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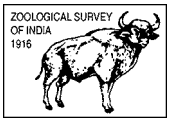

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No. 22(1) **2014** **Page 1-72**

CONTENTS

INTRODUCTION

Rice is the staple diet in almost 39 countries, with the Asian countries being the largest consumers (Rathi, 2008). India is the second largest producer and consumer of rice globally after China. Rice cultivation is thought to be the oldest form of intensive agriculture by man (Fernando, 1977). Irrigated rice fields, being agronomically managed wetland ecosystems with a high degree of environmental heterogeneity operating on a short temporal scale, harbour a rich and varied fauna (Heckman, 1979). The species diversity and total number of insect pests as well as the natural enemies in tropical rice are quite high (IRRI, 2009). Insect pests of rice have had for long, close associations with their natural enemies, allowing stable relationships to develop. In natural ecosystems, a dynamic equilibrium exists between parasitoids, predators and their hosts. Such an equilibrium is not present in agroecosystems due to the agronomic practices, crops and cultivation cycles (Ketipearachchi, 2002). In the Integrated Pest Management (IPM) programs, biological control by natural enemies plays a major role in controlling pest populations. The interactions of predators, parasitoids and insect pathogens are the key elements of modern integrated pest management programs in rice. Hence a knowledge on the indigenous species of natural enemies stay very essential (Ketipearachchi, 2002) for a successful implementation of the IPM programs. The diversity and richness of the natural enemy complex of rice in India are far less explored (Rajmohana, personal observation).

AIM AND SCOPE OF THE STUDY

Hymenopteran parasitoids are an important component of the natural enemy complex of insect pests and have been the most common type of natural enemies introduced for biological control of insects (Ketipearachchi, 2002). The complex of hymenopteran parasitoids of rice agroecosystem is dominated chiefly by members of Chalcidoidea, Ichneumonoidea and Platygastroidea. A major component of the parasitoid community attacking the egg stages of many pests and predators in the rice ecosystem are the members of the superfamily Platygastroidea (Rajmohana, personal observation).

Platygastroidea is the third largest of the parasitic superfamilies after Ichneumonoidea and Chalcidoidea and represents nearly 4460 described species worldwide (Austin *et al.*, 2005). As per the earlier classifications (Masner, 1993), the superfamily is comprised of two families, the Platygastridae and Scelionidae. But Sharkey (2007), based on the results of a phylogenetic analysis by Murphy *et al.* (2007) synonymised Scelionidae under Platygastridae. Of the five subfamilies of Platygastridae viz., Telenominae, Teleasinae, Scelioninae (the three subfamilies of former Scelionidae) Platygastrinae and Sceliotrachelinae, the subfamily Scelioninae is the largest and the most diverse (Johnson, 1992). The above mentioned first three subfamilies are exclusively egg parasitoids (Austin *et al.*, 2005), utilising the eggs of a wide group of insects and spiders as their hosts. They also include many species of economic importance as parasitoids of agricultural insect pests (Polaszek and Förster, 1997). As per their ground plan biology, they are endoparasitoids of the eggs of insects and also spiders and exhibit very high host specificity at tribal level. Particular tribes of the subfamily are associated with particular host groups viz., the Scelionini with Acrididae, Calliscelionini with Gryllidae and Tettigonidae, Embidobiini with Embioptera and Gryonini with Heteroptera. Teleasinae are parasitoids of the eggs of Carabid beetles (Coleoptera) (Austin and Field, 1997).

The present study had been aimed to assess the diversity of the exclusive egg parasitoid

subfamilies under Platygastridae, associated with the rice ecosystems, in north-central Kerala. The study results reflected an extremely rich and diverse parasitoid assemblage. A preliminary analysis at the species level indicated the presence of approximately more than 100 species under 28 genera of Scelioninae, Teleasinae and Telenominae (Platygastridae, exclusive of Platygastrinae). Since a detailed systematic treatment of all the species collected during the study was too large to include under this report, a total of 50 species, under two subfamilies (45 under Scelioninae and 5 under Teleasinae) are dealt here along with dichotomous keys as identification aids. The species belonging to the subfamily Telenominae and a few large genera like *Gryon* Haliday and *Scelio* Latreille under Scelioninae and *Trimorus* Förster (Teleasinae) will be dealt in detail separately as part II of this volume at a later instance.

SIGNIFICANCE OF THE STUDY

Maintaining an inventory of natural enemies is the first step towards recognising their existence (Ooi and Shepherd, 1994). Such a species inventory and systematic characterisation of Scelioninae, the egg parasitoids of Hemiptera (Coreidae, Pentatomidae, Scutelleridae, Gerridae, Nepidae etc) and Orthoptera (Gryllidae, Tettigonidae, Acrididae) and also that of the araneid and lycosid spiders and Teleasinae, the egg parasitoids of Coleoptera present in the rice ecosystem of north central Kerala are presented here. The data on the species diversity of indigenous/native parasitoids will serve as an essential aid in Integrated Pest Management (IPM) initiatives, focussing on sustainable agriculture.

MATERIALS AND METHODS

The study area

Three rice fields at different localities (F1, F2 and F3), at different elevations, belonging to three districts of north-central Kerala, were chosen as the study area (Fig. 1). F1 and F3 belonged to the South Western Ghats, while F2 was a lowland area, near the foothills of the Ghats.

Elevation difference was accepted as one of the criteria in selecting the sites in order to increase the chances of encountering diverse and varied fauna as far as possible.

Locality data of the 3 rice fields at the study sites :

Field 1 (F1)-Locality : Kavalamukkatta, Nilambur, Malappuram District, altitude, 177 ft at Lat 11° 15 132 Long 76° 21 174, during August-September, 2008

Field 2 (F2)-Locality : Peruvayal, Calicut District, altitude 5 ft, at Lat 11° 15.178 and Long 75° 54.237, during December 2008-January 2009

Field 3 (F3)-Locality : Madakkimala, Kalpetta, Wyanad District, altitude 2419 feet at Lat 11° 39 651and Long 76° 05 318 , during December 2008-January 2009

Collection and preservation of specimens

Malaise traps (Fig. 2) were employed as a standard specimen collection methodology, since the study involved continuous monitoring over a long term. At times small samplings were done by aerial sweep nets. Malaise traps are tent-like traps made of fine mesh material and are used primarily for the collection of flies (Diptera) and wasps (Hymenoptera), although they also caught many other flying insects. Thus collections were made continuously for 4 weeks, using two malaise traps per field, during August 2008–January 2009 and were attended once a week. In all the study sites, the cultural practices involved irrigated farming with double cropping along with a moderate input of nitrogen fertilizers and insecticides. The rice fields at all the 3 localities were monitored for the parasitoid assemblages during the pre-flowering to the milky grain stage of paddy.

Thousands of specimens under diverse groups were caught in the malaise traps, from which more than one thousand specimens under Platygastridae were sorted out. All the specimens were preserved

in 70% alcohol. Those for the study were air dried and later mounted on pointed cards. Duplicates were kept preserved in alcohol under refrigeration.

The description and imaging work were carried out employing Leica M 205A stereomicroscope and Leica DFC-500 digital camera. SEM imaging was done with Jeol JCM-5000 NeoScope Bench top SEM, using specimens coated with gold.

The materials studied are deposited in the National Zoological Collection at Zoological Survey of India, Calicut, and Kerala, India.

Literature Review

Debjani *et al.,* 1999 compiled a global checklist of the biodiversity of hymenopteran parasitoids associated with rice agroecosystem comprising a total of 524 species in 181 genera belonging to 19 families. Of a total of 41 species of egg parasitoids of rice reported globally, 6 species were reported from India under Platygastridae.

Pathummal *et al*. (2000) listed the general hymenopteran diversity in general, at generic level, in single and double cropped rice ecosystems in Kerala, India. Nishida and Torii (1970), in their hand book on field methods for research on rice stem borers and their natural enemies provided identification keys to important parasitoids of rice stem borers. Barrion and Litsinger (1994), in their comprehensive treatment of rice entomology, presented an exhaustive identification key at the global level, to the rice insect pests and their arthropod parasitoids and predators.

Bioecological notes on Scelioninae of rice ecosystem

From an economic point of view the Scelioninae has great significance being the egg parasitoids of grasshoppers, locust, crickets, bugs and spiders (Galloway and Austin, 1984), the prominent pest/ predator groups in rice ecosystem. Egg parasitoids are one of the most important biocontrol agents of a number of insect groups.

With the exception of a single genus *Gryon* Haliday, attacking the eggs of Hemiptera, rest of the members of subfamily Scelioninae are parasitic upon the eggs of Orthoptera and spiders and also rarely on Odonata and Mantodea.

Scelioninae attacking the eggs of the Hemipteran community in rice ecosystem

Rice ecosystem is inhabited by a diverse community of Hemipteran insects. Among the Hemipterans, Scelioninae are known to attack only the eggs of suborder Heteroptera.

Several species of *Gryon* Haliday are reported as the solitary primary egg parasitoids active in the control of the rice ear bug (*Leptocorisa* spp.) and the pod bug (*Clavigralla* spp.) in rice. They are also known to attack the members of many heteropteran families viz., Pentatomidae, Scutelleridae, Lygaeidae and Reduviidae.

The rice field being a wetland is inhabited by many aquatic and semiaquatic hemipterans like Gerrids and Nepids. Members of a few genera like *Tiphodytes* Bradley, and *Microthoron* Masner are known to parasitise the eggs of these aquatic hemipterans.

Scelionine Parasitoids of Orthoptera of rice ecosystem

A vast majority of the members of subfamily Scelioninae are parasitic upon the eggs of Orthoptera and play a vital role in controlling their population.

Orthopterans are a well known group, and are quite abundant in the rice ecosystem. Although they are present in the paddy fields throughout their life stages, their impact on insect pests and the parasitoid complex in the field are poorly understood.

Grasshoppers and crickets are widely known for their voracious herbivory and hence are ascertained as pests of a wide range of crops. Recent studies report that they are more significant as predators of stem borer and leaf folder eggs, though they feed on rice panicles, as pests. Their role as predators is less known. The meadow grasshopper *Conocephalus longipennis* (de

Haan) (Orthoptera : Tettigonidae) has been reported to consume up to 65% of the eggs of yellow stem-borers (Pantua and Litsinger 1984). This grasshopper will also feed on rice panicles, but as per the recent studies, its role as a predator is far more important than that as a pest. *C. longipennis* can consume more than eight yellow stem-borer egg masses in three days (Rubia *et al.* 1990).

The rice leaf folder eggs also suffer high predation, by crickets like *Metioche vittataicollis* (Stal) (Orthoptera : Gryllidae).

Since the tettigonids and gryllids by predating on the egg masses are now known to be good control agents of the stem borers and rice folders in the rice ecosystem, the diversity and abundance of Scelioninae which in turn influence the population of the Orthopterans remain quite significant. Scelioninae are known to be host specific at the tribal level. Some of the known host-parasitoid associations being, *Scelio* spp. on short-horned grasshoppers (Acrididae), *Duta* spp. and *Paridris* spp on ground crickets (Gryllidae), *Baryconus* spp., *Platyscelio* spp. and *Macroteleia* spp. on long horned grass hoppers (Tettigonidae).

Scelioninae as natural enemies of Spiders in rice ecosystem

Spiders as efficient predators form a major component of the natural enemy complex of the rice ecosystem. They are the most important natural enemies of the Brown Plant Hopper (BPH), *Nilaparvata lugens* (Hemiptera : Delphacidae), the notorious pest of paddy (FAO, 2010). Together with the parasitoids and insect pathogens the spiders keep the populations of BPH under control. Of particular importance are the hunting spiders, especially the *Lycosa* spp., consuming as many as 20 BPH per day. The voracious appetite of the spiders, rank them as a very important natural enemy of BPH.

The eggs of spiders are attacked by a wide group of hymenopteran parasitoids belonging to Platygastridae, Braconidae and Ichneumonidae. Some genera of Scelioninae viz., *Baeus* Haliday, *Ceratobaeus* Ashmead, *Odontacolus* Kieffer, *Cyphacolus* Ashmead and *Idris* Förster are known to attack the eggs of spiders. The females of *Baeus* are wingless, facilitating the movement through the thick egg sac of spiders, for oviposition. This along with a squat, compact and moderately stream lined body can be considered as their morphological modification towards functional specialisation.

OBSERVATIONS AND RESULTS

Genera/species new to science

A total of 50 species under 26 genera in two subfamilies viz, Scelioninae (24) and Teleasinae (2) have been identified in this study. 1 genus and 15 species are described as new to science and their affinities with other taxa discussed.

Dichotomous keys

Dichotomous keys are provided for easy identification of the subfamilies of Platygastridae and the 26 genera, dealt in the study. 'Key to species of India' is provided for all the 10 genera, under which new species have been described.

New records

Other than the new species described, the study reports for the first time from India, 1 genus, namely *Elgonia* Risbec and 1species viz. *Microthoron miricornis* Masner and Huggert. This study reports 8 genera namely *Baeus* Haliday, *Ceratobaeus* Ashmead, *Cremastobaeus* Ashmead, *Fusicornia* Risbec, *Palpoteleia* Kieffer, *Paridris* Kieffer, *Probaryconus* Kieffer and *Psilanteris* Kieffer for the first time from Kerala and 19 species under these genera form new reports to Kerala.

Changes in taxonomic status and nomenclature

Genus *Elgonia* Risbec has been revalidated by removing from synonymy under *Opisthacantha.* A nomenclatural change has also been made, by proposing a replacement name viz., *Trimorus mukerjii*. nomen, nov. for *Trimorus tuberculatus*

Mukerjee, 1994 on being preoccupied by *Trimorus tuberculatus* (Kieffer, 1908).

Generic/Species description/Diagnosis

Generic and species diagnosis have been developed based on the characters of Indian specimens, through direct observation and also by pooling of information from the relevant literature. A few species whose original descriptions were scanty, have been redescribed. Ample illustrations are provided to supplement the generic and species diagnosis/descriptions. Since this study is confined to rice agroecosystem, generic comparisons are between those genera frequented in particular to this agroecosystem.

Holotypes of *Duta polita* Rajmohana and *Fusicornia tehrii* Mukerjee, *Duta indica* Mukerjee and Paratypes of *Doddiella nigricephala* Mukerjee, *Probaryconus grahwalensis* Mukerjee and *Opisthacantha indica* Mukerjee were examined for this study.

Field Observations

It was observed that most of the Platygastrid species seem to be generalists, (35 species of the 50 species documented here) marking their presence both in the natural and the rice ecosystems, but in different densities. Some genera like *Cremastobaeus, Psilanteris, Duta* that were usually encountered only in low numbers in the natural ecosystems have been represented more in the rice ecosystems.

A review of the overall bioecology of Scelioninae of rice ecosystem has been included as a separate section.

TERMINOLOGY

Morphological terminology follows Masner (1980) and Mikó *et al.* (2007).

ABBREVIATIONS

A1 to A12-Antennal segments 1 to 12; F1 to F4-Flagellar segments 1 to 4; Length-L; LOL-lateral Ocellar length; mv-Marginal vein; OD-Ocellar Diameter; OOL-Ocellocular length; POL-Post Ocellar length; pmv-Postmarginal vein; Width-W; smv-Submarginal vein; stgv-Stigmal vein; T1-T7–Metasomal tergites 1 to 7.

Superfamily PLATYGASTROIDEA

Systematic status : Superfamily Platygastroidea is now comprised of just one family, namely Platygastridae, though earlier there were two families viz., Platygastridae and Scelionidae. Family Platygastridae was originally described by Haliday (1833) and family Scelionidae by Haliday (1839). However with the work of Sharkey (2007), through 'Phylogeny and classification of Hymenoptera', Scelionidae is being treated as a junior synonym of Platygastridae.

Subfamilies in Platygastridae : Platygastrinae, Scelioninae, Telenominae, Teleasinae and Sceliotrachelinae Brues, 1908, are the 5 subfamilies currently recognised under Platygastridae.

[Ashmead 1900, accepted Scelioninae Haliday, Platygastrinae Haliday, Telenominae Thomson (originally Telenomini Thomson, 1860) and Teleasinae Walker (originally Teleasini Walker) as distinct subfamilies.]

Key to the 5 subfamilies of Platygastridae

(Based on Indian fauna)

1. Antenna in females with 10-11 segments, clava distinctly segmented; in males, antenna with 12 segments, two terminal segments not confluent; T2 distinctly longest of all metasomal tergites, laterotergites wide, submarginal groove absent ..... **Telenominae**

— Antenna in females with 6-14 segments, clava distinct, either segmented or unsegmented; in males 12 segmented, terminal two segments at times confluent; T2 or T3 longest among tergites, if T2 longest then laterotergites very narrow and submarginal groove present 2

2. Antenna never with more than 10 segments in females, claval segmentation distinct; usually elbowed after scape and after 4th or 5th segment in both sexes 4

Antenna often with 12 segments (rarely with 14); if with 6-9 segments, then claval segmentation often indistinct; antenna not elbowed 3

3. Forewings with mv usually more than 3x longer than stgv; stgv never elongate; pmv rudimentary or absent; T3 always longest among tergites ..... **Teleasinae**

— Forewings with mv usually shorter than stgv; pmv present or absent; in case mv longer than stgv, then metasoma elongate and pmv distinct, in case smvl absent or rudimentary, then antennal clava unsegmented or post gena and temples with tuft of pilosity; T3 not always longest of tergites ..... **Scelioninae**

4. Female antennal clava with 5 clearly separated clavomeres; habitus often cylindrical .... **Platygastrinae**

— Female antennal clava composed of 3-4 subcompact clavomeres; habitus often stocky and short, wider than high .... **Sceliotrachelinae**

Subfamily SCELIONINAE

Key to the genera of Scelioninae

(Hymenoptera : Platygastridae) of rice agroecosystems in north-central Kerala

1. Antennal segments 2 to 4 (A2-A4) serrate dorsally, A3 and A4 often confluent (Fig. 43); metasoma with a knotty appearance in lateral view (Fig. 42) ..... ***Cremastobaeus*** Ashmead

— Antennal segments 2 to 4 not serrate dorsally, A3 and A4 not confluent; metasoma not knotty in lateral view 2

2. Hindwings with *smv* complete, reaching upto frenal hooks; metasoma elongate or short .. 4

— Hindwings with *smv* incomplete, not reaching frenal hooks; metasoma always elongate ... 3

3. Gena and posterior margin of temples with a dense unusual tuft of white pilosity (Figs. 57-58); margin between T2 and T3 upcurved (Fig. 61); forewing with *smv* present only as stub at wing base ..... ***Doddiella*** Kieffer

— Gena and temple margins without dense tuft of pilosity (Fig. 196); margin between T2 and T3 straight (Fig.195); forewing with *smv* well developed ..... ***Scelio*** Latreille

4. Body dorsoventrally flattened (Fig. 177); antennal scape especially in females expanded into a flat and triangular segment (Fig. 178) ..... ***Platyscelio*** Kieffer

— Body not flattened dorsoventrally, antennal scape in females without any unusual expansion 5

5. Cheeks on either side of mandibles with a white bubble–like structure (167); small and gracile habitus ..... ***Palpoteleia*** Kieffer

— Cheeks on either side of mandibles without any bubble-like structure; habitus either small or robust 6

6. Frons with a deep depression margined by a carina, terminal metasomal segment armed with spines at posterolateral corners (Fig. 14) ..... ***Baryconus*** Förster

— Frons usually without a depression on frons; depression if present, then never with a carinate margin; terminal metasomal segment without spines at posterolateral corners 7

7. Female antenna 6 to 9 segmented, clava with segmentation often obscure 8

— Female antenna 12 segmented, clava with conspicuous segmentation 13

8. Skaphion distinct (Fig. 106) 9

— Skaphion absent 10

9. Female antenna with 7 segments between scape and clava, clava not highly swollen medially; all tergites not always transverse .. .. ***Tiphodytes*** Bradley

— Female antenna with 4-5 segments between scape and clava (146, 148), clava swollen medially; all tergites transverse .... ***Microthoron*** Masner

10. T1 anteriorly with a hump or a large horn in females; mesoscutellum, metascutellum or

propodeum at times excavate to enclose metasomal horn. 11

— T1 in females without a hump or horn; no excavations on mesoscutellum, metascutellum or propodeum 12

11. Metasomal horn large (Fig. 150), laterally compressed, directed backwards towards T2, forewing spoon shaped (Fig. 152), constricted on anterior half and distally broad .... ***Neoceratobaeus*** gen. nov

— Metasomal horn without lateral compression (Figs. 34, 36), vertical or directed forwards towards mesosoma; forewing not spoon shaped (Fig. 33) ..... ***Ceratobaeus*** Ashmead

12. Laterotergites narrow (Fig. 126) and incised into submarginal grooves along sternites; T1 in females well visible dorsally (Fig. 124) .... ***Idris*** Förster

— Laterotergites wide (Fig. 10) and free, not incised into submarginal grooves along sternites; T1 in female not visible dorsally, hidden against mesosoma (Fig.11) .... ***Baeus*** Haliday

13. Metascutellum and propodeum unarmed; medially appearing as two simple strips ... 15

— Either metascutellum armed with spines or produced medially and propodeum unarmed or metascutellum unarmed and propodeum armed 14

14. Metascutellum with spines (Fig. 53) or produced medially into a plate; propodeum unarmed (Fig. 30) 16

— Metascutellum without a spine medially; propodeum medially excavate, with spines or teeth anterodorsally (Fig. 181) .... ***Probaryconus*** Kieffer

15. Skaphion distinct (Fig. 99) ..... ***Duta*** Nixon

Skaphion absent 24

16. Face with radiating striae, at least on anterior gena, originating from mandibular corners (Fig. 173) 17

— Face without any radiating striae originating from mandibular corners 20

17. Basal metasomal tergite always humped in females (175); eyes with very long dense pubescence, often as long as or longer than that on frons or vertex ; metascutellum produced to a median horizontal plate, often bispinose laterally (Figs. 172, 176) .... ***Paridris*** Kieffer

— Basal metasomal tergite may or may not be humped, pubescence on eyes short, usually not longer than that on frons or vertex; metascutellum not bispinose laterally 18

18. Forewings with *pmv* absent (Fig.192); skaphion always distinct (Fig. 190) .... ***Psilanteris*** Kieffer

— Forewing with a distinct *pmv*; skaphion may or may not be present 19

19. Skaphion absent 23

— Skaphion present 21

20. Metascutellum with a plate like expansion medially, or with a bidentate lamella, or a short median spine (as in Fig. 53) 22

— Metascutellum tridentate; median spine prominent than lateral ones (Fig. 116) .... ***Fusicornia*** Risbec

21. Metasomatic T3 densely punctate (Figs. 103, 109); lower metapleuron above hind coxa densely setose (Fig. 114); T1 pedunculate, not transverse (Fig. 109) ..... ***Elgonia*** Risbec

— Metasomatic T3 not punctate (Figs. 158, 162), but with faint traces of striae; lower metapleuron above hind coxa not with dense setae; all metasomal tergites transverse (Fig. 158, 162) ..... ***Opisthacantha*** Ashmead

22. Forewings with *mv* distinctly shorter than *stgv* (Fig. 26); metascutellum not spined medially; metascutellar plate transverse often resting on metasomal horn (Fig. 20) .... ***Calliscelio*** Ashmead

— Forewings with *mv* as long as or longer than *stgv* (Fig. 142); metascutellum at times with

a median spine or metascutellar plate if developed medially, then longitudinal and dividing propodeum into right and left halves (Fig. 144) ..... ***Macroteleia*** Westwood

23. *Mv* shorter than *stgv* (Fig. 55); frons without any depression medially .... ***Dicroscelio*** Kieffer

— *Mv* elongate, longer than *stgv* (Fig. 137); frons medially with an unmargined depression (Fig. 136) ..... ***Leptoteleia*** Kieffer

24. Metasoma elongate; terminal metasomal segment laterally compressed and wedge shaped (Fig. 141).... ***Macroteleia*** Westwood

— Metasoma short and plump; terminal metasomal segment transverse, not wedge shaped (Fig. 120)..... ***Gryon*** Haliday

Species Descriptions and Diagnosis

1. Genus ***Baeus*** Haliday, 1833

1833. ***Baeus*** Haliday : 270.
Type species : *Baeus seminulum* Haliday, by monotypy.

1856. ***Hyperbaeus*** : Förster : 144. Replacement name.

1926. ***Psilobaeus*** Kieffer : 132, 150. Synonymized by Masner (1965).

1956. ***Paraneurobaeus*** Risbec : 821, by monotypy.

1957. ***Anabaeus*** Ogloblin : 440. Proposed as a subgenus of *Baeus* Haliday.

1970. ***Angolobaeus*** Kozlov : 218.

Diagnosis : Length of body, in females, usually less than or equal to 1mm; head wider than mesosoma (Fig. 11), abutting pronotum, a little wider than metasoma (Fig. 11); lateral ocelli much closer to posterior margin of eye than to median ocellus (Fig. 11); hyperoccipital carina distinct atleast along dorsal posterior margin vertex; antenna 7 segmented with 4 funicular segments; F1 about 2x as long as F2; F2-F4 transverse; clava unsegmented; central keel incomplete, not reaching median ocellus; mandibles tridentate; gena broad and distinct; mesoscutum much wider than long (Fig. 9); mesoscutellum transverse; metascutellum much reduced (Fig. 9), often hidden beneath mesoscutellum; both fore and hindwings reduced to minute scelrotized plates; metasoma short (Fig. 10), abutted against vertical posterior surface of propodeum, so body appears fused; T1 not visible dorsally; T2 largest of tergites, laterotergites wide, ventral margins free, not incised into a submarginal groove; Males with an altogether different habitus compared to females, body not rounded and fused; antenna 11 or 12 segmented, F9 and F10 at times fused; division between mesosoma and metasoma distinct; both fore and hindwings present; *mv* shorter than *stgv*, basal vein present often as an infuscations; metasoma petiolate, T1 visible.

Status and distribution in India : Number of species known from India : 1. Karnataka, Tamil Nadu [Rajmohana, (in press); Prabhu and Manickavasagam, (2004)].

Host : Eggs of spiders belonging to Araneidae and Theridiidae.

Remarks : The current study forms the first report of the genus from Kerala.

An unusual genus of parasitic wasps, where females are often wingless, highly compact and with flea-like in appearance, hence the genus is much distinct from all other scelionines, encountered in paddy fields.

Baeus can be distinguished from *Mirobaeoides* Dodd (this genus not reported from India), in the structure of laterotergites, the narrow metasomal laterotergites and the fine submarginal groove, is much different to the wide and free laterotergites of the former.

Only 25 species are recorded world wide (Stevens and Austin, 2007).

Species Diagnosis

1. ***Baeus primitus*** Rajmohana, 2013 (Figs. 10-11)

2013. *Baeus primitus* Rajmohana Holotype Female, India (ZSI, WGRC).

Diagnosis : Female. Length = 0.9 mm. Head and body dark reddish brown, propodeum paler than rest of body; posterior margin of mesoscutum, mesoscutellum and metasomal tergite 2 with a

brownish black band; dorsal head 2x as wide as long, 2.8x as wide as inter-ocular distance and 1.35x wider than mesosoma; gena much narrow (Fig. 10); hyperoccipital carina distinct along dorsal-posterior margin of vertex; mesoscutum length 0.5x its width, 0.7x mesosoma length and > 2x mesoscutellar length; mesoscutellum 1.4x propodeum length; mesoscutum and mesoscutellum coriaceous, latter with a paler sculpture than former; both with a nearly smooth band on posterior margins; dorsolateral propodeum bearing distinct, but incomplete crescent-shaped ridge running from ventral margin of propodeal spiracle and extending on lateral propodeum; area in front of ridge with fine carinae; propodeal spiracle small (Fig. 10); posterior margin of metapleuron curving dorsomedially, dorsal extent of suture equal to level of anterolateral margin of T2; both fore and hindwings reduced to minute sclerotized plates, a little larger than tegula mesoscutellum and T3 dorsally with 2 rows of setae; T2 largest tergite, 1.2x as long as wide and occupying 0.8 of dorsal surface of metasoma.

Male : Unknown.

Distribution in India : Karnataka (Lakhavalli : Muthodi : Bhadra Wildlife Sanctuary).

Material examined : 1 Female. India : Kerala : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008, in malaise trap.

Remarks : *B. primitus* Rajmohana (in press) is the only species described under this genus in India.

B. primitus is much similar to the Australian species, *B. leai* Dodd, in the presence of a crescent shaped ridge on lateral propodeum, in posterior eye margin touching hyperoccipital carina, and in the reduction/absence of femoral spine (Stevens & Austin, 2007). Both the species differ as follows :

Mesoscutellum and T3 dorsally with 2 rows of setae in *B. primitus*, (only one row in *B. leai*), gena is much narrow in *B. primitus* than in *B. leai*. Dorsal head width is nearly 3 xs inter ocellar distance in *B. primitus*, while it is only 2x in *B. leai*. Both the species also differ in general sculpturing of metasoma and in comparative proportions of tergites.

2. Genus ***Baryconus*** Förster, 1856

1856. *Baryconus* Förster : 101, 104.
Type : *Baryconus floridanus* Ashmead.
1893. *Hoploteleia* Ashmead : 210, 211, 227.
1906. *Rhacoteleia* Cameron : 72. Synonymized by Dodd (1920).
1910. *Trichanteris* Kieffer : 87, 88. Synonymized by Masner (1976).
1912. *Apegusoneura* Cameron : 69. Synonymized by Dodd (1920).
1956. *Ivondrella* Risbec : 257. Synonymized by Masner (1976).

Diagnosis : Robust and strongly sculptured; usually black to brownish black; moderate sized (3 to 4 mm); frons with a deep depression margined by a keel; antenna 12 segmented in both sexes; in females with a 5 segmented elongated clava, not abrupt, but gradually enlarged towards tip; no radiating carinae arising from mandibular corners; vertex cut off to occiput; mandibles usually tridentate; eyes bare; skaphion never indicated; mesoscutum often with a median furrow; notauli distinct; metascutellum armed, bidentate medially; netrion present; forewings with *smv* well separated from margin before reaching the much reduced *mv*; *stgv* and *pmv* elongate; hindwings with *smv* complete; metasoma elongate; either T2 or T3 largest of all tergites; end tergite (T6 in females and T7 in males) with posterolateral corners armed with spines; T7 internal in females, not extruded with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, about 0.9-1.5x length of metasoma.

Host : Eggs of Long-horned Grasshopper (Orthoptera : Tettigonidae) (Mani, 1936).

Status and distribution in India : Number of species known from India : 7 (Rajmohana, 2011). Kerala, Tamil Nadu, Maharashtra, Madhya Pradesh, West Bengal, Uttarakhand.

Remarks : One of the common platygastrid genera recorded from the paddy fields of Kerala, the only genus with some degree of similarity to the robust habitus of *Baryconus* is *Scelio* Latreille. The deep margined depression on frons, the two small terminal spines laterally towards the tip of the end tergite in both sexes and a complete *smv* of the hindwings separate *Baryconus* from *Scelio*. In *Scelio smv* is incomplete in hindwings (not reaching frenal hooks). Further the frontal depression is much feeble in *Scelio*, even if present at times, is never margined by a keel.

The members of this genus are collected in low numbers from rice ecosystems as well as from natural habitats. Generally males are collected in low numbers than females (Rajmohana, personal observation).

2. ***Baryconus keralensis*** Narendran, 2001
(Figs. 12-16)

2001. *Baryconus keralensis. in* Narendran, Ramesh Babu, & Karmaly, 262, 268. Holotype Female, India. (ZSI, WGRC).

Diagnosis : Length (Female) = 3 mm. Head and body black; wings hyaline; frons with a median carina in front of ocellus, bifurcating towards scrobal margin; scrobe with transverse striations on sides; vertex between ocelli with scaly reticulate sculpture; OOL a little less than OD; a smooth patch, nearly as its width situated posterolateral to lateral ocelli; eyes large, bare; occiput with large setigerous punctae, setae dense, erect; stumps of equidistant longitudinal carinae, disappearing well before ocellar area, almost in level with lower margin of eyes and reaching in level with lower eye margin; antenna with 12 segments; length of pedicel subequal with F1; F2 and F3 subequal and < F1; mesoscutum medially with a row of setigerous pits, notauli not very deep and wide, faintly foveolate, mesoscutum between notauli and median row and also laterally with same sculpture as that of vertex; with two irregular rows of large setigerous punctae between notauli, and also bordering scutoscutellar sulcus; humeral sulcus foveolate and wide; mesoscutellum with dense large setigerous punctae, as on lower margin of median mesoscutum; metascutellum medially with two closely placed pointed triangular teeth; horizontal row of punctae distinct; propodeum simple; submedian and lateral longitudinal carinae distinct; pronotum in front of fore coxae with dense fine granulose punctae; netrion with large rounded pits; acetabular area setose; mesopleural carina absent, mesopleural scrobe striate, scrobe not deep; metapleuron with same sculpture as that of pronotum; metapleuron with dense fine pilosity towards hind coxa; *mv* not as long *as stgv, pmv* nearly 3x length of *mv*; metasomal tergites transverse; T1 and T2 with longitudinal striae, interspersed with deep pits; T3 longest of all tergites; with densely packed fine longitudinal striae, interspersed with irregular reticulations; T4 with same sculpture as of T3; T6 terminally with distinct lateral spines.

Male : Unknown.

Distribution in India : Kerala (Palghat : Attappady; Malappuram : Nilambur).

Material examined : One female. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008 and two females on 30.ix.2008, in malaise trap. Three females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : Since the original description is not adequate, the species is redescribed here with additional details.

The original description mentions about absence of lateral spines on T6, but all the specimens at hand have distinct lateral spines. However this character state much specific for *Baryconus*, is at times not strongly represented. Since the set of specimens at hand satisfies all other main attributes of the species, they have been assigned as *B. keralensis*. Since the holotype could not be examined, the original description was relied upon for species comparisons.

3. Genus ***Calliscelio*** Ashmead, 1893

1893. *Calliscelio* Ashmead : 209, 218. Original description. *Type* : *Calliscelio laticinctus* Ashmead, by monotypy.
1908. *Prosanteris* Kieffer : 121, 136. Synonymized with *Ceratoteleia* Kieffer by Muesebeck (1958).
1908. *Ceratoteleia* Kieffer : 121. Synonymized by Masner (1976).
1914. *Uroscelio* Kieffer : 291. Synonymized by Masner (1976).
1917. *Mesoteleia* Kieffer : 51. Synonymized by Masner (1976).
1926. *Caenoteleia* Kieffer : 266, 550.
1926. *Glyptoteleia* Kieffer : 272, 487. Synonymized by Masner (1976).
1926. *Baryteleia* Kieffer : 273, 544. Synonymized by Masner (1976).

Diagnosis : Body robust; moderate sized (2-3 mm); head and body black to brownish black; xanthic forms also met with; wings hyaline, infuscate or at times banded; frons without scrobe; no striae radiating from mandibular corners; mandibles sub tridentate; eyes either glabrous or with fine pubescence; antenna in both sexes 12 segmented; in females clava 6 segmented, not abrupt; skaphion absent; netrion distinct; metascutellum medially produced into a horizontal lamella, typically extending over apex of horn, though sometimes feebly concave medially to contain metasomal horn; propodeum unarmed and medially excavate to accommodate horn on T1; forewings with an elongate *stv* and *pmv*; *mv* often much reduced; hindwings with a complete *smv*; metasoma fusiform; T1 in females always with an anterior dorsal horn; T6 elongate, depressed dorsoventrally; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system); ovipositor elongate to extremely elongate, usually extending into horn of first metasomal tergite, 9-1.2x length of metasoma.

Host : Eggs of Ground crickets (Orthoptera : Gyrllidae) (Masner, 1976).

Status and distribution in India : Number of species known from India : 10 (Rajmohana, 2011). Kerala, Karnataka, Tamil Nadu, West Bengal.

Remarks : *Calliscelio* Ashmead is much similar to *Probaryconus* Kieffer and also *Calotelea* Westwood (not reported from paddy ecosystem in this study). Absence of radiating carinae originating from sides of mandibles, the medially produced horizontal plate like metascutellum often resting nearly over the metasomal horn and absence of posterolateral spines on propodeum, serve to distinguish *Calliscelio* from *Probaryconus*. Radiating carinae on either sides of mandibles, the more or less rectangular metascutellar plate not reaching medially to metasomal horn and propodeum with dorsolateral spine-like projections are characteristic to *Probaryconus*. *Calotelea,* with a vertical lamella like metascutellar plate, presence of skaphion at times, antenna with an elongate radicle, and the presence of radiating carina on mandibular sides, can easily be differentiated from *Calliscelio*.

The group is widely distributed and are abundant in paddy ecosystem than in natural habitats. Females are collected more in number than males.

