

## ON SOME ASILIDAE (DIPTERA) FROM INDIA

By

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### ABSTRACT

This paper provides information on the distribution of 32 species of Asilidae representing 19 genera collected in India by various survey parties. Of these, 13 species are described as new, viz., *Maira indiana*, *Microstylum marudamalaiensis*, *Xenomyza dentata*, *X. himalayaensis*, *Michotamia pruthii*, *Ommatius dubius*, *O. gopalpurensis*, *Astochia muralidharani*, *A. pseudoguptai*, *Heligmoneura himalayana*, *H. ladakhensis*, *Machimus pseudonicobarensis*, and *Neoitamus dhenkundensis*.

### INTRODUCTION

Over years asilid specimens collected by the various faunistic survey parties were deposited in the National Zoological Collection, Calcutta. The present paper deals with these specimens plus one provided on loan by Mr. K. G. V. Smith of the British Museum (Natural History), London, where new species have been described. The types have been deposited in the collection of the Zoological Survey of India in Calcutta, with one exception (*Ommatius dubius* n. sp.) which is deposited in the British Museum (Natural History), London. The arrangement of genera followed in this paper is based on that given in 'A Review of the Asilidae (Diptera) from the Oriental Region' by Joseph and Parui (1984).

### Leptogaster Meigon

#### 1. *Leptogaster cheriani* Bromley

*Leptogaster cheriani* Bromley, 1938, *Indian J. agric. Sci.* 8 : 863 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 280.

*Material examined* : 4♂, 2♀ Tamil Nadu : Coimbatore District : Agricultural University Compound, 1. i. 1976. coll. Joseph and Parui.

*Remarks* : This species has been previously recorded only from Tamil Nadu.

### Laxenecera Macquart

#### 2. *Laxenecera albibarbis* Macquart

*Laxenecera albibarbis* Macquart, 1838, *Dipt. exot.* 1(2) : 195 ; Joseph and Parui, 1948, *Oriental Ins.* 17 : 297.

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*Material examined*: 1 ♂, 30. ix. 1955, coll. Nayar; 1 ♀, 29. viii. 1960, coll. Sharda; 1 ♀, 23. x. 1960, coll. Ghatak; 1 ♀, 5. viii. 1961, coll. Sarojk; 1 ♂, 16. vi. 1962, coll. Girish; 1 ♂, 30. viii. 1962, coll. A. Seth; 1 ♂, 20. x. 1962, coll. Sharda; 1 ♂, 4. ix. 1968, coll. Sharda; all collected on the Delhi University Campus.

*Remarks*: It has been previously recorded from West Bengal, Bihar, Uttar Pradesh and Maharashtra.

### Maira Schiner

#### 3. *Maira indiana* n. sp.

(Fig. 1)

A medium sized black species with dorsum of thorax and abdomen shining metallic blue, legs black with shining metallic blue femora, wings dark brown. Male: length 18 mm, wing 14 mm.

♂. *Head* broader than thorax, black with greyish-yellow and grey tomentum; mystax pale yellow with a few black bristles above; fronto-orbital plate with black and pale yellow hairs, ocellar hairs black, postcranium sparsely tomentose with golden yellow hairs below and with both black and golden yellow hairs above, some of the black well developed and forming bristles. Antennae black with black bristles on segments 1 and 2, segment 1 about one-and-a-half times length of 2, segment 3 about one-and-a-half times the combined length of segments 1 and 2. Palpi and proboscis black with golden yellow hairs, the former also with a few black hairs.

*Thorax* black, shining metallic blue dorsally; pronotum black, golden yellow haired; mediolongitudinal stripe of mesonotum indistinct, tomentum more or less confined to the sides, hairs black except for a few

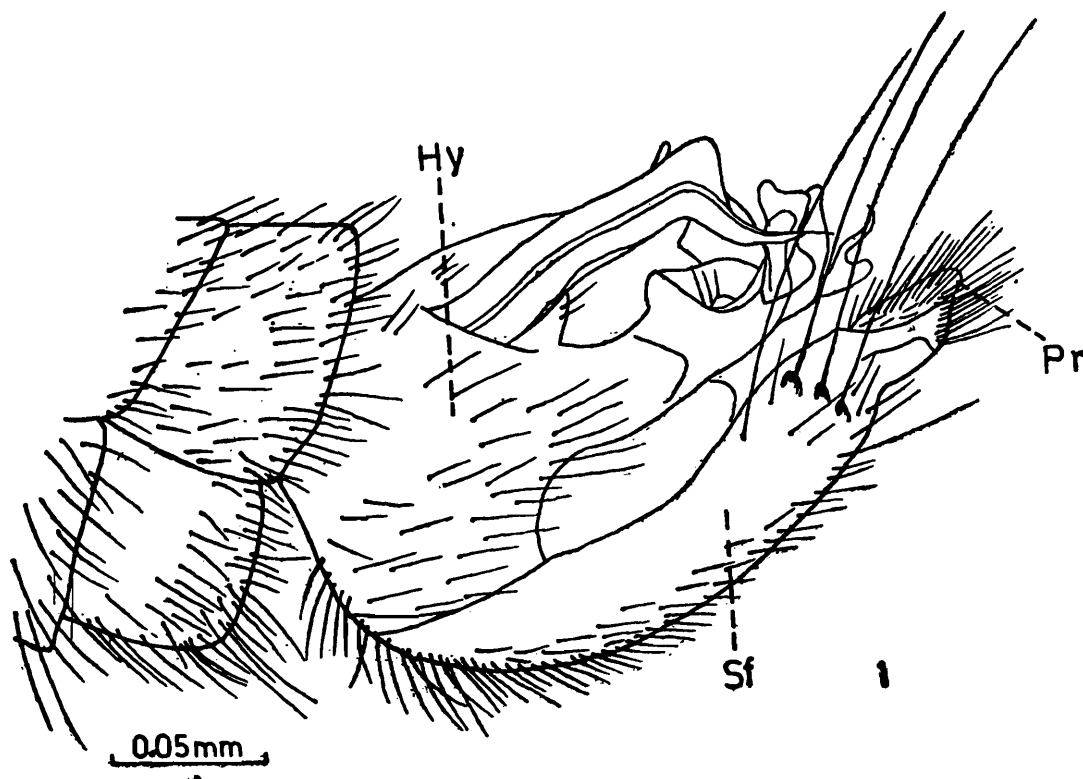


Fig. 1. *Maira indiana* n. sp., lateral view of male genitalia.

anterolateral pale yellow ones, bristles black ; scutellum with disc black haired, hind border with elongate black and pale yellow hairs ; mtauleuron with golden yellow and black bristles. Halteres yellowish-brown.

*Legs* black, femora shining metallic blue ; fore and mid femora and tibia bearing dense, elongate hairs, hairs predominantly golden yellow with some black hairs intermixed, distal half of fore tibia anteriorly and basal two or three tarsal segments, both anteriorly and ventrally, bearing a mat of golden yellow pubescence, on middle tarsi golden yellow mat confined to ventral surface, on hind leg the golden yellow mat present posteriorly and ventrally at the apex of tibia and tarsal segments, hairs mixed black and golden yellow.

*Wings* dark brown, slightly lighter basally, hyaline area present in anal cell and axillary cell.

*Abdomen* shining metallic blue dorsally, tergites 1-4 with golden yellow hairs laterally and posteriorly, lateral hairs long, remaining hairs black. Male genitalia (Fig. 1) black and yellowish-brown, hairs black and pale yellow.

This beautiful fly can be separated from all other *Maira* in Southeast Asia on the basis of the structure of the male genitalia.

*Holotype* ♂, Reg. No. 7261/H6, India : NEFA (Arunachal Pradesh) : Maghi Basti (Lekhabali), 8.x.1966, coll. S. K. Tandon and party.

#### Cyrtopogon Loew

##### 4. *Cyrtopogon laphrides* Walker

*Cyrtopogon laphrides* Walker, 1851, *Insecta Saundersiana* 1 : 99 ; Joseph and Parui, 1948, *Oriental Ins.* 17 : 308.

*Material examined* : 1 ♂, 1 ♀, Simla, 3.x.1966, coll. Raman ; 1 ♂, North West Himalaya ; Dalhousie, 3.x.1968, coll. Sarla ; 1 ♂, Narkanda, 15.v.1971, coll. Gupta ; all in Himachal Pradesh.

*Remarks* : So far this species has been recorded only from Himachal Pradesh and Uttar Pradesh.

#### Microstylum Macquart

##### 5. *Microstylum marudamalaiensis* n. sp.

(Fig. 2)

A medium sized black species with black legs and brownish wings. Male ; length 19 mm, wing 12 mm.

♂. *Head* as broad as thorax, black, grey tomentose ; mystax black ; fronto-orbital plate with black hairs, ocellar bristles black, postcranium white haired below and black haired above, postocular bristles black. Antennal segments 1 and 2 black, with black bristles, segments 1 shorter than 2, segment 3 subequal in length to 1 and 2 combined, apical truncate microsegment with a small projection. Palpi and proboscis black, the former black haired while the latter pale yellow haired.

*Thorax* black, grey tomentose, pronotum pale yellow haired with usually three black bristles on either side ; mesonotum devoid of mediolongitudinal stripe, anterolaterally and posterolaterally it is dark brown with some pale yellow hairs, vestiture black, scutellar disc black haired, hind border with a pair of black bristles, metanotal collosity with a tuft of pale yellow hairs, pleura sparsely grey tomentose. Halteres pale yellow.

