadrocryptus dentatus* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, 48:21. F. des. Type: F, Malaysia: Sarawak: Kuching, (Type in British Museum). Syn. by Gupta & Gupta, 1983.

1983. *Hadrocryptus ditissimus* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:129. M, F. key, syn., des., fig. India: Meghalaya: Khasi Hills. Nagaland: Naga Hills. Bhutan: Buxa. Indonesia: Java: Mt. Gede, 1220 m.; Sukabumi, 600 m.; Praenger Residency: Mr. Djampang Tengah; Mt. Malang, 3000-4000 ft. Malaysia: Sarawak: Muching.

Diagnostic characters : Female 10-14.5 mm. Black, except antennal segments 5-11, face, clypeus, mandible, temple and frons along the eye margin, two marks on pronotum, two spots on middle lobe of mesoscutum at base and one at apex, scutellum and its lateral carina, metascutellum,

tegula, subtegular ridge, mesopleurum with an elongated mark, metapleurum above, a T-shaped mark on propodeum, apices of all the tergites, fore and middle legs, yellow. Fore and middle femora and tibiae with brownish dorsal lines and their tarsi brown. Hind coxa black, with a yellow mark dorsally and ventrally; hind trochanter dark brown; femur and tibia yellowish-brown, tarsus yellow, its fifth segment blackish.

Distribution : India : Meghalaya (East Khasi Hills), Arunachal Pradesh, Sikkim. Elsewhere : Bhutan, Indonesia, Malaysia.

79. Genus *Arhytis* Townes

1970. *Arhytis* Townes, *Mem. Amer. Ent. Inst.*, 12:335.

Type-species: *Echthrus maculiscutis* Cameron, monobasic.

This genus is represented by a single species in Meghalaya

178. *Arhytis maculiscutis* (Cameron)

1907. *Echthrus maculiscutis* Cameron, *Tijdschr. v. Ent.*, 50:94. F. des. Type: F, India: Sikkim (Type in British Museum).

1983. *Arhytis maculiscutis* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:170. M, F. key, des., fig. India: Himachal Pradesh: Palampur, 1220 m. Uttar Pradesh: Garjia, 610 m.; Dehradun: New Forest. Sikkim. Maharashtra: Bombay; Chikalda, 1070 m. Tamil Nadu: Coimbatore. Karnataka: Anmod. Philippines. Burma.

Diagnostic characters : Female : 12-14 mm. Black. Antennal segments 6-15 white. The following are yellow; face, pronotal collar, upper margin of pronotum, two oval marks on base and one at the apex of mesoscutum, scutellum, its lateral carina, metascutellum, tegula, subtegular ridge, speculum, two irregular spots on mesopleurum, mesosternum largely, metapleurum, propodeum with two marks laterally, another trilobate mark at the apical slope and apices of all the abdominal tergites, yellow or dark yellow; legs yellow with fore coxa black at base, a mark on tibia and fifth tarsal segment wholly dark brown; a narrow elongate mark on coxa of hind leg, its trochanter with two marks above, extreme apex of femur, base and apex of tibia and tarsus, black.

Material examined : India : Meghalaya: East Khasi Hills: Shillong, 1460 m, 1 female, 30.iii. 1966. D. Ram, coll. No. T159 in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills). Assam, Bihar, Himachal Pradesh, Karnataka, Maharashtra, Sikkim, Tamil Nadu, Uttar Pradesh. Elsewhere: Burma, Philippines.

80. Genus *Dagathia* Cameron

1903. *Dagathia* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47(14):29.

Type-species : *Dagathia Brunnea* Cameron; monobasic.

This genus is represented by a single species in Meghalaya

179. *Dagathia brunnae* Cameron

1903. *Dagathia Brunnea* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 29. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1970. *Dagathia brunnea* Gupta & Jonathan. *Oriental Ins.*, 3:391. des., fig.

Diagnostic characters : Face rough. Vertex closely rugose. Propodeum basad of basal carina rugoso-punctate. Thorax dark rufous. Upper margin of pronotal collar, base of hind wing, and speculum, wholly yellow. Hind coxa, femur, and tarsus black. Abdomen brown except for the apex of the first tergite (Gupta and Gupta, 1983).

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type female in Oxford University museum.

81. Genus *Torbda* Cameron

1902. *Torbda* Cameron, *Entomologist*, 35:18.

Type-species : *Torbda geniculata* Cameron; designated by Morley, 1913.

Key to the species of *Torbda*

1. Apical transverse carina of propodeum almost absent. Pronotal shoulders highly projecting. Propodeum without any mark along the basal margin. .2
- Apical transverse carina present. Pronotal shoulders not projecting. Propodeum with one or two basal marks. .3
2. First tergite smooth and with sparse punctures laterally. Hind coxa largely black. Wings yellowish-brown; mesopleurum with an oval mark; propodeum with an elongate mark; orbital yellow mark complete. *.violaceipennis*
- First tergite strongly punctate. Hind coxa yellow marked. Wings hyaline; propodeum with a broad mark in the middle and reaching up to the basal transverse carina; orbital mark interrupted above on vertex. *.geniculata*
3. Body reddish-brown, with pale markings. Frons smooth and shiny. Vertex finely and sparsely punctate, on transverse furrow separating the two. Apices of all tergites yellow. Pronotum smooth and shiny. *.nigromaculata*
- Body black. (Face shiny, with minute sparse punctures. Hind femur and tibia wholly orange, except for a brown mark at base of tibia. Fore wing with fuscous marks. *maculipennis*

180. *Torbda geniculata* Cameron

1902. *Torbda geniculata* Cameron, *Entomologist*, 35:19. (F). key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type of Oxford Museum).

1983. *Torbda geniculata* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:198. F. key, des., fig. India: Meghalaya: Khasi Hills: Sikkim. Assam: Rangapara: Charduar Forest. China, Laos.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Sikkim. Elsewhere: China.

Remarks : It is a highly variable species. Gupta and Gupta (1983) gave a detailed description of this species.

181. *Torbda maculipennis* Cameron

1902. *Torbda maculipennis* Cameron, *Entomologist*, 35:20. F. key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills. Sikkim. Burma: Gwethe Res.: North Toungoo; Mt. Popa, 600-1000 m.; Mt. Victoria, 1400 m.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim. Elsewhere: Burma.

Remarks : This species is very close to *T. maculiceps* (Cameron) from Indonesia and Malaysia, but can be distinguished by the characters given in the key. This species is mainly known by its types in British and Oxford Museum.

182. *Torbda nigromaculata* (Cameron)

1907. *Miophatnus nigromaculatus* Cameron, *Tijdschr. v. Ent.*, 50:105. M. des. Type: M, India: Sikkim (Type in British Museum).
1983. *Torbda nigromaculata* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:214. M. key, des., fig. India: Assam: Charduar Forest. Meghalaya: Jaintia Hills. Kerala: Walayar Forest. Burma: Mt. Victoria, 500 m.

Material examined : India : Meghalaya : Jaintia Hills, 1 male 12.iv. 1966, J.K. Jonathan; 1 male, 13.iv. 1966, D.T. Tikar, in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Kerala, Sikkim. Elsewhere: Burma.

183. *Torbda violaceipennis* Cameron

1902. *Torbda violaceipennis* Cameron, *Entomologist*, 35:20. F. key, des. Lectotype (designated by Gupta & Gupta, 1983): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1983. *Torbda violaceipennis* Gupta & Gupta, *Oriental Ins. Monogr.*, 10:202. F. lectotype design., key, des. India: Meghalaya: Khasi Hills.

Distribution : India : Meghalaya : East Khasi Hills.

Remarks : This is known by two type specimens, one in British another in Oxford University Museum. This species is very close to *T. geniculata* Cameron, but differs in having first tergite smooth; hind coxa black, wings yellowish-brown; mesopleurum with an oval mark.

19. Tribe AGROTHEREUTINI

Key to the Genera of Tribe Agrothereutini

1. Mesoscutum broad, rather weakly convex; notaulus short or absent; first abdominal segment elongated; head and thorax black and abdomen mostly reddish. (Prepectal carina extending up to subtegular ridge; epomia weak or absent . *Idiolispa*
- Mesoscutum narrow, strongly convex polished with strong punctures; notaulus extending beyond middle of mesoscutum. (Median portion of apical transverse carina of propodeum usually absent, carina strongly turned forward). *Agrothereutes*

82. Genus *Agrothereutes* Foerster

1850. *Agrothereutes* Foerster, *Arch. f. Naturgesch.*, 16 (1) : 71.

Type-species : (*Pezomachus abbreviator* Gravenhorst) = *abbreviator* Fabricius; designated by Viereck, 1914.

Key to the species of *Agrothereutes*

1. Base of tegulae yellow; legs in general reddish; postpetiole reddish at apex, second and third tergites black with reddish apical band, last segment entirely black. Frons without a median longitudinal carina. Propodeum in the middle trans-rugose and strongly rugose at apex. *. pilosus*
- Base of tegulae black; legs in general black; postpetiole black, yellow at apex, second and third tergites black with yellow apical bands, last segment largely white. Frons with a median longitudinal carina. Propodeum at base closely punctate, rest rugoso-punctate. *rugofemoratus*

184. *Agrothereutes pilosus* (Cameron)

1902. *Dayro pilosus* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9:210 M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Agrothereutes pilosus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:143. n. comb. India.

Distribution : India : Meghalaya.

Remarks : This species is based on a single male from Khasi Hills.

185. *Agrothereutes rufofemoratus* (Cameron)

1903. *Etha rufo-femorata* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47 (14) 28. M. des. Types: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Agrothereutes rufofemoratus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:143. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by a single male type, in Oxford Museum, from Khasi Hills in Meghalaya.

83. Genus *Idiolispa* Foerster

1869. *Idiolispa* Foerster, *Verh. Naurh. Ver. Rheinlande*, 25 : 188.

Type-species ; *Bassus analis* Gravenhorst; designated by Viereck, 1914 from two species included by Tschek, 1870.

186. *Idiolispa analis* (Gravenhorst)

1807. *Bassus analis* Gravenhorst, *Vergleichende Uebersicht des. Linneische und Einiger Neuern Zoologischen Systeme*, p. 266. (F). des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, From Europe but without data (Type in Wroclaw Museum).

1961. *Idiolispa analis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:166. Europe. India.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere: Europe.

Remarks : No material and detailed description was available for study.

20. Tribe ISCHNINI

Key to the genera of tribe Ischnini

1. Axillus vein weakly to strongly diverging from anal margin of hind wing, either distant from the anal margin and or its tip slanted away from margin. (Base of first tergite with a lateral triangular tooth; notauli almost absent except for a remanant). . *Neodontocryptus*
- Axillus vein parallel to anal margin of hind wing, or close to the margin and its tip straight or curved towards the margin. . 2
2. Base of first tergite with a lateral tooth that is sharp or at least from dorsal view it is angular or sharply rounded, the tooth more distinct in female than in males. .3
- Base of first tergite without a lateral tooth, but often with a rounded flange at base .4
3. Front side of areolet longer than outside, intercubiti subparallel (Median section of postpectal carina very short. Face with a strong median tubercle. *Etha*
- Front side of areolet shorter than outer side, intercubiti convergent. Mesoscutum entirely mat and rather densely punctate. . *Ischnus*
4. Propodeal spiracle circular or short elliptic. Subapical 0.6 of mediella weakly arched. Hairs on second tergite of female rather dense. (Clypeus moderately convex, with a median tooth. Ovipositor tip elongate sagittate, without distinct nodus). . *Nippocryptus*

- Propodeal spiracle short elliptic to elongate. Subapical 0.6 of mediella straight or almost so. Hairs on second tergite of female rather dense to very dense. 5
- 5. Frons with a pit dorsolateral of each antennal socket. Second recurrent vein simply arched. Basal carina of propodeum weak or absent. *Buathra*
- Frons without a pit; second recurrent vein simply arched or more or less distinctly sinuate. (Petiole of first segment of abdomen terete, without longitudinal carinae. Front side of areolet quite narrow. *Hedycryptus*

84. Genus *Etha* Cameron

1903. *Etha* Cameron, *Mem & Proc. Manchester Lit. Phil. Soc.*, 47(14):17.
Type-species : *Etha striatifrons* Cameron; designated by Viereck, 1914.

187. *Etha striatifrons* Cameron

1903. *Etha striatifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47(14): 18. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1961. *Etha striatifrons* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:167. India.

Diagnostic characters : *Female* : 13 mm long. Body black in general. The following are yellow: Antennae with scape in front, 6-10 flageller segments above, face, clypeus, frons along the eye margin, temple at the basal half, mandible except the tip, pronotal collar above, upper margin of pronotum, tegula, subtegular ridge, scutellum, metascutellum, metapleurum just above the middle coxa, propodeum between apophyses and at apex, this mark may be extended backward, all the abdominal tergites narrowly, and abdomen ventrally. Legs with four anterior coxae and trochanters light yellow, their femora, tibiae and tarsi deep yellow or yellowish-brown. Hind leg largely brownish-yellow, except coxa, trochanter and femur above with a line dark brown, tibia broadly at apex dark brown, tarsus whitish, its fifth segment brown; leg colour variable. Wings yellowish hyaline.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Java.

Remarks : No material of this species was available for study from Meghalaya.

85. Genus *Ischnus* Gravenhorst

1829. *Ischnus* Gravenhorst, *Ichneumonologia Europaea*, 1:638.
Type-species : (*Ichneumon porrectorius* Fabricius) = *inquisitorius* Mueller; designated by Westwood, 1840.

Key to the species of *Ischnus*

- 1. Face black with a median U-shaped yellow mark. Frons strongly wrinkled with a strong median carina. Propodeum with a bow-shaped mark. Ovipositor tip long 9x as long as wide at nodus .. *striatifrons*

Face entirely yellow. Frons rugose without median carina. Propodeum with a trilobate mark. Ovipositor tip short-about 5.5x as long as wide at nodus. (Nervellus intercepted at its lower 0.45; postpetiole about 1.6x as long as wide). *curvimaculatus*

188. *Ischnus curvimaculatus* (Cameron)

1903. *Aglaocryptus curvimaculatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 31. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Ischnus curvimaculatus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:163. n. comb. India.

Material examined : India : Meghalaya : East Khasi Hills. Shillong, Botanical Gardens, 19 females, 27-28.iii. 1966. colls. J.K Jonathan, D.T. Tikar, D. Ram, colln. Noc. J124, T171-175.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species can be easily recognised by the characters given in the key.

189. *Ischnus striatifrons* (Cameron)

1903. *Aglaocryptus striatifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 33. F, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Ischnus striatifrons* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:163. n. comb. India.

Material examined : India : Meghalaya : East Khasi Hills, Type female of *Aglaocryptus striatifrons* Cameron. Cherrapunjee, 13 females, 3-7.iv. 1966, colls. J.K. Jonathan, D.T. Tikar, M.K. Kamath, D. Ram, Nos. T167-175, J12, K75-76.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh.

Remarks : This species was transferred to genus *Nippocryptus* Uchida by Townes (1970-191), but on examination of the type specimen it was found to belong to genus *Ischnus*.

86. Genus *Nippocryptus* Uchida

1936. *Nippocryptus* Uchida, *Insecta Matsumurana*, 11:3.

Type-species : (*Hemiteles suzukii* Matsumura) = *vittatorius* Jurine; original designation.

190. *Nippocryptus missippus* (Cameron)

1904. *Mesostenus missippus* Cameron, *Trans. Ent. Soc. London*, 1904: 114. F, des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1970. *Nippocryptus missippus* Townes, *Mem. Amer. Ent. Inst.*, 12:191. n. comb.

Diagnostic characters : Female : 10 mm long. Body black. 5-11 flagellar segments white above. Yellow are : Scape in front, face with a triangular mark above, clypeus, orbital mark all along the eye margin, pronotal collar, upper margin of pronotum, an oval mark at the apex of middle lobe of

mesoscutum, a small mark each on lateral lobes near to tegula, scutellum, metascutellum subtegular ridge, speculum, an elongate transverse mark along the sterna, a narrow elongate mark on metapleurum, apical carina of propodeum and apices of all the abdominal tergites. Legs in general reddish-brown, except fore and middle coxae and trochanters yellow with black markings, their tarsi brown. Hind coxa black with an oval mark above and an oval mark apico-ventrally, yellow; first trochanteral segment black, tarsus white, its basal 0.4 of first segment and fifth segment wholly dark brown. Wings clear hyaline.

Male : 9.5 mm long essentially similar to female.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1273 m, 1 female (Homotype), 6.iv. 1966, D.T. Tikar; 4 females, same data as above, 8-7.iv.1977, colls. J.K. Jonathan, D.T. Tikar, No. J. 121-125, T127.

Distribution : India : Meghalaya (East Khasi Hills), West Bengal.

87. Genus *Buathra* Cameron

1903. *Buathra* Cameron, *Trans. Ent. Soc. London.*, 1903:233.

Type-species : *Buathra rufiventris* Cameron; monobasic.

191. *Buathra rufiventris* Cameron

1903. *Buathra rufiventris* Cameron, *Trans. Ent. Soc. London*, 1903. 234. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1970. *Buathra rufiventris* Townes, 1970. *Mem. Amer. Ent. Inst.*, 12:193. rev. status.

Diagnostic characters : Female: 16 mm long. Black. The following are yellow: Orbit all along the margin except above, clypeus, mandible, tegula along the outer margin, subtegular ridge, second to fourth hind tarsal segments. First abdominal tergite apically and all the following tergites, and all legs in general, bright red, except coxae and trochanters largely black. Head and thorax covered with fine silvery hair.

Male : 14 mm long. Essentially similar to female.

Material examined : No material of this species was available from Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Uttar Pradesh.

88. Genus *Hedycryptus* Cameron

1903. *Hedycryptus* Cameron, *Ztschr. System. Hymen. Dipt.*, 3:298.

Type-species : (*Hedycryptus filicornis* Cameron) = *Orientalis* Cameron; monobasic.

Key to the species of *Hedycryptus*

1. Abdomen reddish or red, except its first or basal two segments black . . . *orientalis*

- Abdomen largely black, with first segment red or black and following tergites black with yellow apical bands. Legs in general red. *rufopetiolatus*

192. *Hedycryptus orientalis* (Cameron)

1897. *Cryptus orientalis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 41 (4): 16. F. des. Type: F, India: Uttar Pradesh Mussoorie (Type in Oxford Museum).
1904. *Cryptus himalayensis* Cameron, *Trans. Ent. Soc. London*, 1904: 106. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum) Syn. with *filicornis* by Morley, 1914.

Distribution : India : Meghalaya (East Khasi Hills), Himachal Pradesh, Sikkim and Uttar Pradesh.

193. *Hedycryptus rufopetiolatus* (Cameron)

1904. *Cryptus rufopetiolatus* Cameron, *Trans. Ent. Soc. London*, 1904: 105. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1971. *Hedycryptus rufopetiolatus* Townes, *Mem. Amer. Ent. Inst.*, 17:240. n. comb.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Uttar Pradesh. Elsewhere : Burma, Indonesia, Taiwan.

89. Genus *Neodontocryptus* Uchida

1932. *Odontocryptus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.*, 33:187. Name preocc. by Saussure, 1890, by Cameron, 1903, and by Szepligeti, 1916.
Type-species : *Odontocryptus brilliantus* Uchida; Original designation.
1940. *Neodontocryptus* Uchida, *Insecta Matsumurana*, 14:122. New Name.

194. *Neodontocryptus brilliantus* (Uchida)

1932. *Odontocryptus brilliantus* Uchida, *J. Fac. Agri. Hokkaido Imp. Univ.* 33:186. F. des., fig. Type: F, Taiwan: Shuisheliao (=Suisharyo) (Type in Eberswalde Museum).
1940. *Neodontocryptus Brilliantus* Uchida, *Insecta Matsumurana* 14:122. Syn.
1961. *Neodontocryptus brilliantus* : Townes , *Mem. Amer. Ent. Inst.*, 1:166. Syn.

Diagnostic characters : Male : 13 mm long. Body shiny, metallic blue in colour, wings brown, hyaline.

Body in general with moderately strong and close punctures, except face rough and rugose in the middle; frons shallow; vertex and temple more or less smooth and shiny; lateral carina of scutellum not extending beyond basal 0.3; metascutellum in the form of two lateral tubercles, juxtacoxal carina strong; propodeum at sides appear to be reticulate, apicad of apical carina reticulo-wrinkled and with a

median longitudinal carina, apophyses strong, below the apophyses also present an additional pair of strong tubercles. Ventrally with a flange-like tooth below spiracle. Seventh abdominal tergite at apex with a fringe of thick bristles.

Female : Body structure similar to male.

Material examined : India : Meghalaya : West Garo Hills : Tura, 1000-115 m, 15.vii-30.viii. 1917, coll. S. Kemp.

Distribution : India : Meghalaya (West Garo Hills). Elsewhere: China, Taiwan.

Remarks : This is the first record of this species from Meghalaya.

21. Tribe BARYCERATINI

Key to the Genera of Tribe Baryceratini

1. Body not metallic blue in colour; first tergite long and slender, and clypeus somewhat pyramidal in profile *Jonathania*
- Body metallic blue, purple or greenish in colour; first tergite stout, with lateral triangular flange at base, its ventrolateral carina complete, dorsolateral carina distinct; clypeus not pyramidal in profile. *Chlorocryptus*

90. Genus *Jonathania* Gupta

1971. *Rupa* Jonathan, *Oriental Ins.*, 5 (2) : 149. F. des., fig. Type: F, India: Meghalaya: East Khasi Hills: Shillong and Cherrapunjee (Type in Gupta collection).