3. ***Calliscelio agaliensis*** Narendran and Ramesh Babu, 1999

(Figs. 17-18)

1999. *Calliscelio agaliensis* Narendran & Ramesh Babu : 2. Holotype Female, India. (ZSI, WGRC)

Diagnosis : Female. Length = 3 mm. Head and body predominantly rusty brown, with a brownish black tinge on metasoma, metasomal tip darker; wings faintly infuscated; basalis present; eyes bare; lateral ocelli close to inner orbital margin (Fig. 17), separated by less than its own diameter; vertex and frons granulose punctate; antenna 12 segmented with a 5 segmented clava; F1 longest among flagellar segments, longer than pedicel, nearly 2x F3; notauli narrow, faintly indicated, not foveolate; mesoscutum leathery; scutoscutellar sulcus not crenulate; metascutellum medially expanded to a horizontal transparent lamella, medially wider than at sides, lower margin convex, with 6 longitudinal striae on its dorsal; propodeum unarmed; forewings with mv a little shorter than

stgv; *pmv* < 2x longer than *mv*, subequal or longer than *stgv;* dorsal horn on T1 very much reduced, present only as a projection, anteriorly blackish with rugose and coarse sculpture; T1 otherwise longitudinally striate, without reticulated microsculpture; T2 longest among metasomal tergites; longitudinal striae on T2 not reaching to its dorsal half medially, rest of tergites smooth, T6 with dense pilosity, unlike preceding tergites, not transverse, but elongate.

Male : Unknown.

Distribution in India : Kerala (Palghat : Attappadi, Agali).

Material examined : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap.

Remarks : Bare eyes, rusty brown coloration of head and mesosoma, a black coloured reduced metasomal horn with coarse rugose anterodorsal sculpture, a blackish brown metasomal tip and a transparent metascutellar plate with longitudinal striae dorsally serve to distinguish *C. agaliensis* from other species.

Information supplementing to those in the original description that will eventually enable better characterisation of the species have been incorporated in the diagnosis provided.

4. ***Calliscelio glabratus*** sp. nov.
(Figs. 19-29)

Description : Holotype Female. Length : 2.4 mm; head brownish black, body black; tips of mandibles brown; eyes silvery; antennal radicle, scape, pedicel, brown; flagellar segments and clava brownish black, legs including coxae whitish brown to brown; T2 at its anterior one-third yellowish brown; forewings slightly infuscate, veins brown.

Head (HL : HW = 25 : 49); transverse dorsally; frons and vertex glabrous, except for interrupted small patches of delicate very fine coriaceous microsculpture towards inner orbital margin; pubescence on head extremely sparse, except a few long ones on lower clypeus; frons smooth medially; eyes with fine pubescence (Fig. 21); clypeus narrow, with pointed lateral corners; minimal distance between inner orbits in front of median ocellus less than eye height (23 : 29); malar sulcus distinct and of uniform width throughout; mandibles tridentate, mid tooth smaller than outer ones; ocellar triangle devoid of any sculpture; lateral ocelli separated from inner orbits, by less than its diameter; OOL : OD : POL = 2 : 3 : 14; coriaceous patches on occiput lower to lateral ocelli, discontinuous extending to post temples; occipital carina complete and crenulate; temples bulging laterally in dorsal view; antenna 12 segmented, with a distinct 6 segmented club; scape as long as length of following 2 segments combined; F1 longer than F2 and pedicel; antennal segments in relative proportions (length : width) : (28 : 6); (9 : 4), (11 : 5), (8 : 5), (7 : 5), (5.5 : 5), (6 : 6), (7 : 8), (7 : 8), (6 : 8), (7 : 8), (5 : 7).

Mesosoma : (In dorsal view L : W = 55 : 48), subequal to width of head; cervical collar without foveolae; mesoscutum and mesoscutellum smooth, hardly with distinct coriaceous microsculpture; notauli distinct, narrow (Fig. 20), extending throughout, nonfoveolate, humeral sulcus non foveolate; mesoscutellum not much hairy medially; with a very few long setae on mesoscutum on mesoscutellum; scutoscutellar sulcus extremely narrow medially and much wider (Fig. 20) and costate laterally; anterior margin of mesoscutellum crenulate, lower margin foveolate; metascutellum with a traces of small pits medially; metascutellar plate smooth, devoid of any sculpture, trough shaped (trapezoid), extending medially, resting on top of metasomal horn, lower margin wavy; propodeum medially emarginate; lateral triangular area smooth and densely hairy; anterior margin of pronotum between fore coxa and cervix smooth, except for an incomplete row of foveae, extending to cervical area from mid pronotum; netrion prominent with foveolate anterior border; mesopleural carina distinct, with a row of irregular foveae on its lower margin; meso and metapleuron

with extremely sparse pubescence, except for a dense lot near acetabular area, near fore coxa; smooth all over; traces of a row of fovea bordering mesepimeral sulcus anteriorly and posteriorly separating mesepisternum with mesepimeron; metapleural carina indicated; metapleuron near hind coxae bare, but with a few irregular foveae and stumps of striae (Fig. 19) and a row bordering meso-metapleural suture; forewing narrow (L : W = 4.1 : 18.1); *pmv* nearly 2x length of *stgv*, also longer than *mv* (*mv* : *stgv* : *pmv* = 6 : 9 : 19); *basalis* not distinct.

Metasoma (L : W = 167 : 46); In dorsal view, nearly1.5x as long as head and mesosoma combined; T1 with a smooth and shiny small horn anteriorly on its dorsomedian, lateral to horn and rest of T1 with strong longitudinal striations and without interspersed reticulations; nearly 10 lateral setae distinct; T2 longitudinally striate, interstices smooth, striae extending nearly to its median dorsally; metasoma widest at middle of T3; T3 onwards smooth, T6 elongate, striolate, also with dense pilosity as compared to preceding segments; relative proportions length of metasomal tergites T1 to T5 being (33 : 17), (47 : 42), (33 : 46), (15 : 42), (13 : 33), (21 : 15).

Male : Unknown.

Etymology : The species is named '*glabratus*' (from the latin word 'glabrus') due to its smooth frons, mesoscutellum and metascutellar plate ('glabrus' in Latin = smooth).

Material examined : Holotype. Female (ZSI/WGRS/PF19). India : Kerala : Wyanad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap. 2 paratypes, (ZSI/WGRS/PF34 and ZSI/WGRS/PF35) with same data as that of Holotype, except dates being 19.xii.2008.

Remarks : The species keys to couplet 6. in the key to Indian species by Narendran and Ramesh Babu (1999). It differs from *T. indicus* mainly in the sculpture of head, dorsal mesosoma, sculpture of the metascutellar plate, as mentioned in the key couplet provided.

C. glabratus sp. nov. is distinct from other species known from Oriental region due to its smooth sculpture on frons, vertex, mesoscutellum and also on metascutellar plate. The interrupted patches of fine coriaceous sculpture towards inner orbital margin on frons as well as on occiput and the trough shaped metascutellar plate are also unique to this species.

Key to separate *Calliscelio glabratus* sp. nov. from *Calliscelio indicus* Narendran

(Couplet to be appended to the key to *Calliscelio* species of India

(Narendarn & Ramesh Babu, 1999)

1. Frons, mesoscutellum and metascutellar plate smooth, without any sculpture (Figs. 20-21). ..... ***C. glabratus*** sp. nov.

— Frons and mesoscutellum with finely granulate sculpture, metascutellar plate with irregular punctae (Fig. 30) ....***C. indicus*** Narendran and Ramesh Babu

5. ***Calliscelio indicus*** Narendran and Ramesh Babu, 1999

(Figs. 28-30)

1999. *Calliscelio indicus* Narendran & Ramesh Babu : 2, 6. Holotype Female, India (ZSI, Kolkata).

Diagnosis : Female. Length : 2.7 mm. Head black to brownish black; rest of body honey brown, brownish black towards metasomal tip; wings faintly infuscated; basalis nebulous; eyes with scanty pubescence, visible only in > 50X magnification; lateral ocelli close to inner orbital margin than to median ocellus; vertex and frons granulose punctate; antenna 12 segmented with a 6 segmented clava; F1 longest among flagellar segments, and also longer than pedicel; notauli narrow with fine foveolae, extending throughout; humeral sulcus wider than notauli, non-foveolate; mesoscutellum with a smoother sculpture than mesoscutum; crenulate anteriorly, lower margin bordered by foveolae; metascutellum medially expanded to a narrow plate, with rich irregular coarse sculpture dorsally; propodeum unarmed;

forewing with *mv* distinctly shorter than *stgv* and *pmv*; *pmv* longer than *stgv*, > 2x longer than *mv*; T1 with a dorsal horn, longitudinally striate, with reticulated microsculpture laterally and towards base; T2 longest among metasomal tergites; longitudinal striae on T2 extending nearly to its half dorsomedially, but receding laterally, rest of tergites smooth, T6 with rich pilosity, elongate.

Male : Unknown.

Distribution in India : Kerala (Malappuram : Calicut University Campus, Karimpuzha).

Material examined : 5 females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 16.i.2009 and 2 females on 26.xii.2008, in malaise trap.1 female. INDIA : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in sweep net.

Remarks : Pubescent eyes, irregular and coarsely sculptured narrow metascutellar plate, a long *pmv* which is > 2x *mv*, and metasomal horn with longitudinal striations interspersed with reticulations laterally and towards base, are characteristic to this species.

Information supplementing to those in the original description that will eventually enable better characterisation of the species have been incorporated in the diagnosis provided.

4. Genus ***Ceratobaeus*** Ashmead, 1893

1893. *Ceratobaeus* Ashmead : 167, 175.
Type species : *Ceratobaeus cornutus* Ashmead.

1893. *Ceratobaeus* Ashmead : 167, 175. Original description. *Type species* : *Ceratobaeus cornutus* Ashmead, by original designation.

1979. *Idris (Ceratobaeus)* : Huggert : 7. Change to subgeneric status.

2000. *Ceratobaeus* : Iqbal & Austin : 5, 19, 22. Removed from synonymy with *Idris* Förster.

Diagnosis : Small to moderately sized forms (1.2-1.5 mm); head and body black to brownish yellow; head mostly non-elongate in buccal region in front view (elongated forms also met with); frons without a depression; eyes glabrous, at times with fine, minute pubescence; a few carinae radiating from mandibular corners towards orbital margin (Fig. 41); median frons smooth; antenna 7 segmented in females, clava large, without a distinct segmentation; in males antenna 12 segmented, 11th and 12th separated by only a suture; skaphion absent; metascutellum and propodeum unarmed, and excavated medially, even upto scutellum at times; propodeum sometimes with a transparent lamina, often medially notched and flanking top of metasomal horn; forewings with well developed mv and stgv; basal vein and pmv indicated rarely; hindwing with smv complete; metasoma sub-elongate; widest towards middle of T3; T1 in females produced into a horn or a hump fitting into a concavity on median mesosoma; T7 in females not extruded out along with ovipositor; ovipositor assembly extended and retracted by muscles.

Host : Eggs of spiders belonging to Clubionidae, Salticidae, Gnaphocidae, Lamponidae, Stiphididae (Iqbal & Autsin 2000).

Status and distribution in India : Number of species known from India : 9 (Rajmohana, 2011). Tamil Nadu, Uttarakhand, Maharashtra and Uttar Pradesh.

Remarks : No other genera in rice fields resemble *Ceratobaeus* in having a combination of gracile, sub elongate metasoma and a laterally compressed long or short anterior horn on dorsal T1. Members of another genus, viz., *Odontacolus* Kieffer, also parasitise the same hosts, the clubionid spiders and are hence very likely to be encountered in rice fields. The more elongated buccal region, oval dorsal horn without any lateral compression and propodeum armed laterally with a spine bordering dorsal horn of T1 are much specific to *Odontacolus* and serve to differentiate it from *Ceratobaeus*. *Ceratobaeus* was treated as a junior synonym of *Idris* Förster, by Huggert (1979) and Austin (1981), but was later removed from synonymy by Iqbal & Austin (2000). The group is collected in low numbers from both rice fields and from natural systems. Females are represented more in number than males.

6. ***Ceratobaeus dunensis*** Mukerjee, 1993
(Figs. 31-33)

1993. *Ceratobaeus dunensis* Mukerjee : 88. Holotype. Female. India.

Diagnosis : Female. Length : 1.6 mm. Body predominantly honey brown with yellowish to reddish brown markings; face in the lower one-third yellowish to reddish brown; metasoma honey brown with proximal 0.6 of T3 and end tergites yellowish to reddish brown; eyes and ocelli silvery; wings hyaline; cheeks with fine striae radiating from mandibles, with dense, long, fine setae; upper frons densely pilose; without a granulate sculpture anterior to median ocellus; eyes with very fine pubescence; central keel visible nearly till mid level of eyes; speculum distinct; postgena on lower orbits, vertex, scutum and mesoscutellum densely pilose; lateral ocelli almost touching orbital margin; occipital carina complete; antenna 7 segmented; clava large (Fig. 31), unsegmented; pedicel subequal to length of F1; F1 nearly 2x length of F2; notauli absent; mesoscutum emarginate in more than posterior half to receive metasomal horn; forewing with a short *mv* (Fig. 33); *stgv* > 5x *mv*; *pmv* very much reduced, shorter than *mv*; T1 and T2 longitudinally striate; T3 with fine traces of striae; rest of tergites with matt sculpture; horn on T1 long, a bit tapering towards tip, extending upto lower border of medially emarginate scutellum. T3 longest among tergites.

Male : Unknown.

Material examined : 2 Females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008 and 1 female on 26.xii.2008, in malaise trap.

Distribution in India : Uttarakhand (Dehradun : Rishikesh).

Remarks : The species hitherto known only from its type locality, Dehradun, North India, is being reported for the first time from Kerala. A variation is observed in the general shades of colour of the habitus. The reddish brown area in the holotype is replaced in the series at hand by yellowish/whitish brown markings. The species is rather unique with its distinct banding pattern.

This is a widely distributed species in paddy fields of Kerala.

7. ***Ceratobaeus granulosus*** sp. nov.

Holotype Female. Length = 1.25 mm. Body brownish black, except for pale brownish white legs excluding coxa; coxae brownish black; eyes silvery; mandibles, claval base and basal medial margin of all tergites yellowish brown, rest of antenna brown; wings hyaline; veins brown.

Head : (L : W = 12 : 32, in dorsal view); in anterior view subtriangular in shape, buccal area elongate; vertex medially concave (distinct in front view), upper frons, vertex and occiput finely granulate with scattered minute punctures and with laterally oriented dense pilosity; frons smooth and glabrous medially; cheeks finely striate; cheeks and gena richly pubescent; longitudinal striae not on frons not reaching beyond midpoint of eye level; minimum distance between orbital margin in front of median ocellus greater than eye height (26 : 23); eyes with very fine scanty pubescence visible only at > 60x.; central keel disappearing on median frons just above antennal insertion; lateral ocelli nearly contiguous with margin of eyes (LOL : POL = 9 : 15); hyperoccipital carina distinct, complete; in dorsal view head moderately broad and transverse (2.6x dorsal head length), slightly wider than mesosoma (1.06x); anterior margin of occipital carina striate-scrobiculate; in lateral view temples granulate; antenna with 5 funicular segments; F1 not as long and wide as pedicel, longest among funicular segments, nearly 2x F2; clava large, 4 segmented. 22 : 5; 9.5 : 4.3; 7 : 3.2; 3.5 : 3; 3.3 : 3; 3 : 3.3; 20 : 7.

Mesosoma : (L : W = 26 : 30, including tegula); slightly narrower than dorsal head; surface finely granulate; mesoscutum densely pubescent than vertex; notauli absent, sulcus between scutum and mesoscutellum striate scrobiculate laterally and at posterior margin of scutellum; mesoscutellum moderately convex, surface finely granulate, pilosity

dense, longer towards posterior margin; posterior half deeply excavated for receiving metasomal horn; metascutellum with an arched row of foveolae; propodeal lamellae and flanges bordering horn feebly developed; in lateral view pronotum with longitudinal striae, mesopleural carina not developed; lower mesopleuron on acetabular area with fine coriaceous sculpturing interspersed with rich pilosity and longitudinal elements; forewing elongate, L : W = 92 : 29; *stgv* long, *pmv* very short, basal vein absent (*mv : stgv : pmv*) = 3 : 13 : 1).

Metasoma : L : W = 82 : 35; about 1.9x as long as head and mesosoma combined, slightly more than 2.25x as long as wide; in lateral view horn near vertical, straight, reaching above level of mesoscutellum, surface smooth except for a few basal longitudinal striations (Fig. 36) and scrobiculate anteroventral margins; rest of T1 (other than horn) and T2 longitudinally striate, striae faintly reaching posterior margin; with fine granulate background sculpturing; T1 lower to horn laterally with dense long setae; ratio of midline length of T2 : T3 = 19 : 26; T2 1.6x as wide as long; T3 1.3x wide as long; T3 onwards, all posterior tergites richly granulate-coriaceous with smooth posterior margins; all terga with sparse long hairs (Fig. 36).

Male : Unknown.

Material examined : Holotype : 1 Female. (ZSI/WGRS/PF20) INDIA : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 30.ix.2008, in malaise trap.

Paratype : 1 Female, (ZSI/WGRS/PF36) with same data as that of the Holotype.

Etymology : The species is named ‘granulosus’ due to the granulose sculpture on frons in front of median ocellus.

Remarks : This species runs to couplet 5 in key to species of India by Mukerjee (1978b), and keys to *C. cholakkadensis* Mukerjee (1978b). In *C. granulosus*, T1 is not striated anteriorly on horn (T1 fully striated in *C. cholakkadensis*), T3 is only 1.36x length of T2 (in *C. cholakkadensis* T3 is 2x length of T2). Sculpture on head and metasomal tergites is more granulose in *C. granulosus*, where as head of the latter is reticulate and T3 onwards rugulose.

The new species described here though looks very much similar to *C. longituberculatus* Mukerjee, differs in proportion of basal flagellar segments. The longitudinal striae on frons are confined to lower half of frons near to orbits. (In *C. longituberculatus* striae on lateral frons extend throughout.

A combination of characters, viz., central keel visible on median frons till mid level of eyes, less elongated buccal area, longitudinal striae on frons confined to lower half of frons near to orbits, less pilosity on scutum and mesoscutellum; mesoscutellum excavate on posterior 2/3rd, granulose sculpture on frons anterior to median ocellus, and also on T3-T5 serve as diagnostic to *C. granulosus* sp. nov.

8. ***Ceratobaeus longituberculatus*** Mukerjee, 1981

(Figs. 40-41)

1981. *Ceratobaeus longituberculata* Mukerjee : 30. Holotype Female, India.

Diagnosis : Female. Length : 1.6 mm. Head and body honey brown; mesonotum medially with a black tinge; ocelli black; wings hyaline; metasomal horn black towards tip; antennal funicle and clava brownish yellow; cheeks with fine striae radiating from mandibles, sparsely pubescent; frons with longitudinal striae extending to vertex, laterally towards orbital margins; median area smooth; upper frons not granulate, but smooth anterior to median ocellus; central keel nearly extending more than half length of median frons; eyes with very fine pubescence; pilosity dense towards vertex; lateral ocelli almost touching orbital margin; occipital carina complete; antenna 7 segmented; clava large (Fig. 40), unsegmented; pedicel distinctly longer than any of funicular segments; F1 < 2x length of F2; notauli absent;

mesoscutellum emarginate at its median half, medially with a tuft of long setae (visible well in lateral view); forewing with *pmv* very much reduced; *stgv* elongate, more than 5x *mv*; anterodorsal horn on T1 long, a bit tapering towards tip, slender, extending upto to medially emarginate scutellum; T1 and T2 longitudinally striate; striations on T2 reaching almost to its posterior margin; T3 with rough granulate sculpture; T3 longest among tergites; rest of tergites with matt sculpture.

Male : Unknown.

Material examined : 3 Females. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008 and 3.x.2008 and 28.viii.2008, in malaise trap.

Distribution in India : Karnataka (Maldare).

Remarks : The species was hitherto known only from the type locality and forms the first report from Kerala. Eyes are bare in the series at hand.

Key to *Ceratobaeus* species known from India

(Based on females)

1. Forewing with *pmv* much longer than *mv* (4x) and subequal to *stgv* ..... ***C. marattensis*** (Mani & Mukerjee)
— Forewing with *pmv* usually short, much shorter than *stgv*, if longer than *mv*, then < 2x 2
2. Body yellowish brown 3
— Body not yellowish brown 4
3. Forewings hyaline; T2 and T3 subequal ..... ***C. nigrituberculatus*** Mukerjee
— Forewings transversely banded; T3 > 2x length of T2 ..... ***C. flavicolor*** Mukerjee
4. Forewings hyaline 5
— Forewings infuscate or transversely banded 11
5. Metasomal tergites smooth; T3 nearly 3x length of T2 ..... ***C. peninsularis*** Mani and Mukerjee
— Metasomal tergites, (atleast T1 and T2) with striae; T3 at the most 2x length of T2 6
6. Longitudinal striae on T2 entire 7
— Longitudinal striae on T2 confined to its anterior one-third ..... ***C. nepalensis*** Mukerjee
7. F1 elongate, > 0.7x length of pedicel; T3 at the most 1.5x length of T2 8
— F1 short, only 0.5x length of pedicel; T3 nearly 2x length of T2 9
8. Frons in front of median ocellus smooth, at the most faintly coriaceous: metasoma with alternate yellow and blackish brown bands (Figs. 32, 33) ..... ***C. dunensis*** Mukerjee
— Frons in front of median ocellus with rough granulose sculpture; metasoma not banded (Fig. 35) ..... ***C. granulosus*** sp. nov.
9. Forewings with a brown patch near *stgv*..... ***C. gangnaniensis*** Mukerjee
— Forewings clear, without a brown patch near *stgv* 10
10. Metasomal horn, very long, extending nearly to anterior margin of mesoscutellum (Figs. 40, 41); antennal club yellow ..... ***C. longituberculatus*** Mukerjee
— Metasomal horn not reaching anterior scutellar margin; antennal club brown ..... ***C. cholakadensis*** Mukerjee
11. Notauli present; forewings transversely banded ..... ***C. unifasciatus*** (Mani & Mukerjee)
— Notauli absent; forewings infuscate ..... ***C. rishikeshensis*** Mukerjee

5. Genus ***Cremastobaeus*** Ashmead, 1893

1893. ***Cremastobaeus*** Ashmead : 210, 211, 228. Original description. Type : *Cremastobaeus bicolor* Ashmead, by original designation.

1913. ***Cremastoscelio*** Dodd : 131, 156. Original description. Type : *Cremastoscelio flavipes* Dodd, by original designation. Keyed. Synonymized by Masner (1976)

1966. ***Argentoscelio*** Szabó : 172. Original description. Type : *Argentoscelio horvathi* Szabó, by monotypy and original designation. Synonymized by Masner (1976).

Diagnosis : Body slender and gracile (length 1.2 mm); body black to brownish yellow; frons with a deep depression, margined by a distinct carina; frons or gena with no radiating carinae; eyes very large, densely hairy; mandibles subtridentate; inner orbits connected by a keel anterior to median ocellus; antenna 12 segmented in both sexes, in females appearing 8 segmented, clava abrupt, 4 segmented, segments very close to each other (Fig. 43); second and third antennal segments with dorsal serrations, a character much unique to this genus; third and fourth segments seemingly fused; skaphion absent; mesoscutum without notauli; metascutellum with a median tooth; propodeum medially excavate; to accommodate anterior horn on T1; wings hyaline; forewings with *mv* shorter than *stgv*; *pmv* elongate; hindwings with *smv* complete; metasoma elongate, basal tergites subequal; metasomal segments constricted at base, with a knotty appearance in lateral view; in females T1 sometimes with an anterior dorsal horn; T7 not extruded along with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, more than 0.8x length of metasoma.

Host : Unknown.

Status and distribution in India : Number of species known from India : 1 (Rajmohana, 2011). Uttarakhand.

Remarks : *Cremastobaeus* is very much peculiar in having a constriction at the base of all metasomal tergites, rendering a knotty appearance (best visible in lateral view). Further the second and third antennal segments are dorsally serrated and third and fourth antennal segments are partially fused, making it distinct from all other genera of Scelioninae seen in paddy ecosystem.

Seen in large numbers in paddy fields than in natural ecosystems.

9. ***Cremastobaeus indicus*** Mukerjee
(Figs. 42-44)

1994. *Cremastobaeus indicus* Mukerjee : 22. Holotype Female, India.

Diagnosis : Female. *Length* : 1.2 mm; head and mesosoma black; metasoma brownish yellow, brownish black towards metasomal tip on lower T4, and entire T5 to T7; antennal radicle, scape, pedicel and basal flagellar segments yellowish brown; distal flagellar segments and clava brownish black; mandibles and legs including coxae yellowish brown; wings hyaline; veins brown; eyes and ocelli silvery; antenna with 12 segmented, clava 4 segmented (segmentation visible); pedicel and F1 + F2 with spiny structures; pedicel and F1 + F2 subequal in length; F3 length < length of F1 + F2, but > length of F4; minimum distance between orbital margins anterior to median ocellus a little less than eye height in front view (15 : 19); richly pilose towards inner orbital margin and on vertex; antennal scrobe with fine transverse striae; eyes with dense short pubescence; mesoscutum and mesoscutellum with same sculpture as of vertex and occiput; notauli absent; humeral sulcus lacking; scutoscutellar sulcus not crenulate medially, but costate laterally; posterior margin of mesoscutellum margined by foveae; densely pilose; metascutellum medially developed as a trough shaped coarsely rugulose plate, and with a median carina; left and right propodeal triangles not meeting at centre, finely granulate at margins, otherwise smooth medially; meso and metapleuron with dense striae and foveae, pilosity confined to acetabular area; forewing with an elongated *stgv* and *pmv; stgv* > 3x *mv* and *pmv* > 2x *stgv*; metasomal tergites transverse; T1-T4 with prominent longitudinal striae anteriorly, gradually disappearing into fine granulations, towards its lower margin; T1 not as long as T2; T2-T4 nearly subequal; length of T1 : T2 : T3 : T4 : T5 = 9 : 12 : 12 : 11 : 8; T4 onwards richly pilose.

Male : Unknown.

Distribution in India : Uttarakhand (Dehradun : Rishikesh; Bhaniawala).

Material examined : 2 Females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : This genus as well as the species is reported for the first time in Kerala. Being a less studied group, a detailed diagnosis is provided here with characters additional to those in original description. The characters which differentiate *C. indicus* from its nearest species, *C. unicolor* sp. nov, are given in the key to *Cremastobaeus* species in India.

10. ***Cremastobaeus unicolor*** sp. nov.
(Figs. 45-51)

Description : Holotype Female. Length = 1.15 mm. Head and body mesosoma brownish black, head darker than rest of body; metasoma honey brown; eyes and ocelli silvery; antennal radicle, scape, pedicel and F1 yellowish brown; rest of flagellar segments and clava brownish black; mandibles and legs including coxae whitish to yellowish brown; pilosity on body white; wings hyaline; veins brown.

Head : (L : W = 24 : 52); transverse dorsally; vertex and occiput and upper frons with uniform sculpture, with dense irregular, closely stacked transverse elements; minimum distance between orbital margins anterior to median ocellus only slightly less than eye height in front view (14 : 16) (Fig. 46); pilosity much scarce towards inner orbital margins, but dense on vertex, hairs vertical and rising well above level of median ocellus; area between scrobe and inner orbital margin with close reticulate sculpture; scrobe with dense transverse striations stretching throughout distally, confined at a short stretch on median scrobe, smooth ventrally; central keel not distinct; malar sulcus of uniform width throughout; lateral ocelli close to inner orbits, separated by less their diameter; OOL : OD : POL : OOL = 1 : 3 : 13 : 9; eyes very large (Fig. 46); finely pubescent; post gena lower to orbital margin reticulate; temples visible dorsally in a short stretch dorsally; relative proportions of length to width of antennal segments from scape to clava being 13.9 : 3.6; 5.7 : 3.8; 4.6 : 3.2; 3.7 : 2.5; 3.6 : 2.5; 3.5 : 2.5; 3.4 : 2.5; 16.2 : 7.2.

Mesosoma : L : W = 66 : 46; pronotal collar of cervix, mesoscutum as well as mesoscutellum scaly reticulate, densely setose; setal bases not raised; notauli absent; humeral sulcus non-foveolate; scutoscutellar sulcus medially narrow, laterally wide and foveolate (Fig. 47); posterior margin of mesoscutellum bordered by a row of foveae, outer margin smooth; metascutellar plate medially with fine but indistinct longitudinal elements; medially overlapping propodeum; laterally with a row of foveolae; propodeum not continuous medially, lateral propodeal triangles densely setose, smooth, except for a row of foveolae at its posterior margin; netrion large (Fig. 49), anterior margin foveolate; mesopleural carina absent; mesepimeral sulcus complete; acetabular area finely coriaceous; metapleuron smooth, except for a few longitudinal rugulae ventrally near hind coxae (Fig. 49); metapleural carina indicated; forewing L : W = 58 : 24.

Metasoma : (L : W = 98 : 41); all tergites transverse; T1-T3 striated longitudinally almost entirely, except for a narrow smooth posterior margin; reticulate and setose, setae denser laterally; T4-T5 with striae only at its anterior half to one-third, lower half finely reticulate; T6-T7 without longitudinal striae; T1 longest of all tergites; T1 1.5x T2 2.2x T3, 2.6x as wide as long; relative length of T1 : T2 : T3 : T4 = 21 : 18 : 16 : 15.

Male : Unknown.

Etymology : The species is named ‘unicolor’ since the habitus of this species is of uniform colour.

Material examined : Holotype. Female. ZSI/WGRS/PF21. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 16.i.2009, in malaise trap.

Paratypes : 9 females. 6 females with data same as that of the Holotype except dates being 19.xii.2009 for four (ZSI/WGRS/PF36-PF39) and 2.i.2009 for another two (ZSI/WGRS/PF40-41). 3 females. India : Kerala : Calicut : Peruvayal, Coll :

Rajmohana on 2.i.2009, in malaise trap (ZSI/ WGRS/PF42-44).

Other material examined : 2 females Coll : Rajmohana on 9.i.2009 and 1 female on 26.xii.2008, India : Kerala : Wynad : Kalpetta : Madakkimala, in malaise trap.

Remarks : *C. unicolor* sp. nov. differs from *C. indicus* Mukerjee mainly in colour of body, sculpture of metascutellum, proportion of metasomal segments, and pilosity on frons. Metasoma is honey brown in *C. indcus*. (Metasoma is yellowish brown with a black tinge towards its tip in *C. indicus*).

Key to species of *Cremastobaeus* Ashmead of India

(Based on Females)

1. T1 longer than T2 or T3 (Fig. 42); head, mesosoma and metasoma almost concolorous, brown ..... ***C. unicolor*** sp. nov.

— T1 not as long as T2 or T3 (Fig. 48); head and mesosoma brown to black, metasoma predominantly yellowish brown ..... ***C. indicus*** Mukerjee

6. Genus ***Dicroscelio*** Kieffer, 1913

1913. ***Anteromorpha*** Dodd : 131, 145. Original description. Type : *Anteromorpha australica* Dodd, by original designation. Synonymized by Yoder, Valerio, Masner & Johnson, 2009.

1933. ***Govinda*** Nixon : 292, 465. Type : *Govinda mila* Nixon, by original designation. Synonymized by Kozlov (1971).

1951. ***Aegyptoscelio*** Priesner : 133. Type : *Aegyptoscelio frequens* Priesner, by monotypy and original designation. Synonymized with *Govinda* Nixon by Sundholm (1970), and with *Dicroscelio* by Yoder, Valerio, Masner & Johnson, 2009.

1956. ***Afroscelio*** Risbec : 827. Type : *Afroscelio poussi* Risbec, by monotypy. Synonymized with *Aegyptoscelio* Priesner by Masner (1958) and with *Dicroscelio* by Yoder, Valerio, Masner & Johnson, 2009.

Diagnosis : Body robust, elongate and depressed; moderately sized (2-3 mm); frons without scrobe, often convex; mandibles bidentate; eyes with pubescence; fan-like radiating striae arising from base of mandibles; antennae in both sexes with 12 segments, in females with a 6 segmented abrupt clava, in males antenna fiiform; lateral ocelli either touching inner orbital margins or separated from latter by its own diameter; skaphion absent; notauli absent or faintly indicated posteriorly; metascutellum flat and foliaceous, semicircular and plate-like, at times plate bidentate and lamellate, or like a triangular spine-like process; propodeum unarmed, medially excavated to contain metanotal plate; forewings with a short *mv*, elongate *stgv* and *pmv*; *stgv* forming a very narrow angle with postmarginal; hindwings with submarginal vein complete; metasoma flat, spindle shaped; T1 in females not humped or horned. T7 in females internal; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system).

Host : Unknown.

Status and distribution in India : Number of species known from India : 4 (Rajmohana, 2011) and (Yoder *et al.*, 2009). Kerala, Karnataka, Maharashtra, Himachal Pradesh.

Remarks : The inverted triangular plate like metascutellum and the absence of skaphion serve to differentiate it from *Opsithacantha*, in which skaphion is usually present and metascutellum is with a median spine. Members of this genus are seen in paddy ecosystem in low numbers, females are encountered more in number than males.

11. ***Dicroscelio malabaricus*** (Narendran, 2011) (Figs. 52-55)

2001. *Anteromorpha malabarica* Narendran in Narendran , Ramesh Babu, & Ushakumari : 294, 296. Holotype Female, India.

Diagnosis : Female. Length : 2 mm. Body black to rusty brown; head with dense pubescence; transverse dorsally; vertex and upper frons in front of median ocellus reticulate granulate, eyes densely pubescent; gena and cheeks with radiating striae originating from mandibular corners; frons with uniform sculpture as on vertex, but less impressed; central keel absent; antenna 12 segmented, pedicel

longer than any of flagellar segments; length of F1 > F2 > F3 > F4; clava abrupt and robust, 6 segmented; mesoscutum with reticulate granulose sculpture; notauli absent; mesoscutellum with denser and tightly packed sculpture than on mesoscutum; metascutellum medially produced to a large subtriangular plate with conspicuous reticulations, extending over to median propodeum; forewing with a reduced *mv*; *stgv* and *pmv* elongated; *pmv* < 2x as long as *stgv*; basal metasomal tergites (T1 and T2) with longitudinal striae; horn or tubercle absent on T1; T3 longest of tergites, striolate; T4-T7 with less impressed striolations; lower tergites from T4 onwards densely hairy.

Male : Unknown.

Distribution in India : Kerala (Malappuram : Calicut University Campus).

Material examined : 3 Females : India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap and 1 female. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 30.ix.2008, in malaise trap.

Remarks : These specimens have been tentatively placed under *D. malabaricus*, since the specimens at hand is keying to the species and is tallying with most of the characters, like general appearance of the habitat, proportions of antennal segments, position of lateral ocellus, shape and sculpture of metascutellar spine and also proportion of veins in the forewing. However, a few characters describing the sculpture on median scrobal area, mesoscutellum and dorsomedian T4-T6 and proportions of basal metasomal tergites are not tallying with that of the original description (indicated in the diagnosis). Hence, these specimens currently treated as *D. malabaricus* may eventually be assigned a separate species status, after examination of the holotype.

7. Genus ***Doddiella*** Kieffer, 1913

1913. *Doddiella* Kieffer : 109. Original description. Type : *Doddiella nigriceps* Kieffer, by monotypy and original designation.

1927. *Aratala* Dodd : 74. Type : *Aratala globiceps* Dodd, by monotypy and original designation. Synonymized by Masner (1976).

Diagnosis : A slender elongate species; antenna 12 segmented, with an abrupt 5 segmented clava; gena and posterior margin of temples with a dense unusual tuft of white pilosity; eyes large (Fig.58), with fine pubescence; frons without a distinct median depression; mandibular corners without any radiating striae, but usually with reticulate sculpture on frons, vertex, and gena; mandibles bidentate; prothorax well-developed, visible from above; skaphion absent; notauli absent; mesopleura smooth and shiny without any strong impressions of costae; metascutellum medially drawn to a transparent non-pointed broad spine-like structure, fitting medially between right and left lobe of much excavate propodeum; forewing with only smv indicated, mostly a stub at wing base; hind wing with smv not reaching frenal hooks; T1 elongate; without any dorsomedian protuberance; margin between T2 and T3 upcurved; T7 not exserted in females; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system).

Host : Unknown.

Status and distribution in India : Number of species in India : 2, Kerala, Uttarakhand.

Remarks : The slender habitus, the unusual tuft of white pilosity on posterior temples and also on pronotal collars, much reduced wing venation (*smv* often absent or reduced in fore and hindwings) and the upcurved margin between T2 and T3 dorsally, serve to distinguish this genus from rest of the Platygastrid genera of paddy ecosystem. Often encountered in very low numbers.

12. ***Doddiella nigricephala*** Mukerjee, 1993 (Figs. 56-61)

1993. *Doddiella nigricephala* Mukerjee : 83. Holotype Female. India. (at Northern Regional Centre, ZSI, Dehradun).