*Leg* black, except for basal half of hind tibia being comparatively lighter coloured; hairs and bristles intermixed black and white; mid tibia devoid of spur.

*Wings* brownish, but posterior half comparatively lighter coloured.

*Abdomen* black, tomentum indistinct, tergites 1 and 2 laterally with some long pale yellow hairs, remaining hairs intermixed black and pale yellow. Male genitalia (Fig. 2) black with pale yellow and black hairs, hypandrium distally bearing tuft of elongate hairs.

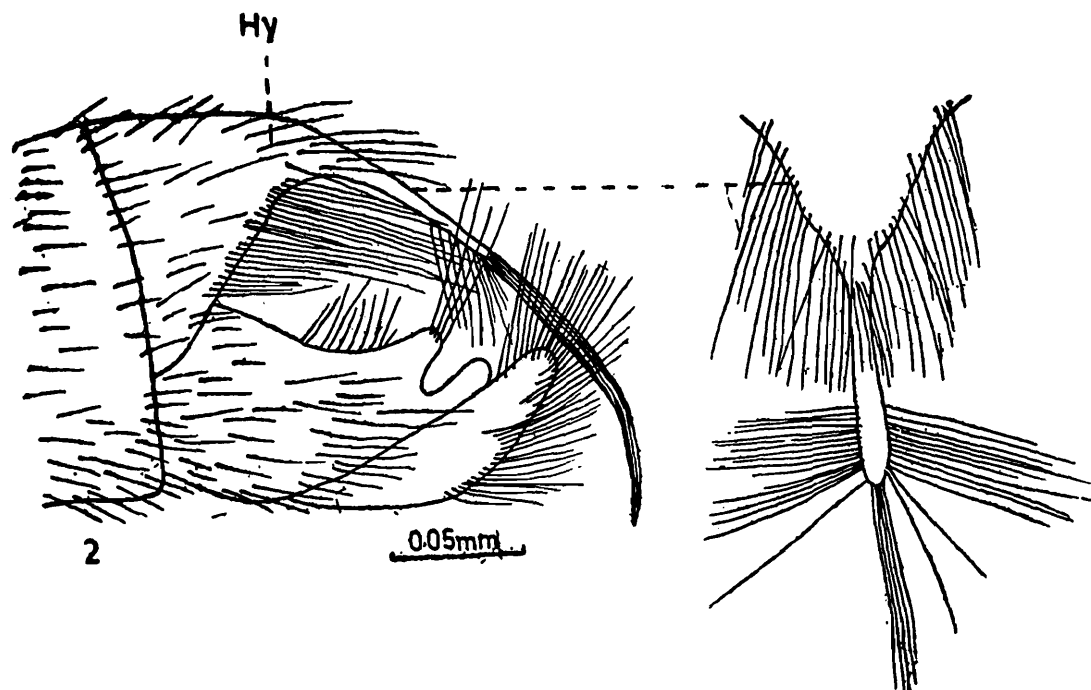


Fig. 2. *Microstylum marudamalaiensis* n. sp., lateral view of male genitalia.

The genus *Microstylum* is represented by fourteen species in India. Of these, the present species is most closely related to *M. bhattacharyai* Joseph and Parui based on the structure of the genitalia, but differs from that species in colour of mystax and legs and in the shape of hypandrium.

*Holotype* ♂, Reg. No. 7245/H6, South India: Coimbatore District: Marudamalai Hills, 549 m, x.1972, coll. P. S. Nathan.

### Saropogon Loew

#### 6. *Saropogon hulli* Joseph and Parui

*Saropogon hulli* Joseph and Parui, 1981, *Oriental Ins.* 15(1): 27-28; Joseph and Parui, 1984, *Ibid.* 17: 314.

*Material examined*: 1 ♂, 1 ♀, Kerala: Ernakulam District: Idamalaya, 18.xii.1978, coll. Joseph and Parui.

*Remarks*: The only other species in the genus described from India is *S. scalaris* Bigot (1878). The present authors described this second species from Kerala and Karnataka.

### Xenomyza Wiedemann

#### 7. *Xenomyza artigasi* Joseph and Parui

*Xenomyza artigasi* Joseph and Parui, 1984, *Ent. Scand.* 15: 447.

*Material examined*: 1 ♂, 1 ♀, Kerala; Ernakulam District: Idamalaya, 18.xii.1979, coll. Joseph and Parui.

*Remarks*: This is the second record from Kerala, the type locality.

8. *Xenomyza dentata* n. sp.

(Fig. 3)

A medium sized black species with yellowish-brown and black or dark brown legs and apically and anteriorly infuscated wings. Male : length 9 mm, wing 9 mm ; female : length 9 mm, wing 9 mm.

♂. *Head* broader than thorax, black infuscated with grey tomentum, mystax black ; fronto-orbital bristles and ocellar bristles black, postcranium black haired above, pale yellow haired and with a row of black hairs below. Antennae black, bristles

disc sparsely pale yellow haired, hind border with a row of long black bristles ; pleura greyish-yellow and grey tomentose. Halteres yellowish-brown, knobs dark brown.

*Legs* yellowish-brown and black ; coxa and trochanter black, femur black anteriorly on fore and middle legs and anteriorly as well as dorsally on hind legs, remainder of femur yellowish-brown, tibia yellowish-brown with black apex, the black colouration more extensive on hind tibia, tarsal segments yellowish-brown with black apex, hind legs larger in comparison with the others, trochanter swollen ventrally towards apex

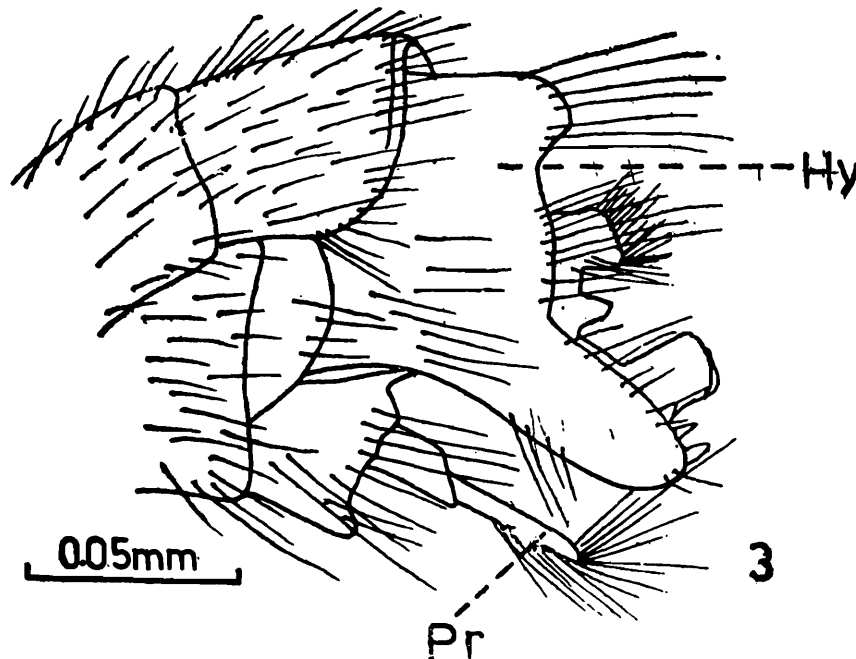


Fig. 3. *Xenomyza dentata* n. sp., lateral view of male genitalia.

of segments 1 and 2 black with an elongate one on the former, segment 2 globular and much longer than 1. Palpi and proboscis black, the former black and pale yellow haired, the latter nearly bare.

*Thorax* black with grey and greyish-yellow tomentum ; pronotum white haired, hairs dense laterally ; mesonotum medially black, hairs and bristles black, scutellar

which bears dense black bristles, femur on distal half bearing anteroventral and posteroventral row of bristles, hairs of legs black and pale yellow, bristles black.

*Wings* apically and at anterior border infuscated, otherwise hyaline.

*Abdomen* black, grey tomentose, tergites 1-3 laterally with long pale yellow hairs,

remaining hairs pale yellow and black. Male genitalia (Fig. 3) yellowish-brown, lower arm of hypandrium bearing three small projections.

♀ Similar to male; legs yellowish-brown to dark brown, genitalia black.

Members of the genus *Xenomyza* can only be differentiated on the basis of male genitalic structure, since other characters do not exhibit much variation. The species under consideration can be distinguished readily from all the other known regional species by the presence of tooth-like projections on the lower arm of hypandrium.

♂. *Head* broader than thorax, black infuscated with grey tomentum; mystax composed of a transverse row of three or four pale yellow and black bristles, fronto-orbital plate bare, ocellar bristles absent, postcranium grey tomentose with sparse white hairs below. Antennae black, bristles of segment 1 black, one of which is elongate, segment 2 lacking bristles, segment 1 shorter than 2, the latter globular. Palpi and proboscis black with pale yellow hairs.