1987. *Jonathania* Gupta. *Mem. Amer. Ent. Inst.*, 41:796. New name for *Rupa* Jonathan.

195. *Jonathania Multimaculata* (Jonathan)

1971. *Rupa multimaculata* Jonathan, *oriental Ins.*, 5:151. F. des. fig. Type: F, India: Meghalaya: Khasi Hills: Shillong Botanical Garden, 1465 m. (Type in Gupta collection). India: Meghalaya: Khasi Hills: Cherrapunji, 1235 m.

Diagnostic characters : *Female* : 12 mm long. Face punctate, dense in the middle, shallow at sides; malar space 1.1x the basal width of mandible; frons somewhat obliquely striate, behind antennal sockets smooth; area behind ocellar triangle punctate; temple sparsely punctate; mesoscutum, scutellum, mesopleurum closely to sparsely, and shallowly to deeply punctate; below subtegular ridge aciculate; metapleurum trans-rugose; propodeum between basal carina and apex reticulate, basally with deep, dense punctures; first tergite smooth and shiny, second and third sparsely punctate, following mat and subpolished.

Body black. 6-13 flagellar segments yellowish-white above. Following are yellow: scape below, face, clypeus, except the clypeus at apex, mandible, frons along the eye margin; lower half of temple, upper pronotum, pronotal collar, median spot on mesoscutum, subtegular ridge, tegula,

elongate mark on mesopleurum, an oval mark on metapleurum, scutellum, metascutellum, inverted U-shaped mark on propodeum and apices of all the abdominal tergites. Fore and middle coxae and trochanters at apices yellow, femora and tibiae brownish-yellow, tarsi dark brown; hind coxa largely yellow, trochanter black, femur yellowish-brown, its apical 0.25 black, tibia yellowish-brown, except broadly at apex and narrowly at base black, tarsus yellowish-white, except its fifth segment at apex blackish.

Material examined : India : Meghalaya : East Khasi Hills: Shillong Botanical Garden, 1 female, 27.iii. 1966, Tikar; Cherrapunjee 4.iv. 1966. J.K. Jonathan, J122 (in Gupta collection).

Distribution : India : Meghalaya (East Khasi Hills).

91. Genus *Chlorocryptus* Cameron

1903. *Chlorocryptus* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 34.

Type-species : *Chlorocryptus Metallicus* Cameron; designated by Viereck, 1914

Key to the species of *Chlorocryptus*

1. Large size species, about 18 mm long; face covered with dense white hairs; scutellum sparsely punctate; propodeum closely reticulate; metanotum without projecting keels . *coeruleus*

Small size species, about 12 mm long; face not covered with dense white hairs; scutellum smooth, with a few scallered punctures; propodeum trans-striate; metanotum with projecting keels . . . *metallicus*

196. *Chlorocryptus coeruleus* Cameron

1903. *Chlorocryptus coeruleus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 36. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Muscum).

1907. *Chlorocryptus reticulatus* Cameron, *Tijdschr. v. Ent.*, 50:84. M. des. Type: M, India: Sikkim (Type in British Museum Nat. Hist.) Syn. by Townes, Townes & Gupta, 1961.

1916. *Cryptaulax cyaneus* Szepliget, *Ann. Mus. Natl. Hungarici*, 14:286. M, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): M, India: Sikkim (Type in Budapest Museum). China: Tschifu-Tschintau; Shanghai. Syn. by Townes, Townes & Gupta, 1961.

1978. *Neodontocryptus hyalina* Sexena, *Oriental Ins.*, 12:216. M, F. key, des., fig. Type: F, India: Manipur: Kanchipur, 793 m. (Gupta). India: Maharashtra: Bombay, Tamil Nadu: Anamalai Hills: Kalampraj, 1050 m. Uttar Pradesh: Garjia, 610 m.; Dehra Dun: New Forest. Nepal: Balaju, 1500 m. Indonesia: Java: Djampang Tengah; Tondano. *New synonymy*.

Material examined : No material was available from Meghalaya, however, holotype and paratypes of *N. hyalina* Krishna were examined, which were from Manipur and Uttar Pradesh.

Distribution : India : Meghalaya (East Khasi Hills), Maharashtra, Manipur, Sikkim, Tamil Nadu, Uttar Pradesh. Elsewhere: China, Indonesia, Nepal.

197. *Chlorocryptus metallicus* Cameron

1903. *Chlorocryptus metallicus* Cameron, *Mem. & Manchester Lit. Phil. Soc.*, 47 (14) : 35. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Chlorocryptus metallicus* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:142.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its female type in Oxford Museum.

22. Tribe MESOSTENINI

Key to the genera of tribe Mesostenini

1. Apex of first sternite opposite or in front of spiracle of first tergite. Apical margin of clypeus usually weakly arcuate or straight . *Gotra*
- Apex of first sternite behind spiracle of first tergite. Apical margin of clypeus broadly truncate or weakly convex . *Mesostenus*

92. Genus *Gotra* Cameron

1902. *Gotra* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9:206.
Type-species : *Gotra longicornis* Cameron; monobasic.

Key to the species of *Gotra*

1. Frons without a median longitudinal carina, sometimes with a median groove. outer orbit yellow . *longicornis*
- Frons with a median longitudinal strong carina. Inner and outer orbits yellow . 2
2. Propodeum with three marks in a triangle, yellow. Legs reddish-yellow. Propodeum reticulate. . . *marginata*
- Propodeum without yellow marks. Legs yellow. Propodeum closely strongly punctate . *carinifrons*

198. *Gotra carinifrons* Cameron

1903. *Gotra carinifrons* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 10. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Gotra carinifrons* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:178. India.

Distribution : India : Meghalaya (East Khasi Hills), Tamil Nadu.

Remarks : This species is recognised by the absence of yellow marks on propodeum and presence of strong median carina on frons.

199. *Gotra longicornis* Cameron

1902. *Gotra longicornis* Cameron, Ann. & Mag. Nat. Hist., (7) 9:206 M. des. Type : M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1904. *Gotra fulvipes* Cameron, Trans. Ent. Soc. London, 1904:104. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes et. al, 1961.
1905. *Skeatia javanica* Cameron, Tijdschr. v. Ent., 48:35. M. des. Type: M, Indonesia: Java: Pasuruan (Type in Amsterdam Museum). Syn. by Townes, Townes & Gupta, 1961.
1908. *Fenenias diversus* Szepligeti, Notes Leyden Mus., 29:239. M. key, des. Type: M, Indonesia: Java: Semarang (Type in Amsterdam Museum). Syn. by Townes, Townes & Gupta. 1961.
1961. *Gotra longicornis* Townes, Townes & Gupta, Mem. Amer. Ent. Inst., 1:179. Syn. Borneo. India. Java.

Distribution : India : Meghalaya (East Khasi Hills), Bihar. Elsewhere : Indonesia, "Borneo".

Host : *Pseudagenia clypeata*; *P. blanda*.

200. *Gotra marginata* (Brulle)

1846. *Mesostenus marginatus* Brulle, In Lapeletier: Histoire Naturelle des Insectes. Hymenopteres, 4:224. F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Bengal (Type in Paris Museum). Philippines.
1897. *Mesostenus himalayensis* Cameron, Mem. & Proc. Manchester Lit. Phil. Soc., 41 (4) : 18. M. des. Type: M, India: "Himalayas" (Type in British Museum Nat. Hist.). Syn. by Townes, Townes & Gupta, 1961).
1904. *Mesostenoides octozonatus* Ashmead, Proc. U.S. Natl. Mus., 28:143. F. des. Type: F, Philippines: Luzon: Manila (Type in U.S. Natl. Mus.). Syn. by Townes, Townes & Gupta, 1961.
1904. *Mesostenus clarinervis* Cameron, Trans. Ent. Soc. London, 1904: 115, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Type in Oxford Museum) Syn. by Townes, Townes & Gupta, 1961.
1916. *Stenaraeus rufipes* Szepligeti, Ann. Mus. Natl. Hungarici, 14:325. (F). key, des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, Taiwan: Puli (=Horisha) (Type in Budapest) Museum). Taiwan: Sunmoon Lake (=Jihyueh Lake). Syn. by Townes, Townes & Gupta 1961.
1936. *Gotra marginata* Cheesman, Nova Guinea, 17:365. n. comb.

Material examined: India : Meghalaya: South Garo Hills: Songsak, 8 females, 3 males, 5-6.v. 1979, J.K. Jonathan and party. East Garo Hills: Dainadubi, 1 female, 8-13.v. 1979, S.B. Roy and party.

Distribution : India : Meghalaya (East and South Garo Hills), Assam; Bihar, Delhi, Kerala, Maharashtra, Tamil Nadu, Rajasthan, Sikkim, Uttar Pradesh, West Bengal. Elsewhere: China, Hong Kong, Taiwan, Philippines.

Remarks : This species has three characteristic yellow spots in a triangle on propodeum. This species is widespread in India, and first time reported from Meghalaya.

93. Genus *Mesostenus* Gravenhorst

1829. *Mesostenus* Gravenhorst, *Ichneumonologia Europaea*, 2:750.

Type-species: *Mesostenus transfuga* Gravenhorst; designated by Westwood 1840.

201. *Mesostenus penetralis* (Cameron)

1902. *Umlima penetralis* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9:208. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1904. *Umlima flexilis* Cameron, *Trans. Ent. Soc. London*, 1904:107. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.

1961. *Mesostenus penetralis* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:183. syn. India.

Diagnostic characters : *Female* : 9-10 mm long. Body black in general. Antennae with 8-13 segments white. Clypeus and palpi whitish. Mesoscutum covered with dense short fuscous hairs. Scutellar carinae yellow, rest of thorax black. Hind femora reddish, tibiae dark yellow, except narrowly at base and broadly at apex, black. Hind tarsi white. Wings clear hyaline. All the abdominal tergites narrowly at apex yellow, band on second little broader.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type male and female only.

23. Tribe GORYPHINI

Key to the genera of tribe Goryphini

1. First abdominal segment without longitudinal carinae or ridges, its spiracle near the apical 0.47. Propodeum about 1.2x as long as wide, the portion behind basal carina polished or subpolished and usually covered with regular transverse wrinkles. Apical carina of propodeum absent or blunt and very close to apex. Areolet about 1.4x as wide as high . *Friona*
- First abdominal segment either with longitudinal carinae or ridges and or its spiracles behind the apical 0.45. Propodeum usually less than 1.0 as long as wide, the portion behind basal carina usually mat and or punctate if wrinkled the wrinkling irregular. Areolet usually less than 1.4x as wide as high . 2

2. Epomia weak or absent, when present divergent abruptly from swollen front margin of pronotum (collar), this swelling continued dorsad of juncture with epomia. Scutellum often with lateral carina on its basal 0.4 to 0.7 (Propodeal spiracle 2.5 to 4.0x as long as wide. Dorsal profile of ovipositor tip not angulate at nodus and evenly convex to apex; lower valve of ovipositor tip with ridges near the apex *Necolio*

Epomia weak to strong, divergent gradually from swollen front margin of pronotum (collar), the submarginal swelling absent or weaker dorsad of its juncture with epomia. Scutellum without lateral carina, or with lateral carina on its basal 0.35 or less .3

3. Frons with a median horn; scutellum without lateral carina; areolet small, about 0.8 to 1.0 as wide as high. *Listrognathus*

Frons without a median horn .4

4. Frons with a semicircular carina above each antennal socket that encloses a shallow basin; brachiella present or absent .5

Frons without a semicircular carina above each antennal socket . 7

5. Epomia and sternaulus absent or almost indistinct; prepectal carina short, 0.5 the height of mesopleurum; first tergite about 2x as long as wide at apex; nervellus intercepted at its upper 0.36, nervellus apicad of basal vein, brachiella absent; ovipositor long, compressed, tip up curved .*Gambroides*

Epomia and sternaulus distinctly present, prepectal carina long extending 0.95 or upto the base of subtegular ridge; first abdominal segment short to long, stout or slender, about 2-3x as long as wide at apex, postpetiole longer than wide or wider than long; nervulus and nervellus conditions various; brachiella present or absent; ovipositor short to long, tip straight or sometimes curve .6

6. First abdominal segment short and thick in shape, about 2 to 2.5x as long as wide at apex, petiole short, quadrate, its spiracles close to the apex than to each other; thorax short and thick, abdomen depressed; ovipositor tip long, blunt, tip never curved *Isotima*

First abdominal segment long and slender in shape, about 3x as long as wide at apex, petiole long, usually tubular, its spiracles close to each other than to the apex; thorax long and slender; abdomen largely spindle shaped; ovipositor long, pointed and usually straight and sometimes curved .*Formostenus*

7. Brachiella almost or entirely absent; apical carina of propodeum present at the midline *Baltazaria*

Brachiella present, reaching at least half the distance to wing margin. Apical carina of propodeum often lacking at the middle .8

8. Lower tooth of mandible 0.2 to 0.6x as long as upper tooth, the mandible narrow at apex. Epomia usually reaching to near upper margin of pronotum and there turned mesad. Ovipositor slender, tip long tapered *Euchalinus*
- Lower tooth of mandible at least two-third as long as upper tooth, the mandible moderately wide at apex. .9
9. Petiole of first tergite with a longitudinal angulation or carina separating its lateral from its ventral surface. Sternaulus reaching to middle coxa. Ovipositor tip short to moderately long, its teeth distinct .10
- Petiole of first tergite rounded ventrolaterally, without a longitudinal angulation or carina separating its lateral from its ventral surface. Sternaulus reaching to middle coxa. Ovipositor tip about 8x as long as deep. Propodeum of female with strong, tooth like apophyses . *Melcha*
10. First abdominal tergite less than 2x as long as wide at apex and postpetiole much wider at base than long, ovipositor tip usually short and blunt, and not so pointed; propodeal apophyses generally crest-like . *Goryphus*
- First abdominal tergite 2x or more as long as wide at apex, and postpetiole as wide or less wider than long at base; ovipositor tip usually long and pointed. Propodeal apophyses largely long and pointed, rarely crestlike . *Skeatia*

94. Genus *Necolio* Cheesman

1936. *Necolio* Cheesman, *Nova Guinea*, 17:373.

Type-species : *Necolio jugosus* Cheesman; Original designation.

202. *Necolio testaceipes* (Cameron)

1903. *Etha testaceipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 24. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Necolio testaceipes* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:168. n. comb. India.

Diagnostic characters : *Female* : 12 mm long. Body black. 8-12 antennal segments white above. Face covered with short sparse hairs. Front along the eye margin, orbit at vertex and temple, apex of scutellum, postscutellum, propleurae and tubercles, yellow. Legs in general pale yellow; hind femora above black, tarsi white; abdominal segments with yellow apical bands.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study.

95. Genus *Friona* Cameron

1902. *Friona* Cameron, *J. Straits Branch Roy. Asiatic Soc.*, 37:61.

Type-species : *Friona striolata* Cameron; Monobasic.

Key to the species of *Friona*

1. Hind leg with coxa yellow, broadly black at apex; femora yellow, broadly black above; tibia black; tarsi white; yellow mark on propodeum more extensive. Frons trans-striate; mesopleurum weakly striate . . . *.curvicarinata*

Hind leg with coxa black, femora deep red; tibia yellow with base and apex black; tarsi pale yellow; yellow mark on propodeum not so extensive. Frons obliquely or longitudinally striate; mesopleurum strongly longitudinally striate *.frontella*

203. *Friona curvicarinata* Cameron

1904. *Friona curvicarinata* Cameron, *Trans. Ent. Soc. London*, 1904: 109. M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is based on a single male from Khasi Hills in Meghalaya.

204. *Friona frontella* Cameron

1904. *Friona frontella* Cameron, *Trans. Ent. Soc. London*, 1904:108. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1904. *Friona varipes* Cameron, *Trans. Ent. Soc. London*, 1904:107. M. Name Preocc. by Cameron, 1903. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Townes, Townes & Gupta, 1961.

1961. *Friona frontella* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:169. syn. India.

Distribution : India : Meghalaya (East Khasi Hills), Assam.

Remarks : It is a large size species, very close to *F. curvicarinata*, but can be identified by the characters mentioned in the key.

96. Genus *Listrognathus* TschekKey to the subgenera of *Listrognathus*

1. Lower lateral edge of 1st abdominal tergite simple; apical transverse carina of propodeum weak or interrupted medially, forming strong sublateral crests; mandibular teeth equal or unequal in shape; lower lateral edge of pronotal collar with or without a tooth-like prominence; postpetiole moderately wide to very wide *.Listrognathus (Listrognathus)*

Lower lateral edge of 1st abdominal tergite with 1 or 2 strong teeth near its mid-length; apical carina of propodeum absent, propodeum with strong sublateral tubercles; lower lateral edge of pronotal collar with a prominent tooth-like projection; post petiole very wide

Listrognathus (Stivedens)

10. Subgenus *Listrognathus* (*Listrognathus*) Tschek1870. *Listrognathus* Tschek, *Verh. Zool-Bot. Gen. Wien.*, **20**:153.Type-species : *Listrognathus cornutus* Tschek=*pubescens* Fonscolombe; monobasic).Key to the species of *Listrognathus* (*Listrognathus*)

1. Frons polished and smooth .2
- Frons strongly striated .3
2. Scutellum at base yellow, apex largely black; oculo-ocellar area with fine punctures and irregularly longitudinally rugose .*laevifrons*
- Scutellum largely yellow oculo-ocellar area mat to smooth. (Fore femur and tibia tawney yellow but femur lined with brown above; hind tarsus with 1st segment basally black, rest yellow . . . *pallidinerva*
3. Mandibular teeth equal in shape; lower lateral margin of pronotal collar without a tooth-like prominence. (Lower end of occipital carina moderately incurved and meeting hypostomal carina at about right angle; postpetiole basally raised *rugifrons*
- Mandibular teeth unequal in shape; lower margin of pronotal collar with a tooth-like projection. .4
4. Frons with oblique and almost parallel striations between horn and median ocellus; postscutellum with a broad yellow spot; abdominal segments with an apical yellow band broadly interrupted in middle; ovipositor tip seen from above, flattened, tapering gradually, without a median carina .*assamensis*
- Frons with transverse as well as oblique striations between horn and median ocellus; postscutellum black; abdominal segments wholly black, sometimes with faint, narrow strips along apical margin; ovipositor tip as seen from above depressed and broadly rounded at apex, with a distinct median carina .*nigriabdominalis*

205. *Listrognathus* (*Listrognathus*) *assamensis* Gupta & Kamath1967. *Listrognathus* (*Listrognathus*) *assamensis* Gupta & Kamath, *Pacific Ins.*, **9**:381. F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1400 m. (Types in Gupta collection). Burma: Mt. Victoria, 1400 m.*Material examined* : India : Meghalaya : East Khasi Hills: Cherrapunjee, 2 females, 3 & 7.iv. 1966, M.K. Kamath, in Gupta collection.*Distribution* : India : Meghalaya (East Khasi Hills).

206. *Listrognathus (Listrognathus) laevifrons* (Cameron)

1903. *Suvalta laevifrons* Cameron, *Ztschr. System. Hymen. Dipt.*, 3:302. "F"=M. key, des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1967. *Listrognathus (Listrognathus) laevifrons* Gupta & Kamath, *Pacific Ins.*, 9:377. n. comb., key.

Distribution : India : Meghalaya (East Khasi Hills), Maharashtra.

Remarks : No material of this species was available for study. This species is known by its type male in Oxford Museum.

207. *Listrognathus (Listrognathus) nigriabdominalis* Gupta & Kamath

1967. *Listrognathus (Listrognathus) nigriabdominalis* Gupta and Kamath, *Pacific Ins.*, 9:348. F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills : Cherrapunji, 1400 m. (Type in Gupta collection). India: Meghalaya: Jaintia Hills: Pynursla, 1350 m.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1400 m. 1 female (Type), 5.iv. 1966. M.K. Kamath, coll. No. K77. Jaintia Hills: Pynursla, 1350 m, 1 male, 11.iv. 1966, J.K. Jonathan, coll. No. 127, in Gupta collection.

Distribution : India : Meghalaya (East khasi and Jaintia Hills).

Remarks : This species has moderately strong body, wholly black abdomen, except for a very narrow faint apical bands; ovipositor subcylindrical, tip depressed with a distinct median carina or dorsal valve between nodus and apex.

208. *Listrognathus (Listrognathus) pallidinerva* (Cameron)

1904. *Suvalta pallidinerva* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 13:221. (F). des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1967. *Listrognathus (Listrognathus) pallidinerva* Gupta & Kamath, *Pacific Ins.*, 9:390. M, F. key, des. Burma: Mt. Popa, 600-1000 m.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere: Burma.

Remarks : No material of this species was available for study from Meghalaya.

209. *Listrognathus (Listrognathus) rugifrons* (Cameron)

1903. *Suvalta rugifrons* Cameron, *Ztschr. System. Hymen. Dipt.*, 3:302. (F). des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1967. *Listrognathus (Listrognathus) rugifrons* Gupta & Kamath, *Pacific Ins.*, 9:378. key.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : Very little is known about this species. This species is known by a female specimen from Khasi Hills. The type is in Oxford Museum.