Diagnosis : *Length* : Female-2 mm, Male-2 mm. Head brownish black to black, body reddish

brown; wings hyaline; head transverse, with reticulate sculpture throughout, clothed with white silvery pubescence; lateral ocelli separated from eye margin by more than its own diameter; frons slightly depressed medially; occipital carina complete; rich tuft of hair present on posterior margin of temples; antenna 12 segmented; radicle long, extending to one third of scape; scape as long as next 5 segments combined; F1 longest among flagellar segments, not as long as pedicel, length slightly less than 2x its width; F2 to F5 nearly subequal; all claval segments transverse; pronotum well developed and visible from above; notauli absent; mesoscutum with same sculpture as that on vertex; metascutellum continued behind into a transparent lamellate spine; propodeum excavate medially; forewing with a faint trace of *smv*; *mv* indicated as a dark vague spot; metasoma elongate, much longer than combined length of head and mesosoma; T3 longest, about 3x length of T2; suture between them finely arched.

Distribution in India : Uttarakhand (Dehradun : Rishikesh).

Material examined : 1 male and 1 female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap. Paratype of *D. nigricephala* Mukerjee, Reg. no : A 8941 NRS/ZSI : Type Depository, Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : This forms the first report of *D. nigricephala* Mukerjee from Kerala. Two species viz. *D. nigricephala* Mukerjee and *D. indica* Mukerjee are known from India, till date. The sculpture, *i.e.*, the striae on cheeks and gena are mentioned as the main character separating both the species (Mukerjee). Since closely placed reticulations may present a deceiving appearance as striae, both the species are likely to be the same. The paratype of *D. nigricephala* (female) has been examined. After examining, it appears that the characters stated to separate this species from *D. indica* are not very strong enough and there is a possibility of *D. indica* being conspecific with *D. nigricephala*.

8. Genus ***Duta*** Nixon, 1933

1933. *Duta* Nixon : 291, 306. Original description. Type : *Holoteleia tenuicornis* Dodd, by monotypy and original designation. Keyed.

1951. *Chaetanteris* Priesner : 136. Type : *Chaetanteris serraticeps* Priesner, by monotypy and original designation. Synonymized by Masner (1976).

Diagnosis : Body brownish black to xanthic; small sized (1-2 mm); head globular; eyes large, with fine pubescence; rounded; head and body usually smooth and shiny, at times with coriaceous microgranular sculpture; cheeks and frons never with radiating striae; frontal depression never developed; central keel not developed in Indian species (present in Vietnamese spp); at times with serrations/denticles on posterior corner of lower orbital margin; ocelli placed top on vertex, occipital carina distinct; antenna 12 segmented in both sexes; clava demarcated in females, usually 6 segmented; male antenna filiform; skaphion distinct; notauli developed or absent; metascutellum and propodeum simple, unarmed; propodeum medially excavate; netrion distinct; metasoma elongate; spindle shaped; T1 at times with an anterior dorsal prominence (horn) medially; T7 extruded in females along with ovipositor; forewing with *mv, stgv* and *pmv*; basal vein indicated at times.

Status and Distribution in India : Species known from India : 4 Kerala, Karnataka, Uttaranchal.

Host : Eggs of Gryllids (Orthoptera).

Remarks : It has been noticed that some of the female specimens of *Duta* possess an anteromedian elevation (horn/hump) on T1. How ever this character state, shows individual variation within species, and hence cannot be considered as a species character. In *D. polita,* this character state is sometimes present as well as absent, where as all other features remain fairly constant.

The density as well as orientation of pilosity on frons exhibit variation between species and is

hereby proposed as a new character in species study of *Duta* Nixon.

The present study recognises 6 species of *Duta* from paddy ecosystem, of which, 3 species viz, *D. dissimilis*, *D. elongata* and *D. bicolour* are described as new to science.

D. polita is recorded for the first time from Kerala.

A key to identify all the 7 species of *Duta* known from India is also presented here.

13. ***Duta bicolor*** sp. nov.
(Figs. 62-69)

Description : Holotype Female. Length = 1.2 mm. Head brownish black; mesoscutum and metasoma predominantly xanthic, with dark infuscations on tegula, mesoscutum mid anterodorsally, lateral mesoscutellum, median T1 and apical metasoma; mesopleuron yellowish brown; eyes and ocelli shining silvery black; mandibles yellowish brown; antennal radicle, basal three fourth of scape and pedicel yellowish brown; rest of antenna blackish brown; legs including coxae yellowish brown, end tarsi and claws brownish black; wings hyaline; veins brown.

Head : (L : W = 25 : 41); dorsally transverse, dense semi-erect hairs on occiput and upper frons and vertex; hairs rising above level of median ocellus on vertex; ocellar triangle low; lateral ocelli wide apart, separated from lateral orbits by more than its own diameter; OOL : OD : POL : LOL = 2.2 : 18 : 10; eyes large (Fig. 66), with dense fine pubescence; minimum distance between inner orbits on frons in front of median ocellus a little less than eye height (18 : 22); malar sulcus distinct, narrow throughout (eye width : malar space = 26 : 8; mandibles tridentate, middle teeth very small; clypeus with an emarginated lower border; interantennal process well developed; frons in front of antennal shelf upto upper frons, smooth; upper frons anterior to hind ocellus onwards upto occiput, granulate punctate; upper frons towards vertex with dense pilosity, oriented variably; pilosity on either side of midline oriented laterally and those at midline straight; lower post orbit with a coriaceous patch, not granulate; orbital inner margin without any sculpture, with scanty hairs; central keel absent; occipital carina complete and finely crenulate; gena with sparse decumbent hairs; antenna clothed with fine pilosity; scape a little longer than combined length of four following segments; only F1 and F2 sub elongate, 2x as long as thick, a little longer than pedicel; F3 distinctly smaller than F2 (Fig. 66); F4 quadrate; funicular segments nearly subequal in width; clava abrupt, 6 segmented and transverse; medially twice as wide as funicular segments; comparative ratio of length to width of antennal segments from scape onwards segment being : (23 : 4.5), (5.6 : 3.6), (6.6 : 3.6), (6.5 : 3.6), (4.4 : 3.6), (2.4 : 2.4), clava 21 : 7.

Mesosoma : (L : W = 42 : 35), width measured upper to tegulae less than that of dorsal head (0.85x); setae on mesoscutum and mesoscutellum dense and semi erect, longer than that on vertex; metanotum bare; skaphion distinct, but small, smooth and shiny; cervical part of pronotum foveolate; notauli complete, distinct as two grooves, impressed and diverging in front; mesoscutum with finer sculpture than on vertex; humeral sulcus and suprahumeral sulcus nonfoveolate; transscutellar sulcus narrower than notauli, with 3-4 foveolae laterally; scutellum smooth, devoid of any sculpture, setae much sparse, with a foveolate lower border; metascutellum simple smooth medially; foveolae more distinct laterally; propodeum excavated medially, lateral subtriangular area medially smooth, with strong slanting carinae laterally; lower border foveolate; posterolateral corners acute; lateral cushion of hairs absent, sides of pronotum smooth and glabrous; netrion distinct, with fine foveolae along anterior margin; mesopleural scrobe smooth, mesopleural carina without foveolae ventrally mesepisternum towards acetabular carina smooth with scattered hairs; mesepimeral row of indicated only anteriorly; metapleuron smooth and glabrous,

without any foveolae, metapleural carina indicated; forewing at rest extending beyond tip of metasoma, nearly 3.6x long as wide (L : W = 61 : 17); *smv* extending nearly to half of wing length, with 10-12 semi-erect bristles; *pmv* more than 2x *mv*; *pmv* : *mv* : *stgv* = 60 : 25 : 12, *mv* 2x length of *stgv*; basal vein pigmented and distinct; *stgv* oblique and knobbed.

Metasoma : (80 : 40) : smooth and shiny; T1 distinctly transverse, with a feeble anterior-median dorsal prominence; strong longitudinal costae extending throughout; costae extending to nearly to 0.7x length of T2; T3 a little more than 2x length of T2, predominantly smooth and shiny, with scattered semi decumbent hairs posterolaterally; T4-T6 also smooth and shiny, with dense pilosity; proportions of length to width of T1 : T2 : T3 : T4 : = (12 : 16), (16 : 32), (30 : 40) : (11 : 36); ovipositor exserted.

Material examined : Holotype. Female. (ZSI/WGRS/PF23.) India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009, in malaise trap.

Paratypes 2 females. 1 female with data same as that of Holotype except date being 19.xii.2008 (ZSI/WGRS/PF45) and 1 female India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 3.ix.2008, in malaise trap (ZSI/WGRS/PF46).

Etymology : The species is named '*bicolor*' since the habitus is not uniform in colour, but with two colours-xanthic and black.

Remarks : The species is much similar to *D. indica* Mukerjee, but differs in colour pattern, have a larger habitus, different proportions of antennal segments,(antenna clava shorter than scape; in *D. indica* antennal clava is longer than scape) and metasomal segments.

The combination of following characters serves as diagnostic characters to the species. Habitus not uniform in colour, but with two colours-major portion xanthic, while some parts like head, median mesosoma, anteromedian T1 and metasomal tip black; F1 and F2 sub elongate, F1 longer than F2, 2x as long as wide, 2x longer than F3; lateral ocelli wide apart, separated from lateral orbits by its own diameter; upper frons anterior to hind ocellus, granulate punctate and also with dense pilosity, oriented variably; pilosity on either side of midline oriented laterally and those at midline straight; forewing more than 3x as long as wide; *mv* 2x length of *stgv*; anteromedian prominence of T2 feebly indicated; costae on T2 extending to more than 0.5x its length; T3 1.2x longer than T2 and more than 2x length of T1.

14. ***Duta dissimilis*** sp. nov.

(Figs. 70-75)

Holotype Female. Length : 1.2 mm. Head and mesosoma brownish black; metasoma predominantly honey brown, with dark infuscations, laterally and apically; eyes and ocelli shining silvery black; mandibles yellowish brown; antennal radicle and basal three fourth of scape yellowish brown; rest of antenna blackish brown; legs including coxae pale yellowish brown, end tarsi and claws brownish black; wings hyaline; veins brown.

Head : (L : W = 20 : 40); dorsally transverse, semi erect hairs on occiput and vertex , hairs rising above level of median ocellus on vertex; ocellar triangle low; lateral ocelli wide apart, separated from lateral orbits by its own diameter; OOL : OD : POL : LOL = 2 : 2 : 12 : 9; gena and cheeks smooth without any sculpture; eyes large, with dense fine pubescence; minimum distance between inner orbits on frons, less than eye height (16 : 21); malar sulcus distinct, narrow throughout (Eye height : malar space = 25 : 12);mandibles tridentate, middle teeth very small; clypeus with an emarginated lower border; interantennal process well developed; frons in front of antennal shelf upto upper frons smooth; upper frons anterior to median ocellus onwards to occiput reticulate leathery; postorbit with a leathery patch, not granulate; orbital inner margin with a strip of same sculpture as that of upper frons; central keel absent; occipital carina complete and finely

crenulate; gena smooth, with very sparse decumbent hairs (Fig. 74); antenna clothed with fine pilosity; scape as long as combined length of next three segments; F1 longest among flagellar segments, 2x as long as wide; F2 a little longer than wide, 0.7x as long as pedicel; F3 distinctly smaller than F2, less than 0.5x length of F1; F4 quadrate; basal funicular segments nearly subequal in width; clava abrupt, 6 segmented and transverse; medially almost twice as wide as basal funicular segments; comparative ratio of length to width of antennal segments from scape onwards being : (20 : 4), (5 : 3.5), (5 : 3.5), (3.5 : 3.2), (3 : 3), (2.6 : 2.6); clava (19 : 6).

Mesosoma : (L : W = 41 : 35), width on upper tegulae less than that of dorsal head; setae on mesoscutum and scutellum dense and semi-erect, longer than that on vertex; metanotum bare; skaphion distinct, but only as a rim, smooth and shiny; cervical part of pronotum foveolate; notauli complete, distinct as two grooves, impressed and diverging in front; mesoscutum with same reticulate leathery sculpture as on vertex; humeral sulcus and suprahumeral sulcus nonfoveolate; trans scutellar sulcus narrower than notauli, with 3-4 foveolae laterally; scutellum with same reticulate leathery sculpture, setae much sparse, with a foveolate lower border; metanotum simple smooth medially; foveolae more distinct laterally; propodeum excavated medially, lateral subtriangular area, with strong longitudinal carinae; lower border foveolate; lateral cushion of hairs absent, sides of pronotum smooth and glabrous; netrion distinct, with fine foveolae along anterior margin; mesopleural scrobe smooth; mesopleural carina without foveolae ventrally; mesepisternum towards acetabular carina smooth with scattered hairs; mesepimeron divided from mesepisternum by a row fine foveolae; metapleuron smooth and glabrous, without any foveolae; metapleural carina complete; forewing at rest extending beyond tip of metasoma (L : W = 46 : 26); *smv* extending nearly to half of wing length, with 10-12 semi-erect bristles; *pmv* well developed, nearly 4x *mv; mv : pmv : stgv* = 10 : 40 : 15; *stg* 1.5x length of *mv*; basal vein pigmented and distinct; *stgv* oblique and knobbed.

Metasoma : (L : W = 85 : 35); reticulate on lateral T1, basal T2 and wholly on rest of tergites; T1 distinctly transverse, anterior-median dorsal prominence weakly indicated, with strong longitudinal costae extending throughout; costae extending to nearly whole of T2; T3 as long as 1.25x length of T2 with scattered semi decumbent hairs posterolaterally; T4-T6 with dense pilosity; proportions of length to width of T1 : T2 : T3 : T4 : = (12 : 16), (20 : 30), (25 : 35), (11 : 32).

Material examined : Holotype. Female. ZSI/ WGRS/PF23 India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap.

Paratype : 1 Female with same data as that of the Holotype (ZSI/WGRS/PF47).

Etymology : The species is named *'dissimilis'*, the leathery reticulate sculpture of the species being dissimilar to that of all other species of *Duta.*

Remarks : This species is unique due to the reticulate sculpture on dorsal head, mesoscutum and T3-T4.

The combination of following characters serves as diagnostic characters to the species.

Lateral ocelli wide apart, separated from lateral orbits by its own diameter; upper frons anterior to median ocellus onwards to occiput reticulate leathery; F1 longest among flagellar segments, 2x as long as wide; dorsal mesosoma and T3 to T6, with reticulate leathery sculpture; forewing 1.7x as long as wide; *pmv* 4x *mv*, stgv 1.5x as long as *mv*; T1 distinctly transverse, anteromedian dorsal prominence weakly indicated; T3 as long as 1.25x length of T2.

15. ***Duta elongata*** sp. nov.
(Figs. 76-81)

Holotype Female. Length : 1.2 mm. Head and body brownish black; T1 and basal T2 honey

brown; eyes and ocelli silvery; mandibles yellowish brown; antennal scape and pedicel yellowish brown; rest of antenna brownish black; legs including coxae yellowish brown, end tarsi and claws brownish black; wings hyaline; veins brown.

Head : (L : W = 10 : 19). dorsally transverse, with short decumbent hairs on vertex rising above the level hind ocellus and occiput; ocellar triangle low; lateral ocelli wide apart, separated from lateral orbits by more than its own diameter; OOL : OD : POL : OOL = 3 : 2 : 10 : 16; frons, gena and cheeks smooth without any sculpture; eyes large (Fig. 79), with fine pubescence; minimum distance between inner orbits on frons, lesser than eye height (5 : 7); malar sulcus distinct, narrow throughout (eye width : malar space = 15 : 14). mandibles tridentate, middle teeth very small; clypeus with an emarginated lower border; interantennal process well developed. vertex and occiput granulate, coriaceous, frons in front of antennal shelf smooth upto median ocellus, without any sculpture on orbital inner margin; central keel absent; occipital carina complete and finely crenulate; gena smooth, with dense decumbent hairs, hairs as on vertex; antenna clothed with fine pilosity; scape as long as combined length of 2.8 following segments; F1, F2 and F3 elongate, longer than pedicel; F4 quadrate; funicular segments nearly subequal in width; clava abrupt, 6 segmented and transverse; medially twice as wide as funicular segments.(21 : 4.7); (6 : 3.5); (8 : 3.5); (7.7 : 3.5); (7.2 : 3.5); (3 : 3), clava 20 : 5; length of clava subequal to scape length.

Mesosoma (L : W = 42); width including tegulae less than that of dorsal head; mesoscutum, scutellum with dense, but longer setae than on vertex, metanotum bare. skaphion smooth and shiny; cervical part of pronotum nonfoveolate; notauli narrow and complete, distinct as two grooves, impressed and diverging in front; mesoscutum with finer sculpture than on vertex; humeral sulcus and suprahumeral sulcus nonfoveolate; trans scutellar sulcus medially narrower than notauli, non-crenulate medially, with 3-4 foveolae laterally; mesoscutellum with sculpture as that of mesoscutum only at its base, smooth medially and apically, with a foveolate border near to posterior rim; metascutellum simple smooth medially; foveolae more distinct laterally; propodeum excavated medially, lateral subtriangular area smooth; with finely foveolate lower border; sides of pronotum smooth and glabrous; netrion distinct, with fine foveolae along anterior margin; mesopleural scrobe smooth and distinct, mesopleural carina without foveolae ventrally, with a row of fine foveolae connecting acetabular carina with anterior end of mesopleural carina; mesepisternum towards acetabular carina smooth with scattered hairs; mesepimeral row foveolae not distinct; metapleuron smooth and glabrous, without any foveolae, metapleural carina indicated; forewing at rest extending beyond tip of metasoma; sm extending nearly to half of wing length, with 10-12 semi-erect bristles; *pmv* well developed, nearly 4x *mv, pmv* : *mv* : *stgv* = 40 : 10 : 10; basal vein pigmented and distinct; *stgv* oblique and knobbed.

Metasoma (90 : 32) : Smooth and shiny; longer than wide, also longer than combined length of dorsal head and mesosoma; T1 length subequal to its basal width, with a raised anteromedian dorsal prominence and with strong longitudinal costae; costae restricted to lateral and apical T1 and extending to nearly 0.9 of T2; T2 longest of all tergites, unusually elongated, nearly 2x length of T1; T3 predominantly smooth and shiny, with scattered semi decumbent hairs posterolaterally; T4-T6 also smooth and shiny, with dense pilosity; proportions of length : width of T1 : T2 : T3 : T4 : = (15 : 18), (29 : 27) (25 : 32).

Material examined : Holotype. Female. (ZSI/WGRS/PF24). India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in sweep net.

Paratype : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap (ZSI/WGRS/PF48).

Etymology : The species is named '*elongata*' due to its elongate T2.

Remarks : *D. elongata* is different from all other species of *Duta* due to its unusually elongate T2, which is longer than T3. In all the other Indian species, T2 is transverse and shorter than T3.

The combination of following characters serves as diagnostic characters to the species. Lateral ocelli wide apart, separated from lateral orbits by more than its own diameter; upper frons anterior to median ocellus coriaceous; F1, F2 and F3 elongate, longest among flagellar segments, *pmv* well developed, nearly 4x*mv. mv* and *stgv* subequal; 2x as long as wide; T1 length subequal to its basal width, with a raised anteromedian dorsal prominence and with strong longitudinal costae; costae restricted to lateral and apical T1 and extending to nearly 0.9 of T2; T2 longest of all tergites, unusually elongated, nearly 2x length of T1.

16. ***Duta indica*** Mukerjee, 1994
(Figs. 82-89)

1994. *Duta indica* Mukerjee : 19. Holotype Female, India (Northern Regional Centre, ZSI, Dehradun).

Diagnosis : Female. Length : 1.2 mm. Body honey brown except T1 and basal T2 being brownish black; head and body smooth and shiny; coriaceous sculpture close to anterior ocellus; eyes with fine pubescence; lateral ocelli close to orbital margin; malar sulcus narrow; antenna 12 segmented; F1 and F2 elongated and subequal to pedicel; clava longer than antennal scape; vertex granulate punctate; upper frons towards vertex with dense pilosity; pilosity on either side of midline oriented laterally and those at midline straight; skaphion distinct; notauli complete; diverging in front; metascutellum and propodeum unarmed; dorsal horn on T1 present or absent; longitudinal striae on T1 complete, while extending only to half length on T2; wings uniformly infuscated light brown; post marginal nearly 3x stigmal; basalis also indicated.

Distribution in India : Uttarakhand (Dehradun : Rishikesh) (Rajmohana, 2011).

Material examined : 3 females. 1 from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 30.ix.2008 in malaise trap and 1 female on 22.viii.2008 in sweep net from the same locality. 1 female, India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009, in malaise trap.

Holotype-*D. indica* Mukerjee, Reg. no : A 8994 NRS/ZSI : Type Depository, Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : One of the common species in rice ecosystem and with a wide distribution (Rajmohana, unpublished data). The species is reported for the first time from Kerala.

With an elongate F1 and F2 and a smooth surface on dorsal head, the species can be separated as per the characters given in the key to species of *Duta* in India, in the following pages.

17. ***Duta polita*** Rajmohana, 2007
(Figs. 90-97)

2007. *Duta polita* Rajmohana : 50, 53., Holotype Female. (WGRC, ZSI Calicut).

Diagnosis : Female : Length : 1.3 mm. Lateral ocelli wide apart, separated from lateral orbits by nearly twice its own diameter, without any sculpture on upper frons in front of median ocellus; pilosity on upper frons not dense and without a definite pattern of orientation; orbital inner margin devoid of any sculpture; pedicel, FI, F2 and F3 subequal and greatly elongated; antennal clava linear, not as long as scape and without a prominent lateral bulge medially; scutellum smooth, devoid of any sculpture; propodeum with parallel longitudinal striae on lateral triangular area; forewing more than 4x as long as wide; *mv* subequal to *stgv*, *pmv* unusually long, 4x length of *mv*l; T1 and T2 transverse; T2 with longitudinal costae extending mid dorsally; T3 smooth 1.2x T2.

Male : Unknown.

Distribution in India : Karnataka (Bhagavathi : Kudremukh National Park) (Rajmohana, 2011).

Material examined : 2 females. One from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 30.ix.2008 in malaise trap and another on 22.vii.2008 in sweep net, rest of the data same as that of the former.

Remarks : *D. polita* shows individual variation in the presence and absence of horn on anterodorsal T1. The species is reported for the first time from Kerala.

The presence of strong longitudinal costae on T1 and T2 differentiates this species from the closely resembling *D. tuberculata* Rajmohana.

18. ***Duta serraticeps*** (Priesner, 1951)
(Figs. 98-100)

1951. *Chaetanteris serraticeps* Priesner : 136. Holotype Female, India.

Diagnosis : Female. Length : 1.4 mm; post gena with a carina towards post orbit, along with a row of small 4-5 denticles, a dull (matt) granulated surface of vertex (beyond the median ocellus) and occiput, elongate basal funicular segments of which F1 longest, clava not as long as scape (11 : 13), a complete and diverging notauli; lateral propodeum with a brush of fine dense hairs; T1 with or without an anterior dorsal prominence, T1 costate wholly excluding median prominence; T2 costate at its basal one third and forewing with a clear hair-less line extending almost to its median and *pmv* vein nearly 2x as long as *mv*, serve to characterise *D. serraticeps*.

Distribution in India : Kerala (Wynad, Malappuram) (Rajmohana, 2010).

Material examined : 5 females. 4 from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, 26.xii.2008 and 2.i.2009 in malaise trap. 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Distribution in India : Kerala (Calicut, Malappuram, Wynad).

Remarks : First reported from Egypt by Priesner (1951), this is the only species of *Duta* having a carina towards post orbit, along with a row of small 4-5 denticles, attributing a laterally pointed appearance to the head when viewed dorsally. The fine brush of dense white pilosity on dorsolateral propodeum is also unique to this species.

Key to species of *Duta* Nixon from India
(Based on females)

1 Lower post orbital corner carinate, bordered with a few tiny denticles (Fig. 99); lateral brush of hairs on propodeum distinct (Fig. 100) ..... ***D. serraticeps*** (Priesner)

— Lower post orbital corner without any carinae and denticles; lateral brush of hairs on propodeum scanty or absent 2

2. F1 to F3 elongate (Figs. 77, 92) F3 more than 2x as long as thick 3

— Only F1 and F2 elongate (Figs. 83-89), F3 short, less than 2x as long as thick 4

3 T2 transverse, or atleast length and width subequal, distinctly shorter than T3; upper frons anterior to median ocellus smooth; without granulate sculpture 5

— T2 not transverse (Fig. 78), longer than T3; upper frons anterior to median ocellus with a patch of granulate sculpture ..... ***D. elongata*** sp. nov.

4. Leathery reticulate sculpture on dorsal head (Fig. 73), mesoscutum and dorsal T3; forewing, 2x as long as wide ..... ***D. dissimilis*** sp. nov.

— Dorsal habitus without a leathery sculpture, T3 smooth; forewing > 2x as long as wide .. 6

5. T1 and T2 without strong costae, except a few incomplete traces; propodeum smooth, without any striae ..... ***D. tuberculata*** Rajmohana

— T1 and T2 distinctly costate; propodeum dorsolaterally with longitudinal striae (Fig.96) .....***D. polita*** Rajmohana

6. Habitus predominantly xanthic (Figs. 62, 67), with patchy brownish black infuscations; antennal clava shorter than length of scape . .....***D. bicolor*** sp.nov.

— Habitus predominantly reddish brown, or brownish black (Figs. 82, 84, 87); xanthic at most on T1; antennal clava longer than length of scape ..... ***D. indica*** Mukerjee

9. Genus ***Elgonia*** Risbec, 1950

1950. *Elgonia* Risbec : 549. Original description. *Type* : *Elgonia maxillosa* Risbec, by monotypy, revalidated here.

1950. *Elgonia* Risbec : 549. *Type* : *Elgonia maxillosa* Risbec, by monotypy. Synonymized with *Opisthacantha* Ashmead by Risbec (1953), Masner (1976).

Diagnosis : Body smooth, shining and robust; habitus large (often > 2.5 mm); head and body black or rarely dark brown; head transverse, lateral ocelli not contiguous with inner orbital margin; eyes large, either pubescent or glabrous; malar sulcus present; cheeks and gena with distinct fanlike striae; mandibles tridentate; clypeus truncate; antenna 12 segmented, clava abrupt, six-segmented in female, with all clavomeres separated; male antennal segment 5 carinate and with a basal, ventral excavation (the sex-segment); mesosoma about as high as wide, only slightly arched dorsally; skaphion well developed; metascutellar plate produced medially into sub-triangular process, often long and pointed (Figs. 101, 111); metascutellum as well as propodeum at times emarginate or excavate medially to accommodate metasomal horn; propodeum variable in length; lower portion of the metapleuron above the hind coxa with dense brush-like setae; forewings with *smv* angled down before reaching *mv*, appearing broken; basal vein spurious; *mv* reduced; *stgv* and *pmv* elongate, latter longer than former; hindwings with *smv* complete; metasoma pedunculate, with 7 visible tergites in female, 8 in male; laterotergites well developed, deeply incised into sternites to form submarginal ridge; T1 elongate, pedunculate, not transverse, in female sometimes with hump, longitudinally striate/costate; T2 also elongate, often with longitudinal costae; T3 widest, not always but not always longest of all tergites; dorsally with numerous small setigerous punctae (as in Figs. 103 and 109). ; T4-T7 also with same sculpture as T3; T7 in female external, sub-triangular, articulating with T6 basally, not extruded with ovipositor; ovipositor internal, non-tubular.

Discussion : Genus *Elgonia*, was erected by Risbec in 1950, based on monotypy, with type species *Elgonia maxillosa*. Later the genus was designated as a junior synonym of *Opisthacantha* Ashmead by Risbec (1953) and Masner (1976).

Though both *Elgonia* and *Opisthacantha* share a common wing venation and characters like presence of skaphion, it has been found that *Elgonia* is very much distinct from *Opisthacantha* Ashmead owing to the presence of a combination of characters as discussed here. Due to the presence of a dense tuft of hair or dense white pilosity on ventral metapleuron, above hind coxa and also due to the presence of fine setigerous punctae on dorsal T3, *Elgonia* stand distinct from *Opsithacantha*, where metapleural pilosity is less and dorsal T3 is finely striate longitudinally. Further, the fusiform pedunculate metasoma, with a non transverse T1 in *Elgonia*, also differ from the spindle shaped non pedunculate metasoma and transverse T1 of *Opisthacantha*, (in *Opisthacantha*, all tergites being transverse). In *Opisthacantha*, the anterior dorsal horn on T1 is never developed to an extent as that in *Elgonia*. For these reasons *Elgonia* Risbec is revalidated here, thus removing from synonymy under *Opisthacantha*.

19. ***Elgonia alpha*** sp. nov.
(Figs. 101-107)

Description : Holotype Female. Length : 2.8 mm. head and body black; antennal radicle, scape and basal funicular segments yellowish brown,

distally dark brown; clava blackish brown; legs including all coxae yellowish brown; eyes and ocelli silvery; wings with mild infuscations, veins deep brown.

Head : (L : W = 24 : 64); head transverse dorsally; vertex and frons on its upper side in front of median ocellus and also laterally towards inner orbital margins richly pilose; pilosity on frons rising above level of median ocellus; eye height nearly subequal to minimum distance between inner orbital margin; radiating striae extending nearly to mid margin of eyes; median frons smooth and shiny; central keel extending throughout distally to median ocellus, flanked with short stretches of 3-4 carinae, extending to one-fourth on frons; frons anterior to median ocellus with fine coriaceous sculpture as on vertex, extending laterally on either side towards inner orbital margins; malar sulcus with uniform width throughout; lateral ocellus separated from inner orbit by less than its own diameter; ocelli large; OOL : OD; POL : LOL = 1 : 3 : 22 : 12; eyes large, occupying nearly whole of dorsolateral head and with rich pilosity; temples in dorsal view much reduced; occipital carina crenulate; ocellar triangle and occiput with same rugose sculpture as on vertex; antenna 12 segmented, clava abrupt, six-segmented female, segmentation distinct; F1 longest of funicular segments, > pedicel and F2; clava robust, 3.75 times longer than wide; apex of A1 well below top of vertex; female A2-A7 dark brown; relative proportion of length to width of antennal segments being 40 : 7, 11 : 6; 12 : 5; 10 : 5; 8 : 6; 6 : 6; 7 : 10, 7 : 11 7 : 11 7 : 11; 7 : 10; 11 : 9; clava : scape 47 : 41.

Mesosoma : (L : W = 60 : 58, in dorsal view); narrower than head dorsally; pronotum without any angular corners; mesoscutum with same sculpture as that of vertex; skaphion well developed, glabrous, smooth, shining; notauli distinct, narrow, diverging distally, only posterior 0.6 of notauli strongly indicated; non foveolate; humeral sulcus foveolate; scutoscutellar sulcus wider laterally than medially, crenulate; mesoscutellum with same sculpture as that of mesoscutum, without any smooth area, with fine dense pilosity as that of mesoscutum; posterior margin bordered by foveolae; metascutellum narrow with a row fine foveolae, medially with a long blunt spine (Fig. 107), spine longitudinally striate dorsally; on either side with a small dent; propodeum densely setose punctae, lateral corners drawn into fine pointed teeth; pronotum richly sculptured; netrion large, smooth with a row of foveae on its anterior margin; mesopleural carina distinct; smooth on its ventral half, with rich rounded setigerous punctae on its dorsal half including acetabular area; mesepimeral sulcus complete, metapleuron towards hind coxa with rich brush of fine pilosity, towards coxa and on its posterolateral border; metapleural carina indicated by a row foveolae; forewing with *pmv* elongate, *stgv* and *mv* very long; basal vein nebulous, *smv* thickened on a short stretch before *mv*; *stgv* knob slightly to distinctly enlarged; basal vein nebulous, V-shaped, upper portion forming distinct acute angle with *smv*.

Metasoma (L : W = 145 : 50); T1 with anterior horn moderately developed, T1 and T2 with strongly impressed longitudinal striae; striae on T2 extending to 0.8 of its dorsum; T3 smooth and with fine setigerous puncture; lateral T3, and whole of T4-T6 with fine pilosity; T3 longest of all tergites, T2 and T3 nearly 1.3x as wide as long; ratio of length of tergites from T1 to T7 being T1 : T2 : T3 : T4 : T5 : T6 : T7 = 25 : 36 : 39 : 15 : 10 : 7 : 11 : 10 : 15 : 33.

Male : Unknown.

Etymology : The species is named so since this is the fist species to be described under the genus after its revalidation and removal from synonymy under *Opisthacantha*.

Material examined : Holotype. Female. ZSI/WGRS/PF25. India : Kerala : Malappuram: Nilambur : Kavalamukkatta, Coll : Rajmohana on 3.ix.2008, in malaise trap.

Paratypes 9. Three females with same data as that of the holotype (ZSI/WGRS/PF49-51), three

on 16.ix.2008 (ZSI/WGRS/PF52-54), two on 28.viii.2008 (ZSI/WGRS/PF55-56). and one on 30.ix.2008 (ZSI/WGRS/PF57). with rest of the data as that of the holotype.

Remarks : The smooth and bare median frons, robust and large metascutellar spine on *E. alpha* serve to distinguish it from *E. maxillosa* Risbec having a highly sculptured and densely pilose frons and also a small metascutellar spine.

20. ***Elgonia chitrae*** sp. nov.
(Figs. 108-115)

Description : Holotype Female. Length : 2.9 mm. head and body black; antennal radicle, scape and pedicel segments golden brown, basal funicular segments light brown, distal ones darker; clava blackish brown; legs including all coxae yellowish brown; eyes and ocelli silvery; wings with mild infuscations, veins deep brown.

Head : (L : W = 40.5 : 74.5); vertex, frons dorsally in front of median ocellus, medially towards central keel and also laterally towards inner orbital margins richly pilose; pilosity on frons rising above level of median ocellus; eye height a little less than minimum distance between inner orbital margins in front of median ocellus (36 : 38); radiating striae extending nearly to mid margin of eyes; median frons smooth and shiny; central keel reaching midlevel height of orbital margin; flanked on its distal tip by short stretches of 3-4 carinae; frons anterior to median ocellus, upto midlevel eye height, with fine coriaceous sculpture as on vertex, extending laterally on either side towards inner orbital margins; malar sulcus with uniform width throughout; lateral ocellus separated from inner orbit by its own diameter; OOL : OD : POL : OOL = 2.5 : 2.5 : 28.6 : 13.5; eyes large, occupying nearly whole of dorsolateral head, almost bare; temples in dorsal view much reduced; occipital carina crenulate; ocelli large; ocellar triangle and occiput with same rugose sculpture as on vertex; antenna 12 segmented, clava abrupt, six-segmented female, segmentation distinct; F1 longest of funicular segments,1.7x pedicel and 1.9x F2 and > 2xF3; clava robust and abrupt; 41 : 8; 11.6 : 5; 19 : 4; 10 : 5; 8 : 6; 6 : 7; 7 : 12; 7 : 12; 7 : 12; 7 : 12; 7 : 11; 11 : 9; clava : scape length = 49 : 41.

Mesosoma : (L : W = 66 : 70); prothorax without any angular corners, cervix non foveolate medially; mesoscutum with finer sculpture than that of vertex; skaphion well developed, glabrous, smooth, shining; notauli distinct, narrow, diverging distally, extending to 0.8 of mesoscutum; non foveolate; humeral sulcus foveolate; scutoscutellar sulcus wider laterally than medially, crenulate; mesoscutellum with same sculpture as that of mesoscutum, without any smooth area, with fine dense pilosity as that of mesoscutum; posterior margin a little emarginate, bordered by large foveolae; metascutellum narrow medially emarginate with a row large foveolae, on either side of a long narrow, thin and dorsoventrally flattened pointed spine, smooth dorsally; small dents seen laterally on either sides of spine; propodeum emarginate medially to accommodate metasomal spine; lateral propodeal triangle finely rugulose and setose, lateral corners not pointed; forewing with *pmv* and *stgv* elongate, *mv* short; basal vein nebulous, *smv* thickened on a short stretch before marginal; *stgv* knob slightly to distinctly enlarged; basal vein nebulous; forewing narrow (L : W = 57 : 20); *mv* : *stgv* : *pmv* = 5 : 16 : 38; V-shaped, upper portion forming distinct acute angle with *smv*.

Metasoma (L : W = 206 : 50); T1 with anterior horn well developed, extending to lower margin of metascutellum, T1 and T2 with strongly impressed longitudinal striae; striae on posterodorsal T1 straight medially and inclined laterally; striae on T2 extending to more than 0.8 of its dorsum; T3 smooth and with fine setigerous puncture; lateral T3 and whole of T4-T6 with fine pilosity; T2 largest of tergites, 1.15x length of T3; T3 not as long as T1; T7 elongate, mat sculpture; proportions of length of T1 : T2 : T3 : T4 : T5 : T6 : T7 = 41.5 : 45.5 : 39 : 22 : 17 : 17 : 28.

Material examined : Holotype : Female ZSI/ WGRS/PF26. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap.

Etymology : The species is named '*chitrae*', after Mrs. Chitra Ganesh Kumar, in honour of the support extended to this study, by facilitating the study site at Nilambur, (Malappuram).

Remarks : *E. chitrae* sp. nov. differs from *E. alpha* sp. nov. in many aspects like proportion of metasomal segments, nature and sculpture of metasomal horn, nature of metascutellar spine, proportion of antennal segments, pilosity on frons, extent of notauli, pilosity of eyes. In particular being those mentioned in the key to species provided here.