*Thorax* black infuscated with grey tomentum; pronotum pale yellow haired, hairs dense laterally; mesonotum medially

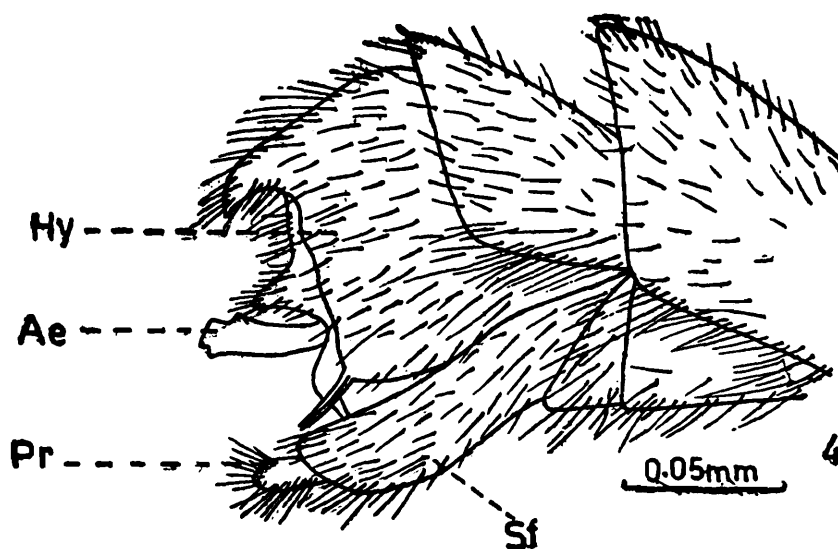


Fig. 4. *Xenomyza himalayaensis* n. sp., lateral view of male genitalia.

*Holotype* ♂, Reg. No. 7249/H6, India: Palni Hills, Kodaikanal, 2042-2134 m, viii. 1922, coll. S. Kemp. *Paratype* ♀, Reg. No. 7250/H6, lacking data.

9. *Xenomyza himalayaensis* n. sp.  
(Fig. 4)

A medium sized species with black thorax, yellowish-brown abdomen and legs, and brown wings. Male: length 10-11 mm, wing 9-10 mm.

black, dark brown anterolaterally and posterolaterally, medial hairs black, white on sides; scutellum sparsely pale yellow haired, hind border with a row of elongate pale yellow setae; pleura sparsely grey tomentose. Halteres pale yellow or yellowish-brown.

*Legs* uniformly yellowish-brown; hind leg larger in comparison with other legs, trochanter swollen ventrally at apex which bears dense pale yellow hairs, some of which

closely adhere and appear like a pair of bristles, femur swollen and at distal half with an anteroventral and posteroventral row of spiny bristles, in paratype posteroventral bristles few in number ; vestiture of legs pale yellow and black, bristles black.

*Wings* brown but gradually becoming light brown posteriorly.

*Abdomen* yellowish-brown, tergites 1-3 with lateral long pale yellow hairs, remaining hairs pale yellow. Male genitalia (Fig. 4) dark brown, hypandrium at the lower angle bearing a pair of spinous bristles.

Of the various known regional species of *Xenomyza*, it is most closely related to *X. artigasi* Joseph and Parui based on the male genitalia but otherwise it is quite distinct differing both in the colouration of legs and structural details of the male genitalia.

*Holotype* ♂, Reg. No. 7247/H6, Himalayas : Manali, 1829 m, 24.vi.1955, coll. V. K. Gupta (Prof. M. S. Mani, School of Entomology, Expedition Himalayas). *Paratype* ♂, Reg. No. 7248/H6, Dehra Dun, on grass, 31.vii.1913, presented by Forest Research Institute per G. Ricardo, 30.xi.1922, for Zool. coll.

### Cophinopoda Hull

#### 10. *Cophinopoda chinensis* (Fabricius)

*Asilus chinensis* Fabricius, 1794, *Ent. Syst.* 4 : 383.  
*Cophinopoda chinensis* : Oldroyd, 1975, *A Catalog of the Diptera of the Oriental Region* 2 : 129 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 326.

*Material examined* : 1 ♂, 1 ♀, Sikkim : Rangpo : Miming, 18.ix.1978, coll. A. N. T. Joseph. 1 ♂, 2 ♀, Assam : Garo Hills : Darugimi Forest Rest House, 16.v.1979, coll.

S. B. Ray. 2 ♂, Kerala : Trichur District : Valapad, 12.xii.1980, coll. A. N. T. Joseph. 1 ♂, Uttar Pradesh : Uttar Kashi District : Dharoti Village, Herseil, 9. ix. 1979, coll. S. K. Gupta.

*Remarks* : It is a cosmopolitan species. In India it has been recorded thus far from Bihar, Orissa and Tamil Nadu. These are the first records for Sikkim, Assam, Uttar Pradesh and Kerala.

### Michotamia Macquart

#### 11. *Michotamia fuscifemorata* Joseph and Parui

*Michotamia fuscifemorata* Joseph and Parui, 1984, *Rec. Zool. Surv. India Occ. Paper No.* 66 : 26.

*Material examined* : 1 ♀, Kerala : Idukki : Kumili, 13.xii.1979 ; 1 ♂, Trichur District : Chalakudi, 23.xii.1979 ; all collected by Joseph and Parui.

*Remarks* : This species was described by us from specimens collected in Kerala and Karnataka.

#### 12. *Michotamia pruthii* n. sp.

(Fig. 5)

A small black species with black and pale yellow legs and infuscated wings. Male : length 9 mm, wing 6 mm.

♂. *Head* broader than thorax, black with grey and greyish-yellow tomentum ; mystax pale yellow with a few black bristles above, fronto-orbital plate with a few black bristles, ocellar bristles black, postcranium pale yellow haired, postocular bristles black. Antennae with segments 1 and 2 yellowish-brown, 3 dark brown, bristles of segments 1 and 2 black, segment 2 slightly shorter than

1, segment 3 about twice the combined length of segments 1 and 2, style slightly longer than half of segment 3. Palpi dark brown with pale yellow hairs, proboscis black with white hairs.

*Thorax* black, grey tomentose ; pronotum with pale yellow hairs with a transverse row of black bristles, mesonotum damaged, black, hairs black with some pale yellow ones on anterolateral angles, bristles black ; scutellum with disc bearing sparse pale yellow hairs, hind border lacking bristles, pleura grey tomentose. Halteres pale yellow.

yellow hairs. Male genitalia (Fig. 5) black with concolourous and pale yellow hairs.

The genus *Michotamia* is represented thus far by five species in India, viz., *M. indiana* Joseph and Parui, *M. analis* Macquart, *M. aurata* (Fabricius), *M. fuscifemorata* Joseph and Parui and *M. macquarti* Joseph and Parui. Of these, the present species is closest to *M. fuscifemorata* Joseph and Parui in the shape of the superior forceps, but differing in having predominantly black legs, wholly black abdomen and deeply infuscated wings.

*Holotype* ♂, Reg. No. 7246/H6, Kumaun

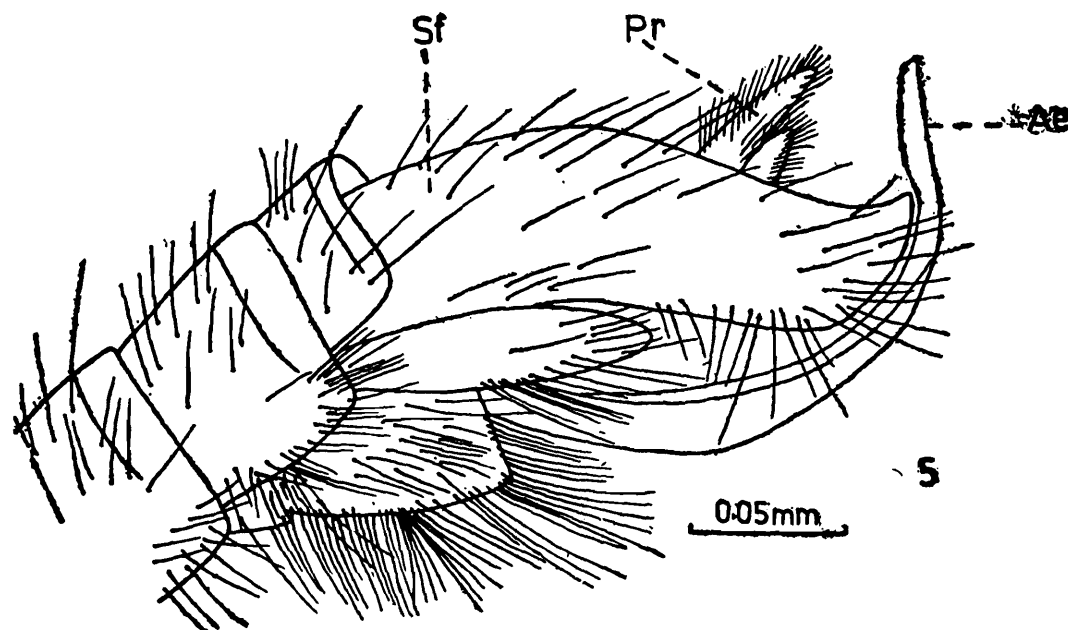


Fig. 5. *Michotamia pruthii* n. sp., lateral view of male genitalia.

*Legs* black and pale yellow ; coxa, trochanter, femur and tarsus black, fore and mid tibia pale yellow with black apex, hind tibia with the basal one-third pale yellow and the remaining two-thirds black, hairs pale yellow and black, bristles black.

*Wings* infuscated.