11. Subgenus *Listrognathus* (*Stivadens*) Townes

1961. *Stivadens* Townes, *Mem. Amer. ent. Inst.*, 1 : 472

Type-species: *Suvala annulipes* Cameron; original designation.

210. *Listrognathus* (*Stivadens*) *annulipes* (Cameron)

1904. *Suvala annulipes* Cameron, *Ann. Mag. Nat. Hist.*, (7) 13:220 "F"=M. des. Type: M, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1967. *Listrognathus* (*Stivadens*) *annulipes* Gupta & Kamath., *Pacific Ins.*, 9:392. M, F. Key, des. India: Bihar: Ranchi Dist.: Namkum. Karnataka: Kottegehar, 650 m. Maharashtra: Mahabelaswar, 1400 m. Tamil Nadu: Shevaroy Hills: Yercaud, 1400 m. Sikkim. Burma: Maymyo, 800 m.; Mt. Victoria, 500 m. China: Hainan Is.: Ta Hian.

Diagnostic characters : Female : 11.5-12.5 mm long. face, clypeus, mandible broadly, inner orbits broadly, lower 0.5 of temple, malar space, pronotal collar, upper margin of pronotum, a pair of median lines on mesoscutum, scutellum, dorsal slopes of propodeum including tubercles, tegula, subtegular ridge, a rectangular oblique mark on mesopleurum and an irregular mark at base of hind wing, yellow. Postscutellum black. Fore and middle coxae and their trochanters largely, yellow; fore and middle femora and tibiae deep yellow, tarsus largely blackish-brown. Hind leg with coxa black, broadly yellow dorsally and underside, 1st tarsal segment and 2nd to 4th segments light yellow, rest of hind leg dark yellow; first abdominal tergites with broad triangular apico-lateral yellow mark and rest of tergites with yellow apical bands, band broadly interrupted.

Male : Essentially similar to female. Body about 10.5 mm long.

Material examined : No material of this species was available for study from Meghalaya.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Karnataka, Maharashtra, Sikkim, Tamil Nadu. Elsewhere : Burma, China.

97. Genus *Goryphus* Holmgren

1868. *Goryphus* Holmgren, *Kongliga Svenska Fregatten Eugenie's Resa*, 2:398.

Type-species : *Goryphus basilaris* Holmgren; designated by Viereck, 1914.

Key to the species of *Goryphus*

1.	First tergite shorter or as long as the second tergite (0.8 to 1.0x)	. 2
-	First tergite longer than the second tergite (1.2 to 1.5x)	. 3

2. Face and frons entirely black; face in the middle deeply punctate; (frons with two shallow areas behind each antennal sockets are not separated by a triangular ridge; lateral carina of scutellum marked yellow). *Cestus*

Face and frons variously marked; face rugose to smooth and subpolished. (Mesopleurum reticulo-wrinkled; apical carina of propodeum broadly absent the middle; base of hind wing and metapleurum black) *.dravidus*

3. Metapleurum and propodeum red; (face rugoso-punctate; malar space about 0.5x the basal width of mandible; lateral carina of scutellum confined to its base; mesoscutum largely black) *apollonis*

Metapleurum and propodeum black (may be with white or yellow markings) *.4*

4. Propodeum with a horse-shoe-shaped mark. Face somewhat rugoso-punctate; lateral carina of scutellum not marked (black); metapleurum broadly yellow; hind legs in general yellowish-brown. *.. brahminus*

Propodeum without a horse-shoe-shaped mark, may be variously marked *.5*

5. Face minutely and shallowly punctate; frons weakly rugose; mesopleurum moderately strongly trans-striate above *.albomaculatus*

Face weakly rugose; frons obliquely striate; mesopleurum rugose to rugoso-striate above. (Speculum largely smooth and shiny; metapleurum strongly trans-wrinkled; sixth tergite black; fifth apico-laterally, yellow *.. saluator*

211. *Goryphus albomaculatus* (Cameron)

1902. *Fenenias albomaculatus* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9:212. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1973. *Goryphus albomaculatus* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3:71. F. key, des., fig. India: Meghalaya: Khasi Hills. Sikkim: Gangtok, 1676 m.

Material examined : India : Meghalaya : East Khasi Hills: 1 female (Type of *Fenenias albomaculatus* Cameron).

Distribution : India : Meghalaya (East Khasi Hills), Sikkim.

Remarks : This species can be identified by the characters given in the key. Jonathan & Gupta (1973) gave a detailed description of this species.

212. *Goryphus apollonis* Jonathan & Gupta

1973. *Goryphus apollonis* Jonathan & Gupta, *Oriental Ins. Monotr.*, 3:57. M, F. key, des., Type: F, India: Karnataka: Mercara, 1219 m. (Type in Gupta collection). India: Tamil Nadu: Kodai Hills : Oothu, 1158 m. Assam: Charduar Forest: Rangapara. Uttar Pradesh: Mussoorie, 2288 m. Karnataka: Bhagmandla;

Kottegehar, 640 m.; Murnard, 609 m. Kerala: Thekkady Sanctuary. Meghalaya: Jaintia Hills: Dawki. Burma.

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 1 female, 13.iv. 1966. D. Ram.

Distribution : India : Meghalaya (Jaintia Hills), Assam, Kerala, Mysore, Tamil Nadu, Uttar Pradesh. Elsewhere: Burma.

Remarks : This species is easily recognised by having head and anterior half of thorax black, and the rest of the thorax including propodeum and first abdominal tergite, red.

213. *Goryphus brahminus* (Cameron)

1904. *Mesostenus brahminus* Cameron, *Trans. Ent. Soc. London*, 1904:113. F. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1973. *Goryphus brahminus* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3:76. M, F. key, des. India: Meghalaya: Khasi Hills. Bihar: Ranchi Dist.: Namkum; Kara. Maharashtra: Matheran. Uttar Pradesh: Dehradun: New Forest. Burma.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Maharashtra, Uttar Pradesh. Elsewhere : Burma.

Remarks : This species is readily identified by the propodeum having an inverted horse-shoe-shaped mark and apices of all the abdominal tergites, yellow.

214. *Goryphus cestus cestus* Jonathan & Gupta

1973. *Goryphus cestus cestus* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3:47. F. key, des., fig. Type: F, India: Uttar Pradesh: Garjia, 609 m. (Type in gupta collection). India: Meghalaya: Jaintia Hills: Dawki. Himachal Pradesh: Nagrota, 914 m. Uttar Pradesh: Dehradun; Pawalgarh; Garhwal Hills: Srinagar, 609 m. Burma.

Material examined : India : Meghalaya : Jaintia Hills: Dawki, 1 female, 13.iv. 1966, M.K. Kamath, coll. No. K. 14.

Distribution : India : Meghalaya (Jaintia Hills), Himachal Pradesh, Uttar Pradesh.

215. *Goryphus dravidus dravidus* Jonathan & Gupta

1973. *Goryphus dravidus dravidus* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3:44. F. key, des., fig. Type: F, India: Karnataka: Kottegehar, 640 m. (Type in Gupta collection). India: Meghalaya: Khasi Hills: Shillong. Kerala: Walayar Forest. Tamil Nadu: Shevaroy Hills: Yercaud, 1371 m.; Tithimatti. Thailand: Chiang Dao, Chiang Mai. Singapore.

Material examined : India : Meghalaya: East Khasi Hills: Shillong, 1463 m, 1 female, 27.iii. 1966, D.T. Tikar, coll. No. T152.

Distribution : India : Meghalaya (East Khasi Hills), Kerala, Karnataka, Tamil Nadu. Elsewhere: Singapore, Thailand.

Remarks : This subspecies has a rugoso-punctate face, tending to be wrinkled, at sides smooth and shiny; frons somewhat rugoso-punctate.

215. *Goryphus saluator* (Cameron)

1904. *Mesostenus saluator* Cameron, *Trans. Ent. Soc. London*. 1904:117. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1973. *Goryphus saluator* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3:69. M, F. key, des. India: Meghalaya: Khasi Hills: Cherrapunji, 1235 m. West Bengal: Rangiroon near Darjeeling, 1897 m. Sikkim: Gangtok, 1676 m.

Material examined : India : Meghalaya: East Khasi Hills : Cherrapunjee, 1235 m, 6 females, 6-7. iv-5.vi. 1966, colls. D.T. Tikar, D. Ram, M.K. Kamath, J.K. Jonathan.

Distribution : India : Meghalaya (East Khasi Hills), Sikkim, West Bengal.

98. Genus *Skeatia* Cameron

1901. *Skeatia* Cameron, *Proc. Zool. Soc. London*, 1901:39.

Type-species: (*Skeatia nigripina* Cameron) = *brookeanus* Cameron, designated by Viereck, 1914.

Key to the species of *Skeatia*

1. First abdominal tergite longer than second tergite (1.2x or more) .2
 First abdominal tergite shorter or as long as the second tergite (0.8 to 1.0x) (All abdominal tergites yellow; head and thorax marked) .*cariniscuta*
2. Propodeum largely red. .3
 Propodeum largely black .5
3. Pronotum largely smooth; scutellum and metapleurum smooth; mesopleurum largely smooth, weakly trans-rugose above; propodeum weakly rugose, basad of basal carina smooth .*simulator*
 . .
- Pronotum punctate, striate in the middle groove; scutellum minutely punctate; metapleurum finely to coarsely striate; mesopleurum striate; propodeum strongly wrinkled, basad of its basal carina weakly punctate to longitudinally striated. .4
4. Pronotum coarsely striate in the middle, upper margin finely obliquely striate; mesopleurum and metapleurum coarsely striate; propodeum long in profile, between apical and transverse carinae longitudinally wrinkled; mesopleurum usually black in its anterior half; hind femur largely dark brown to blackish .*fuscinervis*

- Pronotum with a few striae in the middle, weakly punctate at upper margin; mesopleurum and metapleurum finely trans-striate; propodeum short in profile, between apical and basal carinae wrinkled; mesopleurum largely reddish, hind femur reddish *rubricata*
- 5. Lateral carina of scutellum marked yellow and apical slope of propodeum with two broad or triangular lateral marks .6
 Lateral carina of scutellum black, not marked .9
- 6. All abdominal tergites yellow apically; malar space 0.5x the basal width of mandible; hind leg deep yellow, its coxa wholly, femur and tibia at apical 0.4 black *versatilis*
- Not all the abdominal tergites yellow apically. 7
- 7. Face in middle and along the eye margin, frons along the eye margin and clypeus, yellow (Face and frons closely punctate; propodeum rugose; mesopleurum shagreened) *maculiceps*
- Face, clypeus and frons black .8
- 8. Apical carina of propodeum incomplete in between the apophyses; face rugoso-punctate. (Lateral carina of scutellum extending on its basal 0.3; pronotum black, subbasal band on hind tibia very broad *rothneyi*
- Apical carina of propodeum complete in between the apophyses. (Malar space about 0.7x the basal width of mandible; lateral carina of scutellum more or less confined to its base . *cameroni*
- 9. All the abdominal tergites with apical bands, band on 5th and 6th interrupted in the middle; pronotal collar and speculum, yellow *rugosa*
- Not all the tergites with apical bands, fourth tergite always black. (Malar space 1.16X the basal width of mandible; antennal scrobes distinctly separated by a median V-shaped ridge; face yellow; apical slope of propodeum with two lateral elongate yellow marks *mysorensis*

217. *Skeatia cameroni* Jonathan & Gupta

1973. *Skeatia cameroni* Jonathan & Gupta, *Oriental Ins. Monogr.* 3: 124. F. Key, des. Type: F, India : Meghalaya : Khasi Hills (Type in Oxford Musum).

Distribution : India Meghalaya (East Khasi Hills).

Remarks : This species was described by Jonathan & Gupta (1973) based on a single female on Oxford Museum. Cameron proposed to described this female as *Ancaria apicalis*. This species is recognised by having the malar space 0.75x the basal width of mandible and frons without carination.

218. *Skeatia cariniscuta* (Cameron)

1907. *Mesostenoides cariniscuits* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 20: 22. F. des Type : F, India : Sikkim (Type in Brithish Museum).

1973. *Skeatia cariniscuta* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 135. F. Key, des., fig. Indian : Meghalaya : Jaintia Hills: Dawki. Assam : Charduar Foreset : Rangapara. Sikkim.

Material examined : India : Meghalaya : Jaintia Hills, 2 females, 10-12.iv. 1966, M.K. Kamath, coll., Nos K80 & 83; 1 female, 13.IV. 1966, J.K. Jonathan, coll. J. 129.

Distribution : India : Meghalaya (Jaintia Hills), Sikkim.

Remarks : This species is mainly characterised by having thorax largely rugose, the lateral carina of scutellum extending to its basal 0.5, propodeum black, with propodeal creast only whitish and apices of all the tergites being yellowish.

219. *Skeatia fuscinervis* (Cameron)

1902. *Ancaria fuscinerbvis* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9: 205. F. des. Lectotype (designated by Townes, Townes ? & Gupta, 1961): F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1973. *Skeatia fuscinervis* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3: 109. M.F. n. comb. key, des., fig. India : Meghalaya : Khasi Hills Shillong; Cherrapunji, 1233 m. Indoinesis: Java : Panggerango; Tjibodas, 1400m.

Material examined : India : Meghalaya : East Khasi Hills; Cherrapunee, 1235 m, 19 females, 5-9.iv.1966, M.K. Kamatha; 13 females 4-7.iv.1966, D.T. Tikar; 1 male 3-6.iv.1966. D.Ram; 28 females, 3-7. i.v 1966, J.K. Jonathan; Shillong, 2 females, 14- 15.v. 1962. V.K. Gupta.

Distribution : India : Meghalaya (East Khasi Hills). Bihar, Tamil Nadu. Elsewhere : Indonesia, Taiwan.

Remarks : This species is recognised by having coarsely striate pronotum, mesopleurum and metapleurum; posterior 0.32 of mesopleurum, base of hind wing, whole of propodeum and first abdominal tergite largely reddish.

220. *Sketia maculiceps* (Cameron)

1904. *Mesostenus maculiceps* Cameron, *Trans. Ent. Soc. London*, 1904: 119. F des. Type: F. India : Meghalaya : Khasi Hills (Tupe in Oxford Museum).

1973. *Skeatia Maculiceps* Jonathan Gupta, *Oriental Ins., Monogr.*, 3 : 121. F., n. comb., key des. India : Meghalaya. Khasi Hills.

Distribution : India : Meghalaya (Khasi Hills), Bihar.

Remarks : This species is distinguished by having face, frons closely punctate, propodeum rugose, mesopleurum shagreened and obscurely striated.

221. *Skeatia mysorensis* Jonathan & Gupta

1973. *Skeatia mysorensis* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 117. key, des., fig. Type: F, India : Karnataka; Bhagamandla, 853 m. (Gupta). India : Karnataka : Kottegehar, 640 m.; Mercara, 1219 m.;

Gunji, 609 m.; Bangalore. Maharashtra: Panhala Fort, 914 m.; Nagpur. Bihar: Ranchi Dist.: Namkum. Assam: Gauhati. Meghalaya: Khasi Hills: Cherrapunji, 1235 m. Kerala: Walayar Forest. Tamil Nadu : Kadampari.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1235 m. 7.iv.1966, M.K. Kamath, coll. No. K. 79.

Distribution : India : Meghalaya (East Khasi Hills), Bihar, Kerala, Karnataka, Maharashtra, Tamil Nadu.

Remarks : This is a distinct species having malar space more than 1.0x the basal width of mandible, antennal scrobes distinctly separated by a medium V-shaped ridge and mesoscutum being aciculopunctate. Apical slope of propodeum with two yellow elongate lateral marks.

222. *Skeatia rubricata* Jonathan & Gupta

1973. *Skeatia rubricata* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 111. M., F. Key, des., fig. Type: F, India : Karnataka : Bhagmandala, 853 m. (Gupta collection). India : Karnataka: Mercara, 1219 m.; Kottegehar, 669 m.; Khemmangundi, Murnad, 610 m. Maharashtra : Mahabaleshwar, 1971 m. Meghalaya: Khasi Hills : Cherrapunji, 12135 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherapunjee, 1235 m., 7.i.v. 1966, M.K. Kamath, K 79.

Distribution : India : Meghalaya (East Khasi Hills), Maharashtra, Karnataka.

Remarks : This species is recognised by having a few striations in the middle of pronotum and weak punctures at the upper margin. Mesopleum and hind femur largely red.

223. *Skeatia rugosa* Jonathan & Gupta

1973. *Skeatia rugosa* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 124. F. Key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1235 m. (Gupta collection). India : Meghalaya : Jaintia Hills : Pynursla, 1341 m.

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1235 m, 3.iv.1966, J.K. Jonathan, coll. No. J 127.

Distribution : India : Meghalaya (East Khasi and Jaintia Hills).

Remarks : This species has all the abdominal tergites with apical bands and the bands on fifth and sixth tergites interrupted in the middle.

224. *Skeatia rothneyi* Jonathan & Gupta

1973. *Skeatia rothneyi* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 1232. F. Key, des. Type: F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by a single female deposite in Oxford Museum.

225. *Skeatia simulator* Jonathan & Gupta

1973. *Skeatia Simulator* Jonathan & Gupta, *Oriental Ins. Monogr.*, 3 : 114. M. F. Key, des. Type : F, India : Maharashtra : Mahabnaleshwar, 1371 m. (Type in Gupta collection). India : Karnataka: Khemmangundi.

Material examined : India : Meghalaya : South Garo Hills: Songsak, 1 female, 5-6.v. 1979, J.K. Jonathan and party.

Distribution : India : Meghalaya (South Garo Hills), Maharashtra, Karnataka.

Remarks : This is a new record of this species from Meghalaya.

226. *Skeatia versatilis* (Cameron)

1904. *Mesostenus versatilis* Cameron, *Trans. Ent. Soc. London*, 1904: 118. F. des. Type: F, India : Megjalaya : Khasi Hills (Type in Oxford Museum).

1973. *Skeatia versatilis* : Jonathan & Gupta, *Oriental Ins. Monogr.*: 133. F. n. comb., key des., fig India: West Bengal: TistaKalimpong Route. Meghalaya: Khsai Hills.

Material examined : India : Meghalaya : South Garo Hills: Songsak, 1 female, 5-6.V. 1979, J.K. Jonathan and party.

Distribution : India : Meghalaya (South Garo Hills), West Bengal.

Remarks : This species is recognised by having apices of all the abdominal tergites and face, yellow. Face weakly punctate; mesopleurn strongly rugose. Head and thorax with long fine hairs.

99. Genus *Gambroides* Betrem

1941. *Gambroides* Betrem, *Treubia*, 18 : 67.

Type-species : *Eripternimorpha javensis* Rohwer; Original designation.

227. *Gambroides javensis* (Rohwer)

1918. *Eripternimorpha javensis* Rohwer, *Proc. U.S. Natl. Mus.*, 54: 564. F, Key, des. Tyope: F, Indonesia: Java: Pasurocan (Type in U.S.N.H.)

1980. *Gambroides javensis* : Jonathan, *Rec. Zool. Surve. India, Occ. Paper*, 17 : 30. M, F. Key, des., fig. India : Assam: Gauhati. Meghalaya : Jauharabad. Uttar Pradesh: Lucknow; Hardoi. Orissa: Bhubaneshwar. Karnataka: Madya. Tamil Nadu: Pugalur.

Diagnostic characters : Female: 9 mm. long. Body black. Antenna with 6-9 flagellar segments white above. Thorax beyond scutellum, propodeum and first abdominal tergite red; a mark on pronotal collar above, apex of second tergite, apex of sixth narrowly in the middle, seventh and eight tergite broadly in the middle, yellow; fore leg largely brown to blackish; hind coxa and femur largely reddish

except a small mark at the extreme apex of femur brown, trochanter, tibia and tarsus dark brown to blackish; wings hyaline with a brownish apical spot.

Male : 9 mm long. Essentially similar to female.

Material examined : India : Meghalaya : Jauharabad, 1 female, 11.viii.1960, C.I.B.C. Bangalore, collection.

Distribution : India : Meghalaya. Assam, Karnataka, Tamil Nadu, Orissa, Uttar Pradesh. Elsewhere : Java and Hawaii.

Remarks : This species is recognised by the absence of apical carina of propodeum and first abdominal tergite red in colour, with a distinct yellow band.

Hosts : *Tryporyza nivella* and *Dineutus unidentatus*.

100. Genus *Isotima* Foerster

1968. *Isotima* Foerster, *Verh. Naturh. Ver. Rheinlande*, 25 : 182.

Type-species : *Isotima albicincta* Ashmead, Designated by Townes, 1957.

228. *Isotima ruficollis* (Holmgren)

1968. *Gorpus ruficollis* Holmgren, *Kongliga svenska fregatten Eugenie resa*. ., 2 : 400. M, F. des. Type: F, Java. (type in Stockholm Museum).

1961. *Isotima ruficollis* : Townes, Townes and Gupta. *Mem. Amer. Ent. Inst.*, 1 : 146.

Diagnostic characters : *Female* : 6.5-9 mm long. Body in general black. 5-10 antennal segments white; whole of thorax red, except the propleurum and sometimes pronotal collar, mesosternum and tegula black; apices of first, second, seventh and eighth tergites, yellowish; legs largely reddish, except fore and middle legs with their trochanters and tarsi, brown; hind trochanter, apex of femur, whole of tibia and tarsus, brown (legs colour variable), fore wing with a light brown spot below stigma.