Key to Indian species of *Elgonia* Risbec

(Based on females)

1. Central keel reaching half way to median ocellus (Fig. 110); eyes bare (Fig. 112); metascutellar spine dorsoventrally flattened, longitudinally and smooth dorsally (Fig.111); T1 longer than T3 (Fig. 109) .... ***Elgonia chitrae*** sp. nov.

— Central keel complete (Fig. 105) reaching to median ocellus; eyes with dense pubescence; metascutellar spine not dorsoventrally flattened; striated dorsally (Fig. 101); T3 longer than T1 (Fig. 103) .....***Elgonia alpha*** sp. nov.

10. Genus ***Fusicornia*** Risbec, 1950

1950. ***Fusicornia*** Risbec : 606. *Type* : *Fusicornia bambeyi* Risbec, by monotypy.

Diagnosis : Body usually black; robust (1-3.5 mm); frons without a median depression; cheeks and malar region without radiating carina; eyes very large (Fig. 116) leaving temples much narrow when viewed dorsally, glabrous; mandibles bidentate; in male and female antenna 12 segmented, clava fusiform, not distinctly demarcated in females; male antenna cylindrical with small hairs; lateral ocelli very much close to inner orbits; occipital carina well developed; mesoscutum extremely convex in lateral view; skaphion and netrion absent; metascutellum armed with 3 spines, median spine prominent than lateral ones; dorsal surface of propodeum excavate deeply, densely setose; keels of propodeum well-developed; *mv* and *pmv* in forewings elongated; hind wings with *smv* complete; metasoma fusiform; T1 and T2 with deep longitudinal striae; in female with 7 and in males with 8 visible tergites; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, more than 0.9x length of metasoma.

Host : Unknown.

Status and Distribution in India : Number of species known from India : 2 (Rajmohana (2006b). Tamil Nadu, Uttarakhand, Madhya Pradesh, Uttar Pradesh.

Remarks : *Fusicornia* Risbec has resemblance to *Trimorus* Förster (Teleasinae), but differs in having a long postmarginal and also by the absence of radiating striae on either side of mandibles. The tridentate metascutellum differentiates this genus from other Scelioninae.

Females are caught more in number than males. Of the 2 species from India, *Fusicornia tehrii* Mukerjee is distributed widely than *F. indica* Mani.

The genus is reported from Kerala for the first time. The group is seen in moderate numbers in paddy agroecosystems. They are more common in rice fields than in natural habitats.

21. ***Fusicornia indica*** Mani and Sharma, 1980

(Figs. 116-117)

1980. *Fusicornia indica* Mani & Sharma : 47. Holotype Female, India (Northern Regional Centre, ZSI Dehradun).

Diagnosis : Length : Female-2.19 to 2.58 mm. Male-2.25 to 2.47. Body black; antennal radicle yellow to orange brown; basal funicular segments yellowish brown, distally darker, in females clava brown to black; all coxae brown to black; forewing hyaline or with slight infuscation below *mv*; frons entirely and evenly sculptured; central frons punctate and moderately setose throughout (Fig.

117); OOL less than or equal one ocellar diameter; mesoscutum reticulate with superimposed punctures; humeral sulcus foveolate; notauli: absent; mesoscutellum almost entirely covered by microsculpture; medial metascutellar spine very elongate, distinctly longer than distance between median and lateral spines; lateral spines moderately elongate (Fig. 116), length distinctly greater than width; mesopleural carina complete; mesepimeral sulcus abbreviated; T1, T2 with deep longitudinal striae, basal rows of crenulae present only on T1 and T2, continuous with striae; T1 less than or equal to its width; medial sculpture on; horn on T1 of female well developed sculpture on horn weak or absent; T3 smooth and shiny.

Distribution in India : Madhya Pradesh (Khajuraho : Habra, Pandva Falls).

Material examined : 1 Female. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008 in malaise trap.

Remarks : Densely granulose frons and a long median spine characterise this species. *F. indica* is reported for the first time from Kerala.

22. ***Fusicornia tehrii*** Mukerjee, 1993
(Figs. 118-119)

1993. *Fusicornia tehrii* Mukerjee : 75. Original description. Holotype Female, India (Northern Regional Centre, ZSI, Dehradun).

1998. *Fusicornia noonae* Buhl, synonymised by Taekul *et al.,* (2008).

Diagnosis : Length : Female-1.55 to 1.87 mm; Male-1.38 to 1.56; body black; antennal radicle yellow to orange brown; in females, scape yellow to orange-brown, funicular segments dark brown; clava color dark brown to black; all coxae yellow; fore wing hyaline or with slight infuscation below *mv*; OOL less than or equal one ocellar diameter; sculpture of central frons partly smooth or shallowly impressed reticulate microsculpture, considerably effaced; glabrous; mesoscutum reticulate; notauli : absent; mesoscutellum almost entirely smooth; medial metascutellar spine short to moderately long, distinctly shorter than distance between medial and lateral spines; lateral metascutellar spine short, only slightly longer than wide; mesopleural carina : present dorsally, interrupted or absent ventrally; mesepimeral sulcus complete or briefly interrupted, foveolate above, appearing as fold ventrally; T1, T2 with deep longitudinal striae, basal rows of crenulae present only on T1 and T2, continuous with striae.

Distribution in India : Uttarakhand (Tehri : Narendra Nagar).

Material examined : *6* females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008 (one), 2.1.2009 (two), 9.i.2009 (two) and 16.i.2009 in malaise trap and another from India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Holotype-*Fusicornia tehrii* Mukerjee, Reg. no : A 8936 NRS/ZSI. Type Depository : Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : The species is reported for the first time from Kerala.

Key to Indian species of *Fusicornia* Risbec

1. Frons entirely sculptured (Fig. 117); all coxae brownish black; metascutellum with a strong median (Fig. 116) and two well developed lateral spines ..... ***F. indica*** Mani & Sharma

— Frons medially smooth glabrous (Fig. 119), sculpture much effaced; all coxae yellowish brown (Fig. 118); metascutellum with a small median spine, as long as wide, lateral spines small, not as long as wide ..... ***F. tehrii*** Mukerjee

11. Genus ***Gryon*** Haliday, 1833

1833. *Gryon* Haliday, : 271. Original description. *Type* : *Gryon misellum* Haliday, by monotypy.

1856. *Acolus* Förster, : 100, 102. *Type species* : *Acolus opacus* Thomson, designated by Ashmead (1903). Synonymized by Masner (1961).

1856. *Hadronotus* Förster, : 101, 105. *Type* : *Hadronotus exsculptus* Förster. Synonymized by Nixon (1936).

1863. *Muscidea* Motschoulsky, : 70. *Type* : *Muscidea pubescens* Motschoulsky. Synonymized by Masner (1976).

1908. *Plastogryon* Kieffer, : 119, 141. *Type* : *Plastogryon foersteri* Kieffer, designated by Brues (1908).

1908. *Psilacolus* Kieffer, : 179, 180. *Type species* : *Acolus xanthogaster* Ashmead, designated by Kieffer (1926).

1912. *Holacolus* Kieffer, : 89, 106. *Acolus opacus* Thomson, designated by Muesebeck & Walkley (1956).

1913. *Notilena* Brèthes, : 84. *Type* : *Notilena Gallardoi* Brèthes.

1913. *Telenomoides* Dodd, : 158, 168. *Type* : *Telenomoides flavipes* Dodd.

1913. *Platyteleia* Dodd, : 131, 153. *Type* : *Platyteleia latipennis* Dodd.

1913. *Hadronotoides* Dodd, : 171. *Type* : *Hadronotus pentatomus* Dodd. Synonymized by Caleca (1990).

1914. *Austroscelio* Dodd, : 93. *Type* : *Sparasion nigricoxa* Dodd. Synonymized by Galloway, in Galloway & Austin (1984).

1917. *Hadronotellus* Kieffer, : 341. *Type* : *Hadronotellus pedester* Kieffer. Synonymized by Kieffer (1926)

1926. *Hadrophanurus* Kieffer, : 15, 130. *Type* : *Telenomus pennsylvanicus* Ashmead. Synonymized by Masner (1961).

1926. *Heterogryon* Kieffer, : 271, 446, 448. *Type* : *Plastogryon sagax* Kieffer, designated by Muesebeck Walkley & (1956). Synonymized by Masner (1961).

1927. *Synteleia* Fouts, : 178. *Type* : *Synteleia coracina* Fouts. Synonymized by Masner, in Krombein & Burks (1967).

1966. *Masneria* Szabó, : 422, 442. *Type* : *Hadronotus lymantriae* Masner. Synonymized by Masner (1976).

1966. *Pannongryon* Szabó, : 422, 435. *Type : Pannongryon szelenyii* Szabó. Synonymized by Kozlov (1971) and Masner (1976).

1966. *Sundholmia* Szabó, : 422, 438. *Type* : *Sundholmia nitens* Szabó, Synonymized by Mineo (1980).

Diagnosis : Body compact, robust and plump (1-1.5 mm); often with rich sculpture; head and body mostly black; fully or partially xanthic forms also met with; frontal depression not distinct; if with feeble depression, then not margined by carina; gena and lower frons without any radiating striae; eyes large, mostly with fine pubescence; mandibles bidentate; antenna with 12 segments in both females and males, in females with a non abrupt 5 segmented clava; male antenna filiform; mesosoma convex in lateral view; skaphion never developed; metascutellum and propodeum unarmed; netrion well developed; forewings with a short *mv*, elongate *stgv* and *pmv*; hindwings with *smv* complete; metasoma short and stout, never elongate; T1 never with a dorsal horn; T2 or T3 largest among tergites; T7 internal, not extruded with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, about 0.7-0.9x length of metasoma.

Hosts : Eggs of bugs under Coreidae, Pentatomidae, Scutelleridae, Lygaeidae, Reduviidae, Phymatidae (Hemiptera) and Mantidae (Galloway and Austin, 1984).

Status and Distribution in India : Number of species known from India : 12 (Rajmohana, 2011). Kerala, Karnataka, Tamil Nadu, Maharashtra, New Delhi, Uttar Pradesh.

Remarks : Among the platygastrid genera collected from rice ecosystem, *Gryon* has a slight superficial resemblance in general appearance to *Trissolcus* Ashmead (subfamily Telenominae). By the presence of 12 antennal segments in females, absence of wide laterotergites, with either T2 or T3 being the largest among tergites, by the presence of a submarginal groove/ridge on lateral metasoma and in general body size being large, *Gryon* can be differentiated from *Trissolcus*, the latter having only 11 antennal segments, metasoma with wide laterotergites, submarginal groove absent and with T2 always as the largest tergite (usually more than 2x length of T1).

It is rather interesting to note that that both *Gryon* and *Trissolcus* share many of their hosts (Heteropteran Bugs) in common.

The group is collected in good numbers from both rice ecosystems as well as from natural ecosystems with females collected more in number than males.

23. ***Gryon fulviventre*** (Crawford, 1912) (Fig. 120)

1912. *Hadronotus fulviventris* Crawford, : 2. Original description. Synomymized by Masner 1961. *Lectotype* : *Hadronotus antestiae* Dodd, designation by Masner, 1965.

1920. *Hadronotus antestiae* Dodd, : 351. Synonymized by Mineo (1979).

1978. *Gryon terraesanctae* Mineo & Szabó, : 116. Synonymized by Mineo (1979).

1978. *Gryon tico* Mineo & Szabó, : 96. Synonymized by Mineo (1990).

Diagnosis : Female. Length = 0.98-1.1 mm. Head and mesosoma black; metasoma bright yellow, except its basal and apical 3 tergites brownish black; radicle and basal scape yellowish brown; rest of antenna including clava reddish brown to black; coxae brownish yellow; frontal depression weak, not striate transversely; wings hyaline; eyes with dense pubescence; OOL : OD-2 : 1; pedicel longer than F1; F1 < 2x length of F2; clava 6 segmented; occipital carina incomplete; mandibles tridentate; mesoscutum with reticulate coriaceous sculpture, with longitudinal elements towards its posterior near scutoscutellar sulcus; mesoscutellum also with longitudinal elements; metascutellum with row of prominent foveolae; propodeum also foveolate, ventrally areolate rugose; medially not continuous; all tergites transverse; T1 smooth except for longitudinal striae extending throughout, < length of T2, but > T3; T2 longest of all tergites, nearly 1.5x length of T1; T2 and T3 basally and apically with a smooth band, followed by a transverse row of traces of impressed costae, rest of T2 coriaceous; T3 similar to that of T2 but without impressed costae; *pmv* 2x as long as *stgv* or *mv*.

Material examined : 12 females. Six from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008, one on 30.ix.2008 in malaise trap and one on 22.viii.2008 in sweep net. One from India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in sweep net. Three from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 2.i.2009 and 9.i.2009 in malaise trap.

Distribution in India : Karnataka (Hogenakal, Mysore, Bangalore), Uttar Pradesh (Golagokaranath), Tamilnadu (Thanjavur), Kerala (Malappuram, Idukki : Achankovil : Cardamom hills).

Remarks : A common species in the rice agroecosystem.

12. Genus ***Idris*** Förster, 1856

1856. *Idris* Förster, : 102, 105. Original description. *Type* : *Idris flavicornis* Förster, by monotypy.

1890. *Acoloides* Howard, : 269. *Type species* : *Acoloides saitidis* Howard. Synonymized by Masner (1961).

1910. *Pseudobaeus* Perkins, : 620. *Type species* : *Pseudobaeus peregrinus* Perkins, by monotypy. Keyed. Synonymized by Huggert (1979).

1926. *Dissacolus* Kieffer, : 132, 154. *Type* : *Acolus bidentatus* Dodd. Synonymized by Austin (1981).

1951. *Megacolus* Priesner, : 121. Original description. *Type* : *Megacolus desertorum* Priesner, by monotypy .and original designation. Preoccupied by *Megacolus* Cameron (1903) (Hymenoptera). Synonymized by Masner (1961).

1956. *Philoplanes* : Muesebeck & Walkley, : 384. *Type* : *Megacolus desertorum* Priesner, by substitution of Philoplanes for *Megacolus* Priesner. Replacement name. Synonymized by Masner (1961).

1967. *Tasmanacolus* Hickman, : 30. Original description. *Type* : *Tasmanacolus helpidis* Hickman, by monotypy and original designation. Synonymized by Masner (1976).

1967. *Tasmanibaeus* Hickman, : 27. Original description. *Type* : *Tasmanibaeus niger* Hickman, by monotypy and original designation. Synonymized by Masner (1976).

Diagnosis : Minute to moderate forms (1-2 mm); head and body black to brownish yellow; head non-elongate in buccal region in front view; frons without a depression; eyes often with fine pubescence; a few carinae radiating from mandibular corner towards orbital margin; median frons smooth; antenna 7 segmented in females, clava large, abrupt and without a distinct segmentation; in males antenna 12 segmented, 11th and 12th antennal segment well separated; eyes with or without a fine pubescence; skaphion absent; metanotum, scutellum and propodeum simple, unarmed and entire, not excavated medially; forewings with *mv* and *stgv* well developed; basal vein and *pmv* indicated rarely; hindwings with *smv* complete; metasoma short to

elongate; first metasomal tergite (T1) in females never produced into a horn or a hump; T2 or T3 largest of tergites; T7 in females external, not extruded out with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor not much elongate, 0.55-0.75x metasomal length.

Hosts : Eggs of araneid spiders.

Status and Distribution in India : Number of species known from India : 17 (Rajmohana, 2011). Kerala, Tamil Nadu, Karnataka, Maharashtra, Uttar Pradesh, Himachal Pradesh Uttarakhand, Delhi, Bihar.

Remarks : *Idris* is distinct from *Ceratobaeus* by the absence of a metasomal horn on first metasomal tergite. Further in *Ceratobaeus* the propodeum, metanotum and in some cases scutellum too are medially excavate to accommodate the metasomal horn. Such an excavation is absent in *Idris*.

The latter was synonymised earlier under *Idris* (Masner & Denis 1996) but has now been separated from synonymy (Iqbal & Austin 2000).

The group is seen abundantly in paddy fields and also in natural habitats. They are found in more numbers than the members of *Ceratobaeus*.

24. ***Idris keethami*** Mukerjee, 1981
(Figs. 121-125)

1981. *Idris keethami* Mukerjee, : 39, 46. Holotype Female, India.

Diagnosis : Length : 0.9 mm. Head and body dark brown, metasoma yellowish brown to brown, T1 pale, brownish yellow; antenna entirely yellowish brown; frons densely hairy anterior to median ocellus; coarsely granulate; central keel distinct upto midlevel height of eyes; eyes with dense pubescence; hyperoccipital carina distinct; lateral ocelli much close to orbital margin; antenna with pedicel large and bulged; F1 longest of funicular segments; clava enlarged; mesoscutum reticulate-rugose, notauli though at times obscured present on posterior one-third of mesoscutum ; metascutellum plan and simple, unsculptured; propodeum longitudinally striate, with a pair of pointed denticles at its lower margin; forewing with an elongated *stgv*, nearly 3x length of *mv*; *pmv* short and abbreviated; T1 and T2 with longitudinal striae; T3 with coarse reticulations; rest of tergites appearing smooth but with very fine reticulations.

Male : Unknown.

Distribution in India : India : Uttar Pradesh (Agra : Keetham).

Material examined : 5 females. One from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008, in malaise trap. Two from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009 (one) and 16.1.2009 (one), in malaise trap. One from. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in malaise trap in sweep net.

Remarks : A commonly encountered species in paddy ecosystem. The combination of characters viz., short abbreviate notauli present on the posterior one third of mesoscutum, yellowish brown to brown metasoma, granulate frons, longitudinally striated T1 and T2, and a reticulate T3 serve to distinguish this species.

The species is reported for the first time from Kerala.

25. ***Idris nuperus*** sp. nov.
(Figs. 126-133)

Description : Holotype Female. Length : 0.99 mm.Head and body brownish black; T1and pleura brown with a yellowish tinge; antennal radicle, scape and mandibles whitish yellow; pedicel except at its distal one-third and F1 at its basal three-fourth yellowish brown; F3-F4 and clava brown; eyes and ocelli silvery; legs including coxae pale whitish yellow; wings hyaline; veins brown.

Head : (L : W = 13 : 43, in dorsal view); hyperoccipital carina distinct; frons, vertex and occiput with uniform coarse granulate sculpture;

vertex densely hairy than frons; speculum confined to a small area on median frons; traces of central keel distinct anterior to antennal shelf, but gradually disappearing by mid level of eye height; eyes with dense fine pubescence; minimum distance between orbits measured anterior to mid ocellus ; subequal to eye height; lateral ocelli very close to orbital margin (Fig. 130); POL/LOL = 44/24; gena with densely pubescent; malar sulcus wider towards orbits; post gena with same sculpture as that on vertex; radicle short; scape 6x length of radicle, subequal to length of clava; comparative length to width proportions of antennal segments from scape to clava being; 18.5 : 3.7; 8.1 : 3.7; 4.3 : 3.2; 2.7 : 3; 2.7 : 4.1; 2.7 : 4.2; 18.8 : 9.

Mesosoma : (L : W = 39.2 : 38.3); not as wide as head dorsally; mesoscutum: mesoscutellum = 21 : 14.1; pronotal cervix not foveolate; mesoscutum scaly reticulate, with leathery matt sculpture, densely pubescence; notauli present, abbreviated towards posterior margin of mesoscutum, much obscured by surrounding sculpture; scutoscutellar sulcus medially wider than notauli, crenulate, widest laterally (Fig. 131); setae towards posterior margin long; metascutellum simple and plain; without any sculpture medially; postero-lateral tubercles on propodeum distinct, pointed; lateral propodeum hairy; pleurae without dense setation; netrion distinct; smooth; with foveolate margin at its anterior; rest of pronotum with coarse granulations; mesopleural carina absent; acetabular area finely coriaceous; meso and metapleuron towards coxae with coriaceous sculpture; also with fine not so prominent rugulae; forewing (L : W = 75 : 28); *stgv* elongated > 3x length of *mv* (28 : 90); *pmv* reduced or absent.

Metasoma : (L : W = 43 : 38); all tergites transverse; with dense fine pilosity laterally on tergites; and at posterior margin of T3; T1 and T2 with longitudinal striae, extending throughout; T3 with an anterior plain narrow band; T3 onwards reticulate matt; medially T3 more than 2x length of T2 and nearly 4x length of T1; T1 : T2 : T3 = 6 : 9.2 : 23.8).

Male : Similar to female, except antenna as in fig; segmentation between A11 and A12 not clear, 2x length of F1, > pedicel.

Material examined : Holotype. Female. (ZSI/WGRS/PF27). India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in malaise trap.

Paratypes : 11 females with data same as holotype (ZSI/WGRS/PF58-68); 3 females (ZSI/WGRS/PF69-71) and 1 male (ZSI/WGRS/PF72) with data same as holotype except date being 2.1.2009 and one female (ZSI/WGRS/PF73), India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 26.xii.2008, in malaise trap.

Etymology : The species is named 'nuperus' meaning new in Sanskrit.

Remarks : This species keys to couplet 6, to *I. keethami* Mukerjee, but differs from it in colour, size and general body sculpture.

A brownish black robust body, frons, vertex and occiput with uniform coarse granulate sculpture; finely pubescent eyes; F1 a little less than 0.5x length of pedicel; abbreviate notauli, mesoscutum with a scaly reticulate and leathery matt sculpture, forewing with an elongate *stgv* and reduced *pmv*; entirely and longitudinally striated T1 and T2; reticulate T3-T6, serve to characterise the species.

The species is much common in paddy ecosystems.

Key to species of *Idris* Förster of India

(Based on females)

1. Eyes bare 2
— Eyes pubescent 3
2. T1 entirely and T2 partially striated (only in front or at its basal half) ....***I. chotanagpurensis*** (Mani and Mukerjee)
— T1 and T2 entirely striated 4
3. *pmv* equal to marginal or shorter or absent.. 8
— *pnv* longer than marginal 6
4. Forewing banded ... ***I. mysorensis*** Mukerjee
— Forewing not banded 5

5. Forewing with *pmv* less than 1.5x length of marginal ..... ***I. agraensis*** Mukerjee

— Forewing with *pmv* 2x length of marginal .... ***I. khandalus*** Mukerjee

6. Forewings with an obscure inflammation at tip of *stgv*; head finely shagreened .... ***I. stigmaticus*** (Mani & Mukerjee)

— Forewings with *stgv* normal and not swollen; head not as above 7

7. Lateral ocelli contiguous with eyes; body dark brown; 4.1x as long as thick .... ***I. sayadreus*** (Mani & Mukerjee)

— Lateral ocelli separated from eyes by their own diameter; scape 6x as long as thick; body yellowish brown ..... ***I. hunnaheus*** (Mani)

8. Forewing spotted 9

— Forewing unspotted 11

9. Forewing with *stgv* slightly longer than *mv*; wings slightly clouded behind *stgv* 14

— Forewing with *stgv* nearly 4 x length of *mv* 10

10. Head with fine microsculpture; wing with transverse band; body brown to blackish brown .... ***I. malabaricus*** (Mani & Mukerjee)

— Head finely reticulate; wings generally infumated; body brown .... ***I. obfuscatus*** (Mani & Mukerjee)

11. T1 entirely and T2 only in front or basal half striate 12

— T1 and T2 or T1, T2 and T3 entirely striate... 13

12. Head and mesosoma smooth; forewing with *stgv* 3x length of *mv* .... ***I. brevifunicularis*** (Mani & Mukerjee)

— Head and mesosoma finely reticulate; forewing with *stgv* 3x length of *mv* .... ***I. munnarensis*** Mukerjee

13. Only T1 and T2 entirely striate 15

— T1, T2 entirely and and T3 atleast on its entire median striate ..... ***I. dubarensis*** Mukerjee

14. Metasoma whitish, except for dark brown T4 and brown T5-T6 .... ***I. appangalus*** Mukerjee

— Metasoma brown and not with above colour combination ..... ***I. lakshmani*** (Mani)

15. Body brownish black or reddish black (Fig. 126) 16

— Metasoma yellowish brown wholly or atleast basally (Fig. 124) 18

16. Vertex smooth, frons and gena finely striate; mesosoma smooth; reddish brown body .... ***I. dunensis*** (Mani

— Head and mesosoma finely rugose; brownish black to black body 17

17. Notauli absent 21

— Notauli present, though abbreviate at posterior mesoscutum (Fig.131) ... ***I. nuperus*** sp. nov.

18. Notauli indicated atleast posteriorly (Fig.125).. ..... ***I. keethami*** Mukerjee

— Notauli not indicated 19

19. Tergite 2 and 3 subequal .... ***I. triangularis*** Mukerjee

— Tergite 3 longer than T2 20

20. Gena longitudinally striate; *pmv* shorter than *mv*; head with leathery sculpture .... ***I. annexia*** Mukerjee

— Gena longitudinally striate; *pmv* subequal to *mv*; head finely closely reticulate matt .... ***I. sanctijohani*** Mukerjee

21. T3 3x length of T2 .... ***I. kuruanus*** (Mani & Mukerjee)

— T3 less than 3x length of T .... 2***I. annexia*** Mukerjee

13. Genus ***Leptoteleia*** Kieffer, 1908

1908. *Leptoteleia* Kieffer, : 120, 163. Original description. *Type* : *Baryconus oecanthi* Riley, by monotypy (Muesebeck & Walkley 1956).

1931. *Thelepte* Nixon, : 379. *Type* : *Thelepte serapis* Nixon. Synonymized by Masner (1976).

Diagnosis : Slender, elongate, robust species (2 mm) with cylindrical body; eyes pubescent or

glabrous; head nearly cubical; mandibles tridentate; clypeus narrow; frontal depression present, mostly with well developed transverse sculpture; antenna 12 segmented in both sexes, in females with a 5 segmented clava, rarely clava 6 segmented; basal flagellar segments elongate; skaphion absent; notauli present or absent; if present, at times, abbreviated and anteriorly placed; mesoscutum laterally with parapsidal carinae; metascutellum medially expanded to a median lamina of varied shapes, at times bilobate due to median excision; at times overlapping metasomal horn; dorsal propodeal carinae never developed into spines, medially excavate to receive metasomal horn; mv in forewing distinctly longer than stgv; pmv also long, longer than marginal, basal vein not indicated; metasoma spindle shaped, widest at anterior one-third or at middle; in females T1 usually with a hump or horn anterodorsally; T7 in females external, but not exserted with ovipositor.

Host : Unknown.

Status and Distribution in India : Number of species Known from India : 2 Kerala, Tamil Nadu, West Bengal.

Remarks : Long mv and pmv (distinctly longer than stgv), T1 often with tubercle and an expanded metascutellar plate serve to distinguish this genus from other Platygastrid genera.

26. ***Leptoteleia rustica*** sp. nov.

(Figs. 134-138)

Description : Holotype Female. Length : 2.3 mm. Head black; dorsal and lateral mesosoma yellowish brown; metasoma reddish brown, apical metasoma (T5 and T6) and basal end darker; antennal radicle and flagellar segments yellowish brown, clava brownish black legs including coxae concolorous with mesosoma; eyes and ocelli shining black; mandibles reddish brown; wings hyaline; veins deep brown.

Head : (L : W = 30 : 40); transverse dorsally, with coarse-leathery sculpture entirely except on median frons lower to mid level of eyes; dorsally transverse; pubescence on frons dense and scattered; denser on vertex and occiput; frons with a weak depression medially, traversed closely placed horizontal elements; hardly with any smooth area medially, central keel not visible, eyes densely pubescent; cheeks and gena with radiating striae, striae not extending to lateral frons, much restricted to a small area near to mandibular corners; clypeus narrow, lower margin concave with pointed lateral ends; minimal distance between inner orbits less than eye length (2 : 3); malar sulcus distinct and of uniform width throughout; mandibles not elongate, tridentate, teeth almost equal; lower gena wide, with same sculpture as of vertex, pubescence sparse; ocelli situated medially on vertex; lateral ocelli nearly contiguous to inner orbits,: OD : POL : OOL = 2.5 : 8 : 6; occipital carina complete and crenulate; temples without lateral bulge in dorsal view; antenna 12 segmented, with a distinct 5 abrupt segmented clava; radicle short, nearly x length of scape; scape as long as length of following 3 segments combined; pedicel and F1 elongate; slightly shorter to pedicel, longer than rest of flagellar segments, 2.5x as long as wide; F3-F5 subglobose, subequal; relative proportions of antennal segments from scape to clava being (length : width) being (31 : 7), (13 : 5.5), (10 : 5), 7 : 6), (6 : 5), (5 : 5), (4 : 5); 3(6 : 11); clava : scape length = 36 : 31.

Mesosoma : (L : W = 55 : 38) not as wide as head dorsally; pronotum without any sharp lateral corners; smoothly curved; skaphion absent; mesoscutum with same leathery sculpture as that on vertex; pubescence sparser than on head; notauli narrow, non foveolate, incomplete, extending to 0.6x of length of mesoscutum; parapsidal furrows on lateral mesoscutum distinct; humeral sulcus non-foveolate; scutoscutellar sulcus extremely narrow medially and much wider and costate laterally; mesoscutellum with same sculpture as that of mesoscutum, without any smooth area medially; all edges of mesoscutellum margined by foveolae; metascutellum finely striate

longitudinally; metascutellar lamina roughly semicircular; transparent, medially a lot wider than at sides; plate with irregular longitudinal elements; overlapping propodeum medially; propodeum medially excavate; lateral triangular area with fine longitudinal striae; pubescence on lateral propodeum scanty; anterior margin of pronotum between fore coxa and cervix without foveae, with rugose leathery sculpture; netrion prominent, non foveolate, with faint traces of longitudinal striae; mesopleural scrobe deep; mesopleural carina absent; pleurae with much sparse pubescence; with generalised rugose-leathery sculpture; a row of prominent fovea bordering mesepimeral sulcus separating mesepisternum with mesepimeron; metapleuron sculptured as of mesopleuron; metapleural carina indicated; forewing (L : W = 15.4 : 4.5); *pmv* about 3x length of *stgv*; *mv* elongate, 1.3x length of *stgv* (*mv : stgv : pmv* = 20 : 15 : 45).

Metasoma (L : W = 105 : 34); subequal to width of mesosoma; uniformly setose; T1 dorsally with a median raised area, scaly reticulate throughout; T2 with extremely short stems of longitudinal striae at its base; rest of T2 and T3 onwards richly longitudinally rugose throughout; length of T1 : T2 : T3 = 15 : 18 : 19; T2 and T3 subequal.

Material examined : Holotype. Female. ZSI/ WGRS/PF28. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in sweep net.

Male : Unknown.

Etymology : The species name refers to the rusty colour of the habitus of the species.

Remarks : Though this species is similar to *L. peninsularis* Saraswat (1982) in having an abbreviate notauli and a short metascutellar plate, the two species differ outright in general body colouration, *L. peninsularis* is melanic, while *L. rustica* is xanthic. The former being a male, comparisons are not made for antennal characters and other sexually dimorphic features. The proportions of veins in forewings differ between the species, as mentioned in the key below.

Key to species of *Leptoteleia* Kieffer of India

1. Body melanic; *mv* of forewing 1.7x length of *stgv*, *pmv* less than 2x length of *mv* .... ***L. peninsularis*** Saraswat

— Body xanthic (Fig. 134); *mv* of forewing only 1.3x length of *stgv*, *pmv* 2.25x length of *mv* (Fig. 137) ..... ***L. rustica*** sp. nov.

14. Genus ***Macroteleia*** Westwood, 1835

1835. *Macroteleia* Westwood, : 70. Original description. *Type* : *Macroteleia cleonymoides* Westwood, by monotypy.

1856. *Baeoneura* Förster, : 100, 102. *Type* : *Baeoneura floridana* Ashmead, designated by Muesebeck & Walkley (1956). Synonymized by Muesebeck & Walkley (1956).

1908. *Parapegus* Kieffer, : 149. *Type* : *Apegus (Parapegus) punctatus* Kieffer, designated by Kieffer (1910). Synonymized by Masner (1976).

1908. *Prosapegus* Kieffer, : 121, 147. *Type* : *Anteris elongata* Ashmead,. Synonymized by Masner (1964).

1926. *Stictoteleia* Kieffer, : 272, 546. *Type* : *Macroteleia virginiensis* Ashmead, by original designation. Synonymized by Masner (1964).

Diagnosis : Slender and elongate habitus (1-5.5 mm); head and body black to brownish black and xanthic; wings hyaline; head transverse dorsally; frons slightly depressed, but without a margined keel; mandibular corners without radiating striae; mandibles tridentate; lateral ocelli contiguous to orbits; antenna in both sexes 12 segmented; in females with an abrupt 6 segmented clava; male antenna filiform; skaphion absent; mesoscutum with notauli, often percurrent, mesoscutellum rectangular to semicircular, metascutellum at times with a median dent, or variably developed into a median longitudinal plate like structure, often dividing propodeum into lateral lobes, at times propodeum entire, unarmed; netrion distinct; forewing with *mv* elongate, longer than or atleast equal to *stgv*, but shorter than *pmv*; hindwings with *smv* complete; metasoma sessile long and tapering posteriorly; females with 6 visible and males with 7 visible tergites, never bidentate or bispinose terminally; T6 in females strongly

compressed from sides to form a wedge; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (Scelio-type system).

Host : Eggs of Long horned Grasshopper (Orthoptera : Tettigonidae).

Status and Distribution in India : Number of species known from India : 6 (Rajmohana, 2011). Kerala, Karnataka, Maharashtra West Bengal, Uttarakhand.

Remarks : They are one among the few large-sized Platygastrids and are easily distinguishable from rest of the genera in paddy fields. The slender elongate body, long tapering metasoma, *mv* of forewing longer or atleast subequal to *stgv* and the laterally compressed last metasomal tergite characterise the genus.

Both males and females are frequently collected from rice agroecosystems as well as from natural forested habitats.

27. ***Macroteleia indica*** Sharma, 1978
(Figs. 139-140)

1978. *Macroteleia indica* Saraswat & Sharma, 11. Holotype Female, India.

Diagnosis : Female. Length = 3.6-3.8 mm; head and body except base and tip of metasoma yellowish brown; T1 with a brownish black tinge; lower one-fourth of T5 and lower three-fourth of T6 brownish black; antennal scape and funicular segments brown, clava being black; ocelli black; head and body with rounded setigerous punctae; lateral ocelli close to orbits; eyes bare; with fine coriaceous microsculpture on ocellar zone, not extending towards occiput F1 longest of funicular segments, longer than pedicel and F3, > 2x F4; F4 and F5 subequal; mesoscutum with notauli complete and foveolate; metascutellar plate developed, metascutellum with a minute pointed dent medially; propodeum medially lamellate, semi-transparent irregularly rugulose, medially divided on its lower margin and overlapping anterior T1; forewing extending to tergite 5, marginal elongate, > 2x length of *stgv*, *pmv* nearly 1.5x length of *mv*; metasomal tergites longitudinally striate; T1 medially; T1 without a dorsal horn; T2 and T3 nearly subequal.

Male : The male of this species reported by Saraswat 1982, needs further confirmation.

Distribution in India : Kerala : Idukki (Moozhiyar), Palghat (Walayar); Karnataka (Maldare, Dubare), Uttarakhand : Dehradun (Rishikesh); West Bengal : Alipur Duar (Hasimara) (Rajmohana, 2011).

Material examined : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : The species is distinct due to its yellowish brown coloration base and apex of metasoma being brown to black.

The specimen at hand tallies with the original description of *M. indica*, except for its brownish black ocelli (as stated against ocellar area being yellowish brown in the original description).

28. ***Macroteleia lamba*** Saraswat, 1978
(Figs. 141-144)

1978. *Macroteleia lamba* Saraswat & Sharma, : 13. Holotype Female, India.

Diagnosis : Female. Length : 5-5.9 mm. Head, mesosoma and metasoma brownish black to black; scape, pedicel and F1-F4 brown; clava black; eyes and ocelli silvery; head and body with rounded setigerous punctae; with fine coriaceous microsculpture on posterior to lateral ocelli extending medially towards occiput; lateral ocelli close to orbits; eyes bare; antennal scrobe smooth, deep; F1 longest of funicular segments, subequal to slightly longer than pedicel; > length of F3 and > 2x length of F4; F4 a little < F5 subequal; mesoscutum with notauli complete and foveolate, wider near scutoscutellar sulcus; median plate of metascutellum dorsally with irregular longitudinal foveolae, dividing propodeum medially into right and left halves and reaching anterior T1; forewing extending to lower tip of tergite 5, *mv* elongate, < 2x length of *stgv*, *pmv* < 1.5x length of *mv*;

metasomal tergites 1-4 longitudinally striate; T1 medially; T1 without a dorsal horn; T2 and T3 nearly subequal (Fig. 141); T3 longer than T1.

Distribution in India : West Bengal (Raja Bhat Khawa : Hasimara); Kerala (Kasargod); Uttarakhand (Dehradun : Rishikesh) (Rajmohana, 2011).