*Abdomen* black, tergite 1 laterally with a few pale yellow hairs and three or four black bristles, tergites 2 and 3 with some long pale

Hills ; Bhim Tal : grassy part of the dry bed of the lake, station 36, 1356 m, 17.v.1930, coll. H. S. Pruthi.

#### Ommatius Wiedemann

#### 13. *Ommatius dubius* n. sp.

(Fig. 6)

A medium sized black species with black, dark brown, yellowish-brown and pale yellow legs, infuscated wings and a trifid aedeagus. Male : length 12 mm, wing 9 mm.

♂. *Head* black with sparse grey and greyish-yellow tomentum ; mystax pale yellow with a few black bristles above ; fronto-orbital bristles and ocellar bristles black, postcranium above sparsely and below densely grey tomentose, postocular bristles black, postgena white haired. Antennal segments 1 and 2 yellowish-brown, segment 3 and style dark brown, segment 2 slightly shorter than 1, segment 3 attenuate, much longer than combined length of segments 1 and 2. Palpi and proboscis black, the former with black bristles, latter white haired.

*Legs* variable in colour ; coxa black, trochanter yellowish-brown to dark brown, femur yellowish-brown, tibia pale yellow but in hind leg posteriorly yellowish-brown, tarsus dark brown, hind tibia and basal two tarsal segments posteriorly with mat of golden yellow pubescence, vestiture mostly black with some pale yellow hairs, bristles black.

*Wings* infuscated.

*Abdomen* black, posterior border of tergites 2-4 dark brown and 5-7 with pale

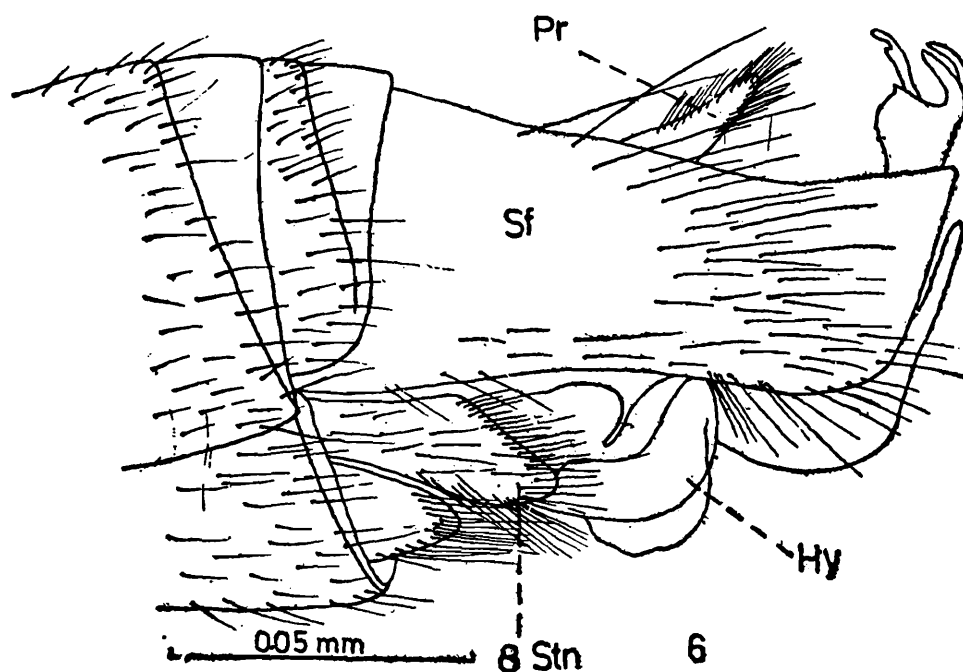


Fig. 6. *Ommatius dubius* n. sp., lateral view of male genitalia.

*Thorax* black with grey tomentum ; pronotum sparsely white haired with a transverse row of four black bristles ; mesonotum black but anterolaterally and posterolaterally dark brown, sparsely grey tomentose, mediolongitudinal stripe lacking ; scutellum damaged ; pleura sparsely grey tomentose, metapleuron with a transverse row of black bristles, hypopleuron bare. Halteres pale yellowish-brown.

yellow bands, posterolateral angles of tergite 1 with pale yellow and black bristles, hairs pale yellow and black. Male genitalia (Fig. 6) dark brown and yellowish-brown with black and pale yellow hairs, aedeagus trifid.

This species has a distinctive genitalia with trifid aedeagus (Fig. 6), which readily separates it from all the known regional members of the genus *Ommatius*. The long,

attenuate third antennal segment and the shape of the superior forceps are similar to those seen in *Michotamia* Macquart.

*Holotype* ♂, India, coll. T. R. Bell, British Museum, 1934-394, no other details.

14. *Ommatius gopalpurensis* n. sp.  
(Fig. 7)

A small black species with black and yellowish-brown legs, distally infuscated wings and clavate abdomen. Male: length 9-10 mm, wing 6-8 mm.

♂. *Head* black infuscated with greyish-yellow and grey tomentum; mystax black above, pale yellow below; fronto-orbital bristles and ocellar bristles black, postcranium above sparsely grey tomentose, below densely grey tomentose, hairs white, sparse above and dense below, postocular bristles black. Antennae including bristles black, segment 2 slightly shorter than 1, segments 3 and 1 subequal in length. Palpi and proboscis

black, the former black haired with a few pale yellow hairs, proboscis wholly white haired.

*Thorax* black with grey tomentum; pronotum sparsely white haired with a transverse row of four bristles, inner pair black and outer pair pale yellow; mesonotum lacking mediolongitudinal stripe, tomentum sparse and restricted to sides; scutellar disc sparsely white haired with a pair of black bristles on border; pleura grey tomentose, metapleuron and hypopleuron with a transverse row of black and pale yellow bristles. Halteres yellowish-brown.

*Legs* black and yellowish-brown; coxa, trochanter and femur black, tibia yellowish-brown, black apically, basitarsus yellowish-brown with black apex, rest of tarsal segments black or yellowish-brown and black, fore and mid femur ventrally with long white hairs, hind femur with anteroventral and posteroventral row of black spines, hairs intermixed black and white, bristles black.

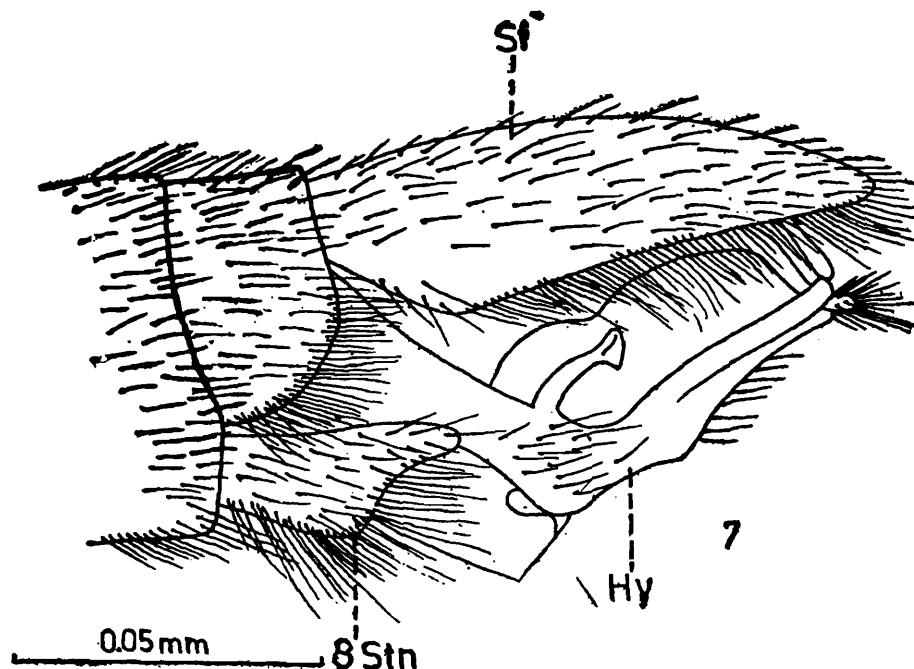


Fig.:7. *Ommatius gopalpurensis* n. sp., lateral view of male genitalia.

*Wings* infuscated but basally and medially hyaline, the infuscation deeper anteriorly.

*Abdomen* clavate, black with its sides yellowish-brown in holotype and grey in paratype, tergites 1 and 2 with some long white or pale yellow hairs on sides, hairs intermixed black and white. Male genitalia (Fig. 7) black with black and pale yellow hairs.

The male genitalia of *Ommatius gopalpurensis* n. sp. and *O. peregrinus* (Wulp) are similar in shape but they differ widely in structural details.

*Holotype* ♂, Reg. No. 7259/H6, India : W. Bengal : 24 Parganas : Gopalpur, 24.vi.1983, coll. P. Parui. *Paratype* ♂, Reg. No. 7260/H6, rest of data as in holotype.

#### 15. *Ommatius indicus* Joseph and Parui

*Ommatius indicus* Joseph and Parui, 1983, *Ent. Scand.* 14(1) : 86 ; Joseph and Parui, 1984, *Oriental Ins.*, 17 : 332.