Frons little raised in the middle; lateral carina of scutellum extending to its basal 0.7, areolet large, about 0.9x as high as the portion of second recurrent vein above bulla and nervellus is intercepted at the middle.

Material examined : India : Meghalaya : South Garo Hills: Songsak, 1 female, 5-6.v. 1979, J.K. Jonathan and party.

Distribution : India : Meghalaya (South Garo Hills), Himachal Pradesh, Uttar Pradesh. Elsewhere : Indonesia, Philippines.

Remarks : This is the first record of this species from Meghalaya.

101. Genus *Formostenus* Uchida

This subgenus is represented by two subgenera in India Subregion, of these only *Formostenus* (*Formostenus*) is reported from Meghalaya.

12. Subgenus *Formostenus* (*Formostenus*) Uchida

1931. *Formostenus* Uchida, *Jour. Facult. Agr. Hokkaido Imp. Univ.* 30: 180.

Type-species : *Mesostenus* (*Formostenus*) *angularis* Uchida. Original designation.

Key to the species of *Formostenus* (*Formostenus*)

1. Thorax black, with or without markings .2
 Thorax not entirely black, partly red, or atleast its propodeum and the area at the base of hind wing red. 3
2. Thorax without any mark, except scutellum and metascutellum with reddish or yellowish hue (Pronotum and mesopleurum trans-stiate; scutellum punctate, lateral carina short; metapleurum trans-striate and propodeum finely wrinkled) *cherraensis*
 Thorax with several markings. (Face in the middle and along the eye margin, pronotal collar, propodeum between apical carina and apex, metapleurum above the base of hind coxa, yellow. Metapleurum and propodeum finely wrinkled) *flavorbitalis*
3. Pronotum coarsely striate, its extreme upper margin somewhat rugose; mesopleurum largely trans-striate; lateral carina of scutellum extending to its basal 0.75; propodeum between basal carina and apex strongly wrinkled; base of hind wing, metapleurum and propodeum red, without any blackish mark. *striatus*
 Pronotum with a few coarse striae in the middle, its upper half (0.5) finely rugose; mesopleurum largely rugose; lateral carina of scutellum extending to its basal 0.5; propodeum between basal carina and apex finely wrinkled; base of hind wing, lower margin of propodeum, blackish *rugipectus*

229. *Formostenus* (*Formostenus*) *cherraensis* Jonathan

1980. *Formostenus* (*Formostenus*) *cherraensis* Jonathan, *Rec. Zool. Surv. India. Occ. Paper*, 17: F. key, deds., fig. Type: F, Indias: Meghalaya : Khasi Hills: Cherrapunji, 1235 m., (Type in Gupta Collection). India: "Assam".

Material examined : India : Meghalaya : East Khasi Hills: Cherapunjee, 1235 m, 1 female (Type), 5.iv.1966, M.K. Kamath, coll. No. K77.

Distribution : India: Meghalaya (East Khasi Hills).

Remarks : This species can be distinguished by having lateral carina of scutellum short, extending about 0.3; pronotum and mesopleurum trans-striate and propodeum largely with fine wrinkles.

230. *Formostenus (Formostenus) flavorbitalis* Jonathan

1980. *Formostenus (Formostenus) flavorbitalis* Jonathan, *Rec. Zool. Surv. India, Occ. Paper*, 17 : 84. F. key, des., fig. Type : F, India : Meghalaya : Khasi Hills : Shillong : Botanical Garden, 1400 m. (Type in Gupta collection).,

Material examined : India : Meghalaya : East Khasi Hills: Shillong, 1400 m, 1 female (Type), 31 iii. 1966, J.K. Jonathan, coll. No. J119.

Distribution : India : Meghalaya : (East Khasi Hills).

Remarks : This species has pronotal collar, mesopleurum near the base of middle coxa, propodeum between apical carina and apex, metapleurum above the base of hind coxa and first abdominal segment ventrally, yellow.

231. *Formstenus (Formostenus) rugipectus* Jonathan

1980. *Formstenus (Formostenus) rugipectus* Jonathan, *Rec. Zool. Surv. India, Occ. Paper*, 17 : 91. F key, des., fig. Type : F, India : Meghalaya : Khasi Hills : Cherrapunji, 1235 m. (type in Gupta colln.)

Material examined: India : Meghalaya : East Khasi Hills: Cherrapunjee, 1235 m, 2 females, 3-7 iv. 1966, D. Ram and M.K. Kamath; 2 females, 23-26. iv.1979., J.K. Jonathan and party.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is having mesopleurum largely rugose, propodeum between basal carina and apex finely wrinkled; base of hind wing, metapleurum below and propodeum at apex, black.

232. *Formostenus (Formostenus) striatus* Jonathan

1980. *Formostenus (Formostenus) striatus* Jonathan, *Rec. Zool. Surv. India, Occ. Paper*, 17: 90. F. key, des., fig. Type : F, India : Meghalaya : Khasi Hills : Cherrapunji, 1235 m. (Type in Gupta collection).

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1235 m, 5 females (Types), 3-7.iv. 1966, colls. J.K. Jonathan, D.T. Tikar, M.K. Kamath.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is distinguished by having mesopleurum largely trans-striate, propodeum in the middle strongly wrinkled, basal area of hind wing, metapleurum and propodeum wholly, red.

102. Genus *Melcha* Cameron

1902. *Melcha* Cameron, *Ann. & Mag. Nat. Hist.*, (7) 9:153.

Type-species: *Melcha varipes* Cameron; monobasic.

233. *Melcha varipes* (Cameron)

1902. *Melcha varipes* Cameron. *Ann. & Mag. Nat. Hist.*, (7) 9:154. F. des. Lectotype (designated by Gupta, 1969): F, India: Meghalaya: Khasi Hills (Type in both London and Oxford Museums. Oxford specimen was designated as type in 1961. This specimen was selected as lectotype in 1969).
1969. *Melcha varipes* Gupta, *Oriental Ins.*, 3:26. M, F. lectotype design., key, des., fig. India: Meghalaya: Khasi Hills: Shillong: Botanical Garden, 1460 m. Uttar Pradesh: Garhwal Hills: Pipalkoti, 1220 m.

Diagnostic characters : Female : 12 mm long. Antennae black with 5th to 9th segments white, except above, scape hairy. Head entirely black; mandible and papi yellow. Thorax black, with scutellum, lateral carinae, postscutellum and propodeal apophyses, yellow. Abdomen black with apex of 1st segment and second segment and apical two segments white. Wings hyaline; four front legs reddish-yellow, fore coxae pale yellow; hind coxae and more than basal half of femur reddish-yellow; trochanters, apex of femur broadly the tibia and the basal half of 1st tarsal segment, black; rest of tarsi white.

Distribution : India : Meghalaya (East Khasi Hills), Uttar Pradesh.

Remarks : No material of this species was available for study from Meghalaya.

103. Genus *Euchalinus* Townes

1961. *Euchalinus* Townes, *Mem. Amer. Ent. Inst.*, 1:471.
Type-species : *Skeatia balteata* Cameron; Original designation.

Key to the species of *Euchalinus*

1. Propodeum largely rugulose, apophyses short and not so strong; apical margin of clypeus black; mesopleurum with a large yellow mark *.respondens*
- Propodeum largely reticulate, apophyses long and strong; apical margin of clypeus not black; mesopleurum with yellow mark near sternaulus and another just above it *reticulatus*

234. *Euchalinus respondens* (Cameron)

1904. *Mesostenus respondens* Cameron, *Trans. Ent. Soc. London*, 1904: 112. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).
1961. *Euchalinus respondens* Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:159. n. comb. India.

Distribution : India: Meghalaya: East Khasi Hills.

Remarks : The type of this species was examined by Dr. V.K. Gupta at Oxford Museum and he was of the opinion that this species belong to genus *skeatia* and conspecific with *Skeatia balteata* Cameron.

235. *Euchalinus reticulatus* (Cameron)

1904. *Mesostenus reticulatus* Cameron, *Trans. Ent. Soc. London*, 1904:116. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Euchalinus reticulatus* Cameron: Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:159. n. comb. India.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is very close to *Skeattia versatilis* (Cameron) and possibly belong there only.

104. Genus *Baltazaria* Townes

1961. *Baltazaria* Townes, *Mem. Amer. Ent. Inst.*, 1:427.

Type-species : *Cryptus tribax* Tosquinet; Original designation.

236. *Baltazaria caligatus* (Cameron)

1904. *Mesostenus caligatus* Cameron, *Trans. Ent. Soc. London*, 1904: 116. F. des. type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Baltazaria caligata* : Townes, Townes & Gupta, *Mem. Amer. ent. Inst.*, 1:175. n. comb. India.

Diagnostic characters : Female : 8 mm long. Black, the inner orbit from the base of clypeus to the end of vertex, outer orbit more broadly, base of mandible, palpi, pronotum above and below, propleurae, tegula, scutellum, propodeum at apex, base of hind wing, an oval mark at the apex of middle lobe of mesoscutum, apices of 1st and 2nd abdominal segments, apical segment entirely and basal two segments ventrally, yellow. Legs in general reddish-yellow, four front coxae and trochanters, white; the apex of the hind tibia brownish. Wings hyaline.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its female type in Oxford Museum.

24. Tribe COESULINI

This tribe is represented by a single genus viz., *Coesula* Cameron from India, including Meghalaya.

105. Genus *Coesula* Cameron

1905. *Coesula* Cameron, *J. Straits Branch. Roy Asiatic Soc.*, 44:145.

Type-species : *Coesula fulvipes* Cameron. Monobasic.

Key to the species of *Coesula*

1. Area between apical and basal carinae of propodeum almost smooth and shiny without distinct sculpture; metapleurum smooth. (Malar space 0.43 the basal width of mandible; abdominal tergite with yellow apical bands *erugans*

- Area between apical and basal carinae of propodeum usually with short longitudinal ridges or carinae; metapleurum finely striate or rugoso-striate .2
- 2. Pronotum minutely punctate, trans-striate in the middle and along the posterior margin, upper rectangular area with fine shallow punctures; scutellum polished with a few fine punctures; mesopleurum coarsely striate above, lower half minutely punctate; area between apical and basal carinae of propodeum with strong longitudinal striations; lateral carina of scutellum extending to its basal 0.55 . . . *flavorbitalis*

Pronotum not punctate, coarsely or finely granulate; mesopleurum finely trans-striate above, area between apical and basal carinae of propodeum not strongly longitudinally striate; 1st abdominal tergite granulate; lateral carina of scutellum extending to its basal 0.25. *varuna*

237. *Coesula erugens* Gupta & Jonathan

1969. *Coesula erugens* Gupta & Jonathan, *Oriental Ins.*, 2:178 (1968). F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1400 m. (Type in Gupta Collection). India: Meghalaya: Shillong, 1400 m. Karnataka: Khemmangundi.

Material examined : India : Meghalaya : East Khasi Hills: Cherrapunjee, 1400 m, 5 females, 3-7.iv. 1966. J.K. Jonathan and D. Ram, Coll. Nos. J 121-124, T175, Shillong, 1400 m, 1 female, 31.iii. 1966, J.K. Jonathan, Coll. No. J119, all in Gupta collection.

Distribution : India : Meghalaya (East Khasi Hills), Karnataka.

Remarks : This species is characterized by its smoother appearance, having very few wrinkles on mesopleurum and propodeum.

238. *Coesula flavorbitalis flavorbitalis* Gupta & Jonathan

1969. *Coesula flavorbitalis flavorbitalis* Gupta & Jonathan, *Oriental Ins.*, 2:180 (1968). F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1400 m. (Type in Gupta Collection).

Material examined : India : Meghalaya : East Khasi Hills : Cherrapunjee, 1400 m, 1 female (type), 6.iv. 1966, J. K. Jonathan, Coll. No. J124.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is characterized by having a complete yellow orbital mark; mesopleurum largely coarsely trans-striated and propodeum in the middle strongly longitudinally striated.

239. *Coesula varuna* Gupta & Jonathan

1969. *Coesula varuna* Gupta & Jonathan, *Oriental Ins.*, 2:181. (1968). F. key, des., fig. Type: F, India: Meghalaya: Khasi Hills: Cherrapunji, 1400 m. (Type in Gupta Collection). India: West Bengal: Darjeeling (doubtfully placed under this species).

Material examined : India : Meghalaya : East Khasi Hills, 1 female (Type), 3.iv. 1966, J.K. Jonathan, Coll. No. J121.

Distribution : India : Meghalaya (east Khasi Hills), West Bengal.

Remarks : This species is recognised by having the orbital mark completely encircling the orbit, pronotum granulose, mesopleurum finely transtriae above, propodeum between apical and basal carinae not strongly longitudinally striate, 1st abdominal tergite granulosé and the lateral carina of scutellum confined to its base.

25. Tribe CERATOCRYPTINI

Key to the genera of tribe Ceratocryptini

1. Upper margin of pronotum not swollen or produced opposite front end of notaulus *Fitatsia*
- Upper margin of pronotum strongly swollen or projecting opposite front end of notaulus .2
2. Malar space about 0.25x as long as basal width of mandible. Lower tooth of mandible almost as long as upper tooth. Hind tarsal claws of male with a median right angle bend. *Silsila*
- Malar space more than 0.5x as long as the basal width of mandible. Lower tooth of mandible distinctly shorter than upper tooth. Hind tarsal claws of male strongly curved. (Frons with a median pair of acute horns. Propodeum evenly tapering near middle to a narrow apex
Ceratocryptus

106. Genus *Fitatsia* Seyrig

1952. *Fitatsia* Seyrig, *Mem. Acad. Malgache*, 39:185.

Type-species : *Fitatsia desperator*. Original designation.

Key to the species of *Fitatsia*

1. Middle and hind second trochanteral segments with a sharp tooth on outer side at apex; mesoscutum polished, moderately closely punctate, apical 0.5 finely trans-striated; ovipositor sheath nearly 1.5x the length of hind tibia. Scutellum yellowish-white; hind coxa yellowish-white with a dark brown streak above; hind second trochanter yellowish-brown, lightly infusate above *hypsipulae*
- Middle and hind second trochanter simple, without a tooth on outer side at apex; mesoscutum densely punctate to rugoso-punctate, with apical 0.25 transstriae; ovipositor sheath 0.8-1.1x the length of hind tibia; (frons with a strong median protuberance; propodeum with apico-lateral acute tubercles; ovipositor tip with a distinct nodus; nodus with a notch; speculum with a yellowish-white spot *tuberculata*

240. *Fitatsia hypsipylae* Kamath

1972. *Fitatsia hypsipylae* Kamath, *Oriental Ins.*, 6:244. F. key, fig. biol. Type: F, India: Uttar pradesh: Dehradun: Kishanpur (CIBC, Bangalore), Meghalaya: Jaintia Hills: Dawki. Burma: Mandalay dist

Material examined : India : Meghalaya : Jaintia Hills : Dawki, 1 female (paratype), 13.iv. 1966, J.K. Jonathan, Coll. Nos. J129.

Distribution : India : Meghalaya (Jaintia Hills), Uttar Pradesh. Elsewhere: Burma.

Hosts : *Hypsipyla robusta* Moore.

241. *Fitatsia tuberculata* Kamath

1972. *Fitatsia tuberculata* Kamath, *Oriental Ins.*, 6:238. F. key, des., fig. Type: F, India: Meghalaya: Jaintia Hills: Dawki (Type in Gupta Collection) Uttar Pradesh: Kumaon Hills: Garjia.

Material examined : India : Meghalaya : Jaintia Hills, Dawki, 1 female (Type), 12.iv. 1966, D. Ram, Coll. No. T180.

Distribution : India : Meghalaya (Jaintia Hills), Uttar Pradesh.

Remarks : This species is readily distinguished by having a strong median protuberance on frons and acute and prominent apico-lateral tubercles on propodeum.

107. Genus *Ceratocryptus* Cameron

1903. *Ceratocryptus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47: (14): 6.

Type-species : *Ceratocryptus bituberculatus* Cameron; designated by Viereck, 1914.

Key to the species of *Ceratocryptus*

1. Face strongly punctate, thickly covered with white hairs. 7th and 8th antennal segments white; lateral carina of scutellum not marked; hind coxa white, except broadly black at base and apex; 1st abdominal segment black, at base and apex yellow; apices of second and third tergites, sides of others and apical segment wholly, yellow *bituberculatus*
- Face smooth, obscurely punctate, sparsely covered with white hairs: 9th to 14th antennal segments white; lateral carina of scutellum marked yellow; hind coxa yellow; apices of all the abdominal tergites with yellow apical bands *tibialis*

242. *Ceratocryptus bituberculatus* Cameron

1903. *Ceratocryptus bituberculatus* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 6. F. des. Type : F, India : Meghalaya : Khasi Hills (Type in Oxford Museum).

1903. *Silsila bilineata* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 4. M. des. Type : M, India: Meghalaya: Khasi Hills (Type in Oxford Museum). Syn. by Uchida, 1932.

1912. *Mesostenus shinshanus* Matsumura, *Thousand Insects of Japan, Supplement*, 4:125. F. des., fig. Type: F, Taiwan: Shinsha (Type in Sapporo Museum) Syn. by Uchida, 1932.

1916. *Polyaenus striatus* Szepligeti, *Ann. Mus. Natl. Hungarici*, 14:264. F. des. Type: F, Taiwan: Jihyueh Lake (Lost). Syn. by Uchida, 1931.

Material examined : Nil.

Distribution : India : Meghalaya (East Khasi Hills). Elsewhere : Taiwan.

243. *Ceratocryptus tibialis* Cameron

1903. *Ceratocryptus tibialis* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 8. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

Distribution : India : Meghalaya: East Khasi Hills.

Remarks : No material of this species was available for study from Meghalaya.

108. Genus *Silsila* Cameron

1903. *Silsila* Cameron, *Mem. Proc. Manchester Lit. Phil. Soc.*, 47 (14): 1.
Type-species : *Silsila fulvipes* Cameron; designated by Vierec, 1914.

244. *Silsila fulvipes* Cameron

1903. *Silsila fulvipes* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 2. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

Diagnostic characters : *Female* : about 10 mm long. Mesoscutum with moderately close, distinct punctures, medially punctures a little apart, and with a yellow spot on disc.

Body is general black. Face, clypeus, mandible, malar space, lower 0.4 of outer orbit, a stripe on inner frontal orbit which extends a little beyond lateral ocellus, pronotal collar, upper margin of pronotum, tegula, scutellum, post-scutellum, lateral carinae of scutellum, a spot below tegula including subtegular ridge, another large mark at posterior lower corner of mesopleurum, a band on metapleurum, base of hind wing, an inverted 'T' shaped mark on propodeum and propodeum apically, yellow. Fore and middle legs with their coxae and trochanters yellowish-white; their femora, tibiae and tarsi yellowish-brown, except 5th tarsal segment brown; hind coxa blackish and with an oblique yellowish-white spot dorsally; hind first trochanteral segment pale yellow except for a light brown spot dorsally at base, its second trochanter blackish; rest of hind leg yellowish-brown with extreme apex of femur, basal 0.1 and apex of tibia 4-5 tarsal segments, light brown; abdomen with basal 0.5 of first tergite and apical bands on all tergites, yellow.

Male : About 9 mm long. Very similar to female in structure and colour.

Distribution : India : Meghalaya (East Khasi Hills), Assam, Bihar, Kerala, Maharashtra, Uttar Pradesh.

Remarks : The only record of this species from Meghalaya is that of type female from Khasi Hills, in Oxford Museum.

Tribe OSPRYNCHOTINI

Key to the genera of tribe Osprynchotini

1. Areolet small, less than 0.35x as high as the length of second recurrent vein. Occipital carina entirely absent, or only present dorsally. Ovipositor tip compressed, without distinct teeth *Nematopodeus*
- Areolet, 0.6 to 0.8 x as high as the length of second recurrent vein. Occipital carina complete, or its lower end not quite reaching hypostomal carina; ovipositor tip depressed, lower value with vertical teeth or ridges. *Acroricnus*

109. Genus *Nematopodius* Gravenhorst13. Subgenus *Nematopodeum* (*Nematopodeus*) Gravenhorst

1829. *Nematopodius* Gravenhorst, *Ichneumonologia Europaea*, 2:955.

Type-species : *Nematopodius formosus* Gravenhorst; designated by Viereck, 1914.

245. *Nematopodius* (*Nematopodius*) *longiventris* (Cameron)

1903. *Leptocryptus longiventris* Cameron, *Mem. & Proc. Manchester Lit. Phil. Soc.*, 47 (14) : 15. F. des. Type: F, India: Meghalaya: Khasi Hills (Type in Oxford Museum).

1961. *Nematopodius* (*Nematopodius*) *longiventris* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.*, 1:187. n. status India.

Diagnostic characters : Female 9 mm long. Body black. Antennae black, its scape reddish beneath, flagellum covered with thick short black hair. Head yellowish-white, except frons in the middle, ocellar triangle and mandibular teeth, black. Thorax black, except pronotal callar, scutellum, post-scutellum, propodeum apically and a transverse band in the middle, mesosternum apically and metapleurum above, yellow. Abdomen with a spot in the middle of the second and other segments broadly dark yellow.