Material examined : 3 females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap, 2 females with same data as above except date being 2.i. 2009, 2 females with same data but dates being 19.1.2009 and 26.xii.2008. 2 females India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Remarks : The specimens at hand have been tentatively placed under *M. lamba* based on the original description, since most of the characters like body colouration, measurements of antennal segments, nature of mesoscutum, nature as well as proportion of metasomal segments are tallying.

15. Genus ***Microthoron*** Masner, 1972

1972. *Microthoron* Masner, : 847. Original description. *Type* : *Microthoron baeoides* Masner, by monotypy and original designation.

Diagnosis : Head and body black, minute robust forms; head transverse, wider than mesosoma; eyes large, with dense pilosity; lateral ocelli nearly touching orbital margin; frontal depression absent; vertex with numerous erect setae; antenna in females 6 segmented; at times F1 elongate, longer than scape (Fig. 146); clava stout, laterally bulged; segmentation not distinct; skaphion distinct; notauli absent; mesoscutellum semicircular; metascutellum simple, unarmed medially; propodeum medially excavated; forewing with *smv*, *mv*, *stgv* and *pmv*; *mv* elongate, often longer than *stgv*, as long as *pmv*; marginal fringe well developed; metasoma short or gracile, usually longer than wide, at times 2x as long as wide; in females with 7 tergites, all tergites transverse; third tergite longest; T1 without a dorsal hump or horn.

Host : Unknown.

Status and Distribution in India : Number of species known from India : 2 (Rajmohana, 2011). Uttarakhand, West Bengal.

Remarks : Closely resembling *Idris* and related genera in nature of antenna, ocelli and shape of body in general shape of habitus, sculptural details and antennal features, but differing mainly in the presence of skaphion, lack of an impressed submarginal groove in metasoma and presence of postmarginal vein in forewing.

The genus is reported for the first time from Kerala.

29. ***Microthoron baeoides*** Masner, 1972

(Figs. 145-146)

1972. *Microthoron baeoides* Masner, : 847.

1978. *Acolomorpha indica* Mukerjee, : 47. Synonymized by Masner & Huggert (1979).

Female : Length = 0.6 mm. Head and body black and shining; wings slightly infuscate, veins brown; head dorsally transverse; eyes with fine pubescence; lateral ocelli contiguous with orbital margin; frons smooth and shiny, except for a few fan like striae from mandibular corners, near to malar sulcus, with sparse erect bristles; antenna with 6 segments; clava a little longer than scape; pedicel longer than any of flagellar segments; F1 longest among flagellar segments; > 3x length of F2; nearly 2x as long as wide, next two segments very small subequal in length; skaphion smooth and shiny; mesoscutum with scattered pilosity; forewing with *stgv* longer than *mv* and *pmv*; marginal shorter than both *stgv* and *pmv*; metasoma a little longer than wide; T1 transverse, T1 and T2 with longitudinal striae, striae extending to nearly three-fourth of T2; T3 longest of all tergites, smooth and shiny, transverse.

Male : Unknown.

Material examined : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : This species is reported for the first time from Kerala. The species is peculiar and unique due to the elongate F1.

30. ***Microthoron miricornis*** Masner and Huggert, 1979

(Figs 147-148)

1979. ***Microthoron miricornis*** Masner & Huggert, : 912. Holotype Female.

Female : Length : 0.8 mm. Head and body black; wings feeble infuscate, vein brown; head transverse dorsally; base of mandibles without fan-like striae; antenna with 6 segments, peculiar in having an elongate first flagellar segment; F1 longer than scape and also clava, wider than scape (Fig. 148), tapering distally, clava slender and spindle-like, longer than scape; radicle nearly one-third length of scape; skaphion smooth and shiny; mesoscutum with scattered pilosity; forewing with *stgv* longer than *mv* and *pmv*; *mv* shorter than both *stgv* and *pmv*; metasoma > 2x as long as wide; all tergites transverse; 2x as long as T1; T1 and T2 with longitudinal striae, striae extending to nearly three-fourth of T2; T3 smooth and shiny; longest of all tergites.

Male : Unknown.

Material examined : 2 females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008 and 19.xii.2008, in malaise trap.

Remarks : This species is reported for the first time from Kerala as well as from India.

16. Genus ***Neoceratobaeus*** gen. nov.

Type species : *Neoceratobaeus gibbus* sp. nov.

Diagnosis : Neoceratobaeus gen. nov. can be distinguished from all other genera of Platygastridae by the following combination of characters : body size of 1mm or less, reddish brown to black body, 7 segmented antenna with 4 funicular segments and a large unsegmented clava, granulate sculpture on head and mesosoma, propodeum with a pair of large, spine-like flanges flanking metasomal horn; forewing spoon shaped, with a constriction on its anterior half and broad distally, with a short marginal, elongate stigmal and postmarginal veins; first metasomal tergite with a laterally compressed horn (elliptical in cross-section), horn very large, backwardly directed and extending on one-fourth dorsum of T2; T1 (all tergites measured medially) longest of metasomal tergites.

Discussion : Though resembling closely to *Ceratobaeus* Ashmead, the following characters are considered significant in erecting a new genus to accommodate this species.

1. Metasomal horn on T1 large and laterally compressed, (elliptical in cross section) backward directed, extending over anterior one-fourth of dorsal T2.

   (In *Ceratobaeus*, the horn is not laterally compressed (Iqbal & Austin, 2000), (circular in cross section), vertical or directed forwards)
2. T1 is the largest tergite measured medially (In *Ceratobaeus* usually T3 or rarely T2 is the longest tergite).
3. Forewing is spoon shaped with its stem or base elongate and narrow; constricted at anterior half and broad in posterior half (Forewing not spoon shaped).

Neoceratobaeus also differs mainly from *Odonatcolous* Kieffer, possessing a similar laterally compressed metasomal horn, in general shape of metasoma, proportion and sculpture of metasomal tergites and in shape of forewing.

Forewing with an anterior constriction is reported in *Cyphacolus* Priesner, but with its unique forewing venation (absence of venation distally) and pedunculate metasoma (Valerio *et al.*, 2010) *Cyphacolus* stays distinct from this genus. A yet another species under this genus, currently undescribed has been collected from Karnataka.

31. ***Neoceratobaeus gibbus*** sp. nov.

(Figs. 149-156)

Holotype Female. Length = 0.98 mm. Head and mesosoma brownish black, metasoma reddish brownish, contrasting in colour with head and mesosoma, horn on T1 deep reddish brown; legs pale brownish white; eyes black; mandibles and claval base yellowish brown; wings hyaline; veins brown.

Head : In anterior view subtriangular in shape, buccal area not elongate; dorsally transverse; vertex straight, upper frons, vertex and occiput finely granulate with scattered minute punctures and dense fine pilosity; granulations extending well anterior to median ocellus, down past mid level of eyes; speculum distinct; cheeks finely striate; granulations absent between striae on cheek, striae extending to a level just above lower margin of eyes; pilosity on cheeks scanty; minimum distance between eyes to width of head to eye height = 22 : 35 : 13 (in front view); eyes with very fine dense pubescence; mandibles tridentate, all teeth pointed and equal; central keel present, continuous till median ocelli; lateral ocelli nearly contiguous with margin of eyes; hyperoccipital carina distinct, complete; in dorsal view head moderately broad, slightly wider than mesosoma; anterior margin of occipital carina striate-scrobiculate; in lateral view temple granulate; antenna 7 segmented, with 4 funicular segments; clava large (Fig. 153), segmentation not visible; length and width of F1 a little less than that of pedicel, F1 longest among funicular segments, > 1.5x length of F2; F3 and F4 much transverse; clava large, with 4 segments, segmentation not distinct.

Mesosoma : (L : W = 29 : 32); narrower than head dorsally (Fig. 152); surface finely granulate as on vertex; mesoscutum densely pubescent than vertex; notauli extending to 0.3 of mesoscutum laterally, sulcus between scutum and anterior margin of mesoscutellum not crenulate; mesoscutellum moderately convex (Fig. 149), surface finely granulose, pilosity scattered; mesoscutellum not excavated, posterior margin not bordered by foveolae; metascutellum with an arched row of horizontal foveolae; propodeum not hairy; propodeal lamellae and flanges bordering metasomal horn developed into spines laterally on either sides of metasomal horn; in lateral view pronotum with longitudinal striae and rough rugosity, mesopleural carina well developed; lower mesopleuron on acetabular area longitudinal elements; pubescence absent on pleurae; lower metapleura near to hind coxa with irregular coarse sculpture; forewing spoon shaped towards tip to accommodate metasomal horn when at rest, stem of wing at its base narrow and elongate; L : W = 53 : 21; *stgv* long, *pmv* longer than *stgv*; (*mv : stgv : pmv* = 2 : 6 : 8), hind wing wider than usual, width of hindwing: forewing = 14 : 19; basal vein absent; forewing with short marginal fringe.

Metasoma : (L : W = 29 : 17); widest at middle of T3; slightly more than 1.7x as long as wide; all tergites transverse, T2 onwards with lateral pilosity; in lateral view horn near vertical, straight, in dorsal view, horn extending backwards, occupying nearly anterior one-fourth of T2, suture between T1 and T2 medially distended downwards; dorsal surface of horn with closely placed concentric striae; medially T1 longest among tergites; proportions of length of T 1 to T7 medially being 15 : 9 : 13 : 6 : 2 : 1 : 11; T1 and T2 with weak and wavy longitudinal striae, striae faintly reaching posterior margin on T2, interstices coarsely rugose; T1 laterally with dense long setae; T3-T4 with dense fine irregular reticulate sculpture; anterior margin of T3 with a narrow smooth band; posterior margins of T3-T6, with a narrow smooth band; T7 all terga with sparse long hairs (Fig. 151); ovipositor extended.

Male : Unknown.

Etymology : The species is named '*gibbus*', due to the hunch backed nature of metasomal horn on T1.

Material examined : Holotype. Female. (ZSI/WGRS/PF29). India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008 in malaise trap.

Paratype 2 females. India : Kerala : Calicut : Tiruvannur : Coll : Rajmohana on 30.ix.2010 (ZSI/WGRS/PF 74) and 1.x.2005 in yellow pan traps (ZSI/WGRS/PF75).

Remarks : Though not from paddy agro-ecosystem, one specimen being conspecific has been included as a paratype in this study.

17. Genus ***Opisthacantha*** Ashmead, 1893

1893. *Opisthacantha* Ashmead, : 209, 210, 211, 221. *Type* : *Opisthacantha mellipes* Ashmead, by monotypy and original designation.

1893. *Raia* Ashmead, : 221. *Type* : *Opisthacantha mellipes* Ashmead, by citation as a synonym of Opisthacantha Ashmead.

1893. *Lapitha* Ashmead, : 209, 211, 222. *Type : Lapitha spinosa* Ashmead. Synonymized by Masner (1976).

1908. *Protrimorus* Kieffer, : 146. *Type* : *Trimorus americanus* Ashmead. Synonymized by Masner (1964).

1908. *Prolapitha* Kieffer, : 117. *Type* : *Lapitha nigriceps* Kieffer. Synonymized by Masner (1976).

1910. *Acanthoteleia* Kieffer, : 311. *Type* : *Acanthoteleia nigriclavis* Kieffer, Synonymized by Masner (1976).

1912. *Acantholapitha* Cameron, : 70. *Type* : *Acantholapitha nigricollis* Cameron. Synonymized by Masner (1976).

1917. *Trissoscelio* Kieffer, : 52. *Type* : *Trissoscelio nigriceps* Kieffer. Synonymized by Masner (1976).

1933. *Gita* Nixon, : 291, 309. *Type* : *Gita infortunata* Nixon. Synonymized by Masner (1976).

1933. *Vardhana* Nixon, : 291, 320. *Type* : *Vardhana selene* Nixon. Synonymized by Masner (1976).

Diagnosis : Body moderately robust (1.5-2 mm); head and body black to brownish black; wings hyaline; frons without a distinct median depression, depression even if present, not keeled; carinae radiating from mandibular corners; eyes often with fine pubescence, at times glabrous; antenna 12 segmented in both sexes; female antenna with a 6 segmented clava, male antenna filiform; skaphion often distinct; metascutellum with a prominent broad based triangular spine; propodeum unarmed medially; sometimes with a small spine posterolaterally; forewings with *smv* angled down before reaching *mv*, appearing broken; basal vein spurious; *mv* very much reduced; *stgv* and *pmv* elongate; *pmv* longer than *stgv*; hindwings with *smv* complete; metasoma elongate, spatulate; T1 usually without a well developed anterior dorsal horn, though at times with a feeble hump; T7 external and extruded along with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, more than 0.9-1x length of metasoma.

Status and Distribution in India : Number of species known from India : 4 (Rajmohana, 2011). Kerala, Maharashtra, West Bengal, Uttarakhand.

Remarks : *Opisthacantha* is distinct from other genera of Scelioninae common in rice ecosystem, by the presence of radiating carinae on cheeks, on either side of mandibles, by the presence of a skaphion, and a distinct spine on median metascutellum. The submarginal vein of the forewing is angled down before reaching marginal vein and appears broken. This genus though resemble *Elgonia* Risbec, in general habitus, the densely punctate T3 and the thick brush like fine hair on metapleuron of the latter, serve to differentiate both the genera.

The medially produced triangular metascutellar plate and absence of skaphion render *Dicroscelio* Kieffer easily separable from *Opisthacantha*.

This genus is very common in paddy ecosystem. Females are seen in more numbers than males.

32. ***Opisthacantha dunensis*** Mukerjee, 1994. (Figs. 157-161)

1994. *Opisthacantha dunensis* Mukerjee, 15. Holotype Female India (Northern Regional Centre, ZSI, Dehradun).

Diagnosis : Female : Length 1.2 mm. Head and mesosoma brownish black; metasoma brown to yellowish brown; antenna brown except for brownish black clava and yellowish scape; forewings uniformly infuscated light brown; veins brown; vertex, occiput coriaceous; frons in front of median ocellus with coriaceous sculpture; central keel distinct from level of coriaceous sculpture on frons; lateral ocelli nearly contiguous with orbital margin; eyes large, with dense, fine pubescence; clava 6 segmented, clothed with fine pubescence; F1 not as long as pedicel; clava not as long as scape; mesoscutum and mesoscutellum densely hairy; skaphion and notauli distinct; metascutellum with a pointed spine; lateral corners of propodeum developed into spines; T3 longest and widest of all metasomal tergites; longitudinal striations on T1 and T2 more pronounced than that on T3; T4 with reticulations, T5-T6 smooth.

Male : Unknown.

Distribution in India : Uttarakhand (Dehradun : Rishikesh).

Material examined : Two females. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana, one on 2.i.2009, in malaise trap and another on 11/12/08, in sweep net. Four females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Paratype-Opisthacantha dunensis Mukerjee, Reg. no : A 8989 NRS/ZSI : Type Depository : Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : The species differs from *O. keralensis* Sharma, in having a smaller body size, general coloration of antenna and metasoma (metasoma black in *O. keralensis*), sculpture on T4 (finely punctate in *O. keralensis*).

33. ***Opisthacantha keralensis*** Sharma, 1978 (Figs. 162-165)

1978. *Opisthacantha keralensis* Saraswat & Sharma, : 44. Holotype Female, India.

Diagnosis : Female. Length : 2 mm. Head and mesosoma black; metasoma brownish black to black; antenna brown to yellowish brown except for last 4-5 segments of clava being black; forewings hardly with any infuscation; veins brown; vertex, occiput coriaceous; frons in front of median ocellus with coriaceous to reticulate sculpture; central keel distinct from level of coriaceous sculpture on frons; lateral ocelli nearly contiguous with orbital margin; eyes large (Fig. 165), with dense, fine pubescence or bare; clava 6 segmented, clothed with fine pubescence; F1 not as long as pedicel; clava not as long as scape; mesoscutum and mesoscutellum densely hairy; former with coriaceous granulose and latter with a coriaceous sculpture as that on vertex; skaphion and notauli distinct; metascutellum with a pointed spine; propodeum not continuous medially, lateral propodeal triangles with longitudinal striae; posterolateral corners pointed; T3 longest and widest of all metasomal tergites; T1, T2 and T3 with longitudinal striations; T4 onwards with fine punctae.

Male : Unknown.

Distribution in India : Kerala (Idukki : Moozhiyar), Maharashtra (Deori), Tamilnadu (Shencotah Gap) (Rajmohana, 2011).

Material examined : 2 females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana, one on 19.xii.2008 and another on 26.xii.2008 in malaise trap. 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Remarks : In original description the eyes are of this species were stated bare; however in the specimens at hand, all of which agreeing to most of the characters of *O. keralensis*, the eyes are pubescent and not bare. apical tergites from T4 onwards with fine setigerous punctae, instead of being matt as stated in original description.

18. Genus ***Palpoteleia*** Kieffer, 1926

1926. *Palpoteleia* Kieffer, : 272, 547. *Type* : *Psiloteleia atra* Kieffer, by original designation.

Diagnosis : Small, gracile (1-1.5 mm); less sculptured; body brownish black to black; frons without a median depression; a large convex, white, blister-like peculiar structure present on cheeks between lower margin of eyes and base of mandibles; mandibles bidentate; eyes with fine pubescence; lateral ocelli never contiguous to inner orbital margin; no radiating carinae arising from mandibular corners; antenna with 12 segments in both sexes; in females with an abrupt 5 segmented clava; skaphion absent; netrion distinct; metascutellum and propodeum simple and unarmed; forewings with *mv* shorter than *stgv* and *pmv*; hindwings with *smv* complete; metasoma elongate, spindle shaped; T1 without anterodorsal horn; T7 extruded along with ovipositor in females; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor moderately elongate, about 0.6x length of metasoma.

Status and Distribution in India : Number of species known from India : 1 (Rajmohana, 2011). Uttarakhand.

Remarks : The white blister–like convex structure of unknown functional significance, present on either side of mandibles is unique to this genus.

The genus is reported for the first time from Kerala. The members of this genus are collected in good numbers from rice ecosystems, than from natural habitats. Females are encountered more in number than males.

34. ***Palpoteleia indica*** Mukerjee, 1994
(Figs. 166-176)

1994. *Palpoteleia indica* Mukerjee, 12. Holotype Female India (Northern Regional Centre, ZSI, Dehradun).

Diagnosis : Length (Female) : 1.2 mm, (male) : 1.18 mm. Head and body brownish black to black, T1 yellowish brown; wings sub hyaline; with dense pubescence; blisters silvery; head, mesosoma except scutellum and T3-T6 with fine reticulate sculpture throughout; head and mesosoma with semi erect setae; malar sulcus distinct; a pair of small transparent blister like structures of unknown function distinct on either sides of mandibles on gena; eyes with long pubescence (Fig. 167); lateral ocelli not very close to orbits; antenna 12 segmented, club 5 segmented; F1 longer than rest of flagellar segments, but shorter than pedicel; notauli complete and deep, highly diverging in front; metapleuron laterally with dense fine whitish hairs; longitudinal striae on T1 and T2 extending throughout; *pmv* of forewing nearly 2x length of *stgv*.

Male : Unknown.

Distribution in India : Uttarakhand.

Material examined : 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.viii. 2008, in sweep-net and 3 females on 2.1.2009 from the same locality, but in malaise trap. 2 females. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana one each on 16.ix.2008 and 30.ix.2008 in malaise trap. 2 females 19.xii.2008, 6 females on 26.xii.2008, 3 females on 2.i.2009, 5 females on 9.i. 2009 and 2 females on 16.i.2009, from. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana, in malaise traps.

Paratype-Palpoteleia indica Mukerjee, Reg. no : A 8983. NRS/ZSI. Type Depository : Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : A commonly encountered species, with wide distribution. This is the only species representing the genus *Palpoteleia* in India. The species is reported for the first time from Kerala.

19. Genus ***Paridris*** Kieffer, 1908

1908. *Paridris* Kieffer, : 122. *Type* : *Idris laeviceps* Ashmead, designated by Kieffer (1926).

1910. *Paranteris* Kieffer, : 292. *Type* : *Paranteris nigriclava* Kieffer, by original designation. Synonymized by Masner (1965).

1958. *Aellenia* Masner, : 47. *Type* : *Aellenia bispinosa* Masner, by monotypy and original designation. Synonymized by Masner (1976).

1976. *Tuora* Kozlov, : 97. *Type* : *Tuora nephta* Kozlov.

Diagnosis : Body robust; moderate sized (2-3 mm); head and body black to brownish black; frons without a median depression; carinae radiating from mandibular corners; eyes large, with well distinct fine long pubescence; mandibles tridentate; clypeus wide with pointed lateral corners; lateral ocelli not contiguous with inner margin of orbits; ocellocular length greater than or equal to ocellar diameter; antenna 12 segmented in both sexes; clava abrupt; 6 segmented; in males antenna filiform; skaphion absent; netrion distinct; notauli usually indicated, complete; metascutellum (ms) medially bispinose; propodeum unarmed, excavate mid dorsally to accommodate horn on T1, pointed dorsolaterally; forewings with *smv* curved down from wing margin near *mv*; *stgv* and *pmv* well developed, *pmv* longer than *mv*, but not as long as *stgv*; hindwing with *smv* complete; metasoma elongate, spatulate; T1 in females always with dorsal horn anteriorly; T7 in females internal, extruded with

ovipositor; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system); ovipositor elongate, about 0.8x length of metasoma.

Host : Eggs of *Gryllus* (Orthoptera : Gryllidae).

Status and Distribution in India : Number of species known from India : 7 (Rajmohana, 2011). Karnataka, Madhya Pradesh and Uttarakhand.

Remarks : This genus is rather distinct from other platygastrid genera of rice ecosystem due to its long and dense pubescence on eyes, skaphion being absent, by the presence of a medially bispinose metascutellum, (rarely plate-like) and a well developed dorsal horn on T1. It differs from *Psilanteris*, where skaphion is distinct and metanotum is with a median broad based spine, from *Opisthacantha* where metascutellum is medially with a spine, and from *Dicroscelio*, where metascutellum is produced medially to a triangular plate, its lower tip resting in the median concavity of propodeum.

The genus is reported for the first time from Kerala. Collected in low numbers, in rice field as well as in natural ecosystems, both males and females are represented in collections.

35. ***Paridris coorgensis*** Sharma, 1978
(Figs. 169-176)

1978. *Paridris coorgensis* Saraswat & Sharma, : 26. Holotype Female India.

Redescription : Female. Length : 1.65 mm. Brownish black; antenna except radicle, mandibles and legs including coxa honey brown; radicle and basal half of scape yellowish brown, mandibular tips brownish black; eyes and ocelli silvery wings slightly infuscated; veins deep brown.

Head : (L : W = 21 : 38); with dense setigerous punctae; dorsally transverse; eyes densely pubescent with hairs nearly as long as pubescence on head; vertex convex; eyes small; temples feebly sloping, vertex curving to occiput; ocelli placed slightly low; lateral ocelli at a distance from orbital margin, nearly 2x ocellar diameter; OOL : OD : POL = 5 : 2.5 : 12; occipital carina complete and carinate; frons smooth and bare medially at a small patch from region of toruli to midlevel height of orbits; length of pubescence more than 2x ocellar height; frons without a median depression and a central keel; inner orbital margin diverging distally; minimum interorbital space infront of median ocellus subequal to eye height; orbital carina extending till lateral ocellus; malar sulcus distinct; orbital bands absent; a few striae radiating from mandibular corners (Fig. 171), but only upper 2 or 3 carinae reaching to median of lower eye margin; mandibles sub tridentate; tridentate, median tooth very small; clypeus with pointed anterolateral corners; lower margin crenulate; interantennal process well developed, finely coriaceous, densely pubescent; antenna 12 segmented, covered with white felt-like hairs; pedicel longer than F1; F1 longer than F2 and rest of flagellar segments; clava with 6 segments, subequal, except smaller basal one length of F4 < F3 < F2 < F1 < pedicel; relative proportions of antennal segments from scape to clava being: 27 : 5, 7 : 3.5, 6 : 4, 4.5 : 4, 4 : 4, 3 : 3, 2.5 : 4, 4 : 5, 4 : 6, 4 : 6 : 4 : 6, 6 : 5; clava : scape = 23.9 : 33.6.

Mesosoma : L : W = 38 : 33, width subequal to that of head dorsally; pronotum without any sharp lateral corners; smoothly curved; mesoscutum with denser and more closely placed setigerous punctures sculpture than on vertex, skaphion absent; notauli distinct towards base, pronounced only in its anterior one-fourth, incomplete, gradually merging with foveolae on mesoscutum; scutellar disc with same sculpture as that of ,mesoscutum; humeral sulcus non-foveolate; with a very few long setae on mesoscutellum; scutoscutellar sulcus medially with width as that of notauli, crenulate; costate laterally; mesoscutellar disc with a small smooth and shiny patch medially, lower margin foveolate; metascutellar plate medially arched and emarginate with two widely placed spines posterolaterally; with dense and large foveolae on plate; lateral propodeal triangle with large foveolate

sculpture, propodeum excavate medially, posterolateral margin produced spine-like; lateral propodeum sparsely hairy; pleura sculptured throughout, with rounded setigerous punctures, except mesopleural scrobe; epomial carina not distinct; netrion with transverse striae; mesopleural scrobe deep, smooth with numerous transverse rugulae; acetabular area with deep close setigerous punctae; metapleuron sculptured as of acetabular area densely setose dorsolaterally; forewings when at rest hardly reaching distal margin of T4; forewing narrow (L : W = 65 : 27); *mv* very much reduced, almost spot-like; *pmv* subequal to *stgv* vein; both distinctly longer than *mv* (*mv* : *stgv* : *pmv* = 19 : 59 : 60).

Metasoma : L : W = 101 : 35; subequal to width of mesosoma; all segments transverse; T1 and T2 with distinct longitudinal striae; extending throughout; length of T1 : T2 : T3 = 19 : 19 : 32 : 13; T1 with a distinct anterodorsal median prominence (horn), smooth and shiny dorsally; finely reticulate microsculpture between striae on T1, basally with a row of prominent costae; T2 with striae as of T1, reticulations indicated, though very faint; T3 with numerous longitudinal rugulae, spaced very close to each other, very faint and not impressed medially; T1 and T2 subequal; T3 1.1x as wide as long, 1.5x as long as T2; T4-T7 smooth without any rugulose sculpture, but with dense small setigerous punctae, densely pilose, pilosity of T4 dense medially; T7 distinct.

Male : Unknown.

Distribution in India : Karnataka (Appangala).

Material examined : 6 females. Two females, India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.viii. 2008, in malaise-trap; 2 females, India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana one each on 16.ix.2008 and 30.ix.2008 in malaise trap; 2 females on 16.i.2009, from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana, in malaise traps.

Remarks : The species is reported for the first time from Kerala.

A detailed redescription of the species is provided above for better characterisation of the species. The couplet no. 6 of the Key to the Indian species of *Paridris* Kieffer (Rajmohana 2007), keying out *P. coorgensis* Sharma, has been modified as follows.

6. *pmv* of forewing longer or subequal to length of *stgv* (Fig. 174); notauli prominent only at its anterior one-fourth (Fig. 172)..... ..... ***P. coorgensis*** Sharma

— *pmv* not as long as *stgv*; notauli pronounced throughout ..... ***P. armigera*** Rajmohana

Genus 20. ***Platyscelio*** Kieffer, 1905

1905. *Platyscelio* Kieffer, : 11. *Type* : *Platyscelio pulchricornis* Kieffer, by monotypy.

Diagnosis : Body usually black; moderate sized (2.5-3.5 mm); mouthparts prognathous; head flattened anteroposteriorly; mesosoma and metasoma flattened dorsoventrally; eyes large (Fig. 178) and glabrous, mandibles tridentate; frons slightly convex, scrobe absent; ocelli placed on top of vertex; hyperoccipital carina distinct; central keel often replaced by a median longitudinal sulcus, bifurcating dorsally near median ocellus and ventrally near toruli; interantennal process well-developed; lower frons, including cheek, with weak fanlike striae arising from mandibular corners; antenna 12 segmented in both sexes; radicle very broad; scape almost triangular and expanded outwardly into spine-like process, particularly in female; clava 5 segmented; mesosoma longer than wide (178); skaphion absent; notauli present or absent; pronotum without netrion; mesoscutellum rectangular in outline; metascutellum simple, not spined, propodeum with a median sulcus; forewing with *mv* elongate, *pmv* reduced or absent; basal vein indicated at times hindwing with *smv* complete; metasoma elongate, with 6 visible tergites in females and 7 in males; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (Scelio-type system); ovipositor elongate, about 0.7x length of metasoma.

Host : Flat Phaneropterinae eggs of Tettigonidae (Orthoptera).

Status and Distribution of Species in India : Number of species known from India : 1 (Taekul *et al.*, 2010). Kerala, Karnataka, Orissa, Uttarakhand.

Remarks : The genus is unique due its dorsoventrally flattened body, triangular and laterally spined antennal scape. Such a flattened body of *Platyscelio* can be an adaptation aiding its habit of phoresy.

Platyscelio pulchricornis Kieffer, the only species found in India is cosmopolitan in its distribution.

On the basis of the available collections, females seems to be collected more in number than males. The group is widely distributed in paddy agroecosystems than in natural forested habitats.

36. ***Platyscelio pulchricornis*** Kieffer
(Figs. 177-179)

1905. *Platyscelio pulchricornis* Kieffer, : 13.
1993. *Platyscelio dunensis* Mukerjee, 78; synonymised by Taekul *et al.*, 2010.
1913. *Platyscelio mirabilis* Dodd, 132; synonymised by Taekul *et al.*, 2010.
1913. *Platyscelio punctatus* Kieffer, 321; synonymised by Taekul *et al.*, 2010.
1910. *Platyscelio abnormis* Crawford, 126; synonymised by Taekul *et al.*, 2010.

Length (female) : 3-5 mm, (male) : 3-5.5 mm. Body brownish black to black; antennal segments except clava yellow; clava black; frons between inner orbit and central keel smooth; malar region smooth; vertex between inner orbit and posterior ocellus smooth or with very faint traces of striae; ocellar triangle with dense striae (> 15); cheeks in front view and temples in dorsal view strongly bulged; mesoscutum longitudinally striate medially and with elongate punctures; notauli present, not reaching anterior margin of mesoscutum, posterior scutellar sulcus interrupted medially; margin of propodeum smooth laterally, longitudinally striate to rugulose posteriorly; forewing hyaline, *pmv* absent; T1 longitudinally striate laterally, uniformly setigerous punctate medially; T2-T4 resembling median T1.

Distribution in India : Karnataka (Mandya); Orissa (Bhuvaneshwar), Uttarakhand (Dehradun : Rishikesh, Kerala (Malappuram : Calicut University Campus).

Material examined : 4 females. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap, 6 females, two on 26.xii.2008, another two on 19.xii.2008 and one each on 9.1.2009 and 16.1.2009, India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : by Rajmohana in malaise trap.

Remarks : This is the only species of *Platyscelio* seen in India. The characters of *P. pulchricornis*-medially interrupted posterior scutellar sulcus, laterally smooth and longitudinally striate to rugulose posterior margin of propodeum and vertex between inner orbit and posterior ocellus being smooth, differentiates it from the closest species *P. africanus* Risbec having posterior scutellar sulcus complete, margin of propodeum longitudinally striate laterally and rugulose posteriorly and with vertex between inner orbit and posterior ocellus densely striate. They are widely distributed in paddy agroecosystems.

21. Genus ***Probaryconus*** Kieffer, 1908

1908. *Probaryconus* Kieffer, : 118, 165, 168. Original description. *Type* : *Baryconus (Probaryconus) spinosus* Kieffer, by monotypy. Proposed as a subgenus of *Baryconus* Förster.
1910. *Procacus* Kieffer, : 319. *Type* : *Procacus striatigena* Kieffer. Synonymized by Masner (1976).
1913. *Neurocacus* Kieffer, : 428. *Type* : *Neurocacus philippinensis* Kieffer,. Synonymized by Kieffer (1926).
1913. *Amblyconus* Kieffer, : 221. *Type* : *Amblyconus quadridens* Kieffer. Synonymized by Masner (1965).
1957. *Urundia* Risbec, : 142. *Type* : *Urundia biarmata* Risbec. Synonymized by Masner (1976).

Diagnosis : Body robust; moderately sized (2-4 mm); head and body black to brownish black; wings hyaline or infuscated; frons without scrobe, but with a few striae radiating from mandibular

corners; mandibles bidentate; eyes with fine pubescence; ocellocular length less than ocellar diameter; antenna in both sexes 12 segmented; in females, clava abrupt with 6 segments; skaphion absent; notauli usually wanting; netrion distinct; metascutellum not produced to a plate of spine medially; wide medially as laterally; two sides of propodeum contiguous atleast anteromedially; bispinose anterodorsally; forewings with *stgv* and *pmv* elongated; *mv* usually reduced; metasoma elongate; spindle shaped; widest in middle; T1 always with an anterior dorsal horn; T2 or T3 largest of tergites; In females, T6 usually elongate and T7 in females internal, extruded with ovipositor; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system).

Host : Eggs of Ground Crickets (Orthoptera : Gryllidae).

Status and Distribution in India : Number of species known from India : 4 (Rajmohana, 2011). Karnataka, Himachal Pradesh, Uttarakhand.

Remarks : Among the genera of Scelioninae encountered in Paddy ecosystem, *Probaryconus* Kieffer is much similar to *Calliscelio* Ashmead. Radiating carinae on either sides of mandibles, the more or less rectangular metascutellar plate not reaching medially to metasomal horn and propodeum with two anterodorsal spine-like projections are characteristic to *Probaryconus*, while the medially produced horizontal plate like metascutellum resting over metasomal horn and an absence of radiating carinae on sides of mandibles of *Calliscelio* serve to distinguish them from *Probaryconus*.

Genus *Paridris* Kieffer also has a horn on T1. But the ocellocular length in *Probaryconus* is less than the ocellar diameter, while the condition is OOL > OD in *Paridris*. The medially contiguous propodeum of *Probaryconus* is also quite different from the medially excavate propodeum of *Paridris*.

The genus is reported fro the first time from Kerala. It is widely distributed in paddy ecosystem than in natural habitats. Females are seen more in number than males.

37. ***Probaryconus cauverycus*** Saraswat, 1978 (Figs. 180-181)

1978. ***Probaryconus cauverycus*** Saraswat & Sharma, : 22. Holotype Female. India.

Female. Length : 2.7 mm. Head cuboid, black to brownish black; rest of body honey brown; wings hyaline; basalis absent; eyes with scanty pubescence, visible only in > 50x magnification; lateral ocelli close to inner orbital margin; OD : POL : OOL = 2 : 10 : 6; vertex and frons granulose punctate; gena with radiating striae; antenna 12 segmented with a 6 segmented clava; F1 longest among flagellar segments, and not as long as pedicel; F1 > 2x length of F2; F2 to F4 subequal; mesoscutum and mesoscutellum with dense closely placed rounded punctae, without any smooth area, with fine micropits; notauli absent; parapsidal lines present laterally; transscutellar sulcus crenulate; metascutellum present as thin strip, with a horizontal row of foveolae, plate medially emarginate, with pointed lateral ends; propodeum excavate medially; semi-horizontal bidentate process on right and left sides; lateral propodeum with dense fine pilosity; forewing with *mv* distinctly shorter than *stgv* (< 0.5x) and *pmv*; *pmv* longer than *stgv*, > 2x longer than *mv*; T1 with a dorsal horn, smooth anteriorly; longitudinally striate, with reticulated microsculpture laterally and towards base; T2 longest among metasomal tergites; longitudinal striae on T2 extending nearly to its half dorsomedially, but receding laterally, T3 smooth and shiny; T4-T6 finely punctate and fine pilosity.

Male : Unknown.

Material examined : 3 females from India : Kerala : Calicut : Peruvayal, Coll : Rajmohana, two on 11.xii.2008 in malaise trap and one on 2.i.2009 in sweep net. 10 Females. India : Kerala : Wynad : Kalpetta : Madakkimala, two on 9.i.2009,

one on 16.i.2009, three on 2.i.2009 and four on 19.xii.2008, Coll : Rajmohana in malaise trap.

Distribution in India : Karnataka (Maldare, Thalacauvery) (Rajmohana, 2011).

Remarks : The species is reported for the first time from Kerala.

38. ***Probaryconus punctatus*** sp. nov.
(Figs. 182-189)

Description : Holotype Female. Length : 1.98 mm. Head brownish black, mesosoma rusty brown; tips of mandibles brown; eyes silvery; antennal radicle, basal three fourth of scape and basal flagellar segments (F1 and F2) brown; F3 and F4 deep brown; distal scape, pedicel, and clava brownish black, metasomal tergites except T2 and T3 brownish black; T2 deep brown, T3 pale brown; legs including coxae whitish brown to brown; forewings slightly infuscate, veins brown.