*Material examined* : 2 ♀, Kerala : Idukki : Periyar, 900 m, 12.xii.1979, 2 ♂, 2 ♀, Ernakulam District : Malayattur, 16.xii.1979 ; 2 ♀, 2 ♀, Ernakulam District : Pandupara, 16.xii.1979 ; 8 ♂, 11 ♀, Ernakulam District : Idamalaya, 18.xii.1979 ; 3 ♂, 3 ♀, Trichur District : Anamalai Hills : Poringalkuth, 21.xii.1979 ; 2 ♂, 6 ♀, Trichur District : Chalakudy : Kannakuzhi, 22.xii.1979 ; all collected by Joseph and Parui.

*Remarks* : It has thus far been recorded only from Kerala and Karnataka.

#### 16. *Ommatius tuberculatus* Joseph and Parui

*Ommatius tuberculatus* Joseph and Parui, 1983, *Ent. Scand.* 14 (1) 87 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 336.

*Material examined* : 1 ♂, Kerala : Idukki : Periyar, 900 m, 12.xii.1979, coll. Joseph and Parui.

*Remarks* : This species has thus far been recorded only from Kerala and Tamil Nadu.

### Astochia Becker

#### 17. *Astochia muralidharani* n. sp.

(Fig. 8)

A medium sized black species with black and pale yellow legs and brownish wings. Male : length 19mm, wing 12mm.

♂. *Head* broader than thorax, black, dense greyish-yellow tomentose ; mystax white with black bristles above and laterally, fronto-orbital bristles and ocellar bristles black, postcranium white haired below, black haired above, postocular bristles black. Antennae black but base and apex of segment 2 and base of segment 3 yellowish-brown, bristles on segments 1 and 2 black, segment 2 slightly shorter than 1, segment 3 subequal to segments 1 and 2, style longer than segment 3. Palpi and proboscis black, the former pale yellow haired, the latter white haired.

*Thorax* black covered with grey tomentum, pronotum white haired with a transverse row of four black bristles ; mesonotum greasy, the presence of medio-longitudinal stripe cannot be ascertained, hairs black with some pale yellow ones laterally, bristles black ; scutellar disc black haired, hind border with a pair of black bristles, metapleuron and hypopleuron with a transverse row of long pale yellow bristles. Halteres pale yellow to yellowish-brown.

*Legs* black and pale yellow; coxa, trochanter, femur and tarsus black, fore and mid tibia anteriorly and ventrally black, the rest pale yellow, basal one-fourth of hind tibia yellowish-brown, the remainder black, fore tibia ventrally at apex with a brush of long black hairs, hind tibia at apex posteriorly and basitarsus posteriorly with adpressed golden yellow pubescence, hairs intermixed white and black, bristles black.

*Wings* brown, but medially light brown.

Of the known regional species in the genus, it is closer to *Astochia guptai* Joseph and Parui from which it can be readily distinguished by the presence of elongate apical hairs on the fore tibia, narrow and darker abdomen and by the shape of the superior forceps.

*Holotype* ♂, Reg. No. 7251/H6, India: Tripura: S. Tripura District: 1 km. east of Forest Rest House, 28.ix.1977, coll. N. Muralidharan.

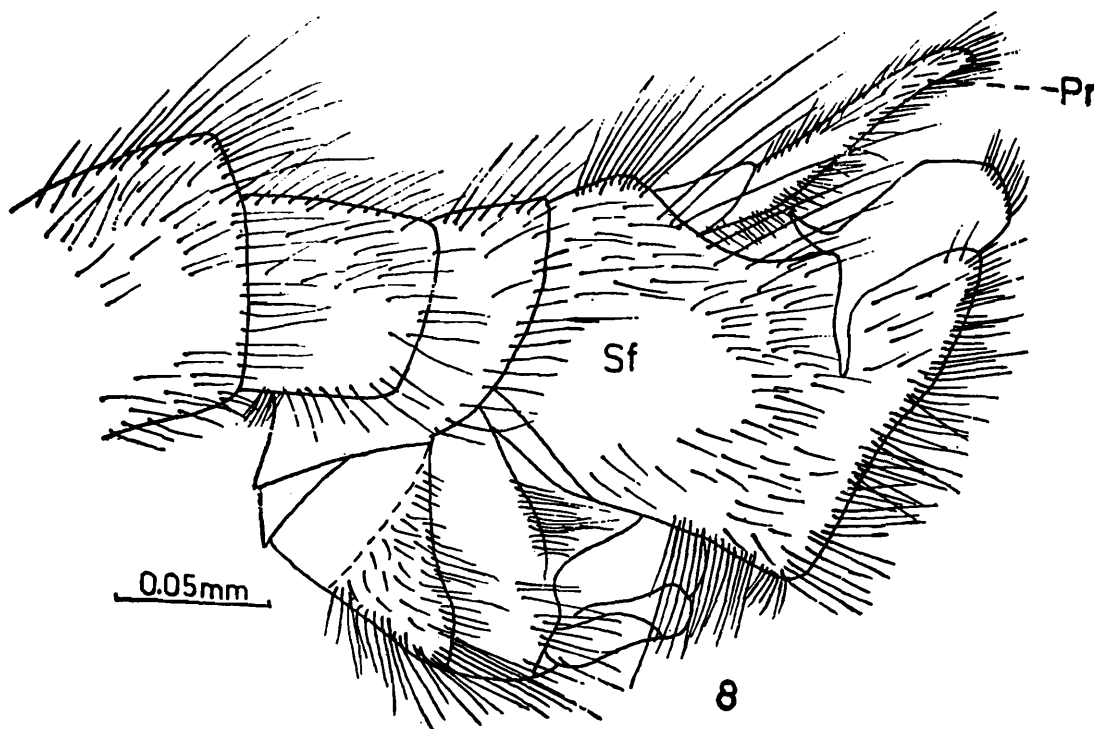


Fig. 8. *Astochia muralidharani* n. sp., lateral view of male genitalia.

*Abdomen* black with posterolateral angles of tergites infuscated with grey, the grey infuscation gradually decreasing in area from the anterior to posterior tergites, tergite 1 laterally with a brush of white hairs, a few of which form bristles, hairs black with some white ones laterally. Male genitalia (Fig. 8) black with black and white hairs.

#### 18. *Astochia pseudoguptai* n. sp.

(Fig. 9)

A medium sized black and grey species with dark brown and pale yellow legs and infuscated wings. Male: length 17 mm, wing 11 mm.

♂. *Head* broader than thorax, black, tomentum grey, sparse and restricted to

occiput ; mystax pale yellow, fronto-orbital plate with mostly black and a few yellowish-brown bristles, ocellar bristles black, postcranium with sparse black and white hairs above, white haired below, postocular bristles black and four on either side. Antennae black, yellowish-brown on base and apex of segment 2 and base and lower side of segment 3, bristles on segments 1 and 2 black, segment 2 slightly shorter than 1, segment 3 subequal to the combined length of segments 1 and 2, style slightly longer than segment 3. Palpi and proboscis black with pale yellow hairs.

black spots followed by another small black spot, hairs black ; scutellum densely grey tomentose, hairs on disc mostly white with some black ones, border with two black bristles ; pleura densely grey tomentose, metapleuron and hypopleuron each with elongate pale yellow hairs. Halteres with pale yellowish-brown knob and lighter coloured stalks.

*Legs* dark brown and pale yellow ; coxa, trochanter, femur and tarsus dark brown, tibia pale yellow with black apex, the black colouration more extensive on hind tibia

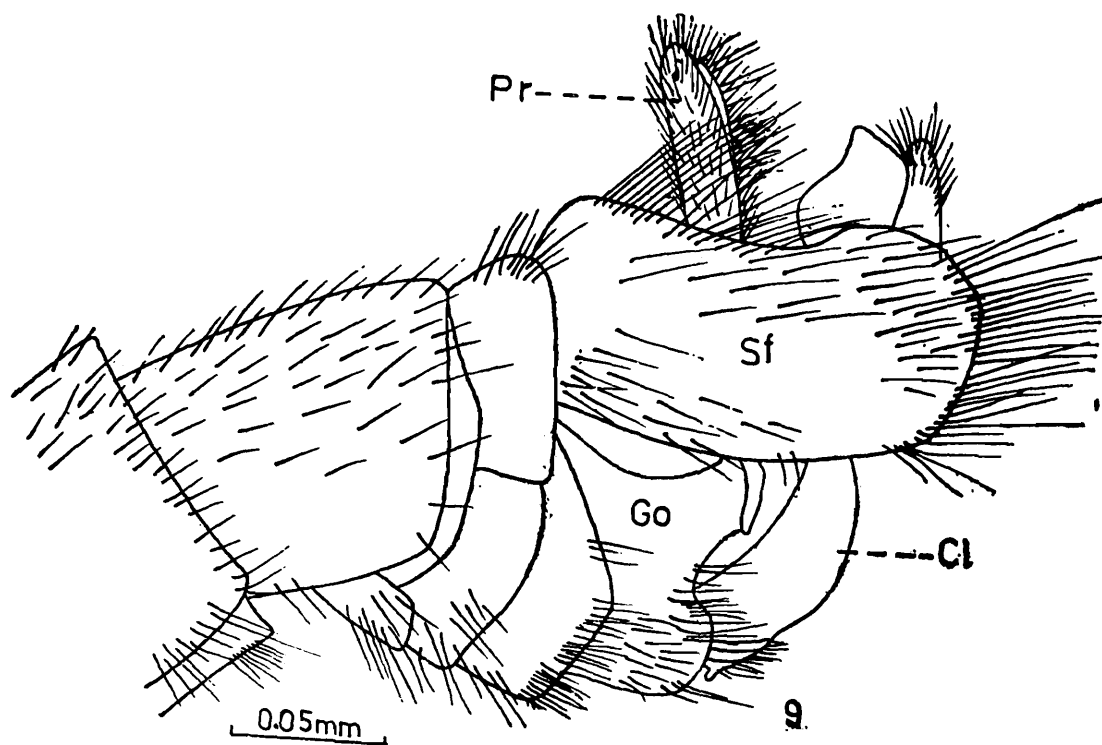


Fig. 9. *Astochia pseudoguptai* n. sp., lateral view of male genitalia.