Face smooth and shiny, impunctate, covered with sparse short brownish hair. Face projecting in the middle; clypeal furrow narrow. Thorax largely smooth; mesoscutum covered with short hair. Propodeum smooth and shiny with only a few shallow minute punctures visible only on the black areas. Meso- and metapleurum closely punctate. Mesosternum with a large triangular tooth at sides. Wings clear hyaline.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : This species is known by its type female, in Oxford Museum. No material of this species was available for study.

110. Genus *Acroricnus* Ratzeburg

1852. *Acroricnus* Ratzeburg, *Ichneumonodien der Forstinsecter*, 3:92.

Type-species : (*Acroricnus schaumii* Ratzeburg) = *stylator* Thunbrugg; monobasic.

246. *Acroricnus peronatus* (Cameron)

1902. *Osprynchotus peronatus* Cameron, *Entomologist*, 35:182. M, F. des. Lectotype (designated by Townes, Townes & Gupta, 1961): F, India: Meghalaya: Khasi Hills (Oxford Museum).
1916. *Acroricnus cingulatus* Szepligeti, *Ann. Mus. Natl. Hungarici*, 14:24. F, key, des. Type: F, Himalayas (Budapest Museum). Syn. by Townes, Townes & Gupta.
1961. *Acroricnus perinatus* : Townes, Townes & Gupta, *Mem. Amer. Ent. Inst.* 1:191. lectotype desing., syn. India.

Diagnostic characters : Female 16 mm long. Body black; 10-15 antennal segments white; scape yellow beneath, covered with short white hair. Face, except a triangular mark near the antennal sockets, clypeus, inner and outer orbits, palpi, yellow. Thorax black, with mesoscutum with a broad line on either side at base, tegulae, scutellum, post-scutellum, lateral carinae of scutellum, propodeum at base and sides, base of hind wing and metapleurum above hind coxa, yellow. Legs largely yellow, all coxae, trochanters, apical 0.5 of femora, apical 0.33 of hind tibiae, black; hind tarsus yellowish. Abdomen black. shiny, all the abdominal segments with apical yellow bands. Wings clear hyaline, apically brownish.

Face closely; clypeus coarsely punctate. Vertex strongly punctate with a few oblique striations near ocelli. Frons depressed, smooth and shiny. Mesoscutum strongly punctate, thickly covered with short white hair; scutellum sparsely punctate, thickly covered with long white hairs. Postscutellum impunctate. propodeum basad of basal carina closely punctate, apicad of basal carina coarsely punctate, regulose towards the apex. Pronotum and mesopleurum closely punctate, former with longitudinal striations; metapleurum strongly punctate, punctures running into reticulations. Areolet longer than wide.

Distribution : India : Meghalaya (East Khasi Hills).

Remarks : No material of this species was available for study from Meghalaya.

APPENDIX I

LIST OF TAXA OF SUBFAMILY ICHNEUMONINAE FROM MEGHALAYA

Sl. No.	Name of Taxa	Distribution
SUBFAMILY ICHNEUMONINAE		
1. Tribe PHAEOGENINI		
1. Genus <i>Oronotus</i> Wasmal, 1845 (1844)		
1.	<i>O. mandibularis</i> (Cameron)	India : Meghalaya
	= <i>Pramha mandibularis</i> Cameron, 1903	

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2. <i>O. tricolor</i> (Cameron) = <i>Femalma tricolor</i> Cameron, 1903 2. Genus <i>Auberteterus</i> Diller, 1981	India : Meghalaya: Khasi Hills
3. <i>A. alternecoloratus</i> (Cushman) = <i>Centeterus alternecoloratus</i> Cushman, 1929 2. Tribe HETERISCHNINI 3. Genus <i>Lusius</i> Tosquinet, 1903	India : Meghalaya: East Khasi Hills
4. <i>L. apollos</i> (Morley) = <i>Oedematopsis apollos</i> Morley, 1913 3. Tribe OEDICEPHALINI 4. Genus <i>Imeria</i> Cameron, 1903	India : Meghalaya : East Khasi Hills
5. <i>Imaria albomaculata</i> Cameron, 1903 4. Tribe JOPPOCRYPTINI 5. Genus <i>Eccoptosage</i> Kriechbaumer, 1898	India : Meghalaya : Khasi Hills
6. <i>E. crassispina</i> (Cameron) = <i>Zanthojoppa crassispina</i> Cameron, 1903	India : Meghalaya : Khasi Hills
7. <i>E. lutea</i> (Cameron) = <i>Acanthojoppa lutea</i> Cameron, 1903	India : Meghalaya : Khasi Hills
8. <i>E. nigromaculata</i> (Cameron) = <i>Acanthojoppa nigromaculata</i> Cameron, 1903 = <i>A. nigrolineata</i> Cameron, 1903 = <i>A. dudgeonii</i> Cameron, 1903	India : Meghalaya : Khasi Hills
9. <i>E. schizoaspis schizoaspis</i> (Cameron) = <i>Acanthojoppa schizoaspis</i> Cameron, 1902 = <i>A. flavo-orbitalis</i> Cameron, 1907	India : Meghalaya : Khasi Hills, Sikkim, Uttar Pradesh Burma

10. *E. wasgenii* Kriechbaumer India : Meghalaya : Khasi Hills
 = *E. waagenii* Kriechbaumer, 1898 Sikkim, West Bengal
 = *Acanthojoppa Indica* Cameron, 1903 China
 = *A. tictipennis* Cameron, 1903
 = *A. apicilineata* Cameron, 1903
 = *A. curtispina* Cameron, 1903
11. *E. xanthopsis xanthopsis* (Cameron) India : Meghalaya : Khasi Hills
 = *Acanthojoppa xanthopsis* Cameron, 1903 Assam, Sikkim.
 = *A. varicornis* Cameron, 1903 Burma.
 = *A. tricolor* Cameron, 1907
5. Tribe GYRODONTINI
6. Genus *Ulesta* Cameron, 1903
12. *U. varicornis* Cameron, 1903 India : Meghalaya : Khasi Hills.
7. Genus *Stenichneumon* Thomson, 1893
13. *S. appropinquans* (Cameron) India : Meghalaya : Khasi Hills
 = *Ichneumon appropinquans* Cameron, 1897 Uttar Pradesh.
 = *Myermo rufipes* Cameron 1901 Taiwan.
 = *M. fumipennis* Cameron, 1903
 = *Stenichneumon gultatus* Uchida, 1925
14. *S. maculiceps* (Cameron) India : Meghalaya : Khasi Hills
 = *Hadrojoppa maculiceps* Cameron, 1904
15. *S. maculitarsis* (Cameron) India : Meghalaya : Khasi Hills,
 = *Myermo maculitarsis* Cameron, 1903 Himachal Pradesh. Burma.
8. Genus *Chiaglas* Cameron, 1902
16. *C. longicornis* Cameron, 1903 India : Meghalaya : Khasi Hills,
 = *C. tinctipennis* Cameron, 1903 Sikkim. Burma, Thailand.

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17. *C. nigripes* Cameron, 1902
 = *C. varipes*, 1903
 = *C. longiventris*, 1903
 = *Bobbomyschus albipictus* Tosquinet, 1903
 9. Genus *Leptojoppa* Cameron, 1901
18. *L. erythrothorax* Cameron, 1901
 10. Genus *Caspipina* Cameron, 1903
19. *C. ferruginea* Cameron, 1903
 = *C. violaceipennis* Cameron, 1903
 11. Genus *Eutanyacra* Cameron, 1903
20. *E. pallidicoxis pallidicoxis* Cameron, 1903
 12. Genus *Achaius* Cameron, 1903
21. *E. stramineomaculata stramineomaculata* Cameron, 1903
 13. Genus *Hepiopelmus* Wesm. & M., 1845
22. *A. flavobalteatus* Cameron, 1903
 = *Haliphera maculipes* Cameron, 1903
 = *H. latibalteata* Cameron, 1907
 14. Genus *Setanta* Cameron, 1901
23. *H. flavomaculatus* (Cameron)
 = *Ancyra flavomaculata* Cameron, 1903
 15. Genus *Zanthojoppa* Cameron, 1901
24. *S. rufipes* Cameron, 1901
 = *S. femoralis* Cameron, 1903
 16. Genus *Zanthojoppa* Cameron, 1901
25. *Z. trilineata* Cameron, 1901
- India : Meghalaya : Khasi Hills
 Sikkim, Tamil Nadu.
 Burma, Pakistan, Indonesia.
- India : Meghalaya : Khasi Hills.
 Burma.
- India : Meghalaya : Khasi Hills
- India : Meghalaya : Khasi Hills.
 Burma.
- India: Meghalaya : Khasi Hills
- India: Meghalaya: Khasi Hills,
 Himachal Pradesh, Sikkim,
 West Bengal. Burma.
- India : Meghalaya : Khasi Hills
 Burma
- India: Meghalaya: Khasi Hills
 Indonesia.
- India: Meghalaya: Khasi Hills

Burma.

16. Genus *Stenaoplus* Heinrich, 1938

26. *S. intermedius* (Cameron) India: Meghalaya: Khasi Hills
 = *Hemiteles intermedius* Cameron, 1903
27. *S. khasianus* (Cameron) India: Meghalaya: Khasi Hills
 = *Algathia khasiana* Cameron, 1903
28. *S. ornatitarsis* (Cameron) India: Meghalaya: Khasi Hills
 = *Hemiteles geniculatus* Cameron, 1904
 = *H. ornatitarsis* Cameron, 1904
 = *H. caducus* Schulz, 1906
29. *Stenaoplus varipes* (Cameron) India: Meghalaya: Khasi Hills
 = *Algathia varipes* Cameron, 1904

17. Genus *Losgna* Cameron, 1903

30. *L. forticeps* Cameron, 1903 India: Meghalaya: Khasi Hills.

18. Genus *Hiorada* Cameron

31. *H. bilineata* Cameron, 1902 India: Meghalaya: Khasi Hills

19. Genus *Bovijoppa* Heinrich, 1963

32. *B. monitor* (Morley) India: Meghalaya: Khasi Hills
 = *Lagenesta monitor* Morley, 1919 Burma.

20. Genus *Eupalamus* Wesm., 1845 (1844)

33. *E. ferrugineus* (Cameron) India: Meghalaya: Khasi Hills.
 Burma, Japan.

21. Genus *Mesophadnus* Cameron, 1907

34. *M. femorata* (Cameron) India: Meghalaya: Khasi Hills.
 = *Xanthojoppa femorata* Cameron, 1903
 = *X. geniculata* Cameron, 1903

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35. *M. violaceipennis* (Cameron) India: Meghalaya: Khasi Hills,
 = *Lagenestra* (!) *violaceipennis* Cameron, 1905 Sikkim, West Bengal.
 = *Eupalamus fumipennis* Townes et al, 1961
 22. Genus *Pseudeupalamus* Heinrich, 1980
36. *P. nigrolineata* (Cameron) India: Meghalaya: Khasi Hills.
 = *Xanthojoppa nigrolineata* Cameron, 1903
 23. Genus *Xestojoppa* Cameron, 1901
37. *X. olivacea* Cameron, 1901 India: Meghalaya: Khasi Hills
 = *X. bilineata* Cameron, 1903
 24. Genus *Lareiga* Cameron, 1903
38. *L. rufosemorata rufosemorata* Cameron, 1903 India: Meghalaya: Khasi Hills
 = *Belargea albomaculata* Cameron, 1903 Sikkim.
 = *Holphurnia* (lapsus for *Haliphera*) *Ornatipes* Cameron, 1905
 25. Genus *Sycaonia* Cameron, 1903
39. *S. rufosacies rufosacies* Cameron, 1903 India: Meghalaya: Khasi Hills.
 26. Genus *Odontojoppa* Cameron, 1903
40. *O. metallica* Cameron, 1903 India: Meghalaya. Burma
 27. Genus *Gyrodonta* Cameron
41. *G. glavomaculata* Cameron, 1901 India: Meghalaya: Khasi Hills
 28. Genus *Cosmijoppa* Cameron, 1902
42. *C. violaceipennis* Cameron, 1902 India: Meghalaya: Khasi Hills.
 Burma.
 29. Genus *Benyllus* Cameron, 1903
43. *B. rufus* Cameron, 1903 India: Meghalaya: Khasi Hills
 30. Genus *Bystra* Cameron, 1902
44. *B. pallidimaculata* (Cameron) India: Meghalaya: Khasi Hills

= *evichoma* (!) *pallidimaculata* Cameron, 1903

45. *B. rufa* (Cameron)

India: Meghalaya: Khasi Hills

= *Lortygia rufa* Cameron, 1903

46. *B. testacea* Cameron, 1902

India: Meghalaya: Khasi Hills

31. Genus *Algathia* Cameron, 1902

47. *A. maculiceps* Cameron, 1902

India: Meghalaya: Khasi Hills

= *A. rufipetiolata* Cameron, 1904

32. Genus *Barichneumon* Thomson

48. *B. erythropoda* (Cameron)

India: Meghalaya: Khasi Hills

= *Algathia erythropoda* Cameron, 1904

6. Tribe ICHNEUMONINI

33. Genus *Protichneumon* Thomson

49. *P. flavoornatus* (Cameron)

India: Meghalaya: Khasi Hills

= *Amblyjoppa flavo-ornata* Cameron, 1903

Burma

50. *P. rufocinctus* (Cameron)

India: Meghalaya: Khasi Hills

= *Amblyjoppa rufocincta* Cameron, 1903

51. *P. tibialis* (Cameron)

India: Meghalaya: Khasi Hills

= *Amblyjoppa tibialis* Cameron, 1903

34. Genus *Ichneumon* Linnacus

Subgenus *Ichneumon* (*Ichneumon*)

52. *I. (I.) albonotatus* (Cameron)

India: Meghalaya: Khasi Hills

= *Cyanojoppa labonotata* Cameron, 1903

Burma

53. *I. (I.) flavolineatus* (Cameron)

India: Meghalaya: Khasi Hills

= *Aglaojoppa flavolineata* Cameron 1903

Sikkim.

= *A. latemaculata* Cameron, 1903

Burma.

= *A. maculiceps* Cameron, 1905

54. *I. (I.) fuscipennis* (Cameron) India: Meghalaya: Khasi Hills
 = *Amblyjoppa fuscipennis* Cameron, 1903
 = *Protichneumon piceipennis* Morley, 1915
55. *I. (I.) godwinausteni* Cameron India: Meghalaya: Khasi Hills
 = *Ichneumon godwin-austeni* Cameron Burma.
 = *Cyanojoppa caerulea* Cameron, 1903
56. *I. (I.) quinquemaculatus* (Cameron) India: Meghalaya: Khasi Hills
 = *Aglaojoppa 5-maculata* cameron, 1903
57. *I. (I.) rufofemoratus* Cameron India: Meghalaya: Khasi Hills
 = *Cyanojoppa rufofemorata* Cameron Himachal Pradesh, Uttar Pradesh
 = *Ç. caeruleicaudis* Cameron, 1903 West Bengal, Sikkim.
 = *C. nigro-coerulea* Camcron, 1903 Burma.
35. Genus *Aglaojoppa* Cameron, 1901
58. *A. caeruleodorsata caeruleodorsata* Cameron, 1903, India: Meghalaya: Khasi Hills.
 = *A. maculipes* Cameron, 1905 Sikkim. Burma.
59. *A. femorata* Cameron, 1903 India: Meghalaya: Khasi Hills
 Burma.
60. *A. flavomaculata* Cameron, 1901 India: Meghalaya: Khasi Hills
 = *Bady-orygma flavoguttatum* Uchida, 1936 Burma, Taiwan.
61. *A. rothneyi* Cameron, 1902 India: Meghalaya: Khasi Hills
 Himachal Pradesh. Burma.
62. *A. rufofemorata rufofemorata* Cameron, 1903 India: Meghalaya: Khasi Hills
 = *Ichneumon flavodes assamensis* Townes
 et al., 1961 Uttar Pradesh Sikkim.
 Burma, Nepal.
63. *A. violaceipennis* Cameron, 1903 India: Meghalaya : Khasi Hills

= *A. quadrimaculata* Cameron, 1903

36. Genus *Facydes* Cameron, 1901

64. *F. parpureomaculatus* Cameron, 1901

India: Meghalaya: Khasi Hills

Burma, Taiwan.

37. Genus *Amblyjoppa* Cameron

65. *A. aelvanus* (Cameron)

India: Meghalaya: Khasi Hills:

= *Amblyjoppa violaceipennis* Cameron, 1903

Sikkim.

= *A. varicornis* Cameron, 1905

= *A. melanoptera* Cameron, 1905

= *A. iridipennis* Cameron, 1907

66. *A. forticornis forticornis* (Cameron)

India: Meghalaya: Khasi Hills

= *Hadrojoppa forticornis* Cameron, 1903

Sikkim, West Bengal.

67. *A. fumipennis* (Cameron)

India: Meghalaya: Khasi Hills

= *Hadrojoppa fumipennis* Cameron, 1904

Burma, China.

= *Amblyjoppa annulitarsis fumipennis* Heinrich, 1968..

68. *A. rufobalteata rufobalteata* Cameron, 1902

India: Meghalaya: Khasi Hills

= *A. japonica f. kulingensis* Uchida, 1937.

China

69. *A. varipes* Cameron, 1903

India: Meghalaya: Khasi Hills.

38. Genus *Cnemojoppa* Heinrich, 1937

70. *C. rufipes* (Cameron)

India: Meghalaya: Khasi Hills

= *Amblyjoppa rufipes* Cameron, 1903

Uttar Pradesh, Sikkim.

Burma

39. Genus *Naenaria* Cameron, 1903

71. *N. grandiceps* Cameron, 1903

India: Meghalaya: Khasi Hills.

Burma, Indonesia.

72. *N. nigrocoerulea* (Cameron)

India: Meghalaya: Khasi Hills

= *Aglaojoppa nigro-coerulea* Cameron, 1905

Sikkim, West Bengal.

40. Genus *Gathetus* Cameron, 1901

- 73.
- G. melanocerus*
- Cameron, 1901

India: Meghalaya: Khasi Hills

41. Genus *Atanyjoppa* Cameron, 1901

- 74.
- A. rufomaculata rufomaculata*
- Cameron, 1901.

India: Meghalaya: Khasi Hills.
Burma.42. Genus *Cratojoppa* Cameron

- 75.
- C. robusta*
- Cameron, 1901

India: Meghalaya: Khasi Hills
Sikkim, West Bengal.
Bhutan, Burma.43. Genus *Ileanta* Cameron, 1899

- 76.
- I. fulvipes*
- Cameron, 1903

India: Meghalaya: Khasi Hills.
Burma.

- 77.
- I. latitarsis*
- Cameron, 1899

India: Meghalaya: Khasi Hills

- 78.
- I. trochanterata*
- Cameron, 1903

44. Genus *Lachmetha* Cameron

- 79.
- L. spinitarsis*
- Cameron, 1903

India: Meghalaya: Khasi Hills
Sikkim.
Burma, Indonesia, Taiwan.45. Genus *Heresiarches* Wesmahl, 1859

- 80.
- H. pseudobirmanicus*
- Heinrich, 1970

India: Meghalaya: Khasi Hills
Burma.46. Genus *Darachosia* Cameron, 1903

- 81.
- D. fulvipes fulvipes*
- Cameron, 1903

India: Meghalaya: Khasi Hills,
Uttar Pradesh.
Burma.

47. Genus *Legnatia* Cameron, 1903

- 82.
- L. fulvipes fulvipes*
- Cameron, 1903

India: Meghalaya: Khasi Hills

Tribe ISCHNOJOPPINI

48. Genus *Ischnojoppa* Kriechbaumer, 1896

- 83.
- I. luteator*
- (Fabricius)

India: Meghalaya: Khasi Hills,

= *Ichneumon luteator* Fabricius, 1798

Bihar, Karnataka, Maharashtra,

= *Joppa lutea* Fabricius, 1804

Sikkim, Tamil Nadu, West Bengal.

= *Ichneumon adspersor* Thunberg, 1822

Australia, Bangladesh, Bhutan,

= *Joppa rufa* Brulle, 1840

Burma, China, Germany, Hong-

= *Ichneumon agraensis* Cameron, 1897

kong, Indonesia, Japan, Malaysia,

= *Bodargus rufus* Cameron, 1902

Nepal, Sri Lanka, Singapore,

= *Exephanes akonis* Matsumura, 1912

Taiwan, Tibet, Philippines.

Tribe PLATYLABINI

49. Genus *Platylabus* Wesmael, 1845

- 84.
- P. caeruleus*
- (Cameron)

India: Meghalaya: Khasi Hills.

= *Lamprojoppa caerulea* Cameron, 1901

Burma.

- 85.
- P. cariniscutis*
- (Cameron)

India: Meghalaya: Khasi Hills

= *algathia cariniscutis* Cameron, 1904

- 86.
- P. fuscinerva*
- (Cameron)

India: Meghalaya: Khasi Hills

= *lamprojoppa fuscinerva* Cameron, 1901

- 87.
- P. parvimaculatus*
- (Cameron)

India: Meghalaya: Khasi Hills

= *Algathia parvimaculata* Cameron, 190350. Genus *Pachyjoppa* Cameron, 1901

- 88.
- P. tibialis*
- Cameron, 1901

India: Meghalaya: Khasi Hills
Burma.