Head : (HL : HW = 23.6 : 40); distinctly wider than long, vertex, occiput and upper frons in front of median ocellus with rough granular sculpture; frons densely pubescent except for a smooth median scrobal area; pubescence; frons smooth medially, central keel not distinct; eyes with dense fine pubescence; gena with radiating striae, clypeus trapezoid narrow, lateral corners pointed, medially emarginate feebly with two small dents; minimal distance between inner orbits < than eye length (18 : 21); malar sulcus distinct and of uniform width throughout; mandibles sub tridentate, middle teeth small; ocelli situated high on vertex; lateral ocelli separated from inner orbits by one ocellar diameter; OOL : OD : POL = 1.5 : 1.5 : 14.7; occipital carina complete and crenulate; temples bulging laterally in dorsal view ; antenna 12 segmented, with a distinct 6 segmented club; pedicel longer than F1; F1 > 2x length of F5; F3 and F4 subequal; antennal segments in relative proportions (length : width) : (26 : 5); (8 : 4), (7.5 : 3), (5.5 : 3), (5 : 3), (4 : 3), (3 : 5), (4 : 7), (5 : 8), (5 : 8), (5 : 8), (7 : 7); length of clava : radicle, 5 : 1.

Mesosoma : In dorsal view L : W = 44 : 44; wider than head dorsally; mesoscutum and mesoscutellum with closely placed setigerous and rounded punctae; notauli absent; scutoscutellar sulcus extremely narrow medially and much wider and costate laterally; lower margin of mesoscutellum foveolate; metascutellar plate, extremely narrow, smooth, with a wavy lower margin; lateral corners drawn as fine points; propodeum densely foveolate entirely, medially emarginate with rich fine uniform pilosity; anterior and posterior lateral corners of propodeum developed into long pointed teeth; anterior margin of pronotum above fore coxa with fine rugulae; medially with a smooth patch, dorsal and lateral to smooth area with rounded setigerous punctae; pronotal cervix pilose and with dense, fine foveolae; netrion prominent with foveolate anterior border; mesopleural carina absent; entire mesopleuron with rounded setose punctae; a row of faint foveae bordering mesepimeral sulcus separating mesepisternum with mesepimeron present only halfway dorsally, not extending towards midcoxae; mesopleural scrobe distinct; metapleuron with irregular rugulose longitudinal elements and rounded punctae, except for a, smooth patch on its posterodorsal; finely and densely pubescent ventrally towards hind coxa; metapleural carina indicated; forewing narrow (L : W = 140 : 36); postmarginal vein (*pm*) a little more than 3x length of *mv*; *stgv* longer than *mv* (*mv* : *stgv* : *pmv* = 4 : 13 : 15); basal vein indicated.

Metasoma (L : W = 125 : 39.5). In dorsal view, T1 with a smooth and shiny horn anteriorly on its dorsomedian, rest of T1 with strong longitudinal striations, interstices almost bare, with very few punctae laterally and at base; all tergites except T1 transverse; T11.32x as long as wide; length to width ratio of T1 to T4 being 21 : 15.9; 31.9 : 35.6; 33.5 : 39.5; 12.2 : 36.6; longitudinal striations on T2 exceeding its base half medially and receding laterally; T3 longest, smooth and shiny, with no longitudinal elements;T1-T3 pubescent only

laterally, T4 onwards densely pubescent; T7 narrow, elongate and with fine punctae.

Male : Unknown.

Etymology : The species is named '*punctatus*' due to the dense punctae on the mesosoma.

Material examined : Holotype. Female (ZSI/WGRS/PF30). India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Paratype-Probaryconus garhwalensis Mukerjee, Reg. no : A 8996. NRS/ZSI. Type Depository : Northern Regional Centre, Zoological Survey of India, Dehradun, India.

Remarks : *P. punctatus* sp. nov., due to its well distinct basal vein on forewing, eyes with dense short pubescence, F1 > 2x length of F5 and < 2x length of F2; F3 and F4 subequal > length of F5 and T1 with much reduced interstitial punctae on T1 differs from *P. cauverycus* Saraswat and *P. garhwalensis* Mukerjee, the two similar species. In *P. cauverycus*, basal vein is not clearly indicated in forewings and interstices of T1 between longitudinal striae is richly punctate, lateral spines on propodeum not much distinct; F1 > 2x length of F2; F2, F3 and F4 subequal; pubescence on eyes long and sparse.

The new species differs from *P. garhwalensis* by the nature of punctae on mesosoma and general colouration of body. It differs from *P. dunensis* Mukerjee in eyes being pubescent and whereas the eyes are bare in *P. dunensis*.

Key to species of *Probaryconus* Kieffer in India

1. Eyes pubescent 3
— Eyes bare and glabrous 2
2. Forewing with *pmv* longer than *stgv* ..... ***P. dunensis*** Mukerjee
— Forewing with *stgv* longer than *pmv* ..... ***P. khajjiarus*** (Mani)
3. Basal vein present (Fig. 187); F1 < 2x length of F2; F2 > length of F3 or F4 (Fig. 188) 4
— Basal vein not distinct; F1 > 2x length of F2; F2 to F4 subequal (Fig. 181) ..... ***P. cauverycus*** Saraswat
4. Punctae on mesoscutum large (Fig. 186); and closely arranged, inter punctae distance less than its own diameter propodeal tooth pointed and distinct (Fig. 185); head brownish black (Fig. 183) ..... ***P. punctatus*** sp. nov.
— Punctae on mesoscutum small (Fig. 189) inter punctae distance more than its own diameter; propodeal tooth very small; head xanthic ..... ***P. garhwalensis*** Mukerjee

Genus 22. ***Psilanteris*** Kieffer, 1916

1916. *Psilanteris* Kieffer, : 177. Original description. *Type* : *Anteris bicolor* Kieffer, by original designation.

1926. *Oxyphanurus* Kieffer, : 15, 19. *Type* : *Telenomus charmus* Walker. Synonymized by Masner (1976).

Diagnosis : Body robust; moderately sized (1.5-2 mm); head and body brownish black to black; head and mesosoma with fine coriaceous sculpture; eyes large occupying a a major portion of dorsal head, glabrous or with fine scattered or dense pubescence; fan like carina radiating to from mandibular corner towards orbital margin and also towards gena; frons with a shallow declivity medially, but without a keeled margin; lateral ocelli variably laced either contiguous with inner orbits or distant from latter by their own diameter, (variable within species); antenna 12 segmented in both sexes; clava large, abrupt and 6 segmented in females; in males flagellar segments filiform; skaphion distinct; notauli variable, abbreviated anteriorly, complete or seen as a trace; metascutellum with a robust triangular spine medially; metapleuron with varying degree of pilosity; forewing with *mv* and a well developed *stg*, *pmv* absent; *smv* complete in hind wings; metasoma flattened; spatulate, widest medially; T1 without any median horn, basal metasomal tergites with longitudinal striae; T3 largest, T7 internal in females, exserted with ovipositor; ovipositor assembly telescopic, tube extended and retracted by hydrostatic system (*Scelio*-type system); ovipositor elongate, about 0.8x length of metasoma.

Hosts : Eggs of Grasshoppers (Orthoptera).

Status and Distribution in India : Number of species known from India : 4 (Rajmohana, 2011). Karnataka, Maharashtra, Uttarakhand.

Remarks : An abrupt and massive 6 segmented antennal clava in females, presence of skaphion, absence of postmarginal vein in forewing and a broad based triangular spine on median metascutellum characterize the genus (see also section under *Paridris*).

The group is collected in large numbers from rice fields and in less numbers from natural habitats. Females are collected more in number than males.

The genus is reported for the first time from Kerala.

39. ***Psilanteris coriacea*** Rajmohana, 2007
(Figs. 190-193)

2007. *Psilanteris coriacea* Rajmohana, : 57, 64. Holotype Female, India. (WGRC, ZSI Calicut).

Length : Female = 1.4 mm. Male = 1.4 mm. Body robust; head and body brownish black to black. Head and mesosoma with fine coriaceous sculpture; eyes large, with fine scattered pubescence, visible at >50x only; vertex with dense and finely coriaceous sculpture than on dorsal mesoscutum; posterior ocelli nearly contiguous to lateral orbital margin, hardly separated by half its diameter; in females antenna 12 segmented with a massive 6 segmented clava; F1 longest among flagellar segments, but smaller than pedicel; males with a filamentous antenna, F1 sexually modified, having small spine like projection; skaphion distinct, with coriaceous sculpture as on mesoscutum; notauli complete, though faintly represented at times; metascutellum with a triangular spine medially; lateral propodeum and lower metapleuron with dense white fine pilosity; T1 and T2 with longitudinal striae, extending throughout; T3-T6 usually finely coriaceous.

Distribution in India : Karnataka (Kerekatte : Kudremukh National Park), Kerala (Calicut Kadalundi) (Rajmohana, 2011).

Material examined : 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.viii.2008, in sweep-net and 2 females on 2.1.2009 from the same locality, but in malaise trap. Two females. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana one each on 16.ix.2008 and 30.ix.2008 in malaise trap. Four females 19.xii.2008, 3 females on 26.xii.2008, 3 females on 2.i.2009, three females on 9.i.2009 and four females on 16.i.2009, from. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana, in malaise traps.

Remarks : This is the most common species under *Psilanteris* with a wide distribution in paddy fields as well as forested areas alike. The species shows a high degree of variability and intergradation of characters. In some forms notauli remain highly obscure and the coriaceous sculpture on T3 is seen fully effaced medially on its dorsal area, and the coriaceous sculpture is confined towards lateral T3; the degree of pilosity of the eyes also varies from scattered to a bare state; the ocelli are seen touching orbital margin as well as separated from the latter by its own diameter. The size of eyes in dorsal view care also variable, with temples very narrow in some. The extent of pilosity on lateral propodeum and on lower metapleuron is found to remain constant.

Genus 23. ***Scelio*** Latreille, 1805

1805. *Scelio* Latreille, : 226. Original description. *Type* : *Scelio rugosulus* Latreille, designated by Latreille (1810).

1874. *Aleria* Marshall, : 208. *Type* : *Aleria flavibarbis* Marshall, by monotypy. Synonymized by Kieffer (1908).

1878. *Caloptenobia* Riley, Packard, & Thomas, : 306. *Type* : *Caloptenobia ovivora* Riley, by monotypy. Synonymized by Riley, in Riley *et al.* (1880). Riley implicitly synonymized his genus *Caloptenobia*.

1910. *Enneascelio* Kieffer, : 293. *Type* : *Enneascelio exaratus* Kieffer. Synonymized by Nixon (1958).

Diagnosis : Body robust; moderately sized (1.5-5 mm) and heavily sculptured; black to brownish black; forms with a slight deep green metallic tinge also met with; frons without a median depression,

mandibles usually bidentate; eyes bare; lateral ocelli either contiguous with orbital margins or separated by less than their own diameter; antennae 12 segmented in females, an abrupt clava absent; segments gradually enlarged towards tip; in males antenna 10 segmented; skaphion absent; metanotum at times bidentate medially; propodeum with or without sharp lateral corners; forewing hyaline, infuscate or even pictate, with broad brownish patches; venation much indistinct, *smv* obscure; *mv* often indicated as a pterostigma; hindwings with *smv* incomplete, not reaching frenal hooks, indicated only as a stem at base; metasoma flat and spindle shaped, T1 without any median dorsal prominence; T7 in females internal; ovipositor system telescopic; ovipositor elongate, 0.8-0.9x length of metasoma.

Host : Eggs of short-horned grasshoppers (Orthoptera : Acrididae).

Status and Distribution in India : Number of species known from India : 11 (Rajmohana, 2011) and (Yoder *et al.*, 2009). Kerala, Karnataka, Maharashtra, West Bengal, Uttarakhand, Madhya Pradesh, Jharkhand.

Remarks : One of the largest genera in Scelioninae, with an estimation of 500 species worldwide. Some species of *Scelio* have been used in the biological control of *Oxya* (Acrididae : Orthoptera). *Scelio* with its robust and moderately large body can be easily distinguished from other members of Scelioninae in rice ecosystem by the presence of an incomplete submarginal vein on hindwings, absence of both a margined frontal depression and also a snout-like protrusion on buccal part, and clypeus not being concealed by mandibles. Though in general habitus the genus has resemblance to the phoretic genera *Sceliocerdo* Muesebeck and *Synoditella* Muesebeck (yet to be reported from rice ecosystem), both of them have a snout-like protrusion on buccal region and clypeus is concealed by mandibles.

40. ***Scelio nilamburensis*** Mukerjee, 1979. (Figs. 194, 195, 196)

1979. *Scelio nilamburensis* Mukerjee, : 103. Holotype Female, India.

Diagnosis : Female. Length : 4.5 mm. Head and body black; antennae honey brown; setae on head and body golden brown; forewing hyaline; gena with very distinct fan-like carinae, frons in middle smooth and shiny and slightly impressed; rest of frons and vertex with impressed large setigerous reticulations; OD = 2xOOL; dorsal mesosoma with similar sculpture as that on frons; notauli absent; pronotal collar sharply angled at sides; lateral propodeum with dense fine pubescence; in forewing *mv* very short, *stgv* slender, linear, very much longer than *mv*; metasoma narrowing gradually beyond third tergite; first tergite distinctly shorter than width at base; T3 nearly 1.5x as long as length of T2; metasoma distinctly longer than head and thorax combined.

Distribution in India : Kerala (Malappuram : Nilambur); Karnataka (Hanumangundi, Manikyadharabetta, Gangadikkal. (Rajmohana, 2011).

Material examined : 3 females. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap, 2 females from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana one each on 16.ix.2008 and 2 females on 28.vii.2008, in malaise trap. 5 females from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on in malaise trap, three on 26.xii.2008, one on 2.i.2009 and 9.i.2009.

Remarks : The specimens are hand is tentatively placed as *S. nilamburensis*, pending conformation, on examination of the holotype. A female of *S. nilamburensis* is reported for the first time. This is the only *Scelio* known from India having a combination of characters, namely a hyaline wing and fan-like radiating striae on gena, a reticulate frons and vertex, and densely pilose lateral propodeum. The species is frequently encountered in paddy fields.

41. ***Scelio spinifera*** Mukerjee, 1979
(Figs. 197-198)

1979. *Scelio spinifera* Mukerjee, : 111. Holotype Female, India.

Diagnosis : Female. Length : 3.6 mm. Body black; wings faintly infuscated throughout; coxae and legs yellow; vertex and frons with closely placed reticulate punctae; setose; gena with obscure fan–like striations arising from mandibular corner, not extending till lower eye margin; eyes bare; pronotal corners acute; antenna 12 segmented; F1 longest of all segments, > length of pedicel, nearly 2x length of F2; mesoscutum, and mesocutellum reticulate punctuate and with a minute spine on either side towards its lateromedian; lateral propodeum finely hairy; metasomal tergites with longitudinal rugulae.

Distribution in India : Kerala (Idukki : Moozhiyar : Cardamom hills), Karnataka : Bhagavathy : Kudremukh National Park). (Rajmohana, 2011).

Material examined : 2 females, one from India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 28.viii.2008 in malaise trap and the other with same data as above except collection date being 22.viii.2008, caught in sweep-net.

Remarks : This species is tentatively kept under *S. spinifera* Mukerjee, 1979, based on the original description. Lateromedian spine on mesoscutellum is the most striking distinguishing feature of this species.

24. Genus ***Tiphodytes*** Bradley, 1902

1902. *Tiphodytes* : Bradley, : 179. *Type* : *Limnodytes gerriphagus Marchal*, by substitution of *Tiphodytes* for *Limnodytes*. Replacement name.

1957. *Hungaroscelio* Szabó, : 289. *Type* : *Hungaroscelio kaszabi* Szabó. Synonymized by Masner & Kozlov (1965).

Diagnosis : Small and gracile (0.8-1.2 mm), slender and less sculptured forms; body smooth and shining; numerous semi-erect setae on head and mesosoma; mandibles tridentate; frons without scrobe; nearly convex medially; radiating carinae absent on mandibular corners; antenna 12 segmented in both sexes; in females claval segmentation very much obscure and antenna appearing 9 segmented; skaphion well distinct; notauli present or absent; metascutellum and propodeum simple, unarmed; wings narrow; hind margin of forewing with angular process; marginal ciliae long and well developed on fore and hind wings; forewing with *mv* very short (Fig. 199); *pmv* though developed, usually obscure; hindwing with *smv* complete; metasoma obpyriform, little or strongly pedunculate; laterotergites wide; T1 without any protuberance anterodorsally; T3 largest of all tergites; T7 in females extruded along with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, about 0.73x length of metasoma.

Host : Eggs of semi aquatic bugs (Heteroptera : Gerridae) (Masner, 1976).

Status and Distribution in India : Number of species known from India : 3 (Rajmohana, 2011). Kerala.

Remarks : *Tiphodytes* Bradley, with its angular process on hind margin of forewing, erect bristles scattered on head and body, presence of a skaphion and a 9 segmented antennae (in females), with an obscurely segmented clava is unique from all other common platygastrid genera of paddy ecosystem. *Tiphodytes* by its slender and gracile metasoma, can be distinguished from *Microthoron* Masner (a not so common genus in paddy fields), having a short and stumpy metasoma.

The members of this genus are not very common in paddy ecosystem, compared to natural habitats and are seen in low numbers.

42. ***Tiphodytes gracilis*** Rajmohana, 2012
(Fig. 199)

2012. *Tiphodytes gracilis* Rajmohana, Holotype Female India (WGRC, ZSI Calicut).

Diagnosis : Female. Length : 0.93 mm 1.06 mm; head and body black; funicular segments and clava brownish black; radicle, scape, pedicel, mandibles and legs including coxae honey brown; eyes with sparse bristle-like setae; OOL : OD : POL = 0.5 : 1 : 7.2 antenna visibly with 8 segments; pedicel longer than length of F1 or F2. F1 nearly 2x length of F4 or F5; F notauli abbreviated on its posterior; forewing with a distinct *mv*, subequal to *mv*, *stgv* elongate longer than *mv*; longest marginal ciliae as long as half of maximal width of forewing; metasoma gracile, slender and spindle shaped, greater than or equal to 2x as long as wide, longer than combined length of head and mesosoma. T1 transverse, entirely striated longitudinally; striae on T2 not as long as that on T1.

Male : Unknown.

Distribution in India : Kerala (Ernakulam : Thattekkad Bird Sanctuary; Palghat : Thellikkal : Parambikulam Wildlife Sanctuary; Idukki : Chinnar Wildlife Sanctuary). (Rajmohana, 2011).

Material examined : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009, in malaise trap.

Remarks : By the presence of notauli, the species is similar to *T. gerriphagus* Marchal, but differs from it due to the presence of the post marginal vein in the forewings.

A commonly encountered species, represented in paddy fields as well as in natural ecosystems in low numbers.

Subfamily TELEASINAE

Key to the genera of Teleasinae (Hymenoptera : Platygastridae) of rice agroecosystem in north-central Kerala

1. Female metasoma rarely subcircular, usually subpetiolate and pedunculate; male antenna without bottle-shaped flagellomeres, only with short scattered hair; body usually well sculptured (Figs. 206, 210, 214) .... ***Trimorus*** Förster

— Female metasoma often perfectly circular; male antenna with flagellomeres bottle-shaped, with very long bristles; most of head, mesosoma and metasoma highly shining (Figs. 227, 230) ..... ***Xenomerus*** Walker

25. Genus ***Trimorus*** Förster, 1856

1856. *Trimorus* Förster, : 101, 104. Original description. *Type* : *Gryon nanno* Walker, designated by Ashmead (1903).

1887. *Trichasius* Provancher, : 209. *Type species* : *Trichasius clavatus* Provancher. Synonymized by Masner (1965).

1888. *Pentacantha* Ashmead, : 51. *Type* : *Pentacantha canadensis* Ashmead. Preoccupied by *Pentacantha* Stal (1871) (Orthoptera). Synonymized by Masner, in Sarazin (1986).

1893. *Hoplogryon* Ashmead, : 181, 200. *Type* : *Prosacantha minutissima* Ashmead. Synonymized by Dodd (1930).

Diagnosis : Body robust; moderate sized (2-4 mm); head and body black to brownish black; wings hyaline or infuscated; frons without a median depression on frons, but with a few striae radiating from mandibular corners on cheeks and gena; mandibles bidentate or sub tridentate; eyes with fine pubescence; ocellocular length often greater than ocellar diameter; antenna in both sexes 12 segmented; in females, clava abrupt with 6 segments; skaphion absent; netrion distinct; metascutellum not produced medially into a large plate, often with a median spine; two sides of propodeum contiguous atleast anteromedially; bispinose anterodorsally; forewings with *mv* and *stgv* elongated; *mv* elongate, atleast 3x *stgv*; metasoma elongate; spindle shaped; T1 at times with an anterior dorsal horn; T3 largest of tergites; in females, T6 usually elongate and T7 not extruded with ovipositor; ovipositor assembly extended and retracted by muscles (*Ceratobaeus*-type); ovipositor elongate, about 0.8x length of metasoma.

Host : Eggs of Carabidae (Coleoptera).

Status and Distribution in India : Number of species known from India : 25 (Rajmohana, 2006b). Kerala, Karnataka, Maharashtra Uttar Pradesh, Uttaranchal.

Remarks : *Trimorus* is the largest genus among Teleasinae. The genus can be separated from *Xenomerus* Kieffer by the general shape of metasoma. Female metasoma is usually sub-petiolate or pedunculate.

The genus has superficial resemblance to *Fusicornia* Risbec (Scelioninae). Presence of carinae radiating from sides of mandibles and absence of *pmv* in forewings in *Trimorus*, serve an outright distinction from *Fusicornia* which has an elongate postmarginal and lacks the radiating striae on sides of mandibles.

Members of this genus are very common in paddy ecosystem and are also abundant.

43. ***Trimorus anamalaianus*** Mukerjee, 1981
(Figs. 200-202)

1981. *Trimorus anamalaianus* Mukerjee, : 5, 27. Holotype Female, India.

Diagnosis : Female. Length :1.6 mm. Head and body brownish black, basal metasoma pale; wings infuscated light brown; head smooth and shiny; eyes silvery; OOL : OD : POL = 1.5 : 1 : 3 malar sulcus distinct; gena with radiating fan like carinae; vertex and gena setose; eyes with dense, fine pubescence; antenna with 12 segments; 6 segmented clava distinct; F1, F2 and pedicel almost subequal; F4 and F5 smallest of antennal segments and subequal; notauli present, complete and diverging in front; metascutellum with a short medial spine; mesopleural carina distinct; metasoma ovate; T1, T2 and T3 with longitudinal striae; striations on T3 restricted at base, extending nearly to its one-third; T3 nearly 3x length of T2.

Distribution in India : Kerala (Idukki) (Rajmohana, 2006b).

Material examined : 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap and another female on the same date from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana in malaise trap.

Remarks : A widely distributed species, though present in small numbers. (Rajmohana, personal observation).

44. ***Trimorus sringatus*** sp. nov.
(Figs. 203-208)

Description : Holotype Female. Length : 1.01 mm. Head, antenna except radicle and basal one third of scape, anterior mesoscutum; mesoscutellum and metascutellum medially, tegula, dorsal horn on T1 and metasomal tergites from lower half of T2 onwards brownish black; radicle and basal scape whitish/yellowish brown, mesopleura, and rest of dorsal mesosoma, lateral and posterior T1 and anterior T2 and legs including coxae pale yellowish brown; eyes and ocelli silvery white; wings hyaline.

Head : L : W = 41 : 20.5; smooth and shiny without any sculpture, and much spare setae; frons highly polished, with a 4-5 pairs of setae anterior to median ocellus, 2-3 pairs along orbital margin and a few towards cheeks, near malar sulcus and amidst of radiating striae, central keel distinct, weakly developed, not extending till median ocellus, reaching past mid level of eyes; setae on vertex rising above level of median ocellus; LOL : OOL : POL = 8 : 7 : 19; OOL nearly subequal to POL; POL/OOL = 2.7; eyes large (Fig. 204); bare; vertex, occiput and post gena entirely smooth, occipital carina complete, without any sculpture; relative length to width ratio of antennal segments being scape 18.7; 5.9 4.4, 3.8, 3.8, 3.4, clava 19; clava subequal to scape, only trifle longer; radicle 0.4x length of scape; eye height : frons between orbits anterior to median ocellus 17 : 20.

Mesosoma : (L : W 37 : 34, width including tegulae); pronotal cervix without any foveae; mesoscutum and mesoscutellum, without an elaborate sculpturing, except for raised setal bases, with dense scattered setae; notauli extending through out diverging anteriorly; scutoscutellar sulcus wider medially than width of notauli; finely crenulate, with a pair of bristle like elongates curved setae, on lower lateral corner of mesoscutellum; metascutellum simple and plain without any spines medially and laterally; lateral pronotum and pleurae with much reduced sculpture; netrion distinct, bordered anteriorly by

foveae; mesopleural carina not distinct; propodeum not visible medially; lateral propodeum with dense fine setae; *mv* more than 3x *stgv* (140 : 38); forewing very narrow (L : W = 91.8 : 21.6); marginal fringe well developed (Fig. 207); forewing at its lower margin medially angular.

Metasoma (L : W = 57 : 27.9); T1 and T2 nearly subequal. T1 : T2 : T3 : T4 = 11.8 : 11.9 : 23.3, 5.9; T1 striated dorsally on its posterior half medially and on anterior half of median T2; striae disappearing laterally; T3 onwards smooth, without any striae.

Male : Unknown.

Etymology : The species is named '*sringatus*', due to the prominent horn on anterior T1. ('sringa' in Sanskrit = horn).

Material examined : Holotype. Female. ZSI/WGRS/PF31, India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Paratypes : 4 females. Two females with data same as that of the holotype, except date of collection of one being 16.i. 2009 (ZSI/WGRS/PF76-77). One female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009 (ZSI/WGRS/PF78), in malaise trap and another female with same data as above except date being 11.xii.2008 and collected in sweep net (ZSI/WGRS/PF79).

Remarks : *T. sringatus* sp. nov. is similar to *T. fasciatus* Mukerjee due to the presence of complete notauli on mesoscutum and also longitudinal striae being confined to T1 and anterior T2. However, the forewings of *fasciatus* are banded, where as that of *T. sringatus* is hyaline. Forewing at its lower margin is medially angular in *T. sringatus*, while it is not so in *T. fasciatus*. In addition, *T. fasciatus* is devoid of a meatsomal horn. *T. mukerjii* nom. nov. though possess a horn on T1, the species is devoid of notauli.

45. ***Trimorus fasciatus*** Mukerjee, 1981 (Fig. 209)

1981. *Trimorus fasciatus* Mukerjee, : 15, 27. Holotype. Female, India.

Diagnosis : Female. Length : 2-2.3 mm; body robust; head and body black; antenna black except for deep brown basal segments; forewing with 3 light bands alternating with and 2 dark bands; hind wings hyaline; body with dense white pubescence; eyes also with fine and dense pubescence; OOL < OD; antennal radicle elongate, subequal to pedicel; F1 longest of all segments, a little longer than pedicel, > 2x length of F3; F2 subequal to length of pedicel : F3 and F4 subequal; mesosoma rugoso-punctate; notauli absent; forewing narrow, 101 : 31.5; T1 entirely and T2 at its anterior with longitudinal striations; T3 longest, a little less than 2x length of T2.

Male : Unknown.

Distribution in India : Karnataka (Maldare), Kerala (Rajmohana 2006a, 2006b).

Material examined : 1 Female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : This is the only species of *Trimorus* known in India, having banded wings.

46. ***Trimorus microstriatus*** sp. nov. (Figs. 210-215)

Description : Holotype Female. Length : 0.81 mm. Head, antenna except radicle and basal one third of scape, clava, mesosoma, pleurae metasomal tergites from posterior three-fourth of T2 onwards brownish black; radicle, basal scape yellow, pedicel, F1-F4, yellowish brown to brown, T1 and anterior one-fourth of T2 and legs including coxae pale brownish yellow; eyes silvery black; ocelli silvery white; wings hyaline; veins brown.

Head : (L : W = 26 : 47); transverse; smooth and shiny without any sculpture, setae much sparse; frons highly polished, without any setae anterior to median ocellus, 2-3 pairs of setae along orbital margin and a few towards cheeks, near

malar sulcus and amidst of radiating striae, central keel distinct, weakly developed, reaching hardly mid level of eyes; setae on vertex rising above level of median ocellus; LOL : OOL : POL = 7 : 10 : 10; OOL nearly subequal to POL; POL/OOL = 1.43; eyes large; pubescence extremely sparse, visible only under high magnification (> 100x); vertex, occiput and post gena entirely smooth, occipital carina complete, without any sculpture eye height : frons between orbital margin anterior to median ocellus = 3 : 4; antennal radicle elongate; F1 slight smaller than length of F2; relative ratio of length : width from scape to clava being scape 16.8 : 3.3; 5.7 : 2.6, 5.1 : 2.2; 5.6 : 2; 2.7 : 2 : 2.4 : 2.2, clava 18.8 : 3.9; clava/scape = 1.1; scape/radicle = 2.7.

Mesosoma : (L : W 51 : 52), width including tegulae in dorsal view); pronotal cervix without any foveae; mesoscutum on its anterior two-third with scaly reticulate sculpture, posteriorly smooth and shiny; setae scattered and dense; setal bases finely raised; notauli absent; humeral and suprahumeral sulci foveolate; scutoscutellar sulcus narrow medially than laterally; mesoscutellum smooth, devoid of any sculpture; lateral and posterior margins crenulate, lower margin laterally with two long setae; metascutellum smooth, simple and plain without any spines medially and laterally; lateral corners bluntly pointed posteriorly; propodeum not continuous medially lateral propodeal triangle setose; propodeum not visible medially; lateral pronotum and pleurae with much reduced sculpture; netrion distinct, though very short, foveolate; mesopleural carina not distinct; sternaulus continuous with anterior row of foveae of mesopleural carina mesepimeral sulcus long and complete; posterior metapleural sulcus distinct; *mv* more than 3x *stgv*; forewing very narrow (L : W = 68 : 15); marginal fringe well developed; forewing at its lower margin medially angular.

Metasoma (L : W = 57 : 36); T1 and T2 nearly subequal in length. T1 : T2 : T3 : T4 = 9 : 12 : 26, 4.5; longitudinal striae on dorsal T1 extending more than its anterior three-fourth, T2 striated only on its anterior half; T3 with longitudinal striae on extending hardly to its anterior one-fourth; T1 and T2 with a pair of long setae laterally; T3 setose laterally as well as posteriorly.

Male : Unknown.

Etymology : The species is named '*microstriatus*' due to the minute longitudinal striae on anterior T3.

Material examined : Holotype. Female. (ZSI/WGRS/PF32), India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in sweep net.

Paratypes : 4 females. One female with same data as that of the holotype (ZSI/WGRS/PF80). Another female, India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 3.ix.2008, in malaise trap (ZSI/WGRS/PF81) and two females one each on 26.xii.2008 and 2.i.2009 from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009, in malaise trap ZSI/WGRS/PF82-83).

Remarks : This species is very much similar to *T. simplex*. sp. nov. Other than the fine proportion of segments of antenna and metasomal tergites, the presence a row of small costae on basal T2 is the prominent character separating the two species (Figs. 214 and 220). Both the species have forewings with an angular lower margin medially/proximally and can be considered characteristic. Such an angulate lower margin is not reported in any *Trimorus* from India, other than those described as new in this work.

47. ***Trimorus mukerjii*** nom. nov.

(Figs. 216-219)

1994. *Trimorus tuberculatus* Mukerjee, : 34, preoccupied by *Trimorus tuberculatus* (Kieffer, 1908).

1994. *Trimorus tuberculatus* Mukerjee, : 34. Holotype Female India.

Diagnosis : Female. Length : 1.6 mm. Body deep brown to black; antenna dark brown except for the yellowish brown radicle and basal half of scape; lower one-third of T1 yellowish brown; T2

pale in comparison with rest of tergites; forewing infuscate brown; frons anterior to median ocelli smooth, setose; vertex and occiput coriaceous; POL 2x LOL; OOL 1.5x OD; eyes hairy; antennal radicle not elongate; scape nearly 1.5x length of clava; F1 subequal to pedicel, > 2x length of F3, F2 not as long as F1; F3 and F4 subequal; notauli absent; mesoscutellum and metascutellum unarmed; propodeum excavated medially to accommodate anterior tubercle on T1; forewing L : W = 70 : 23; T1 with a well developed smooth and long tubercle, reaching upto lower margin of scutellum; T1 at its basal one-third and T2 nearly at its entire length striated; rest of tergites smooth and shiny except for dense pubescence laterally; T3 > 2x length of T1.

Male : Unknown.

Distribution in India : Uttarakhand (Dehradun : Rishikesh) (Rajmohana 2006b).

Material examined : 1 female. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 11.xii.2008, in malaise trap. 1 female. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 19.xii.2008, in malaise trap.

Remarks : Other than *T. sringatus* sp. nov. described here, this is the only species of *Trimorus* in India possessing a long tubercle on T1. The species is reported for the first time from Kerala. Since the name *T. tuberculatus* Mukerjee, 1994 is preoccupied by *T. tuberculatus* (Kieffer, 1908), a new name viz., *T. mukerjii* (in honor of the contribution of Prof.. M.K. Mukerjee towards Indian fauna of Platygastroidea) is hereby proposed for this species.

48. ***Trimorus simplex*** sp. nov.
(Figs. 220-226)

This species is very much similar to *T . microstriatus* sp. nov., both in size of the habitus and body colouration. There exists a high degree of similarity in body sculpture. Measurements and characters that differ from *T. microstriatus* is noted below.

Holotype Female. Length = 0.75 mm. Head (L : W = 26 : 53) minimum distance between inner orbital margins on frons : eye height = 35 : 30; LOL : OOL : POL = 7 : 10 : 10; comparative proportions of length and width of antennal segments from scape to clava beings 15 : 3.4; 5.6 : 2.7; 5.5 : 2.3; 5.7 : 2.3; 2.5 : 2.3; 2.5 : 2.3; 19.8 : 5.2; scape/radicle = 2.6; clava/scape = 1.2.

Mesosoma (L : W = 52 : 46); mesoscutum (L : W) = Metasoma L : W = 54 : 35; T1 : T2 : T3 = 7 : 11 : 27; longitudinal striae on dorsal T1 extending more than its posterior three-fourth, T2 striated only on its anterior half; T3 onwards smooth, without any striae; T1 and T2 with a pair of long setae laterally; T3 setose laterally as well as posteriorly.

Male : Unknown.

Etymology : The species is named '*simplex* ' since the metascutellum is simple and plain, with no spines.

Material examined : Holotype. Female. ZSI/ WGRS/PF33. India : Kerala : Calicut : Peruvayal, Coll : Rajmohana on 2.i.2009, in malaise trap.

Paratypes : 2 females. One female with same data as that of the holotype (ZSI/WGRS/PF84), and the other from India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana on 9.i.2009, in malaise trap (ZSI/WGRS/PF85).

Remarks : Absence of notauli, a plain smooth metascutellum, wings with well developed marginal fringe, lower margin of forewing angular, striae or costae confined to T1 and T2, T3 even without traces of any microstriae serve as a diagnosis of *T. simplex* sp. nov. *T. microstriatus* sp. nov., though very much similar to this species has a distinct row of microstriae on anterior T3 (also refer to remarks section under *T. microstriatus*).

Key to *Trimorus* Förster species of India
(Based on females)

1. First metasomal tergite developed into a tubercle (Figs. 203, 205, 216) 2

— First metasomal tergite not developed into a tubercle (Figs. 209, 210, 220) 3

2. Body predominantly yellowish brown (Fig. 203); notauli distinct (Fig. 205), complete; T2 striated only at its base (Fig. 206); F3 nearly 0.8x length of F1 ..... ***T. sringatus*** sp. nov.

— Body predominantly brown to dark brown (Fig. 216); notauli absent (Fig. 219); T2 striated entirely (Fig. 217); F3 only 0.5x length of F1 ..... ***T. mukerjii*** nom. nov.

3. Forewing with distinct dark and light band (Fig. 209) ..... ***T. fasciatus*** Mukerjee

— Forewing without a banding pattern (Fig. 207) 4

4. Forewing distinctly angular at base (Fig. 226); metascutellum simple, without any spines or teeth (Figs. 215, 222) 5

— Forewing not angular at base (Fig. 207); metascutellum with or without spines or teeth 6

5. Base of T3 with strong costae (Fig. 215) .... ***T. microstriae*** sp. nov.

— Base of T3 smooth, without traces of any costae (Fig. 225) ..... ***T. simplex*** sp. nov.

6. Striae only on T1 and T2 .... ***T. dubarensis*** Mukerjee

— Striae on T1, T2 and also on T3..... 7

7. Striations on T3 almost complete; F1 greatly elongated and distinctly longer than pedicel; notauli absent ..... ***T. dimdicornis*** Mukerjee

— Striations on T3 at its base only; F1 not greatly elongated, subequal to pedicel; notauli present (Fig. 201) 8

8. Metasoma ovate; mesosoma closely punctate; wings infuscated light brown (Fig. 200) .... ***T. anamalaianus*** Mukerjee

— Metasoma elliptic-ovate; mesosoma with well separated umbilicate punctae; wings hyaline.. 9

9. Mesoscutum reticulate in front, rest of thorax with well separated umbilicate punctae; scape 8x longer than thick; ocellocular space subequal to ocellar diameter .... ***T. abbicolus*** Mukerjee

— Mesosoma as a whole with well separated umbilicate punctae; scape 6.8x longer than thick; ocellocular space 1.66x ocellar diameter ..... ***T. appangalus*** Mukerjee

26. Genus ***Xenomerus*** Walker, 1836

1836. *Xenomerus* Walker, : 355. *Type* : *Xenomerus ergenna* Walker, by monotypy.