*Thorax* black with grey tomentum ; pronotum pale yellow haired with a transverse row of four pale yellow bristles ; mesonotum with a mediolongitudinal slate grey stripe divided by a grey stripe, the stripe extending from the anterior border to well beyond the transverse suture, each side with two large

and hind basitarsus, distal part of hind tibia posteriorly with adpressed golden yellow pubescence, hairs intermixed white and black, bristles black.

*Wings* infuscated, but medially almost hyaline.

**Abdomen** black with a transverse grey band at posterior border of tergites, the grey border decreasing in area from anterior to posterior tergites, tergite 1 laterally with elongate white hairs amidst which present four black bristles, tergite 2 laterally with elongate white hairs, remaining hairs white. Male genitalia (Fig. 9) dark brown to black with intermixed black and white hairs.

It is closely allied to *Astochia guptai* Joseph and Parui from which it can be distinguished by the not so dense hairs on the sides of abdominal tergites 2 and 3 and the shape of superior forceps.

**Holotype** ♂, Reg. No. 7252/H6, Sikkim : Rangli, 810 m, 2.v. 1962. coll. S. Ali.

sparsely grey tomentose ; mystax with white or pale yellow bristles surrounded by black ones ; fronto-orbital bristles and ocellar bristles black, postcranium black haired above and white haired below, postocular bristles black. Antennal segment 3 missing, segments 1 and 2 black with black bristles, segment 2 slightly longer than half of preceding. Palpi and proboscis black, the former with pale yellow hairs, the latter white haired.

**Thorax** black, grey tomentose ; pronotum white haired with one black bristle on each side ; mesonotum with faint mediolongitudinal black stripe divided by a narrow black stripe, lateral spots indistinct, vestiture black

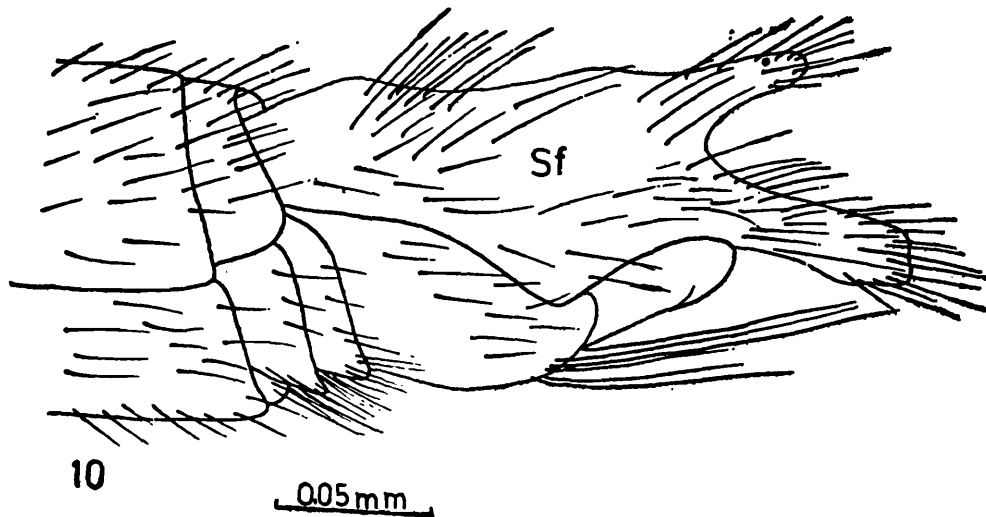


Fig. 10. *Heligmoneura himalayana* n. sp., lateral view of male genitalia.

### **Heligmoneura** Bigot

#### 19. *Heligmoneura himalayana* n. sp.

(Fig. 10)

A black species with black legs, black and pale yellow mystax and brownish wings. Male : length 17-19 mm, wing 11-13 mm.

♂. **Head** as broad as thorax, black,

with a few pale yellow hairs on anterolateral angles, bristles black ; scutellum black, sparsely grey tomentose, hairs of disc black, border with four black bristles. Halteres yellowish-brown.

**Legs** black, but tarsal segments dark brown ; fore femur densely haired, mid and hind femora with anteroventral row of white

bristles, in holotype an anterodorsal row of white bristles is present on the hind femur, hairs intermixed white and black.

*Wings* light brown.

*Abdomen* black with a transverse grey band on posterior border of tergite 1 and 2, and on both posterior and anterior borders of tergites 2 to 5, grey band indistinct in paratype, sides of tergite 1 with pale yellow hairs amidst which occur a row of black bristles, tergites 2 and 3 with long black hairs laterally, and a few black bristles posterolaterally, hairs black, with a few pale yellow ones intermixed. Male genitalia (Fig. 10) black with black and pale yellow hairs.

*Paratype* ♂, Reg. No. 7243/H6, India : U. P. : Mussoorie, 15.viii. 1971, coll, name indistinct.

20. *Heligmoneura ladakhensis* n. sp.

(Fig. 11)

A black species with yellowish-brown legs, white and black mystax and brownish wings. Male : length 12 mm, wing 8 mm.

♂. *Head* as broad as thorax, black, densely grey tomentose ; mystax with white bristles surrounded by black ones ; fronto-orbital bristles pale yellow, ocellar bristles black, postcranium pale yellow haired. Antennal segments 1 and 2 yellowish-brown with pale yellow bristles, segment 3 black, segment 2 shorter than 1, segment 3 slightly

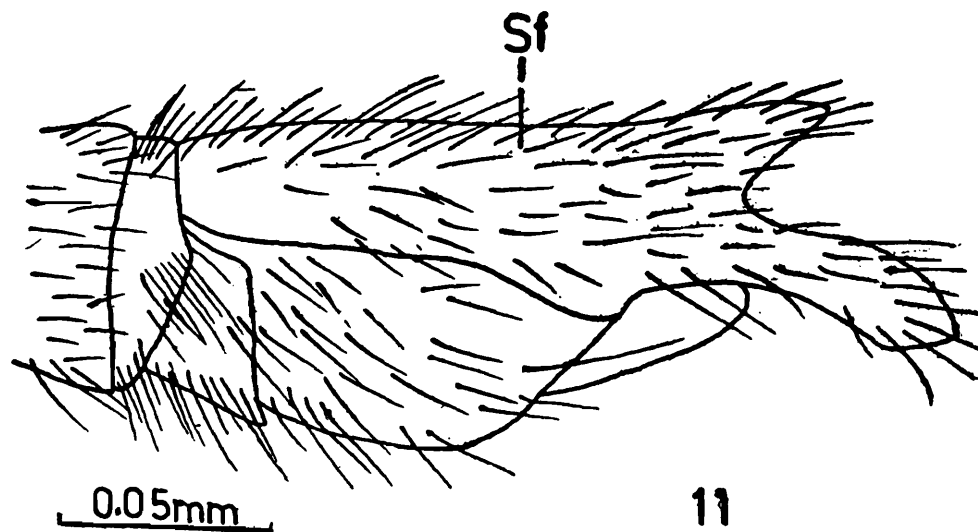


Fig. 11. *Heligmoneura ladakhensis* n. sp. ; lateral view of male genitalia.

In the key to Indian species of *Heligmoneura* (Joseph and Parui 1980), it would come under the couplet 13 and is somewhat similar to *H. gnava* (Wulp) from which it differs due to the slender abdomen, wholly black legs and quite distinct male genitalia.

*Holotype* ♂, Reg. No. 7242/H6, Himalaya : Mussoorie, 15.viii. 1968, coll. Renuka.

longer than 1+2 combined, style much shorter than segment 3. Palpi and proboscis black with white hairs.

*Thorax* black, grey tomentose ; pronotum white haired, mesonotum with a mediolongitudinal black stripe divided by a longitudinal grey stripe, the stripe extending from anterior border to midway between the transverse

suture and posterior border, hairs black with a few pale yellow ones on anterolateral angles, bristles black; scutellum with disc pale yellow haired and with five black and white bristles on posterior margin. Halteres pale yellow.

*Legs* yellowish-brown; mid and hind femora with anteroventral row of white bristles, hind femur also with a row of posteroventral long white bristles, hairs predominantly white with some black ones intermixed, bristles both white and black.

*Wings* light brown.

*Abdomen* black with posterior border of tergites grey tomentose, tergite 1 with a tuft of white hairs laterally, postero-lateral angles of tergites 2-4 with three pale yellow bristles, hairs pale yellow and black. Male genitalia (Fig. 11) black with pale yellow hairs.

Of the various known regional species of *Heligmoneura*, the species under consideration is nearest to *H. himalayana* n. sp. from which it differs by its smaller size, yellowish-brown legs and the specific difference in the shape of superior forceps.