Tribe GOEDARTIINI

51. Genus *Maraces* Cameron, 1902

- 89.
- M. pectinata*
- Cameron, 1902

India: Meghalaya: Khasi Hills
Sikkim

Tribe COMPSOPHORINI

52. Genus *Habrojoppa* Cameron, 1902

90. *H. leucozona* Cameron, 1903 India: Meghalaya: Khasi Hills
91. *H. maculiceps* Cameron, 1903 India: Meghalaya: Khasi Hills
Burma, Indonesia.
92. *H. rufopetiolata* Cameron, 1902 India: Meghalaya: Khasi Hills.
Uttar Pradesh.
Burma.

53. Genus *Charitojoppa* Cameron, 1901

93. *C. coerulea coerulea* Cameron, 1901 India: Meghalaya: Khasi Hills.
Sikkim.
Burma.

54. Genus *Xenajoppa* Cameron, 1901

94. *X. crassispina* (Cameron) India: Meghalaya: Khasi Hills
= *Magrettiu crassispina* Cameron, 1901 Burma.
= *Xenajoppa* (?) *maculiceps* Cameron, 1903

Tribe TROGINI

55. Genus *Callajoppa* Cameron, 1903

95. *C. flavinerva* (Cameron, 1903 India: Meghalaya: Khasi Hills
= *Dimaetha flavinerva* Cameron, 1903

56. Genus *Dimaetha* Cameron, 1901

96. *D. ferruginea* (Cameron) India: Meghalaya: Khasi Hills.
= *Erythrojoppa ferruginea* Cameron, 1902
= *E. lineata* Cameron, 1903
= *E. nigromaculata* Cameron, 1903

97. *D. tibialis tibialis* Cameron, 1901 India: Meghalaya: Khasi Hills

57. Genus *Neofacydes* Heinrich, 1960

98. *N. nigrolineatus* (Cameron) India: Meghalaya: Khasi Hills

= *Dimaetha nigrolineata* Cameron, 1903

58. Genus *Holcojoppa* Cameron, 1902

99. *H. orientalis* (Kriechbaumer)

India: Meghalaya: Khasi Hills

= *Psilomastax orientalis* Kriechbaumer, 1898

= *Holeojoppa flavipennis* Cameron, 1902

DISTRICT-WESE DISTRIBUTION OF TAXA OF FAMILY ICHNEUMONIDAE IN MEGHALAYA

Sl. No.	NAME OF TAXA	DISTRIBUTION
	1. Subfamily PIMPLINAE	
	1. Tribe PIMPLINI	
	1. Genus <i>Eremochila</i> Foerster	
1.	<i>E. kamrupa</i> Gupta & Tikar	East Khasi Hills
	2. Genus <i>Dolichomitus</i> Smith	
2.	<i>D. khasianus</i> Gupta & Tikar	East Khasi Hills
3.	<i>D. melanomerus tinctipennis</i> (Cameron)	East Khasi Hills?
4.	<i>D. nigratarsis</i> (Cameron)	East Khasi Hills
	3. Genus <i>Flavopimpla</i> Betrem	
5.	<i>F. nigromaculata nigromaculata</i> (Cameron)	East Khasi Hills
	4. Genus <i>Afrephialtes</i> Benoit	
6.	<i>A. robustus</i> Gupta & Tikar	East Khasi Hills
	5. Genus <i>Iseropus</i> foerster	
	1. Subgenus <i>Iseropus</i> (<i>Gregopimpla</i>) Momoi	
7.	<i>I. (G.) himalayensis</i> (Cameron)	Jaintia Hills
	6. Genus <i>Scambus</i> Hartig	
	2. Subgenus <i>Scambus</i> (<i>Scambus</i>) Hartig	

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8.	<i>S. (S.) assamensis</i> Gupta & Tikar	East Khasi Hills
7. Genus <i>Acropimpla</i> Townes		
9.	<i>A. bicarinata</i> (Cameron)	East Khasi Hills
10.	<i>A. leucostoma</i> (Cameron)	East Khasi Hills
11.	<i>A. uchidai</i> (Cushman)	East Khasi Hills
8. Genus <i>Camptotypus</i> Kriechbaumer		
12.	<i>C. arianus arianus</i> (Cameron)	East Khasi Hills
13.	<i>C. olynthus</i> (Cameron)	East Khasi Hills
2. Tribe EPHIALTINI		
9. Genus <i>Itoplectis</i> Foerster		
14.	<i>I. himalayensis</i> Gupta	East Khasi Hills
10. Genus <i>Coccygomimus</i> Saussure		
15.	<i>C. bilineatus</i> (Cameron)	East Khasi Hills
16.	<i>C. cameronii</i> (Dalla-Torre)	East Khasi Hills
17.	<i>C. carinifrons</i> (Cameron)	East Khasi Hills
18.	<i>C. erebus</i> (Cameron)	East Khasi Hills
19.	<i>C. flavipalpis</i> (Cameron)	East Khasi Hills
20.	<i>C. laothoe</i> (Cameron)	East Khasi and Jaintia Hills
21.	<i>C. turionellae</i> (Linnaeus)	East Khasi Hills
11. Genus <i>Echthromorpha</i> Holmgren		
22.	<i>E. agrestoria notulatoria</i> (Fabricius)	East Khasi Hills
12. Genus <i>Lissopimpla</i> Kriechbaumer		
23.	<i>L. albopicta albopicta</i> (Walker)	East Khasi Hills
13. Genus <i>Xanthopimpla</i> Saussure		
24.	<i>X. appendicularis appendicularis</i> (Cameron)	East Khasi Hills
25.	<i>X. bifida</i> Townes & Chiu	Jaintia Hills

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26. <i>X. brachycentra obscuricornis</i> Townes & Chiu	Jaintia Hills
27. <i>X. clivulus indicata</i> Gupta	Jaintia Hills
28. <i>X. conica</i> Cushman	Jaintia Hills
29. <i>X. Curvimaculata curvimaculata</i> (Cameron)	East Khasi Hills
30. <i>X. despinosa leipephelis</i> Townes & Chiu	Jaintia Hills
31. <i>X. elegans apicipennis</i> (Cameron)	East Khasi Hills
32. <i>X. glaberrima</i> Roman	Jaintia Hills
33. <i>X. homorata homorata</i> (Cameron)	East Khasi Hills
34. <i>X. lepcha</i> (Cameron)	East Khasi and Jaintia Hills
35. <i>X. nana nana</i> Schulz	Jaintia Hills
36. <i>X. pedator</i> (Fabricius)	East Khasi Hills
37. <i>X. pleuroschista</i> Townes & Chiu	East Khasi Hills
38. <i>Xanthopimpla stemmator</i> (Thunberg)	East Khasi Hills
3. Tribe THERONINI	
14. Genus <i>Parema</i> Gupta	
39. <i>P. nigrobalteata nigrobalteata</i> (Cameron)	East Khasi Hills
4. Tribe NEOXORIDINI	
15. Genus <i>Eugalla</i> Cameron	
40. <i>E. albitarsis albitarsis</i> Cameron	Jaintia Hills
41. <i>E. leucops</i> Townes	East Khasi Hills
42. <i>E. linearis linearis</i> Morley	East Khasi Hills?
43. <i>E. strigosa strigosa</i> Cameron	East Khasi Hills
16. Genus <i>Acrocephalus</i> Kreichbaumer	
44. <i>A. nigricolis nigricolis</i> (Cameron)	East Khasi and Jaintia Hills
45. <i>A. punctulatus punctulatus</i> (Cameron)	East Khasi Hills
46. <i>A. spinosus</i> (Cameron)	East Khasi Hills

5. Tribe RHYSSINI

17. Genus *Lytarmes* Cameron

47. *L. maculipennis hyalinipennis* Cameron East Khasi Hills

18. Genus *Megarhyssa* Ashmead

48. *M. fulvipennis* (Cameron) East Khasi Hills

19. Genus *Triancyra* Baltazar

49. *T. maculicornis* (Cameron) East Khasi Hills
 50. *T. sarojinae* Kamath and Gupta Jaintia Hills

20. Genus *Sychnostigma* Baltazar

51. *S. anamikae* Jonathan West Garo Hills
 52. *S. assamense* Kamath & Gupta East Khasi Hills
 53. *S. flavobalteatum* (Cameron) East Khasi Hills

21. Genus *Myllenyx* baltazar

54. *M. carinifrons* (Cameron) East Khasi Hills

2. Subfamily TRYPHONINAE

6. Tribe SPHINCTINI

22. Genus *Sphinctus* Gravenhorst

55. *S. trichiosoma* (Cameron) East Khasi Hills

7. Tribe PHYTODIETINI

23. Genus *Netelia* Gray3. Subgenus *Netelia* (*Longiterebates*) Kaur & Jonathan

56. *N. (L.) interstitialis* (Cameron) East Khasi Hills

4. Subgenus *Netalia* (*Toxochiloides*) Tolkanite

57. *(T.) latro latro* (Holmgren) East Khasi and Jaintia Hills

5. Subgenus *Netelia* (*Netelia*) Gray

58. *N. (N.) corrugata* Kaur & Jonathan East Khasi Hills

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59. <i>N. (N.) intermedia</i> (Cameron)	Jaintia Hills
60. <i>N. (N.) lavis</i> Cameron)	East Khasi Hills
61. <i>N. (N.) orientalis</i> (Cameron)	East Khasi Hills
62. <i>N. (N.) rimosa</i> (Enderlein)	East Khasi Hills
63. <i>N. (N.) siva</i> Kaur & Jonathan	Jaintia Hills
64. <i>N. (N.) vinulae</i> (Scopoli)	East Khasi Hills

3. Subfamily XORIDINAE

24. Genus *Xorides* Latreille

6. Subgenus *Xorides* (*Epixorides*) Smith

65. <i>X. elizabethae</i> (Bingham)	East Khasi Hills

7. Subgenus *Xorides* (*Cyanoxorides*) Cameron

66. <i>X. (C.) abaddon</i> (Morley)	

4. Subfamily BANCHINAE

8. Tribe GLYPTINI

25. Genus *Apophua* Morley

67. <i>A. carinata</i> Morley	

9. Tribe LISSONOTINI

26. Genus *Lissonota* Gravenhorst

68. <i>L. albomaculata</i> (Cameron)	East Khasi Hills
69. <i>L. castaneae</i> Chandra & Gupta	East Khasi Hills
70. <i>L. nigrominiata</i> Chandra & Gupta	East Khasi Hills
71. <i>L. xuthosoma</i> Chandra & Gupta	East Khasi Hills

27. Genus *Syzeuctus* Foerster

72. <i>S. villosus</i> (Cameron)	East Khasi Hills

28. Genus *Leptobatopsis* Ashmead

73. <i>L. indica</i> (Cameron)	East Khasi and Jaintia Hills

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74. <i>L. bicolor</i> Cushman	East Khasi Hills
29. Genus <i>Banchus</i> Fabricius	
75. <i>B. nox</i> Morley	East Khasi Hills
5. Subfamily CTENOPELMATINAE	
30. Genus <i>Perispuda</i> Foerster	
76. <i>P. khasiana</i> (Cameron)	East Khasi Hills
6. Subfamily PORIZONTINAE	
10. Tribe NESOMESOCHORINI	
31. Genus <i>Klutiana</i> Betrem	
77. <i>K. khasiana</i> Gupta	East Khasi Hills
11. Tribe PORIZONTINI	
32. Genus <i>Campoplex</i> Gravenhorst	
78. <i>C. oriens</i> Gupta & Maheshwary	East Khasi Hills
79. <i>C. maximalus</i> Gupta & Maheshwary	Jaintia Hills
80. <i>C. septentrionalis septentrionalis</i> Gupta & Maheshwary	East Khasi Hills
33. Genus <i>Venturia</i> Schrottky	East Khasi Hills
81. <i>V. assamensis</i> Maheshwary	East Khasi Hills
82. <i>V. inquinata</i> (Morley)	East Khasi Hills
34. Genus <i>Casitaria</i> Holmgren	
83. <i>C. minima</i> (Morley)	East Khasi Hills
84. <i>C. pedunculata pedunculata</i> (Szepligeti)	East Khasi and Jaintia Hills
35. Genus <i>Charops</i> Holmgren	
85. <i>C. bicolor</i> (Szepligeti)	East Khasi Hills
86. <i>C. obtusa obtusa</i> Morley	East Khasi Hills

12. Tribe CYMODUSINI

36. Genus *Menaka* Gupta & Gupta

87. *M. crunea* Gupta & Gupta East Khasi Hills

37. Genus *Delopia* Cameron

88. *D. brevisoctrea* (Gupta & Gupta) East Khasi Hills
 89. *D. cameroni* (Dalla-Torre) East Khasi Hills
 90. *D. femoralis* (Gupta & Gupta) East Khasi and Jaintia Hills
 91. *D. himalayensis* (Cameron) East Khasi Hills?
 92. *D. pyrtanes* (Cameron) East Khasi Hills
 93. *D. simlaensis* (Cameron) East Khasi and Jaintia Hills
 94. *D. sumptuosa* (Cameron) East Khasi Hills?
 95. *D. tyrannus* (Cameron) East Khasi Hills

13. Tribe MACRINI

38. Genus *Campoletis* Foerster

96. *C. chlorideae* Uchida East Khasi Hills

39. Genus *Diadegma* Foerster

97. *D. albicalcar* (Morley) East Khasi Hills

40. Genus *Hyposoter* Foerster

98. *H. ebeninus* Gravenhorst East Khasi Hills
 99. *H. indicus* (Cameron) East Khasi Hills?
 100. *H. volens* (Cameron) East Khasi Hills

41. Genus *Eriborus* Foerster

101. *E. buddha* (Cameron) East Khasi Hills
 102. *E. spinipes* (Cameron) East Khasi Hills

7. Subfamily CREMASTINAE

42. Genus *Pristomerus* Curtis

103. *P. marginicollis* (Cameron) East Khasi Hills

43. Genus *Trathala* Cameron

104. *T. striata* Cameron East Khasi Hills

8. Subfamily TERSILOCHINAE

44. Genus *Diaparsis* Foerster

105. *D. caudata* Morley East Khasi Hills

9. Subfamily OPHIONINAE

45. Genus *Ophion* Fabricius

106. *O. areolatus* Cameron East Khasi Hills

107. *O. fuscomaculatus* Cameron East Khasi Hills

46. Genus *Leptophion* Cameron

108. *L. maculipennis* (Cameron) East Khasi Hills

109. *L. radiatus* (Uchida) East Khasi Hills

47. Genus *Dicamptus* Szepligeti

110. *D. cantoni* Gauld & Mitchell East Khasi Hills

111. *D. reticulatus* Gauld & Mitchell East Khasi Hills

48. Genus *Enicospilus* Stephens

112. *E. bharatensis* Nikam East Khasi Hills

113. *E. fittoni* Nikam East Khasi Hills

114. *E. hedilis* Gauld & Nitchell East Khasi Hills

115. *E. heliothidis* Viereck East Khasi Hills

116. *E. lineolatus* (Roman) East Khasi Hills

117. *E. melanocarpus* Cameron East Khasi Hills

10. Subfamily MESOCHORINAE

49. Genus *Mesochorus* Gravenhorst118. *M. confusus* Holmgren East Khasi Hills

11. Subfamily METOPINAE

50. Genus *Metopius* Panzer8. Subgenus *Metopius* (*Metopius*) Panzer119. *M. (M.) rufus rufus* Cameron East Khasi Hills51. Genus *Colpotrochia* Holmgren9. Subgenus *Colpotrochia* (*colpotrochia*) Holmgren120. *C. (C.) assamensis* Townes et al. East Khasi Hills121. *C. (C.) coenuta* Cameron East Khasi Hills122. *C. (C.) melanosoma* Morley East Khasi Hills10. Subgenus *Colpotrochia* (*Scallama*) Cameron123. *C. (S.) trilineata* (Cameron) East Khasi Hills52. Genus *Hypsicera* Latreille124. *H. parca* (Morley) East Khasi Hills53. Genus *Macromelon* Townes125. *M. orientale* Kerrich East Khasi Hills54. Genus *Exochus* Gravenhorst126. *E. coronellus* (Morley) East Khasi Hills

12. Subfamily GRAVENHORSTINAE

55. Genus *Aphanistes* Foerster127. *A. carinifrons* (Cameron) East Khasi Hills56. Genus *Barylypa* Foerster128. *B. apicate* (Cameron) East Khasi Hills

57. Genus *Therion* Curtis

129. *T. circumflexum* (Linnaeus) East Khasi Hills
 130. *T. mussouriensis* (Cameron) East Khasi Hills

58. Genus *Heteropelma* Wesmael

131. *H. amictus* (Fabricius) East Khasi Hills
 132. *H. flavitarse* Cameron East Khasi Hills
 133. *H. orbitale* (Morley) East Khasi Hills

59. Genus *Trichomma* Wesmael

134. *T. nigricans* Cameron East Khasi Hills

60. Genus *Agrypon* Foerster

135. *A. nox* Morley East Khasi Hills

61. Genus *Brachynervus* Uchida

136. *B. confusus* Gauld East Khasi Hills

13. Subfamily ACAENITINAE

62. Genus *Siphimedia* Cameron

137. *S. varipes* (Cameron) East Khasi Hills

63. Genus *Yezoceryx* Uchida

138. *Y. ferrugineus* (Cameron) East Khasi Hills
 139. *Y. luteus* (Cameron) East Khasi Hills
 140. *Y. nigricans* (Cameron) East Khasi Hills

14. Subfamily DIPLAZONTINAE

64. Genus *Diplazon* Viereck

141. *D. orientalis* (Cameron) East Khasi Hills

65. Genus *Sussaba* Cameron

142. *S. cognata albicoxa* (Thomson) East Khasi Hills

15. Subfamily PHYGADEUONTINAE

14. Tribe CHIROTICINI

66. Genus *Caenopimpla* Cameron

143. *C. ruficollis* Cameron East Khasi Hills

15. Tribe GELINI

67. Genus *Formocryptus* Uchida

144. *F. bidentatus* (Cameron) East Khasi Hills

145. *F. khasianus* (Cameron) East Khasi Hills

146. *F. pulcherrimus* (Cameron) East Khasi Hills

16. Tribe MASTRINI

68. Genus *Charitopes* Foerster

147. *C. densus* Townes East Khasi Hills

17. Tribe ROTHNEYIINI

69. Genus *Rothneyia* Cameron

148. *R. annulicornis* Cameron East Khasi Hills

16. Subfamily HEMIGASTERINAE

70. Genus *Mansa* Tosquinet

149. *M. fulgidipennis* (Cameron) East Khasi Hills

150. *M. fulvipennis* (Cameron) East Khasi Hills

151. *M. pulchricornis* Tosquinet East Khasi Hills

152. *M. tarsalis* (Cameron) East Khasi Hills

153. *M. tibialis* (Cameron) East Khasi Hills

154. *M. tuberculata* (Cameron) East Khasi Hills

71. Genus *Hemigaster* Brulle

155. *H. carinifrons* Cameron East Khasi Hills

156. *H. fulvipes* Cameron East Khasi Hills

157. *H. malayensis* Cushman East Khasi Hills

72. Genus *Platymystax* Townes

158. *P. striatifrons* (Cameron) East Khasi Hills

73. Genus *Javra* Cameron

159. *J. longicornis* Cameron East Khasi Hills

160. *J. parviceps* Cameron East Khasi Hills

74. Genus *Aptesis* Foerster

161. *A. latiannulata* (Cameron) East Khasi Hills

162. *A. pallidinervis* (Cameron) East Khasi Hills

163. *A. pulchripes* (Cameron) East Khasi Hills

17. Subfamily MESOSTENINAE

18. Tribe GABUNINI

75. Genus *Apocryptus* Uchida

164. *A. biserratus* Gupta & Gupta East Khasi Hills

165. *A. fusciventris* (Cameron) East Khasi Hills

166. *A. laevifrons* (Cameron) East Khasi Hills

167. *A. nitidus* Gupta & Gupta East Khasi Hills

168. *A. plumbeus* (Cameron) East Khasi Hills

169. *A. tikari* Gupta & Gupta East Khasi Hills

76. Genus *Dinocryptus* Cameron

170. *D. apicalis* (Cameron) East Khasi Hills

171. *D. femoratus* (Cameron) East Khasi Hills

172. *D. fulgidipennis* (Cameron) East Khasi Hills

77. Genus *Xoridesopus* Cameron

173. *X. flavispeculum* Gupta & Gupta East Khasi Hills

174. *X. kamathi* Gupta & Gupta Jaintia Hills

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175. *X. orientalis* Gupta & Gupta East Khasi Hills
176. *X. xanthosema* Gupta & Gupta East Khasi Hills
78. Genus *Hadrocryptus* Cameron
177. *H. ditissimus* (Tosquinet) East Khasi Hills
79. Genus *Arhytis* Townes
178. *A. maculiscutis* (Cameron) East Khasi Hills
80. Genus *Dagathia* Cameron
179. *D. brunnea* Cameron East Khasi Hills
81. Genus *Torbda* Cameron
180. *T. geniculata* Cameron East Khasi Hills
181. *T. maculipennis* Cameron East Khasi Hills
182. *T. nigromaculata* Cameron East Khasi Hills
183. *T. violaceipennis* Cameron East Khasi Hills
19. Tribe AGROTHEREUTINI
82. Genus *Agrothereutes* Foerster
184. *A. pilosus* (Cameron) East Khasi Hills?
185. *A. rufofemoratus* (Cameron) East Khasi Hills
83. Genus *Idiolispa* Foerster
186. *I. analis* (Gravenhorst) East Khasi Hills?
20. Tribe ISCHNINI
84. Genus *Etha* Cameron
187. *E. striatifrons* Cameron East Khasi Hills
85. Genus *Ischnus* Gravenhorst
188. *I. curvimaculatus* (Cameron) East Khasi Hills
189. *I. striatifrons* (Cameron) East Khasi Hills