Diagnosis : Body black to yellow; head transverse, almost as high as wide; mandibles short, broad, with three teeth, teeth size invariant; facial striae short, not reaching or long, extending over but not obscuring or sometimes obscuring frontal patch, in some cases reaching anterior ocellus; median area on frons smooth and bare; central keel usually present, rarely absent; hyperoccipital carina sometimes developed' antenna 12 segmented in both sexes, radicle elongate, scape nearly as long as clava; notauli present or absent; in male flagellomeres A3-A11 bottle-shaped, with long, erect, whorl of bristles; mesoscutum with posteriorly diminishing scaly reticulate sculpture, usually not reaching posterior margin, mesoscutellum transverse, usually simple, at times with a median spine; metascutellum striated proximally; metascutellar spine bluntly triangular; lateral propodeal carina well developed; Fore wing wider or slightly narrower than mesoscutum; *mv* 2–3 times as long as *stgv*; metasoma transverse, usually circular in shape, T3 as wide or slightly wider than mesoscutum; T1 with 2 lateral setae; basal depressions on T1 and T2 present; T1, T2 and T3 with longitudinal costae.

Status and Distribution in India : Number of species known from India : 4 (Miko *et al.*, 2010, Rajmohana, 2006b). Kerala, Karnataka, Tamil Nadu.

Host : Carabidae : Coleoptera. (One of the Indian species, *X. orientalis* Miko and Masner has been reared from eggs of *Parena nigrolineata* (Carabidae : Coleoptera) (Miko *et al.*, 2010).

Remarks : Very much similar, but certainly not as diverse as *Trimorus*. The short tridentate mandibles, scaly reticulate sculpture on inter notauli area and circular metasoma serve to distinguish *Xenomerus* from *Trimorus*.

49. ***Xenomerus atomus*** Rajmohana and Narendran, 2001
(Figs. 227-229)

2001. *Xenomerus atomus* Rajmohana K. & Narendran, : 253. Holotype Female India (WGRC, ZSI Calicut).

2011. *Xenomerus atomus* : Rajmohana K. and T.C. Narendran. reaffirmation of species status.

Diagnosis : Female. Length : 1 mm. Head and body black; antennal parts and coxae yellow; facial striae exceeding midlevel of eye, curving inward dorsally, obscuring frontal patch; frontal patch indistinct; frons setae dense, thin; central keel complete; POL about than 1.9x as long as OOL; OOL subequal to LOL; antennal scape 4x length of radicle, subequal to length of clava; hyperoccipital carina present, sharp, extending to inner orbit; vertex without sculpture; notauli reaching transscutal line; mesoscutum coriaceous, with dense thin setae, setal bases pustulate, sculpture extending to lateral and internotaular area, not reaching posterior margin of mesoscutum; mesoscutellum not areolate rugose anteriorly; mesopleural carina complete; *mv* 3 times as long as stigmal vein; T1 less than 2 times as wide as T1+T2 ; T3 about as wide as mesoscutum, costae on T3 extending almost to apex of tergum submedially, laterally and medially costae not emerging from basal depressions; lateral patch distinct; anterior half of T4 reticulate.

Male : Unknown.

Material examined : 3 females. India : Kerala : Wynad : Kalpetta : Madakkimala, Coll : Rajmohana, one each on 19.xii.2008, 2.i.2009 and 16.i.2009 in malaise trap.

Distribution in India : Kerala (Calicut). (Rajmohana, 2006b).

Remarks : A species with wide distribution in Kerala. This species differs from *X. orientalis* Miko and Masner in mesoscutellum not being areolate rugose anteriorly as in the former.

50. ***Xenomerus yamagishi*** Miko and Masner, 2010
(Figs. 230-232)

2010. *Xenomerus yamagishii* Mikó, Masner, & Deans, : 11, 13, 49. Holotype Female. (Canadian National Collection).

Diagnosis : Female Length : 0.9 mm; body yellowish brown (ochre); T3 posteriorly and T4-T6 entirely brownish black; facial striae not exceeding midlevel of eye; frons setae dense, setae thin; central keel complete; POL almost as long as OOL; OOL more than 1.5 times as long as LOL; hyperoccipital carina absent; vertex patch present, with diameter equal to lateral ocellus; A1 more than 5 times as long as radicle, as long as clava : notauli absent; mesoscutum with dense setae; mesoscutum sculpture extending to posterior margin; mesoscutellum anteriorly punctate, with fine wrinkles between punctures, with dense setae; metascutellum bluntly triangular, entirely striated; posterior propodeal projection distinct, tubercle-like; fore wing almost as wide as mesoscutum ; *mv* more than 3 times as long as *stgv*; T1 about 1.5 times as wide as T1 + T2 length; T3 as wide as mesoscutum; basal depressions on T3 thin.

Male with characters very much similar to that of female, except antenna being filiform.

Material examined : 1 Female. India : Kerala : Malappuram : Nilambur : Kavalamukkatta, Coll : Rajmohana on 16.ix.2008, in malaise trap.

Distribution in India : Karnataka (Bangalore).

Remarks : This is the first report of the species from Kerala.

SUMMARY

A knowledge on the indigenous species of natural enemies present in agro-ecosystems would largely benefit the integrated pest management programs. The diversity and richness of the natural enemy complex in rice ecosystem in India are far

less explored. A major component of the parasitoid community attacking the egg stages of many insects and spiders in the rice ecosystem are the members of the superfamily Platygastroidea. Subfamilies Scelioninae and Teleasinae (Hymenoptera : Platygastridae) constitute egg parasitoids, controlling the population of a number of insect groups like Hemiptera, Orthoptera, Coleoptera and also spiders. The present study aimed to assess the diversity of Scelioninae and Teleasinae, associated with the rice ecosystems, in north-central Kerala and the results reflected an extremely rich and diverse parasitoid assemblage.

A total of 50 species under 26 genera have been identified in this study. One genus and 15 species are described as new to science and their affinities with related taxa discussed. Dichotomous keys are provided to subfamilies of Platygastridae and the 26 genera dealt in this study. Key to species of India is provided for all the 10 genera, under which the new species have been described. *Elgonia* Risbec which has been resurrected and *Microthoron miricornis* Masner and Huggert are new reports from India. Since a detailed systematic treatment of all the species collected during the study was too large to include under this report, a few large genera like *Gryon* Haliday, *Macroteleia* Westwood and *Scelio* Latreille (Scelioninae) and *Trimorus* Förster (Teleasinae) would be dealt in detail separately as part II of this volume at a later instance.

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PLATE-I

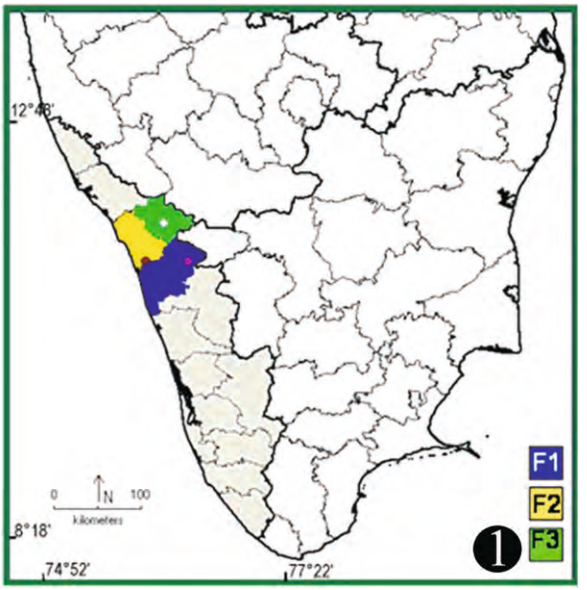


Fig. 1. Map of Kerala showing the three study sites

Fig. 2. Malaise trap set in paddy field

Figs. 3-4. Orthopteran pests of paddy

Figs. 5-6. Heteropteran pests of paddy

PLATE-II

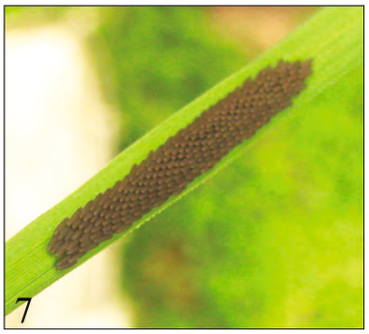
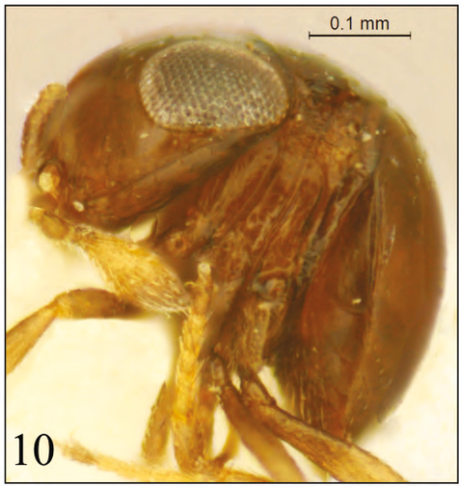


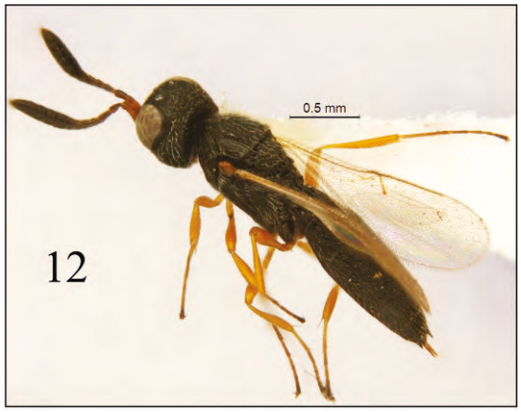
Fig. 7. Orthopteran egg mass

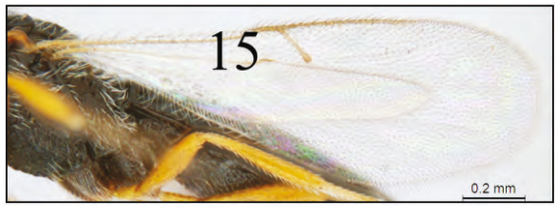
Fig. 8. Heteropteran egg mass

Fig. 9. *Gryon* sp. emerging from Heteropteran egg mass



Figs. 10-11. *Baeus primitus* Rajmohana (Female)
10. Body-profile **11.** Body-dorsal view

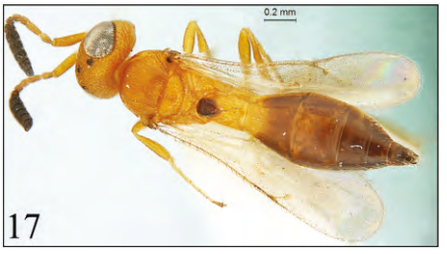


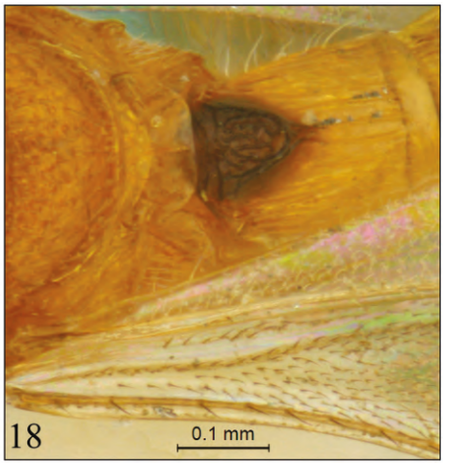


Figs. 12-15. *Baryconus keralensis* Narendran (Female)
12. Body-profile **13.** Head and Mesosoma –dorsal view
14. Metasoma –dorsal view **15.** Forewing venation

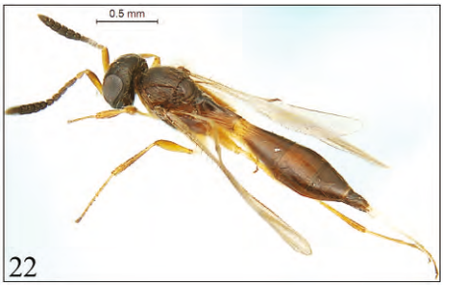
PLATE-III

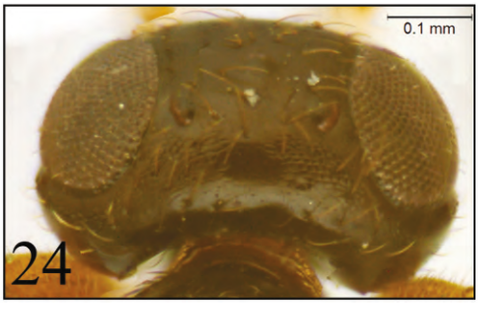
Fig. 16. *Baryconus keralensis*
Head-front view

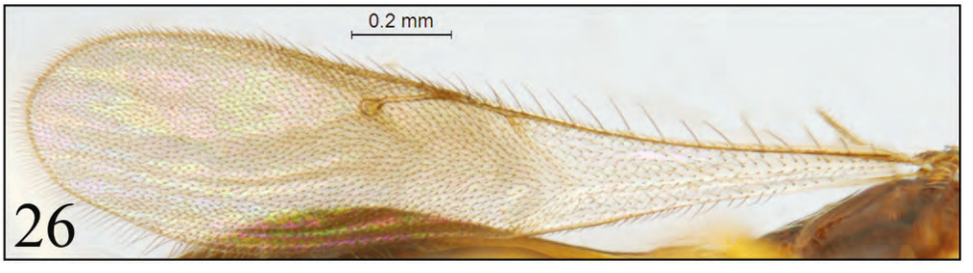




Figs. 17-18. *Calliscelio agaliensis* Narendran and Ramesh Babu (Female)
17. Body-dorsal view
18. Lower mesosoma and Upper metasoma –dorsal view





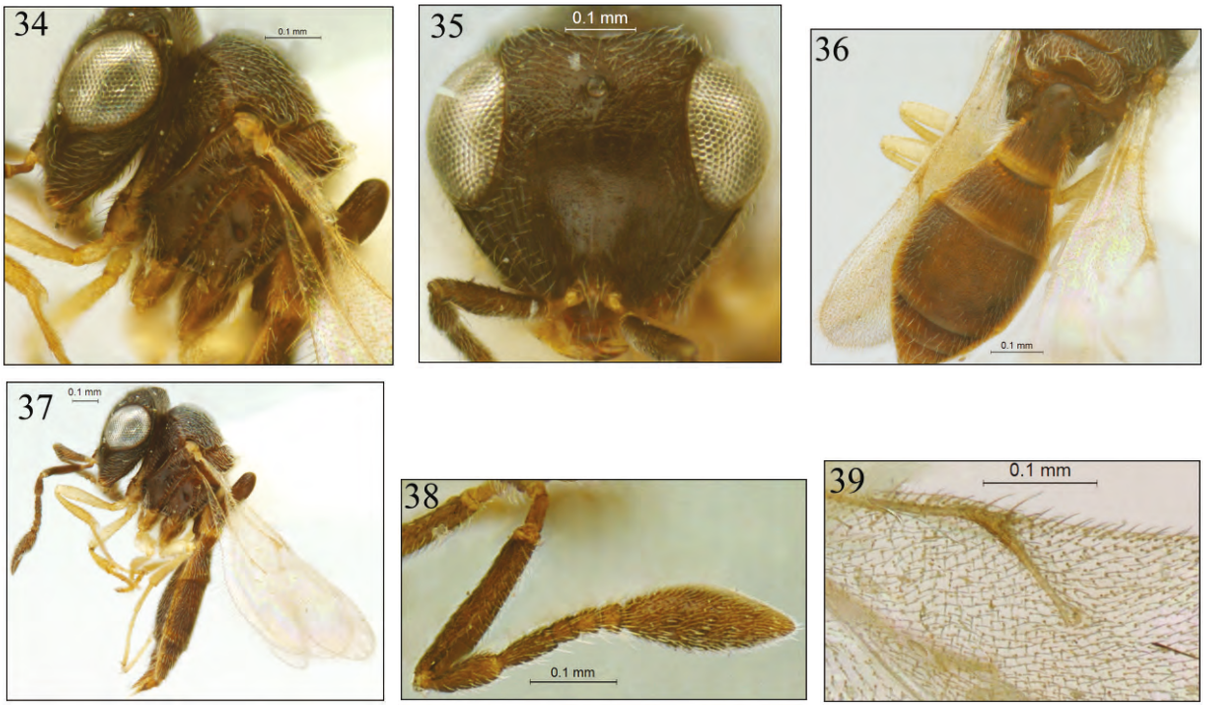


Figs. 19-26. *Calliscelio glabratus* sp. nov (Female)
19. Mesosoma –profile **20.** Mesosoma-dorsal view
21. Head-frontview **22.** Body-dorsolateral view
23. Metasoma –dorsal view **24.** Head-dorsal view
25. Antenna **26.** Forewing venation

PLATE-IV

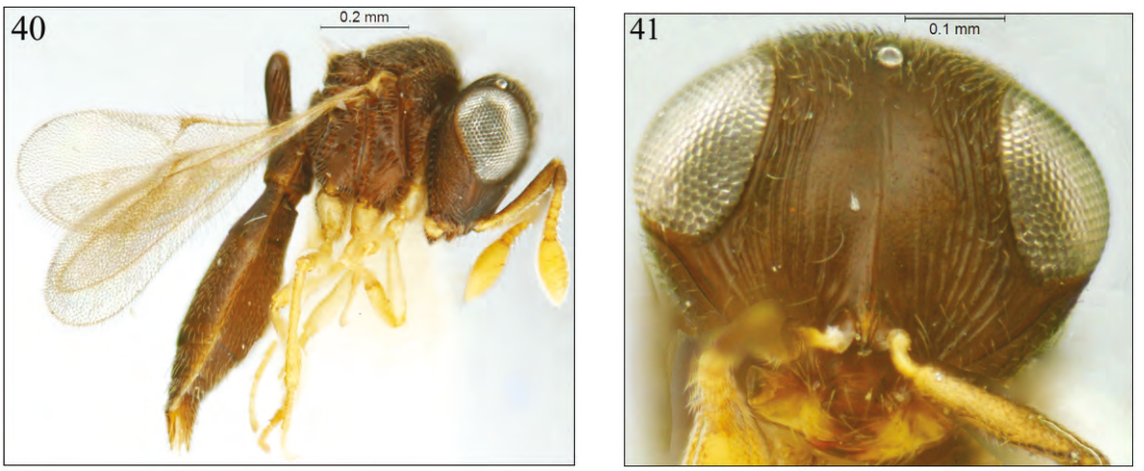
Figs. 27-30. *Calliscelio indicus* Narendran and Ramesh Babu (Female)
27. Forewing venation **28.** Body-profile
29. Terminal metasomal tergites **30.** Metascutellum and T1

Figs. 31-33. *Ceratobaeus dunensis* Mukerjee (Female)
31. Mesosoma-profile **32.** Head-front view
33. Body-profile

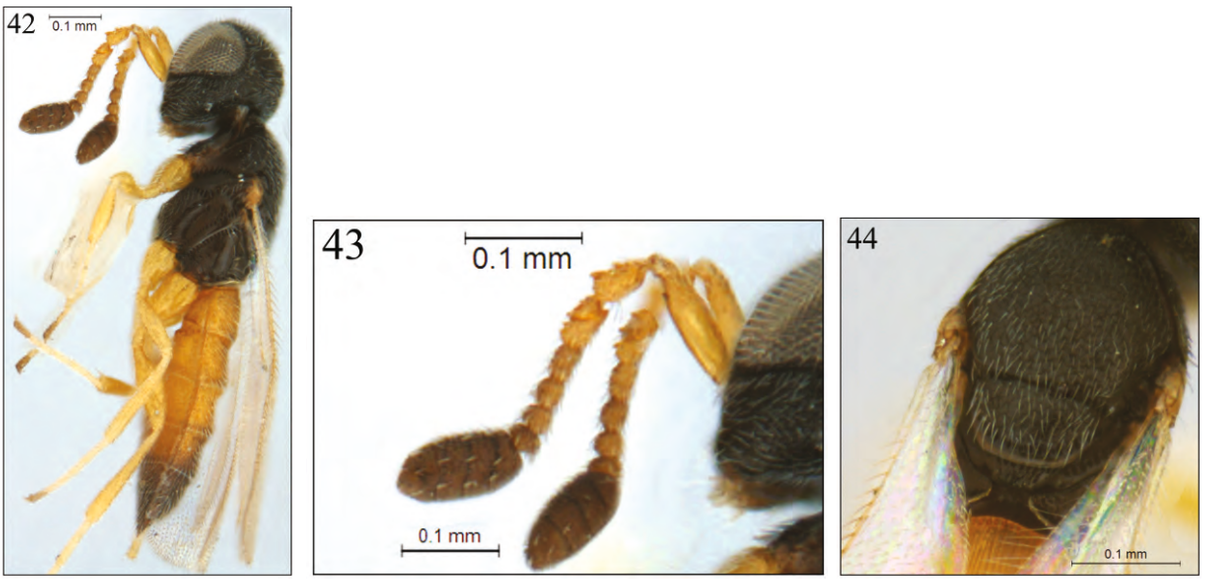


Figs. 34-39. *Ceratobaeus granulosus* sp. nov (Female)
34. Mesosoma-profile **35.** Head-front view **36.** Metasoma –dorsal view
37. Body-profile **38.** Antenna **39.** Forewing venation

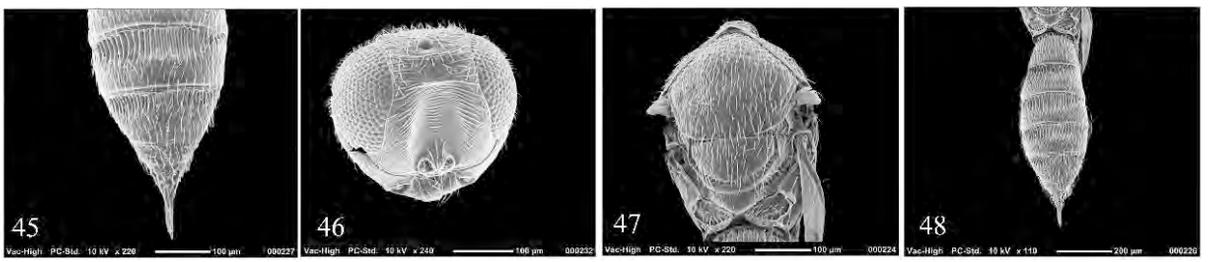
PLATE-V



Figs. 40-41. *Ceratobaeus longituberculata* Mukerjee (Female)
40. Body-profile **41.** Head–front view



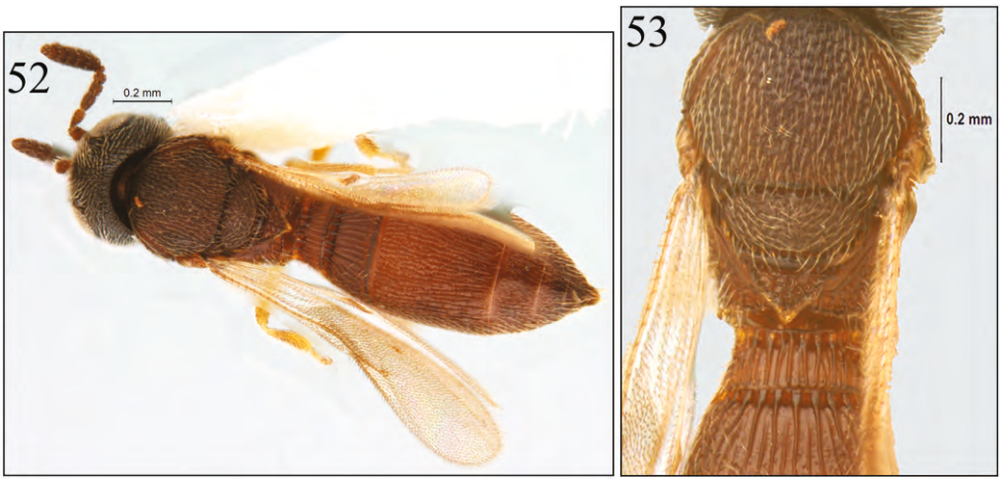
Figs. 42-44. *Cremastobaeus indicus* Mukerjee (Female)
42. Body-profile **43.** Antenna
44. Mesosoma –dorsal view

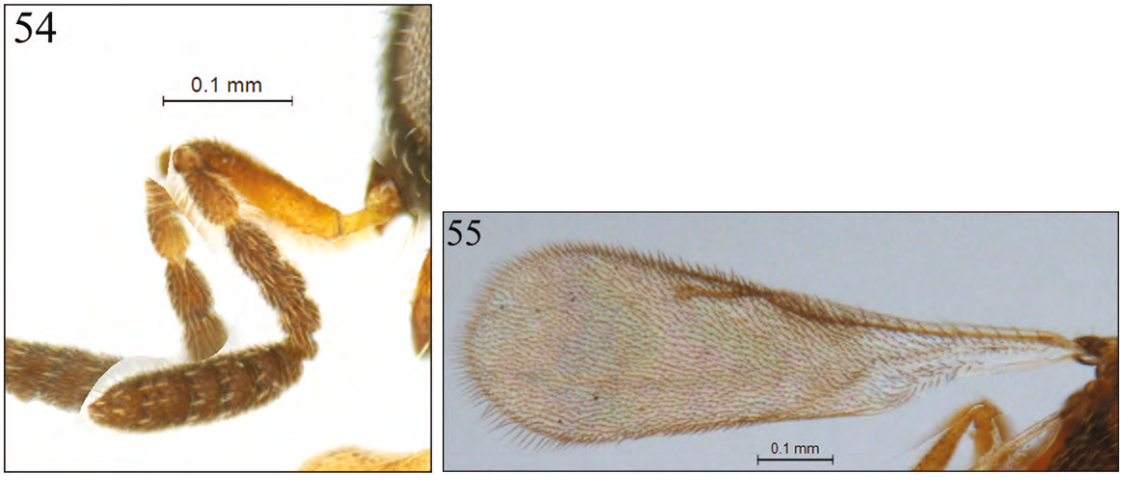


Figs. 45-48. *Cremastobaeus unicolor* sp. nov. (Female)
45. Tip of Metasoma **46.** Head –front view
47. Mesosoma-dorsal view **48.** Metasoma –dorsal view

PLATE-VI

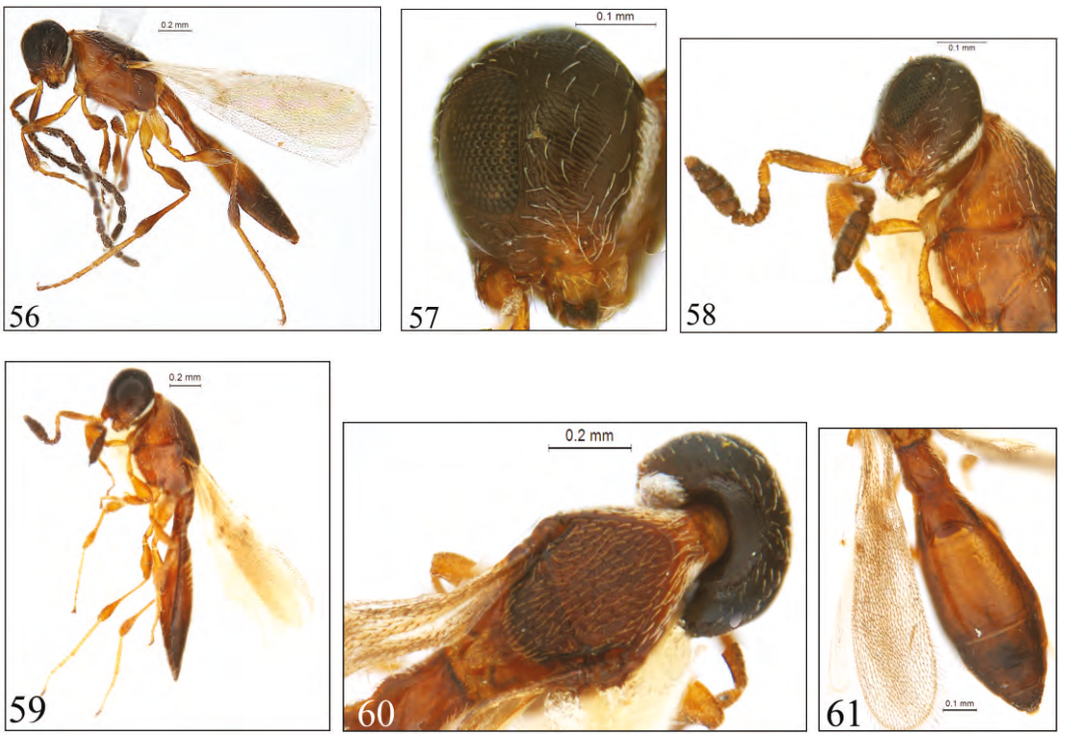
Figs. 49-51. *Cremastobaeus unicolor* sp. nov. (Female)
49. Mesosoma –profile **50.** Antenna **51.** Body-profile



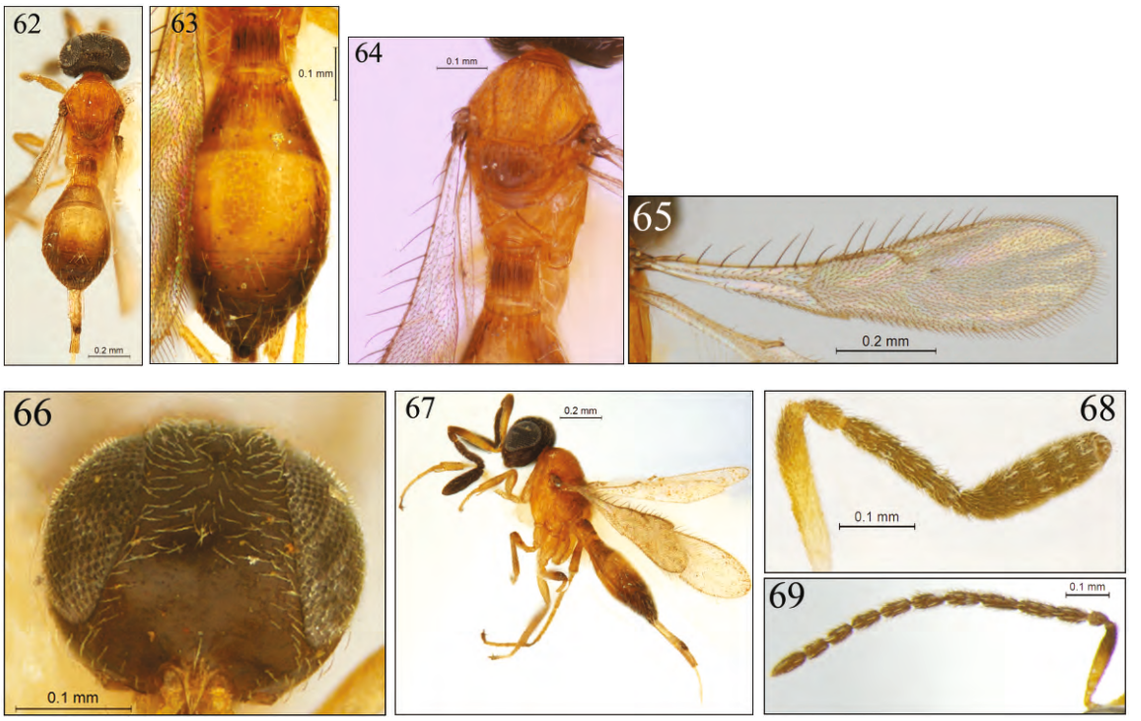


Figs. 52-55. *Dicroscelio malabaricus* (Narendran) (Female)
52. Body-dorsal view **53.** Mesosoma-dorsal view
54. Antenna **55.** Forewing venation

PLATE-VII

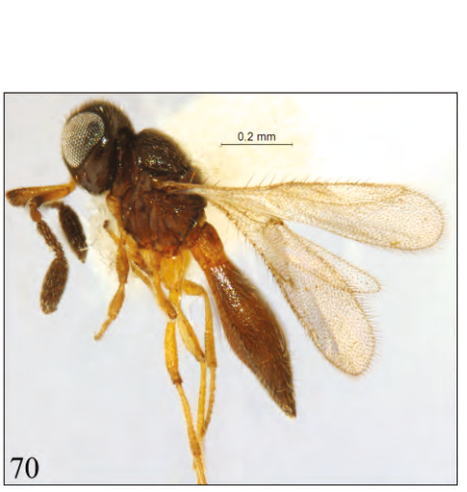


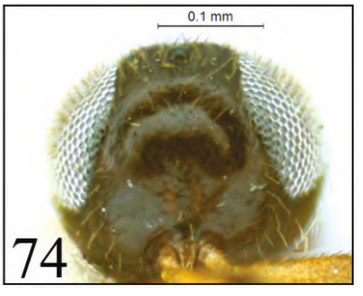
Figs. 56. *Doddiella nigricephala* Mukerjee (Male), **Figs. 57-61** (Female)
57. Head-profile **58.** Head and antenna
59. Body profile **60.** Head and Mesosoma –dorsal view
61. Metasoma –dorsal view



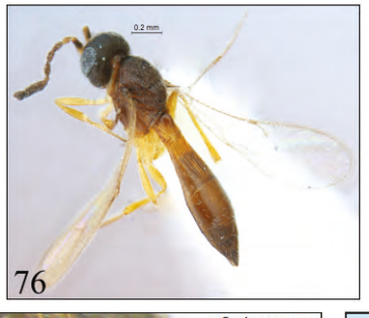
Figs. 62-68. *Duta bicolour* sp. nov. (Female)
62. Body-dorsal view **63.** Metasoma –dorsal view
64. Mesosoma –dorsal view **65.** Forewing venation
66. Head-front view **67.** Body-profile **68.** Antenna **69.** Male antenna

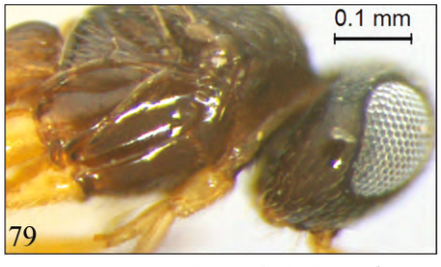
PLATE-VIII

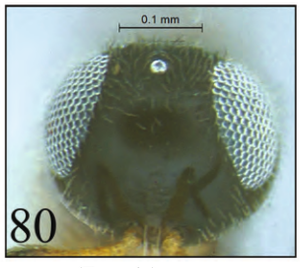


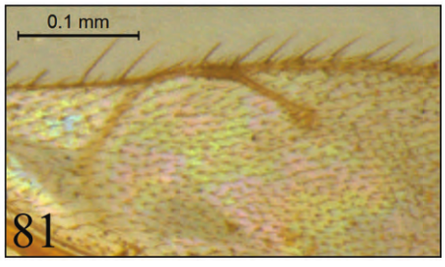


Figs. 70-75. *Duta dissimilis* sp. nov. (Female)
70. Body-profile **71.** Metasoma-dorsal view **72.** Head and Mesosoma-dorsal view
73. Metasoma –dorsal view **74.** Head-front view **75.** Antenna