*Holotype* ♂, Reg. No. 7244/H6, Kashmir; Ladakh: Drass, 3900 m, 12.vi.1973, coll. Girish (No. G. 35).

## 21. *Heligmoneura poonmudiensis*

Joseph and Parui

*Heligmoneura poonmudiensis* Joseph and Parui, 1980, *Ent. Scand.* 11(3): 287; 1984, *Oriental Ins.* 17: 351.

*Material examined*: 1 ♂, Kerala: Ernakulam District: Idamalaya, 18.xii.1979, coll. Joseph and Parui.

*Remarks*: This is only the second record of this species from the type locality. It has not been recorded elsewhere.

## *Machimus* Loew

### 22. *Machimus angularis* (Ricardo)

*Tolmerus angularis* Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) 10: 64-

*Machimus angularis*: Oldroyd 1975, *A Catalog of Diptera of the Oriental Region*, 2: 144; Joseph and Parui, 1984, *Oriental Ins.* 17: 354.

*Material examined*: 1 ♂, Himachal Pradesh: Simla, 3.x.1966, coll. Ram; 2 ♂, Uttar Pradesh: Mussoorie, 17.vi.1967, coll. Gupta; 1 ♂, Uttar Pradesh: Mussoorie, 2100 m, 20.x.1972, coll. Khanna; 3 ♂, 21.x.1972; 6 ♂, 4 ♀, 22.x.1972; 1 ♂, 2 ♀, 23.x.1972 and 2 ♂, 2 ♀, 25.x.1972, other details as in preceding; 1 ♂, Uttar Pradesh: Kumaon Hills: Dhakuri, 2621 m, 29.xi.1973, coll. Gupta.

*Remarks*: So far the species has only been recorded from Uttar Pradesh. This is the first record for Himachal Pradesh.

### 23. *Machimus inutilis* Bromley

*Machimus inutilis* Bromley, 1935, *Rec. Indian Mus.* 27: 222; Joseph and Parui, 1984, *Oriental Ins.* 17: 355.

*Material examined*: 1 ♂, Himachal Pradesh: Manali, 1828 m, 13.v.1970, coll. M. Gupta; 1 ♂, Himachal Pradesh: Dhenkund, 2743 m, 5.v.1971.

*Remarks*: Thus far this species has been collected only in Himachal Pradesh.

24. *Machimus pseudonicobarensis* n. sp.

(Fig. 12)

A rather large black species with black legs, infuscated wings and eighth sternite not produced. Male : length 20 mm, wing 14 mm.

♂ : *Head* narrower than thorax, black, grey tomentose ; *mystax* black with some pale yellow bristles below, *fronto-orbital* bristles and *ocellar* bristles black, *postcranium* pale yellow and black haired above, with some black hairs just below it, and the remaining almost bare, *postocular* bristles black, *postgena* densely white haired. *Antennae*

white, sparse : *mesonotum* with a broad, black mediolongitudinal stripe divided by a medium stripe, the stripe extending from anterior margin to well beyond the transverse suture, sides with three black spots in a longitudinal row, hairs and bristles black ; *scutellum* black haired with a few pale yellow ones laterally, posterior border with five black bristles ; *metapleuron* and *hypopleuron* each with a transverse row of black bristles, black on the former and black and pale yellow on the latter. *Halteres* whitish.

*Legs* black ; fore femur with five long

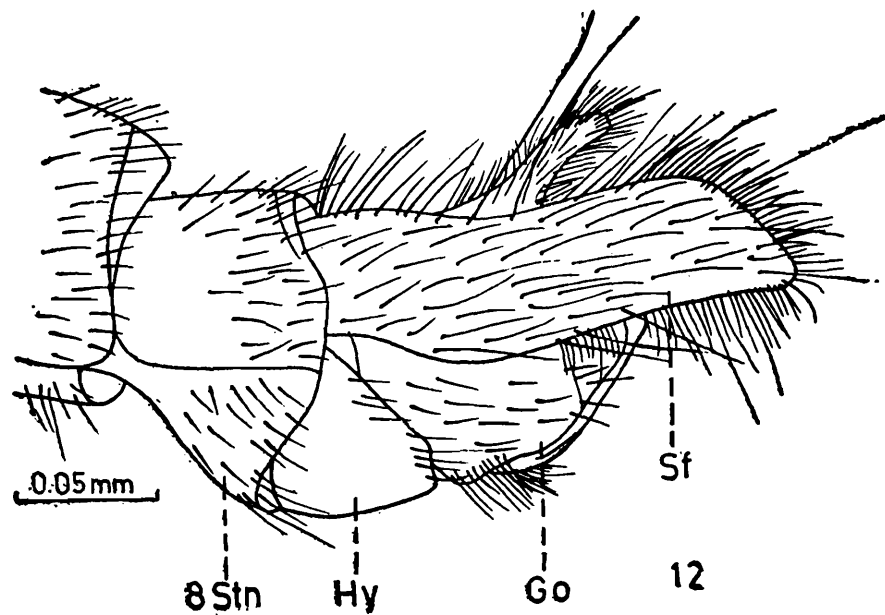


Fig. 12. *Machimus pseudonicobarensis* n. sp., lateral view of male genitalia.

black, segments 1 and 2 bearing black bristles, segment 2 about two-thirds the length of 1, style subequal to segment 3. Palpi and proboscis black, the former black haired, the latter white haired.

*Thorax* black with grey and greyish-yellow tomentum ; pronotum with a median transverse row of black bristles, some black hairs present on posterolateral angles, vestiture

black hairs ventrally on the basal half, mid femur with an anteroventral row of bristles from base to middle, hind femur with anterodorsal, anteroventral and posteroventral rows of bristles extending well beyond the middle, on hind leg distal part of tibia and whole of basitarsus posteriorly with adpressed golden yellow pubescence, hairs black and pale yellow.

*Wings* infuscated but medially and basally almost hyaline.

*Abdomen* black and grey, tergite 1 grey, 2-4 laterally and posteriorly grey with a median black spot, 5-8 laterally grey and medially black, tergite 1 laterally with a tuft of pale yellow intermixed with black bristles, tergites 2-4 laterally with some pale yellow and black bristles in a row, hairs black. Male genitalia (Fig. 12) black with concolourous hairs, eighth sternite neither produced nor bearing dense bristles.

It is closely allied to *Machimns nicobarensis* (Schiner) from Nicobar from which it differs in its larger size and lack of dense hairs on eighth sternite.

*Holotype* ♂, Reg. No. 7262/H6, India: Himachal Pradesh: Dhenkund, (trap), 2743 m, 5, viii. 1971, coll. name not given.

### Neoitamus Osten-Sacken

#### 25. *Neoitamus dhenkunde* n. sp.

(Fig. 13)

A medium sized black species with black and pale yellow legs and apically infuscated wings. Male: length 13 mm, wing 9 mm; female: length 16-21 mm, wing 11-13 mm.

♂. *Head* as broad as thorax, black, grey tomentose; mystax white surrounded by black bristles; fronto-orbital bristles and ocellar bristles black, postcranium bare above, with black and pale yellow bristles below. Antennae black with base and apex of segment 2 and base of segment 3 yellowish-brown, bristles on segments 1 and 2 black, segment 2 at least one and-a-half times that of 1, segment 3 subequal to segments 1 and 2. Palpi and proboscis black, the former