86. Genus *Nippocryptus* Uchida

190. *N. misippus* Cameron East Khasi Hills

87. Genus *Buathra* Cameron

191. *B. rufiventris* Cameron East Khasi Hills

88. Genus *Hedycryptus* Cameron

192. *H. orientalis* (Cameron) East Khasi Hills

193. *H. rufopetiolatus* (Cameron) East Khasi Hills

89. Genus *Neodontocryptus* Uchida

194. *N. brilliantus* Uchida East Khasi Hills

21. Tribe BARYCERATINI

90. Genus *Jonathanina* Gupta

195. *J. multimaculata* (Jonathan) East Khasi Hills

91. Genus *Chlorocryptus* Cameron

196. *C. coeruleus* Cameron East Khasi Hills

197. *C. metallicus* Cameron East Khasi Hills

22. Tribe MESOSTENINI

92. Genus *Gotra* Cameron

198. *G. carinifrons* Cameron East Khasi Hills

199. *G. longicornis* Cameron East Khasi Hills

200. *G. marginata* (Brulle) East and South Garo Hills

93. Genus *Mesostenus* Gravenhorst

201. *M. penetralis* (Cameron) East Khasi Hills

23. Tribe GORYPHINI

94. Genus *Necolio* Cheesman

202. *N. testaceipes* (Cameron) East Khasi Hills

95. Genus *Friona* Cameron203. *F. curvicarinata* Cameron East Khasi Hills204. *F. frontella* Cameron East Khasi Hills96. Genus *Listrognathus* Tschek10. Subgenus *Listrognathus* (*Listrognathus*) Tschek205. *L. (L.) assamensis* Gupta & Kamath East Khasi Hills206. *L. (L.) laevifrons* (Cameron) East Khasi Hills207. *L. (L.) nigriabdominalis* Gupta & Kamath East Khasi and Jaintia Hills208. *L. (L.) pallidinerva* (Cameron) East Khasi Hills209. *L. (L.) rugifrons* (Cameron) East Khasi Hills11. Subgenus *Listrognathus* (*Stivadens*) Townes210. *L. (S.) annulipes* (Cameron) East Khasi Hills97. Genus *Goryphus* Holmgren211. *G. albomaculatus* (Cameron) East Khasi Hills212. *G. apollonis* Jonathan & Gupta Jaintia Hills213. *G. brahminus* Jonathan & Gupta East Khasi Hills214. *G. cestus cestus* Jonathan & Gupta Jaintia Hills215. *G. dravidus dravidus* Jonathan & Gupta East Khasi Hills216. *G. saluator* (Cameron) East Khasi Hills98. Genus *Skeatia* Cameron217. *S. cameroni* Jonathan & Gupta East Khasi Hills218. *S. cariniscuta* (Cameron) Jaintia Hills219. *S. fuscinervis* (Cameron) East Khasi Hills220. *S. maculiceps* (Cameron) East Khasi Hills?221. *S. mysorensis* Jonathan & Gupta East Khasi Hills222. *S. rubricata* Jonathan & Gupta East Khasi Hills

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223. *S. rugosa* Jonathan & Gupta East Khasi and Jaintia Hills
224. *S. rothneyi* Jonathan & Gupta East Khasi Hills
225. *S. simulator* Jonathan & Gupta South Garo Hills
226. *S. versatilis* (Cameron) South Garo Hills
99. Genus *Gambroides* Betrem
227. *G. javensis* (Rohwer)
100. Genus *Isotima* Foerster
228. *I. ruficollis* (Holmgren) South Garo Hills
101. Genus *formostenus* Uchida
12. Subgenus *Formostenus* (*Formostenus*) Uchida
229. *F. (F.) cherraensis* Jonathan East khasi Hills
230. *F. (F.) flavorbitalis* Jonathan East Khasi Hills
231. *F. (F.) rugipectus* Jonathan East Khasi Hills
232. *F. (F.) striatus* Jonathan East Khasi Hills
102. Genus *Melcha* Cameron
233. *M. veripes* Cameron East Khasi Hills
103. Genus *Euchalinus* Townes
234. *E. respondens* (Cameron) East Khasi Hills
235. *E. reticulatus* (Cameron) East Khasi Hills
104. Genus *Baltazaria* Townes
24. Tribe COESULINI
236. *B. caligatus* (Cameron) East Khasi Hills
105. Genus *Coesula* Cameron
237. *C. erugenu* Gupta & Jonathan East Khasi Hills
238. *C. flavorbitalis flavorbitalis* Gupta & Jonathan East Khasi Hills
239. *C. varuna* Gupta & Jonathan East Khasi Hills

25. Tribe CERATOCRYPTINI

106. Genus *Fitatsia* Seyrig240. *F. hypsipylae* Kamath Jaintia Hills141. *F. tuberculata* Kamath Jaintia Hills107. Genus *Ceratocryptus* Cameron242. *C. bituberculatus* Cameron East Khasi Hills243. *C. tibialis* Cameron East Khasi Hills108. Genus *Silsila* Cameron244. *S. fulvipes* Cameron East Khasi Hills

26. Tribe OSPRYNCHOTINI

109. Genus *Nematopodius* Gravenhorst245. *N. (N.) longiventris* (Cameron) East Khasi Hills110. Genus *Acroricnus* Ratzeberg246. *A. peronatus* (Cameron) East Khasi Hills

SUMMARY

The present paper deals with Ichneumonidae fauna of Meghalaya, India. Altogether 246 species/subspecies under 110 genera, belonging to 17 subfamilies have been treated in the text. The subfamily Ichneumoninae has not been discussed in detail, however, a list of species/subspecies along with district-wise distribution has been appended. The keys to subfamilies, tribes, genera, subgenera, species and subspecies have been provided for easy identification of taxa. Distributional table, maps and illustrations of morphological characters are given.

The Ichneumonidae comprise many parasites of pests associated with forests and crops. It is hoped that many of these may be economically exploited for the biological control of these pests.

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INSECTA : HYMENOPTERA : BRACONIDAE

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INTRODUCTION

The fauna of family Braconidae is very little known from the state of Meghalaya, except the valuable publications by Cameron (1899 & 1900), Rohwer (1924) and Bhatnagar (1948). Altogether 36 species of Braconids are recorded from Meghalaya, whereas 360 species are reported from India as is evident from the published work of Bingham (1901), Turner (1922), Enderlein (1923), Ramakrishna Ayyar (1924), Wilkenson (1928-29), Lal (1940), Nixon (1950 & 1965), Sharma (1970) and Shenefelt (1970, 1972-'73, 1975-'76 & 1978).

In the present work, all the 36 species of Meghalaya are recorded with synonymy, diagnostic characters, distribution and remarks, only from the published literature, except one species (*Apanteles glomeratus* (Linn.) for which the material was available for study.

These parasitic insects for which Lepidopterous larvae act as hosts, play an important role, specially by genus *Apanteles* for the biological control of agricultural insect pests. The family is characterised by the following characters : antennae long and slender, 16-20 segmented, head smaller than body, eyes small; thorax, specially the mesothorax is modified into pleurae and sometimes carinate also; wings, hyaline or fusco and flavohyaline; legs long and slender; abdominal tip in female is furnished with an ovipositor.

SYSTEMATICS

There are 7,500 species of the family Braconidae reported from the world, classified under 23 subfamilies and 520 genera; 760 species belonging to 125 genera and 13 subfamilies from the Oriental region; 360 species belonging to 60 genera and 11 subfamilies are known in India and 36 species belonging to 18 genera and 6 subfamilies are known from Meghalaya.

The keys to the subfamilies, genera and species are provided for identification of various taxa of this region. Taxonomic terms, Distribution table and Map, are included for ready reference.

MATERIAL AND METHOD

Braconids are endoparasites of Lepidopterous larvae and can be collected from the leaves, flowers and bushes in the open fields or by rearing the larvae in the laboratory. The Braconids thus collected can be transferred into a killing tube (prepared with Chloroform or Benzene or Ethyl Acetate). On top of chemicals in the tube a round white piece of blotting paper can be placed, to avoid

damage of the collection. The dead specimens then to be kept in a relaxing or damp box for stretching of bodyparts, then dried up and set and pinned with proper labelling viz., name, locality, collector and date. The specimen is made ready in this way for study under binocular or microscope.

The methodology applied here specially for male genitalia is as follows:

Male genitalia (Paramere) : attached to 9th segment of abdomen in form of genital capsule, can be extracted by putting the genital organ through abdominal tip aperture with forcep and putting pressure on the 8th segment. The genitalia then to be put in 10% KOH solutions overnight or boiled water with distilled water and later on, excess of KOH can be washed out and mounted on slide after dehydration with alcoholic strength.

MORPHOLOGY AND TERMINOLOGY

General Morphology

Braconid specimens are small 2.00 - 23.00 mm in length, have a small head, moderate thorax with modifications above, small eyes, slender and long antennae 16-20 segmented; with two pair of membranous, hyaline to fusco or flave-hyaline fore and hind wings, legs small to long, slender to medium built, abdomen elongate to subglobular, 8-segmented in male and 9 segmented in female, while the genital organs lie in their respective sterna.

List of terms used in key and text

Cubital cell	- The cell which articulates with the median axillary sclerites or plates and has two median branches.
Hypopygium	- The large apical ventrite of the female.
Interorbital space	- The space lying in front of vertex of head capsule.
Propodeum	- The median segment.
Scutellum	- The posterior plate of mesothorax.
Stigma	- The corneous mass in the centre of front margin of the forewing.

SYSTEMATIC ACCOUNT

Family BRACONIDAE

Subfamily BRACONINAE

1. *Bracon declaratus* Cameron
2. *Bracon firmus* Cameron

3. *Bracon leptogaster* Cameron
4. *Bracon umbratilis* Cameron
5. *Campyloneurns trimaculata* Cameron
6. *Chaoilta himalayensis* Cameron
7. *Chaoilta lammellata* Cameron
8. *Euurobracon cephalotes* (Smith)
9. *Hybogaster jejusus* (Cameron)
10. *Iphiaulax dodoneus* (Cameron)
11. *Iphiaulax khasianus* (Cameron)
12. *Iphiaulax lepcha* (Cameron)
13. *Iphiaulax pauparatus* (Cameron)
14. *Iphiaulax phaedo* (Cameron)
15. *Iphiaulax seditiosus* (Cameron)
16. *Ischnobracon indiscretus* (Cameron)
17. *Ischnobracon v-macula* (Cameron)

Subfamily HELCORINAE

18. *Wronghtonia cornuta* Cameron

Subfamily AGATHIDINAE

19. *Agathis infortunata* Schulz
20. *Braunsia fumipennis* (Cameron)
21. *Braunsia tuberculata* (Cameron)
22. *Cremonops nigratarsis* (Cameron)
23. *Euagathis forticarinata* (Cameron)
24. *Euagathis khasiana* (Cameron)
25. *Euagathis melanocerus* (Cameron)
26. *Euagathis ophippium* (Cameron)

27. *Euagathis peronata* (Cameron)

28. *Euagathis ruficollis* (Cameron)

29. *Oreba purpurea* Cameron

30. *Zelomorpha erythrocephala* (Cameron)

Subfamily ROGADINAE

31. *Neontsira typica* Rohwer

32. *Spinaria albiventris* (Cameron)

Subfamily DORYCTINAE

33. *Ontsira reticulata* Cameron

Subfamily MICROGASTERINAE

34. *Apanteles camilla* Nixon

35. *Apanteles glomeratus* (Linnaeus)

36. *Apanteles grandiculus* Wilkinson

Key to the subfamilies of family BRACONIDAE

1.	Body length 7-23 mm	.Braconinae
	Body length 2-4 mm	.2
2.	Mesonotum trilobate	.Doryctinae
	Mesonotum not trilobate	.3
3.	Wing -venation reduced, Intercubital and Discoidal cells demarcation clear	.Microgasterinae
	Wing-venation not reduced, Intercubital and Discoidal cells demarcation not clear	.4
4.	Median segment clearly furnished with a Keel; mandible bidentate	Rogadinae
	Median segment not clearly furnished with a Keel; mandible unidentate	.5
5.	Scutellum pyramidal, wing apex clear	.Helconinae
	Scutellum not pyramidal, wing apex smoky	. Agathidinae

Subfamily BRACONINAE

Key to the genera of subfamily Braconinae

1. Head orange-yellow in colour .2
- Head fulvous-black in colour .3
2. Vertex of head punctate, female ovipositor short, thickened and curved downwards *Hybogaster*
- Vertex of head smooth, female ovipositor long, slender and not curved downwards .4
3. Median segment punctate, stigma of forewing smoky or black *Iphiaulax*
- Median segment impunctate, stigma of forewing yellowish or brown .5
4. Wings hyaline and iridescent; second cubital cell as long as third cubital cell *Campyloneurus*
- Wings not hyaline and iridescent, having brownish tinge; second cubital cell not as long as third cubital cell .6
5. Second cubital cell of forewing, short; thorax and abdomen not flat or depressed *Bracon*
- Second cubital cell of forewing, large; thorax and abdomen flat and depressed *Chaoilta*
6. Second abdominal segment with a raised pyriform area, notauli deeply impressed *Ischnobracon*
- Second abdominal segment without a raised pyriform area, notauli not deeply impressed *Urrobracon*

1. Genus *Bracon* Fabricius, 1804Key to the species of genus *Bracon*

1. Length of the specimens attains upto 23 mm .2
- Length of the specimens attains upto 7-8 mm .3
2. Wings smoky, darker at apex *leptogaster*
- Wings fusco-hyaline, not darker at apex *firmus*
3. Legs covered with rufo-testaceous hairs. *declaratus*
- Legs covered with white hairs *umbratilis*

1. *Bracon declaratus* (Cameron)

1899. *Bracon declaratus* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, **43** (3) : 79.

1978. *Bracon declaratus* Cameron: Shenefelt, *Hym. Cat.*, **10** (3) : 1658.

Diagnostic characters : Terebra attains only 3 mm. in length.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

2. *Bracon firmus* Cameron

1900. *Bracon firmus* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, **44** (15) :84.

1978. *Bracon firmus* Cameron : Shenefelt, *Hym. Cat.*, (15) **10** :1484.

Diagnostic characters : Basal slope of mesosternum, red.

Distribution: India :; Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

3. *Bracon leptogaster* Cameron

1899. *Bracon leptogaster* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, **43** (3) :60.

1978. *Bracon leptogaster* Cameron: Shenefelt *Hym. Cat.*, (15) **10** : 1502.

Diagnostic characters : The specimen attains the largest size 23 mm in length.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

4. *Bracon umbratilis* Cameron

1899. *Bracon umbratilis* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, **43** :74.

1978. *Bracon umbratilis* Cameron ; Shenefelt, *Hym. Cat.*, (15) **10** : 1548.

Diagnostic characters : Hypopygium sharply cultriform.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere Australia and Pacific regions.

2. Genus *Campyloneurus* Szepligeti, 1900

5. *Campyloneurus trimaculata* (Cameron)

1900. *Spinaria trimaculta* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, **44** (150) :81.

1978. *Spinaria trimaculata* (Cameron) : Shenefelt, *Hym. Cat.*, (15) **10** : 1665.

Diagnostic Characters :Second abdominal segment raised and stoutly irregularly reticulated in the middle.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Sri lanka, Australia and Pacific regions.

3. Genus *Chaoilta* cameron, 1899

Key to the species of genus *Chaoilta*

1. Head luteous shining; palpi yellow; stigma of forewing luteous himalayensis
 - Head smooth shining; palpi luteous; stigma of forewing black .lammellata

6. *Chaoilta himalayensis* (Cameron)

1899. *Bracon himalayensis* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, **43** ; 80.

1978. *Chaoilta himalayensis* (Cameron) : Shenefelt, *Hym. Cat.*, (15) **10** : 1667.

Diagnostic characters : Front and vertex shining, impunctate.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

7. *Chaoilta lammellata* Cameron

1899. *Chaoilta lammellata* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, **43** (3) : 81.

1978. *Chaoilta lammellata* Cameron : Shenefelt, *Hym. Cat.*, (15) **10** : 1668.

Diagnostic characters : Stigma of forewing black at base and apex.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

Genus 4. *Euurobracon* Ashmead, 1900

8. *Euurobracon cephalotes* (Smith)

1858. *Bracon cephalotes* Smith. *J. Proc. Linn. Soc. (Zool.)*, **2** : 123.

1978. *Euurobracon cephalotes* (Smith) : Shenefelt, *Hym. Cat.*, (15) **10** : 1746.

Diagnostic characters : Mesosternum smooth, shining and furrowed down the middle.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

Genus 5. *Hybogaster* Szepligeti, 1906

9. *Hybogaster jejunos* (Cameron)

1899. *Bracon jejunos* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, **43** (3) : 78.

1978. *Hybogaster jejunos* (Cameron) : Shenefelt, *Hym. Cat.*, (15) **10** : 1689.

Diagnostic characters : Petiole of abdomen irregularly, longitudinally striated with apical depressions.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

6. Genus *Iphiaulax* Forster

Key to the species of genus *Iphiaulax*

1. Wings yellowish .2
 Wings fuscons .3

2.	Second abdominal segment striated	<i>.dodoneus</i>
	Second abdominal segment smooth	<i>.4</i>
3.	Thorax rufous in colour	<i>.khasianus</i>
	Thorax fuscous in colour	<i>.seditiosus</i>
4.	Antennae yellowish in colour	<i>.lepcha</i>
	Antennae fulvous in colour	<i>.5</i>
5.	Second cubital cellulae not shorter than the third	<i>.paupauratus</i>
	Second cubital cellulae shorter than the third	<i>.phaedo</i>

10. *Iphiaulax dodoneus* (Cameron)

1899. *Bracon dodoneus* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43 (3) : 75.

1978. *Iphiaulax dodoneus* (Cameron) : Shenefelt, *Hym. Cat.*, (15)10 : 1760.

Diagnostic characters : Abdominal segments III - V variegated with lemon yellow and black above.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia And Pacific Regions.

11. *Iphiaulax khasianus* (Cameron)

1899. *Bracon khasianus* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) : 72.

1978. *Iphiaulax khasianus* (Cameron) : Shenefelt, *Hym. Cat.*, (15)10 : 1774.

Diagnostic characters : Terebra of the specimen reaches upto 18mm length.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

12. *Iphiaulax lepcha* (Cameron)

1899. *Bracon lepcha* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) : 66.

1978. *Iphiaulax lepcha* (Cameron) : Shenefelt, *Hym. Cat.*, (15)10 : 1776.

Diagnostic characters : Depression of base of scutellum is strongly crenulated.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Bhutan, Myanmar, Sri Lanka, Australia and Pacific regions.

13. *Iphiaulax pauparatus* (Cameron)

1900. *Bracon pauparatus* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 44(150) : 83.

1978. *Iphiaulax pauparatus* (Cameron) : Shenefelt, *Hym. Cat.*, (15)10 : 1786.

Diagnostic characters : Middle lobe of mesonotum raised and furrowed.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

14. *Iphiaulax phaedo* (Cameron)

1899. *Bracon phaedo* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) : 68.

1978. *Iphiaulax phaedo* (Cameron): Shenefelt, *Hym. Cat.*, (15)10 : 1788.

Diagnostic charaters : Base of the petiole deeply and traingularly depressed.

Distribution : India : Meghalaya (Khasi Hills). Elsewhre : Australia and Pacific regions.

15. *Iphiaulax seditiosus* (Cameron)

1899. *Bracon seditiosus* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43 : 76.

1978. *Iphiaulax seditiosus* (Cameron) : Shenefelt, *Hym. Cat.*, (15)10 : 1795

Diagnostic characters : Wings yellow hyaline, apex smoky.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

7. Genus *Ischnobracon* Baltazar, 1963

Key to the species of Genus *Ischnobracon*

1.	Underside of hind coxa with a large v-shaped black mark	<i>v- macula</i>
-	Underside of hind coxa without a large v-shaped black mark	<i>indiscretus</i>

16. *Ischnobracon indiscretus* (Cameron)

1899. *Bracon indiscretus* Cameron. *Mem. Proc. Manch. Lit. Phil.. Soc.*, 43(3) : 71.

1978. *Ischnobracon indiscretus* Cameron : Shenefelt, *Hym. Cat.*, (15)10 : 1690.

Disgnostic characters : Antenna longer than body and thickly covered with white down.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

17. *Ischnobracon v-macula* (Cameron)

1899. *Bracon v-macula* Cameron. *Mem. Proc. Manch Lit. Phil. Soc.*, 43(3) : 62.

1978. *Ischnobracon v-macula* (Cameron) : Shenefelt., *Hym. Cat.*, (15)10 : 1690.