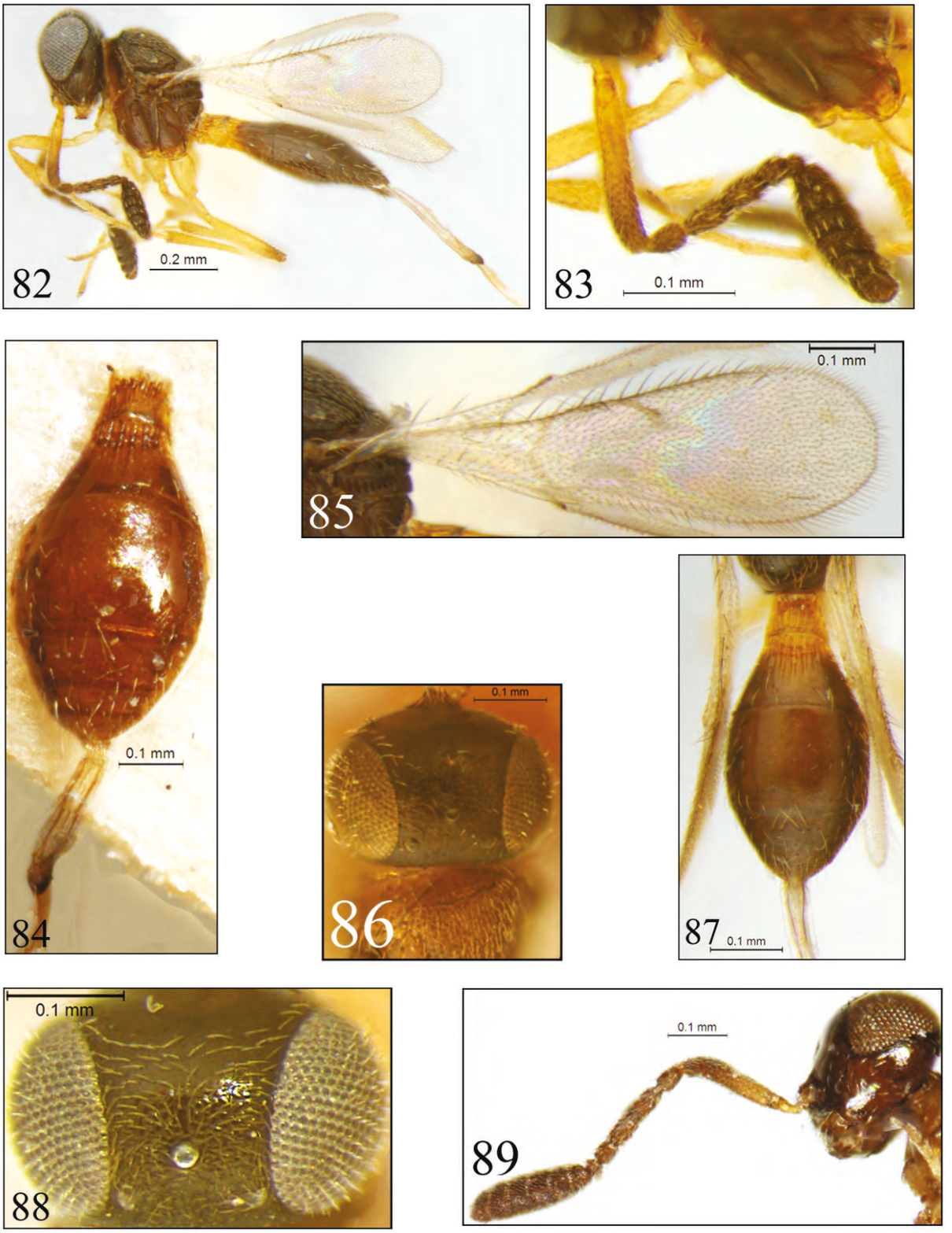






Figs. 76-81. *Duta elongata* sp. nov. (Female)
76. Body profile **77.** Head and Antenna **78.** Metasoma –dorsal view
79. Mesosoma-profile **80.** Head-anterior view **81.** Forewing venation

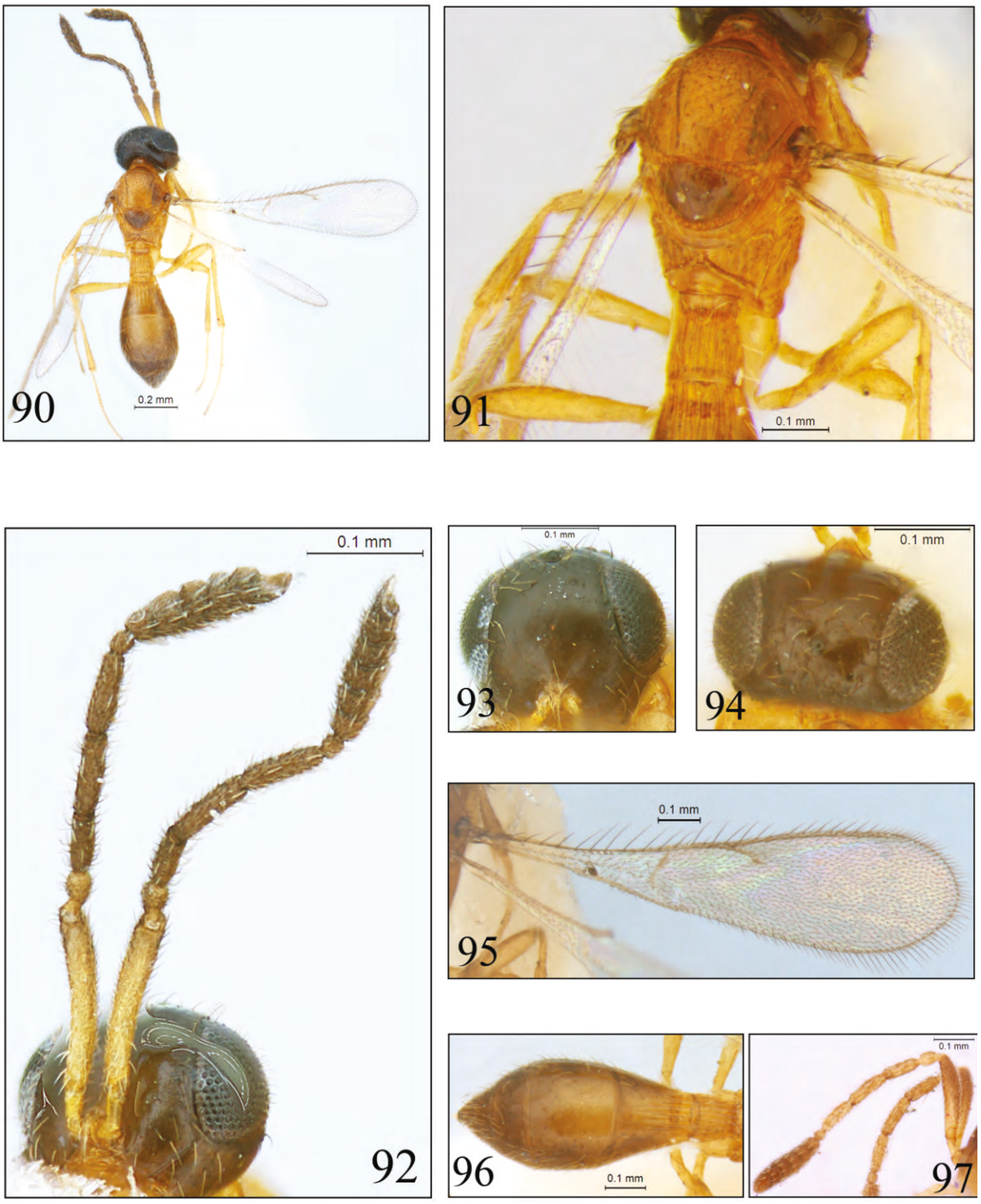
PLATE-IX



Figs. 82-89. *Duta indica* Mukerjee (Female)

82. Body-profile
83. Antenna
84. Metasoma-dorsal view (HOLOTYPE)
85. Forewing venation
86. Head dorsal view (HOLOTYPE)
87. Metasoma-dorsal view
88. Vertex
89. Antenna (HOLOTYPE)

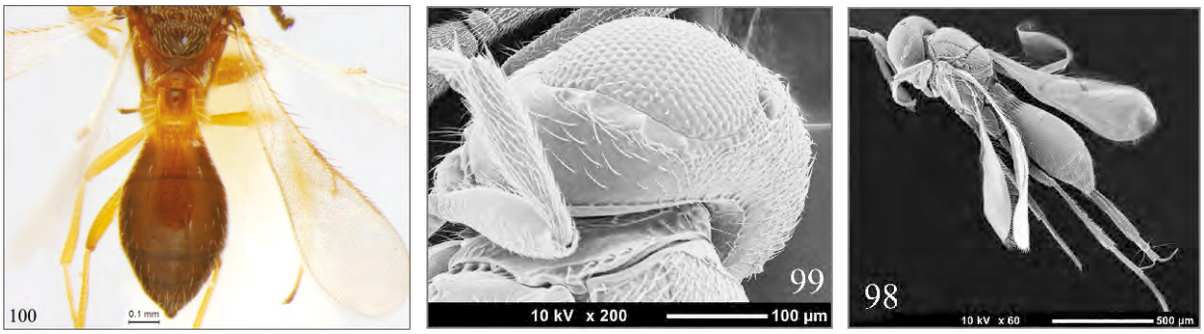
PLATE-X



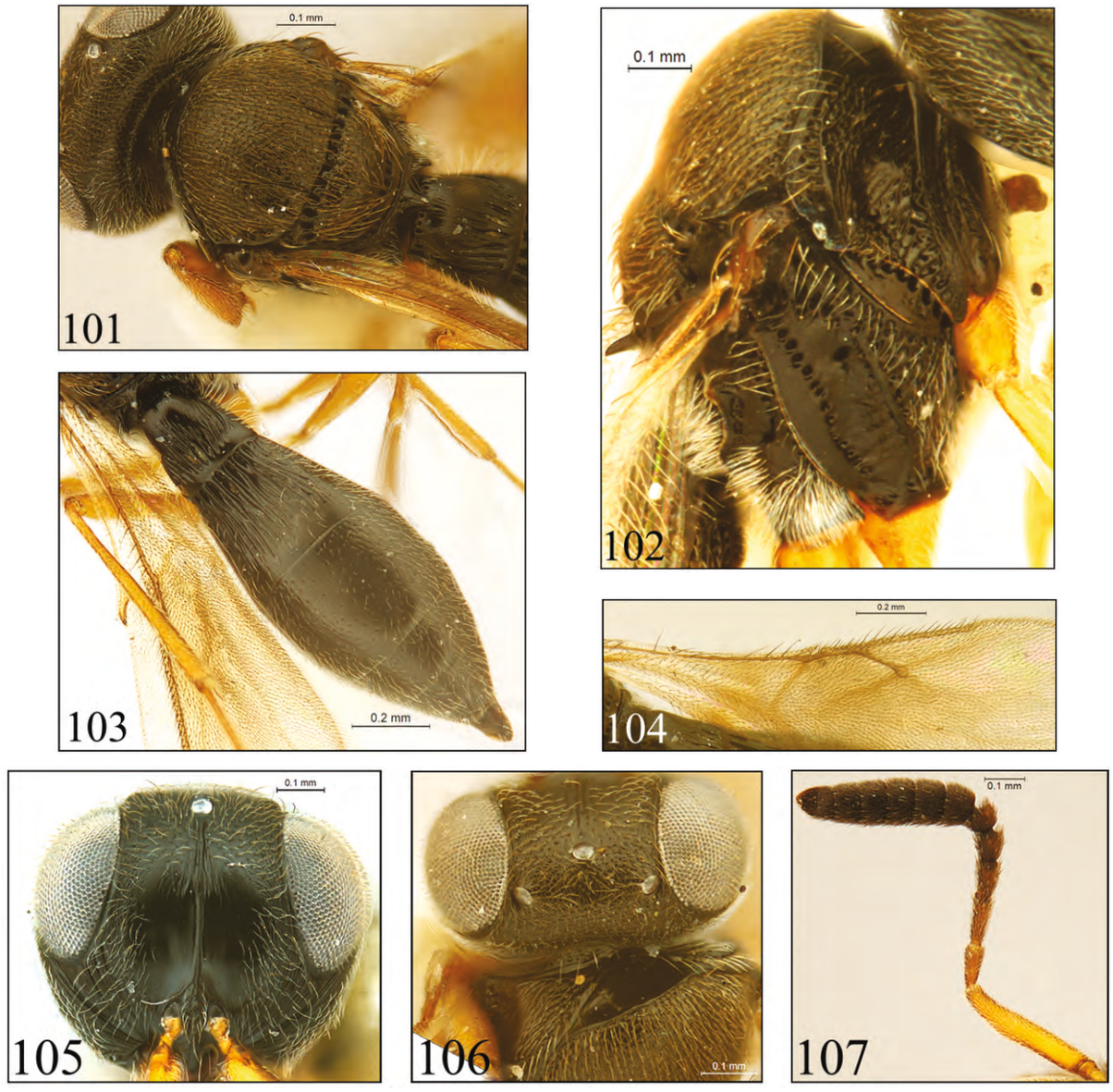
Figs. 90-97. *Duta polita* Rajmohana (Female)

90. Body-dorsal view **91.** Mesosoma –dorsal view
92. Antenna **93.** Head-Front view
94. Head-dorsal view **95.** Forewing venation
96. Metasoma dorsal view **97.** Antenna (Holotype)

PLATE-XI

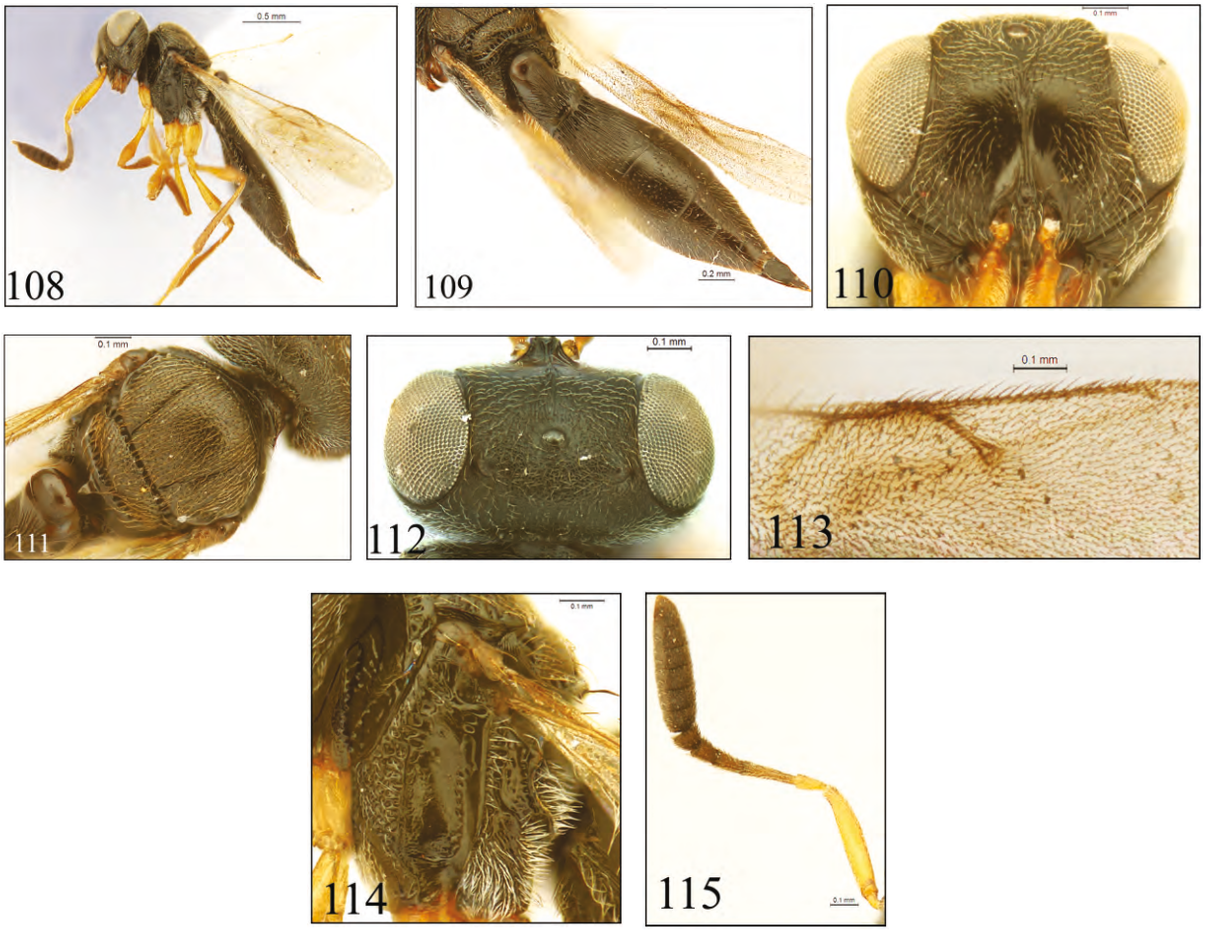


Figs. 98-100. *Duta serraticeps* (Priesner) (Female)
98. Body-dorsolateral view **99.** Head-profile
100. Metasoma-dorsal view

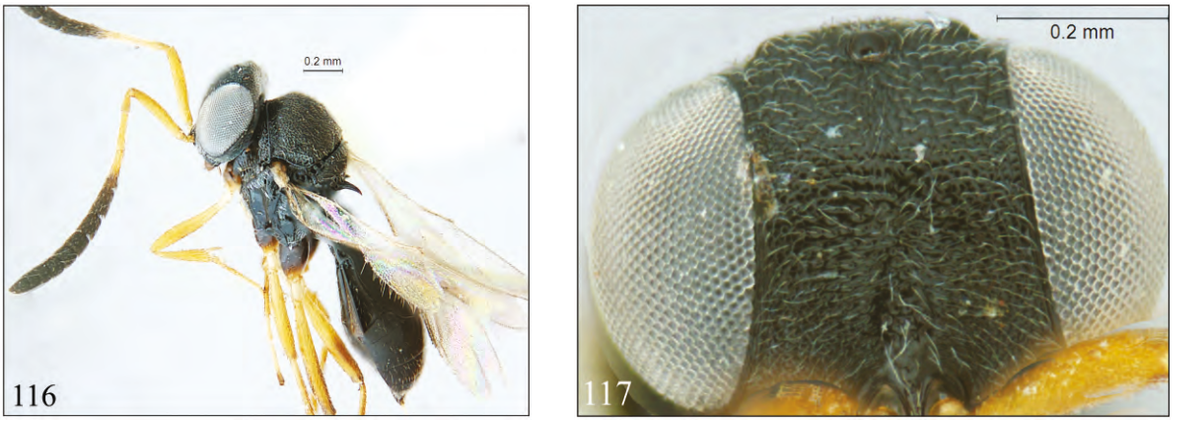


Figs. 101-107. *Elgonia alpha* sp. nov. (Female)
101. Mesosoma –dorsal view **102.** Mesosoma –profile **103.** Metasoma-dorsal view. **104.** Forewing venation
105. Head-Front view **106.** Head-dorsal view **107.** Antenna

PLATE-XII

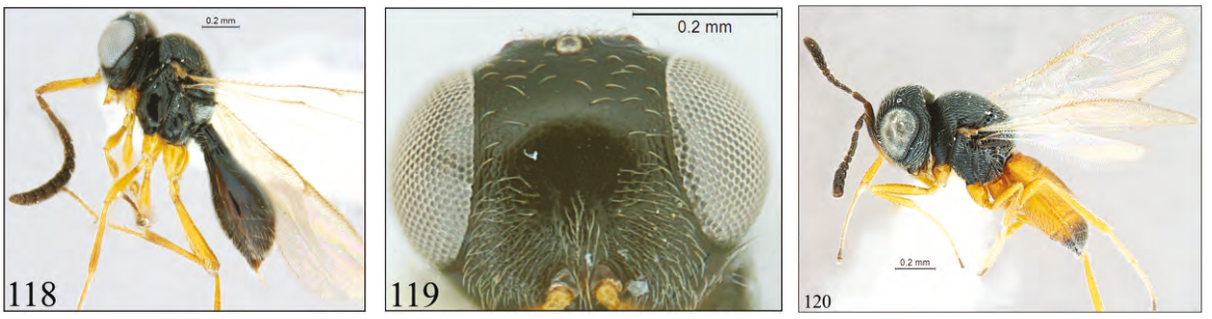


Figs. 108-115. *Elgonia chitrae* sp. nov. (Female)
108. Body-profile **109.** Metasoma- dorsolateral
110. Head-front view **111.** Mesosoma –dorsal view
112. Head –dorsal view **113.** Forewing Venation
114. Mesosoma-profile **115.** Antenna

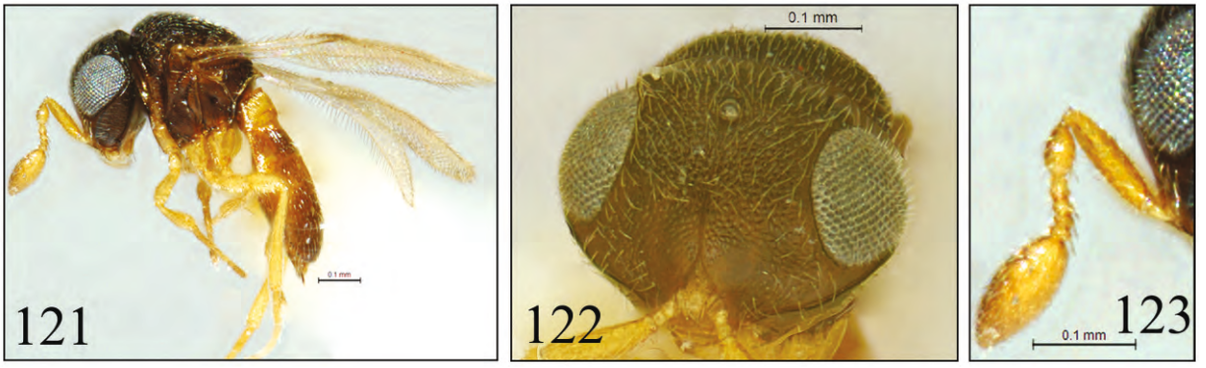


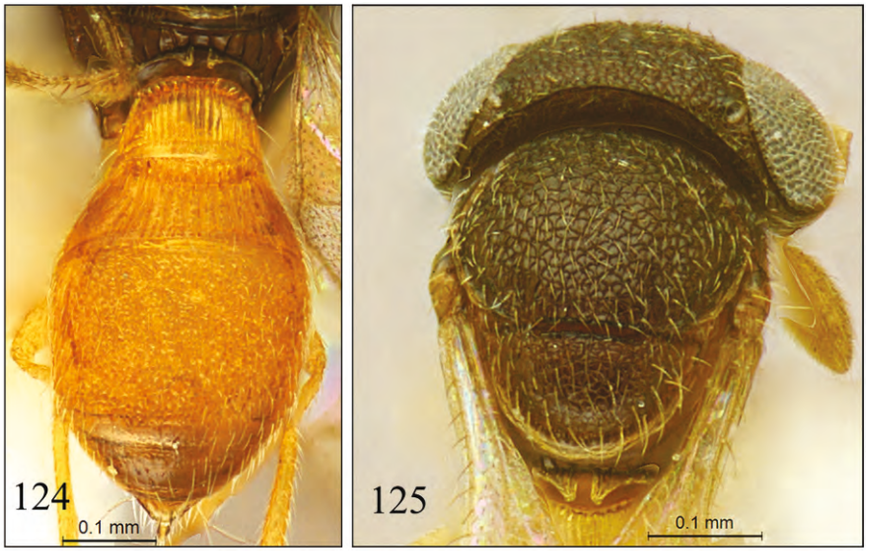
Figs. 116-117. *Fusicornia indica* (Mani and Sharma) (Female)
116. Body-profile **117.** Head-front view

PLATE-XIII



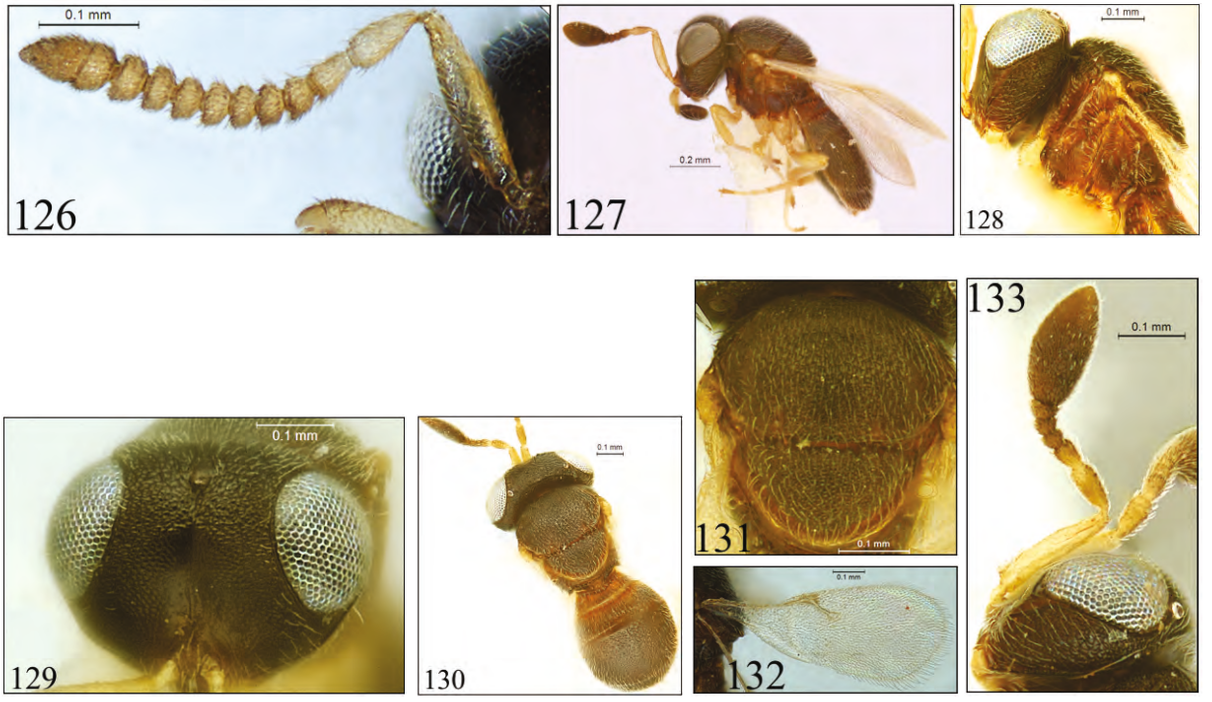
Figs. 118-119. *Fusicornia tehrii* Mukerjee (Female)
118. Body-profile **119.** Head-front view
Figs. 120. *Gryon fulviventre* (Crawford) (Female)- profile



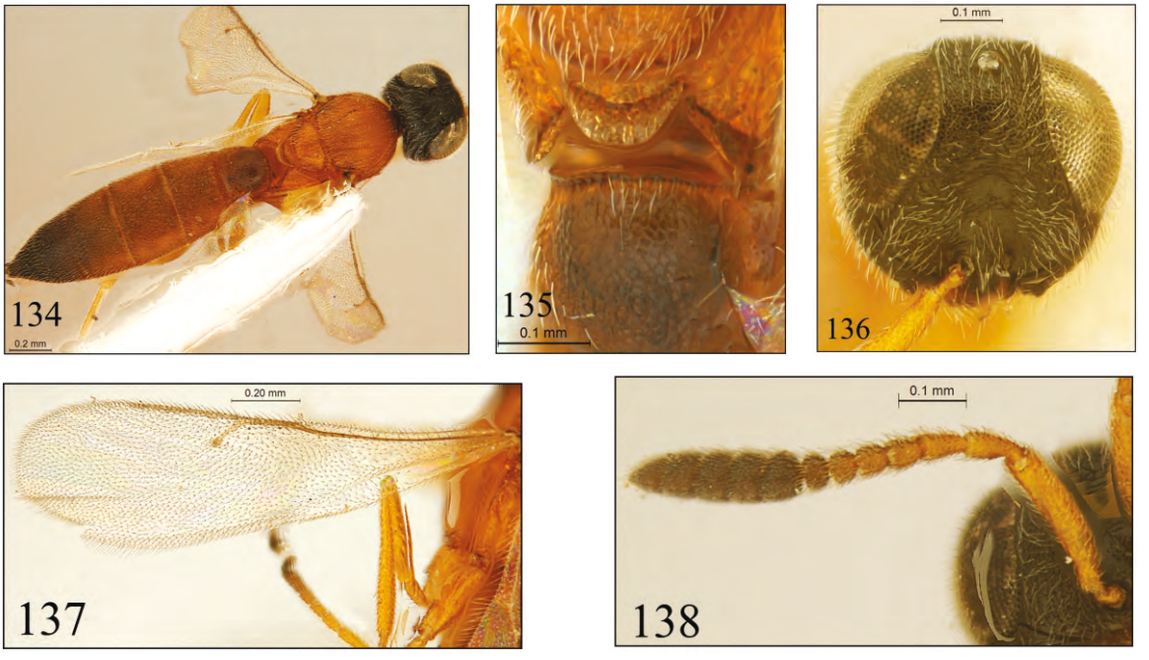


Figs. 121-125. *Idris keethami* Mukerjee (Female)
121. Body-profile **122.** Head- front view
123. Antenna **124.** Metasoma-dorsal view
125. Mesosoma-dorsal view

PLATE-XIV

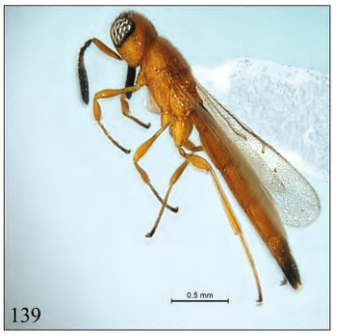


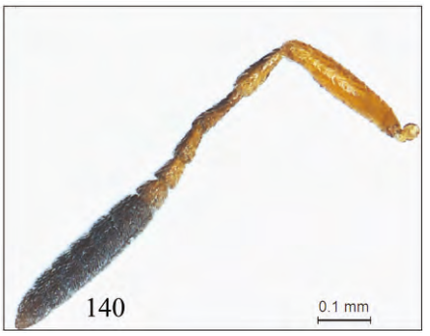
Figs. 126. Male antenna *Idris nuperus* sp. nov.
127-133. Idris nuperus sp. nov. (Female)
127. Body-profile **128.** Head and Mesosoma-Profile
129. Head. Front view **130.** Body-dorsal view
131. Mesosoma-dorsal view **132.** Forewing venation
133. Antenna



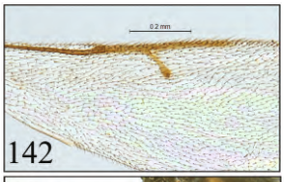
Figs. 134-138. *Leptoteleia rustica* sp. nov. (Female)
134. Body-dorsal view **135.** Metascutellum and T1 **136.** Head- front view
137. Forewing venation **138.** Antenna

PLATE-XV

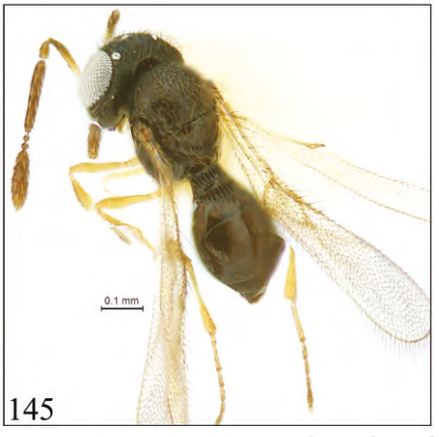




Figs. 139-140. *Macroteleia indica* Sharma (Female)
139. Body-profile **140.** Antenna



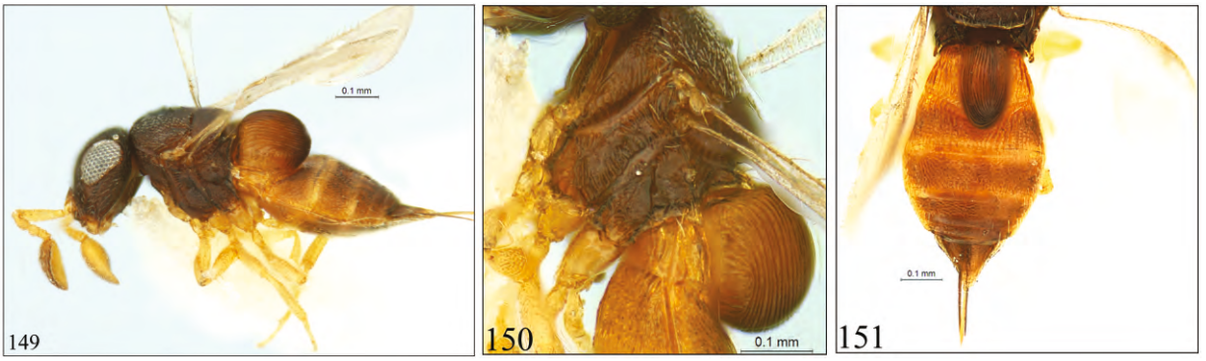
Figs. 141-144. *Macroteleia lamba* Saraswat (Female)
141. Body-dorsal view **142.** Forewing venation
143. Antenna **144.** Mesosoma-dorsal view



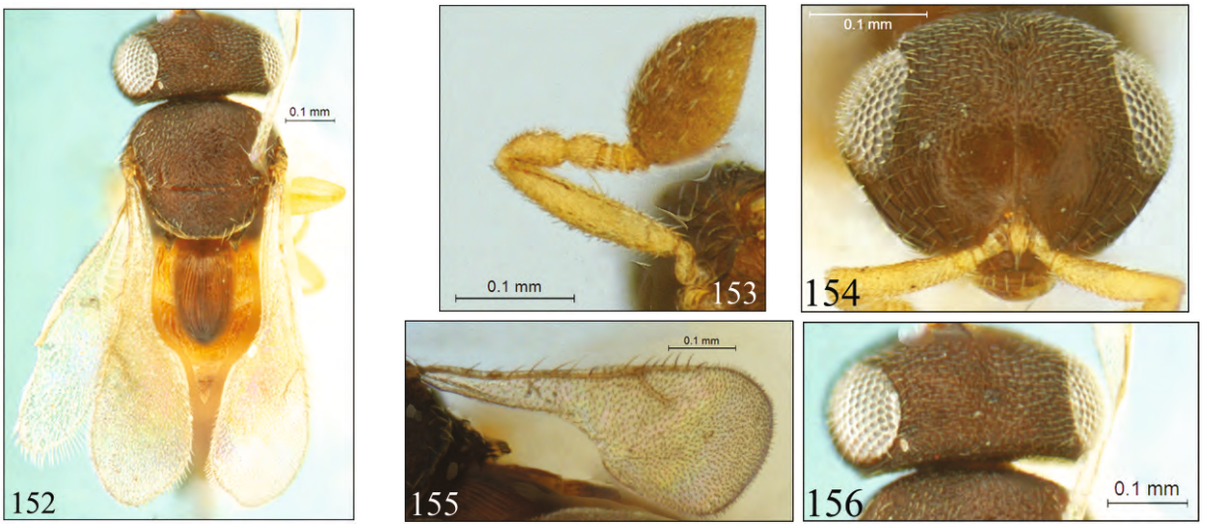
Figs. 145-146. *Microthoron baeoides* Masner (Female)
145. Body-dorsal view. **146.** Antenna

Figs. 147-148. *Microthoron miricornis* Masner (Female)
147. Body-profile **148.** Antenna

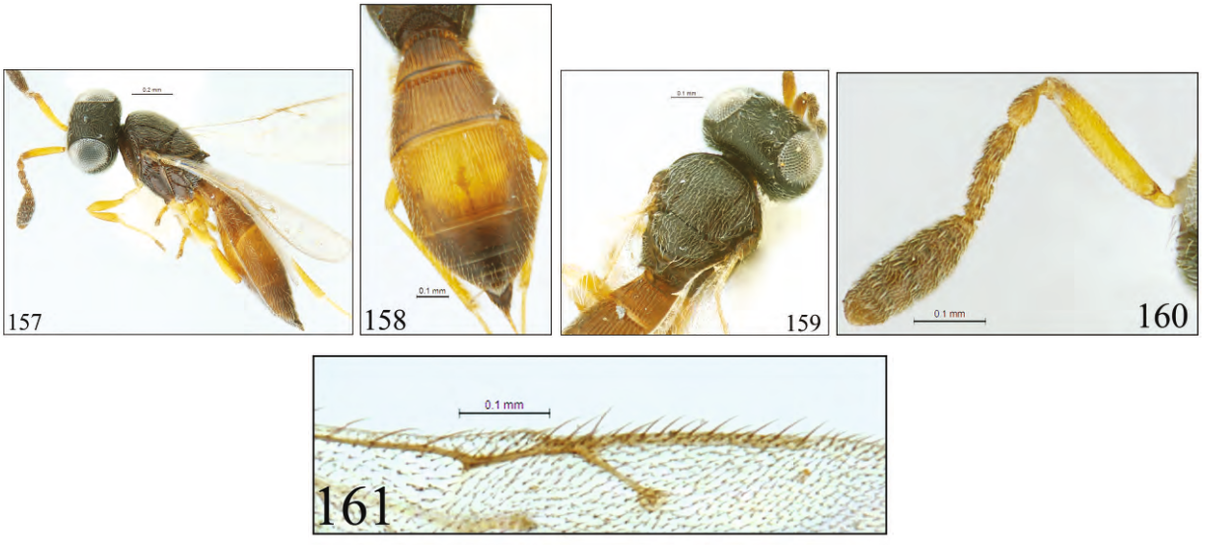
PLATE-XVI



Figs. 149-151. *Neoceratobaeus gibbus* sp. nov. (Female)
149. Body -profile **150.** Mesosoma and T1 –profile **151.** Metasoma –dorsal view



Figs. 152-156. *Neoceratobaeus gibbus* sp. nov. (Female)
152. Body-dorsal view **153.** Antenna
154. Head-front view **155.** Forewing **156.** Head-dorsal view



Figs. 157-161. *Opisthacantha dunensis* Mukerjee (Female)
157. Body-profile **158.** Metasoma–dorsal view
159. Head and mesosoma –profile **160.** Antenna **161.** Forewing venation