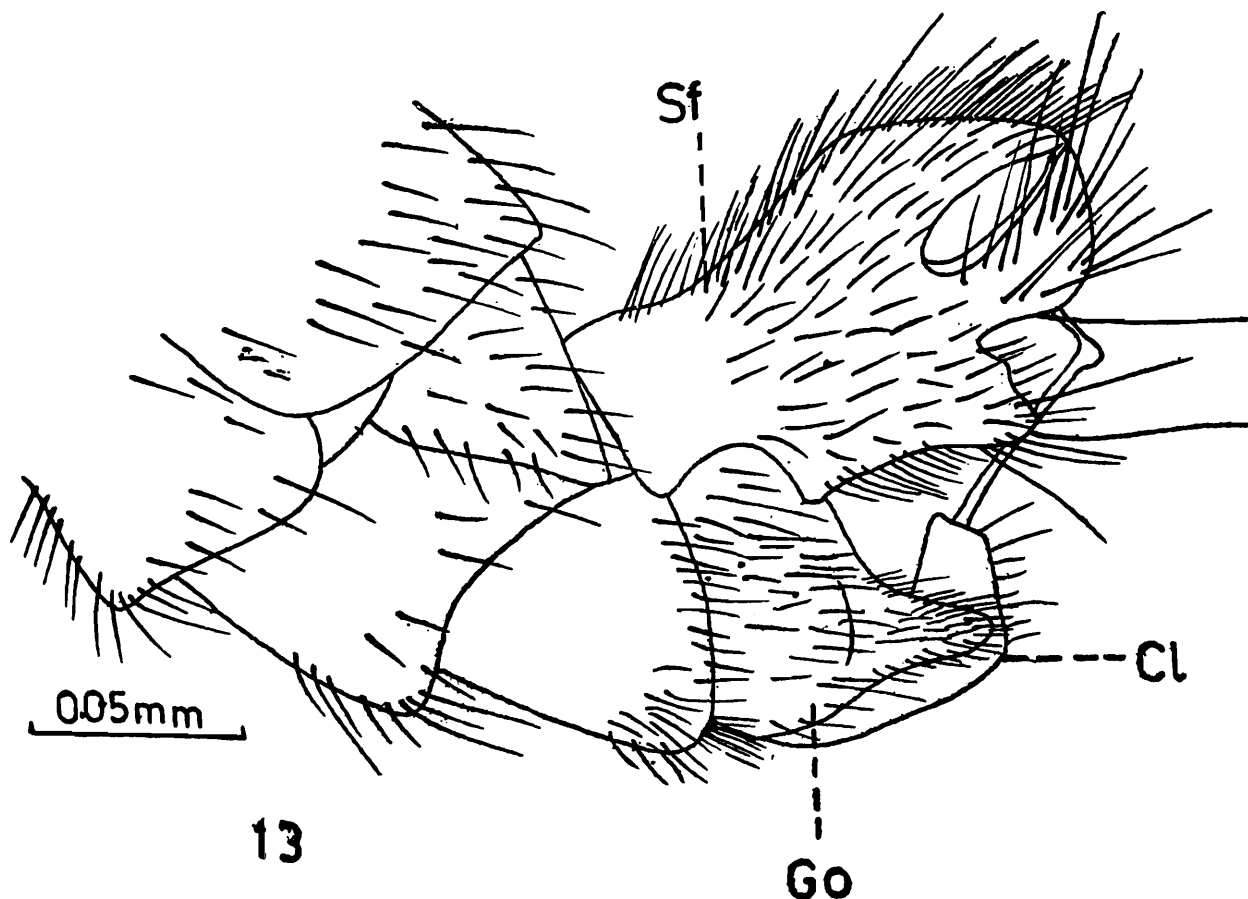


Fig. 13. *Neoitamus dhenkundensis* n. sp., lateral view of male genitalia.

with black and some pale yellow hairs, the latter pale yellow haired.

*Thorax* black, grey tomentose; pronotum pale yellow haired, medially with a transverse row of pale yellow bristles; mesonotum with a faintly marked medilongitudinal black stripe divided by a grey line, the stripe extending from anterior margin to midway between the transverse suture and the posterior border, hairs black with some pale yellow ones on posterolateral angles, bristles black; scutellar disc black and pale yellow haired, border bearing a pair of black bristles; pleura grey tomentose, metapleuron with a brush of elongate white hairs. Halteres whitish.

*Legs* black and pale yellow; coxa, trochanter and femur black, tibia pale yellow with black apex, tarsus pale yellow but apex of segments of hind leg dark brown; fore and mid femora with black bristles ventrally from base to middle, hind femur with a posteroventral row of white bristles, hairs and bristles both black and white.

*Wings* apically infuscated extending posteriorly into the fifth posterior cell.

*Ahdomen* black, grey infuscated, tergite 1 laterally with a few elongate hairs, hairs both black and pale yellow. Male genitalia (Fig. 13) black and yellowish-brown with mostly black and a few pale yellow hairs.

♀. Similar to male but with the following differences: some specimens comparatively darker in which case mystax with a pair of pale yellow bristles or wholly black; antennae in one paratype completely black; black colouration of tibia more extensive in some paratypes.

It is closely allied to *Neoitamus barsilensis* Joseph and Parui from which it differs in the shape of superior forceps and gonopod.

*Holotype* ♂, Reg. No. 7253/H6, India: Himachal Pradesh: Dhenkund (trap), 2743 m, v-vi.1971, coll. name not given. *Paratypes* 5 ♀, Reg. No. 7254/H6 to 7258/H6, details as in holotype.

### *Neomochtherus* Osten Sacken

#### 26. *Neomochtherus gnavus* (Van der Wulp)

*Mochtherus gnavus* van der Wulp, 1872, *Tijdschr. Ent.* 15: 243.

*Neomochtherus gnavus*: Oldroyd, 1975, *A Catalog of Diptera of the Oriental Region* 2: 148; Joseph and Parui, 1984, *Oriental Ins.* 17: 358.

*Material examined*: 13 ♂, 5 ♀, Sikkim: Rangpo: Duga, 400 m, 16.x.1978. coll. Joseph and Parui.

*Remarks*: This is a widely distributed species in the Oriental Region. In India it has been reported from Assam, Arunachal Pradesh and Uttar Pradesh. This is the first record for Sikkim.

### *Orophotus* Backer

#### 27. *Orophotus montanus* (Ricardo)

*Asilus montanus* Ricardo, 1922, *Anu. Mag. nat. Hist.* (9) 10: 47.

*Orophotus montanus*: Oldroyd, 1975, *A Catalog of Diptera of the Oriental Region* 2: 148; Joseph and Parui, 1984, *Oriental Ins.* 17: 36.

*Material examined*: 1 ♂, Uttar Pradesh: Almora District: Kausani, 1.vi.1930, coll. H. S. Pruthi.

*Remarks*: The species was described from Assam. The Z.S.I. collection contains specimens from West Bengal. It is recorded here for the first time from Uttar Pradesh.

**Philodicus Loew****28. Philodicus femoralis Ricardo**

*Philodicus femoralis* Ricardo, 1921, *Ann. Mag. nat. Hist.* (9) 8 : 190 ; Joseph and Parui, 1984 *Oriental Ins.* 17 : 361.

*Material examined* : 1 ♂, Goa : Mercus, 24.iii.1966 ; 1 ♂, Margoa, 11.iv.1966 ; 1 ♀, Velury : Valpoi, 13.iv.1966 ; and 1 ♂, Margoa : Fatonda, 21.iv.1966 ; all collected by Pradhan and Party. 6 ♂, 2 ♀, Kerala : Trichur District : Chalakudy, 12.xii.1980, coll. A.N.T. Joseph.

*Remarks* : The species has been collected in Meghalaya, Arunachal Pradesh, West Bengal, Bihar and Uttar Pradesh. These are the first records for Goa and Kerala.

**29. Philodicus javanus (Wiedemann)**

*Asilus javanus* Wiedemann, 1819, *Zool. Mag.* (Wied.) 1 (3) : 32.

*Philodicus javanus* : Oldroyd, 1975, *A Catalog of Diptera of the Oriental Region 2* : 149 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 362.

*Material examined* : 1 ♂, Himachal Pradesh : Kufri, 2500 m, 12.ix.1969 ; and 1 ♂, Solan : Saprion, 1450 m, 31.ix.1969 ; all collected by G. S. Arora. 2 ♂, 1 ♀, Uttar Pradesh : Garhwal District : Sirar Village, 1372 m, 6.ix.1979 ; and 1 ♀, Hersil, 2438 m ; all collected by S. K. Gupta.

*Remarks* : This species was previously recorded from Sikkim, Assam, Arunachal Pradesh, West Bengal, Bihar, Uttar Pradesh, Tamil Nadu and Karnataka. It is recorded here for first time from Himachal Pradesh.

**Promachus Loew****30. Promachus duvaucelii (Maquart)**

*Trupanea duvaucelii* Macquart, 1838, *Dipt. exot.* 1 (2) : 97.

*Promachus duvaucelii* : Oldroyd, 1975, *A Catalog of Diptera of the Oriental Region 2* : 152 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 366.

*Material examined* : 1 ♀, 25.viii.1960, coll. N. Viswani ; 1 ♀, 21.vii.1961, coll. Saxena ; 1 ♀, 2.ix.1962, coll. P. Seth ; 1 ♀, 9.ix.1962, coll. K. B. ; 1 ♂, ix.1962, coll. Gupta ; and 1 ♀, 2.ii.1963, coll. S. Mohla ; all collected on Delhi University Campus. 2 ♀, Uttar Pradesh : Chaukettia, 2000 m, 17.viii.1973, coll. Neelam. 2 ♀, Delhi : Ridge. 30.viii.1975, coll. Mohan.

*Remarks* : Records are available for West Bengal, Uttar Pradesh, Madhya Pradesh, Punjab, Gujarat, Delhi, Karnataka, and Tamil Nadu.

**31. Promachus genitalis Joseph and Parui**

*Promachus genitalis* Joseph and Parui, *Bull. Zool. Surv. India.* (In press).

*Material examined* : 2 ♂, Madhya Pradesh : Jabalpur, 487 m, ix.1957, collector's name not given.

*Remarks* : This is the second record, and it is from the type locality.

**Trichomachimus Engel****32. Trichomachimus pubescens (Ricardo)**

*Asilus pubescens* Ricardo, 1922, *Ann. Mag. nat. Hist.* (9)10 : 67.

*Trichomachimus pubescens* : Oldroyd, 1975, *A Catalog of Diptera of the Oriental Region 2* : 156 ; Joseph and Parui, 1984, *Oriental Ins.* 17 : 372.

*Material examined* : 1 ♂, Sikkim : Gangtok, 500 m, 20.x.1978, coll. A. N. T.

Joseph and party. 1 ♂, Arunachal Pradesh : Subansiri District : Baskem Village, 27.x. 1981, coll. S. K. Gupta and M. Prasad.

*Remarks* : The only previous records thus far for India were from Sikkim. This is the first record from Arunachal Pradesh.

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#### Abbreviations used in text-figures

Ae, aedeagus ; Cl, clasper ; Go, gonopod (gonocoxite) ; Hy, hypandrium ; Pr, proctiger ; Sf, superior forceps (epandrium) ; 8 Stn, eighth sternite.

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