Diagnostic characters : Abdomen darker at apex, lemon-yellow on ventral surface.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

II Subfamily HELCONINAE

Genus 8. *Wroughtonia* Cameron, 189918. *Wroughtonia cornuta* Cameron

1899. *Wroughtonia cornuta* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43(3) :56.

1970. *Wroughtonia cornuta* Cameron : Shenefelt, *Hym. Cat.*, (5)2 : 204.

Disgnostic characters : Mandible stout, short and furnished with one shor upper tooth.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

III Subfamily AGATHIDINAE

Key to the genera of subfamily AGATHIDINAE

1.	Wings dark and smoky	2
-	Wings yellowish and non-smoky	.3
2.	Mesonotum smooth	. <i>Braunsia</i>
-	Mesonotum trilobate	.4
3.	Median segment obliquely depressed	. <i>Euagathis</i>
	Median segment not obliquely depressed	.5
4.	Legs stout	. <i>Oreba</i>
	Legs slender	<i>Zelomorpha</i>
5.	Mesopleura with 8 keels	<i>Cremnops</i>
	Mesopleurae with less than 8 keels	<i>Agathis</i>

9. Genus *Agathis* Latreille, 180419. *Agathis infortunata* Schulz

1899. *Agathis nigritarsis* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43(3) :92.

1970. *Agathis infortunata* Schulz : *Hym. Cat.*, (6)3 : 337.

Diagnostic characters : Median segment divided into 4 distinct areae.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

10. Genus *Braunsia* Kriechbaumer, 1894.Key to the species of genus *Braunsia*

1. A stout tubercle lies between the antennae; mesopleural suture smooth *tuberculata*
 - No stout tubercle lies between the antennae; mesopleural suture bears oblique keels *. fumipennis*

20. *Braunsia fumipennis* (Cameron)1899. *Microdes fumipennis* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43 :96.1970. *Braunsia fumipennis* (Cameron) : Shenefelt. *Hym. Cat.*, (6)3 :373*Diagnostic character* : Mesonotum closely punctured, central furrow closely crenulated.*Distribution* : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.*Remarks* : Host - *Trabala vishnu* Lefebvre.21. *Braunsia tuberculata* (Cameron)1899. *Microdes tuberculatus* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) :951970. *Braunsia tuberculata* (Cameron) : Shenefelt, *Hym. Cat.*, (6)3 : 378.*Diagnostic characters* : 2 antennal keels are stout and laterally oblique.*Distribution* : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.*Remarks* : Host - *Trabala vishnu* Lefebvre.11. Genus *Cremnops* Foster, 186222. *Cremnops nigratarsis* (Cameron)1899. *Agathis nigratarsis* Cameron.. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43 :87.1970. *Agathis nigratarsis* (Cameron) : Shenefelt, *Hym. Cat.*, (6)3 : 387.*Diagnostic characters* : Metanotal areae short, broad and rounded at base.*Distribution* : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.12. Genus *Euagathis* Szepligeti, 1900Key to the species of genus *Euagathis*

1. Occiput fulvous .2
 - Occiput black .3
 2. Mesonotum not keeled, depressed *khasiana*

- Mesonotum keeled, punctured *ophippium*
- 3. Median segment keeled . . *ruficollis*
- Median segment not keeled .4
- 4. Scutellum depressed; wing apex fuscated *melanocerus*
- Scutellum carinate; wings apex infuscated 5
- 5. Wing infuscated with 2 clouds *peronata*
- Wing infuscated with no such clouds . *forticarinata*

23. *Euagathis forticarinata* (Cameron)

1899. *Agathis forticarinata* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43 : 86.

1970. *Euagathis forticarinate* (Cameron) : Shenefelt, (6) 3 : 411.

Diagnostic characters : Basal central area of Median segment triangular in shape.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

24. *Euagathis khasiana* (Cameron)

1899. *Agathis khasiana* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43 : 84.

1970. *Euagathis khasiana* (Cameron) : Shenefelt, *Hym. Cat.* (6) 3 : 412.

Diagnostic characters : Ovipositor sheaths black, pale at apex and pilose.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

25. *Euagathis melanocerus* (Cameron)

1899. *Agathis melanocerus* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43 : 91.

1970. *Euagathis melanocerus* (Cameron) : Shenefelt *Hym. Cat.* (6) 3 : 413.

Diagnostic characters : legs stout and covered with white fulvous hairs.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

26. *Euagathis ophippium* (Cameron)

1900. *Disophrys ophippium* Cameron. *Mem. Proc. Manchr. Phil. Soc.*, 44 : 93.

1970. *Euagathis ophippium* (Cameron) : Shenefelt, *Hym. Cat.*, (6) 3 : 413.

Diagnostic characters : Mesopleurae black, red at base and below with white hairs.

Distribution : India: Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

27. *Euagathis peronata* (Cameron)

1899. *Agathis peronata* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 43(3) :89.

1970. *Euagathis peronata* Cameron: Shenefelt, *Hym. Cat.* (6)3 :413.

Diagnostic characters : Median segment stoutly transversely striated.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

28. *Euagathis ruficollis* (Cameron)

1899. *Disophrys ruficollis* Camron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) :98.

1970. *Euagathis ruficollis* (Cameron) : Shenefelt, *Hym. Cat.* (6)3 : 414.

Diagnostic characters : Black mark at base of stigma extends into the middle or Discoidal cellulae.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and pacific regions.

13. Genus *Oreba* Cameron 1900**29. *Orbea purpurea* Cameron**

1900. *Oreba purpurea* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 44 (15) : 95.

1970. *Oreba purpurea* Cameron : Shenefelt, *Hym. Cat.*, (6)3 : 423.

Diagnostic characters : Face and clypeus indigoblue, face carinate.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

14. Genus *Zelomorpha* Ashmead 1900**30. *Zelomorpha erythrocephala* (Cameron)**

1900. *Disophrys erythrocephala* Cameron. *Mem. Proc. Manchr. Phil. Soc.*, 44(15) :91.

1970. *Zelomorpha erythrocephala* (Cameron) : Shenefelt, *Hym. Cat.*, (6)3 : 426.

Diagnostic characters : Wings uniformly dark, smoky violaceous with black stigma and nervures.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Sri Lanka, Sumatra, Formosa, Australia and Pacific regions.

IV Subfamily ROGADINAE**15. Genus *Neontsira* Rohwer, 1924.****31. *Neontsira typica* Rohwer**

1924. *Neontsira typica* Rohwer. *Rec. Indian Mus.*, 26 : 125.

1975. *Neontsira typica* Rohwer : Shenefelt, *Hym. Cat.*, (12)8 : 1204.

Diagnostic characters : Scutellum opaque, finely granular; basal part of venter whitish.

Distribution : India : Meghalaya (Garo Hills). Elsewhere : Australia and Pacific regions.

Genus 16. *Spinaria* Baulle, 1846

32. *Spinaria albiventris* Cameron

1899. *Spinaria albiventris* Cameron. *Mem. Proc. Manchr. Lit. Phil. Soc.*, 43(3) : 82.

1975. *Spinaria albiventris* Cameron : Shenefelt, *Hym. Cat.* (12) 8 : 1257.

Diagnostic characters : Wings fulvohyaline, at stigma base with an oblique, black cloud.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Laos, Vietnam, Australia and Pacific regions.

V Subfamily DORYCTINAE

17. Genus *Ontsira* Cameron, 1900

33. *Ontsira reticulata* Cameron

1900. *Ontsira reticulata* Cameron. *Mem. Proc. Manch. Lit. Phil. Soc.*, 44 (15) : 90.

1976. *Ontsira reticulata* Cameron : Shenefelt and Marsh, *Hym. Cat.*, (13) 9 : 1326.

Diagnostic characters : Legs variegated with black and white; wings hyaline and iridescent.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

VI Subfamily MICROGASTERINAE

18. Genus *Apanteles* Forster

Key to the species of Genus APANTELES

1.	Ovipositor without an apical sinuation	2
-	Ovipositor with an apical sinuation	<i>glomeratus</i>
2.	Scutellum smooth, posterior margin rounded	<i>camilla</i>
-	Scutellum punctate, posterior margin not rounded	<i>grandiculus</i>

34. *Apanteles camilla* Nixon

1965. *Apanteles camilla* Nixon. *Bull. Brit. Mus. Nat. Hist., Ent. Suppl.* 2:165.

1972. *Apanteles camilla* Nixon : Shenefelt, *Hym. Cat.*, (7) 4 : 462.

Diagnostic characters : Propodeum dull regulose and without a medial keel.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

35. *Apanteles glomeratus* (Linnaeus)

1758. *Ichneumon glomeratus* Linnaeus. Syst. Nat., (10) 1 : 568.

1972. *Apanteles glomeratus* Linnaeus : Shenefelt, *Hym. Cat.*, (7) 4 : 519.

Material examined : India: Meghalaya : Shillong : 2 females, 3.3.1991. Coll. K.K. Ray.

Diagnostic characters : Inner orbital border straight, interorbital space narrower below than above.

Distribution : India : Meghalaya (Khasi Hills); Tripura and Bihar. Elsewhere : Brazil, Uruguay, Barbados, Australia, New Zealand, Fiji and majority of Palacartic countries.

Remarks : Host - *Pieris brassicae* Linn.

36. *Apanteles grandiculus* Wilkinson

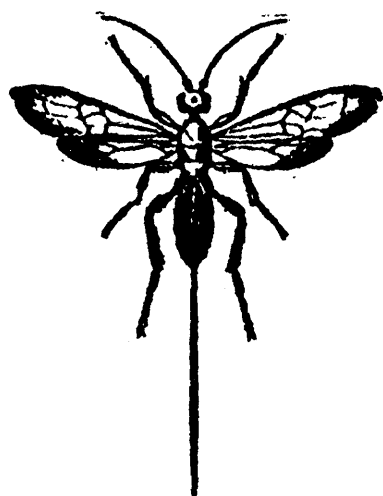
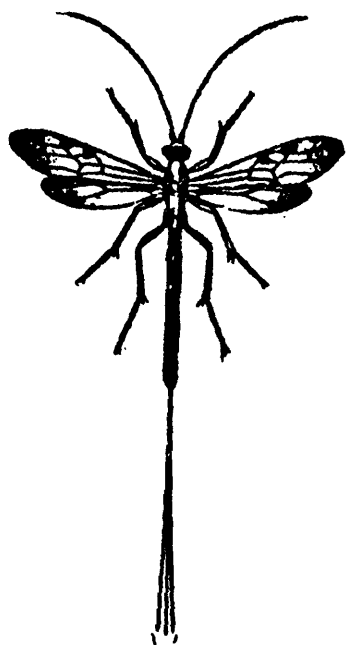
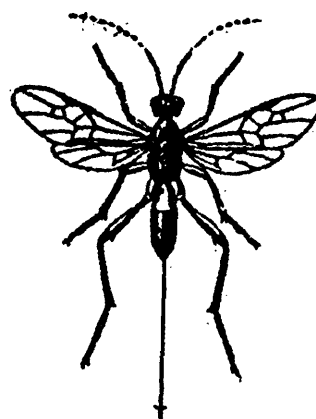
1929. *Apanteles grandiculus* Wilkinson, *Bull. Ent. Soc.*, 20 : 110.

1972. *Apanteles grandiculus* Wilknison : Shenefelt, *Hym. Cat.*, (7) 4 : 526.

Diagnostic characters : Ovipositor female at least one and two thirds as long as hind tibia.

Distribution : India : Meghalaya (Khasi Hills). Elsewhere : Australia and Pacific regions.

Remarks : Host - *Rubus* sp.

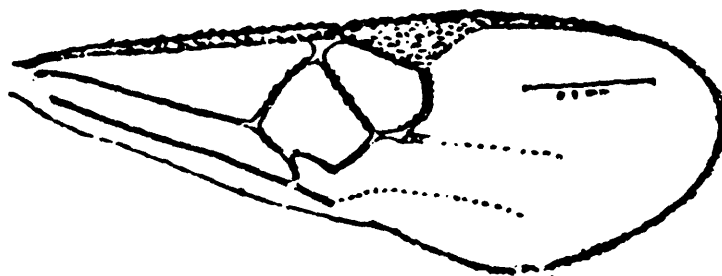
**1****2****3**

A. PHOTOGRAPHS

1. *Chaoilta Lammellata* Cameron (After Cameron, 1899)

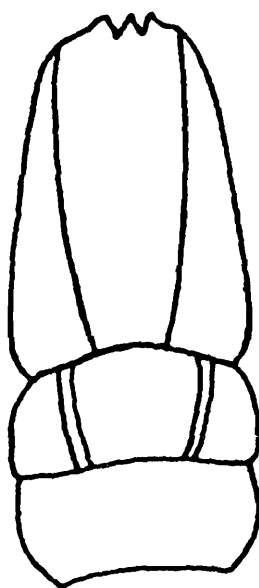
2. *Bracon Leptogaster* Cameron (-DO-)

3. *Wroughtonia Cornuta* Cameron (-DO-)



1

FORE WING



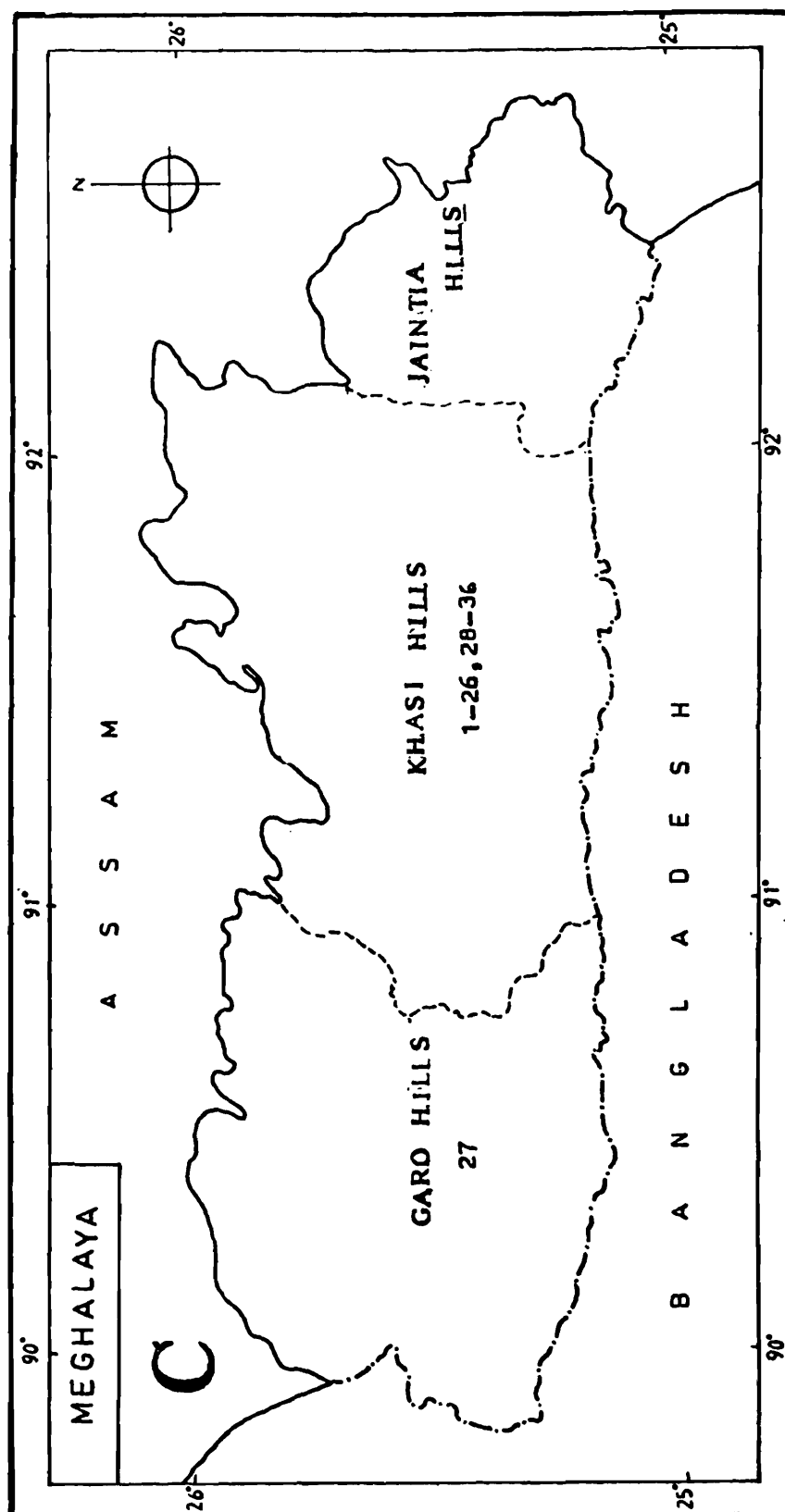
I, II & III ABDOMINAL SEGMENTS

2

B. FIGURES

1. *Apanteles Glomeratus* (Linnaeus) Forewing (After Bhatnagar, 1948)

2. *Apanteles Glomeratus* (Linnaeus) Abdominal Tergites (After Bhatnagar, 1948)



MAP 1. Distribution of taxa of Subfamilies, Braconidae:
Braconidae, Agathidinae, Doryctinae, Helconinae, Microgasterinae and Rogadinae in Meghalaya.
 (Number indicates the name of the taxa as treated as in the text.)

SUMMARY

Altogether 36 species belonging to 18 genera and 6 subfamilies have been recorded, in this paper, which were collected mostly from Khasi Hills of Meghalaya state.

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DISTRIBUTION OF TAXA OF FAMILY BRACONIDAE IN MEGHALAYA

1. Subfamily Braconinae

1. Genus *Bracon* Fabricius

1. <i>Bracon declaratus</i> (Cameron)	Khasi Hills
2. <i>Bracon firmus</i> Cameron	Khasi Hills
3. <i>Bracon leptogaster</i> Cameron	Khasi Hills
4. <i>Bracon umbratilis</i> Cameron	Khasi Hills

2. Genus *Campyloneurus* Szepligeti

5. <i>Campyloneurus trimaculata</i> Cameron	Khasi Hills

3. Genus *Chaoilta* Cameron

6. <i>Chaoilta himalayensis</i> (Cameron)	Khasi Hills
7. <i>Chaoilta lamellata</i> (Cameron)	Khasi Hills

4. Genus *Hybogaster* Szepligeti

8. <i>Hybogaster jejunos</i> (Cameron)	Khasi Hills

5. Genus *Iphiaulax* Forster

9. <i>Iphiaulax dodoneus</i> (Cameron)	Khasi Hills
10. <i>Iphiaulax khasianus</i> (Cameron)	Khasi Hills
11. <i>Iphiaulax lepcha</i> (Cameron)	Khasi Hills

12. *Iphiaulax pauparatus* (Cameron) Khasi Hills

13. *Iphiaulax phaedo* (Cameron) Khasi Hills

14. *Iphiaulax seditiosus* (Cameron) Khasi Hills

6. Genus *Ischnobracon* Baltazar

15. *Ischnobracon indiscretus* (Cameron) Khasi Hills

16. *Ischnobracon v-macula* (Cameron) Khasi Hills

7. Genus *Uurobracon* Ashmead

17. *Uurobracon cephalotes* (Smith) Khasi Hills

II. Subfamily Helconinae

8. Genus *Wroughtonia* Cameron

18. *Wroughtonia cornuta* Cameron Khasi Hills

III. Subfamily Agathidinae

9. Genus *Agathis* Latreille

19. *Agathis infortunata* Schulz Khasi Hills

10. Genus *Braunsia* Kriechbaumer

20. *Braunsia fumipennis* (Cameron) Khasi Hills

21. *Braunsia tuberculata* (Cameron) Khasi Hills

11. Genus *Cretnops* Forster

22. *Cretnops nigrilarsis* (Cameron) Khasi Hills

12. Genus *Euagathis* Szepilgeti

23. *Euagathis forticarinata* (Cameron) Khasi Hills

24. *Euagathis khasiana* (Cameron) Khasi Hills

25. *Euagathis melanocerus* (Cameron) Khasi Hills

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26. <i>Euagathis ophippium</i> (Cameron)	Khasi Hills
27. <i>Euagathis peronata</i> (Cameron)	Khasi Hills
28. <i>Euagathis ruficollis</i> (Cameron)	Khasi Hills
13. Genus <i>Oreba</i> Cameron	
29. <i>Oreba purpurea</i> Cameron	Khasi Hills
14. Genus <i>Zelomorpha</i> Ashmead	
30. <i>Zelomorpha erythrocephala</i> (Cameron)	Khasi Hills
IV. Subfamily Rogadinae	
15. Genus <i>Neontsira</i> Rohwer	
31. <i>Neontsira typica</i> Rohwer	Garo Hills
16. Genus <i>Spinaria</i> Brulle	
32. <i>Spinaria albiventris</i> Cameron	Khasi Hills
V. Subfamily Doryctinae	
17. Genus <i>Ontsira</i> Cameron	
33. <i>Ontsira reticulata</i> Cameron	Khasi Hills
VI. Subfamily Microgasterinae	
18. Genus <i>Apanteles</i> Forster	
34. <i>Apanteles camilla</i> Nixon	Khasi Hills
35. <i>Apanteles glomeratus</i> (Linnaeus)	Khasi Hills
36. <i>Apanteles grandiculus</i> Wilkinson	Khasi Hills
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