

MISCELLANEOUS PUBLICATION  
OCCASIONAL PAPER NO. 66

# **Records of the Zoological Survey of India**

Studies on the Asilidae (Diptera)  
Collections made by Dr. Ghorpade

by

A. N. T. JOSEPH AND P. PARUI

Issued by the Director  
Zoological Survey of India, Calcutta

RECORDS  
OF THE  
ZOOLOGICAL SURVEY OF INDIA

MISCELLANEOUS PUBLICATION  
OCCASIONAL PAPER No. 66

STUDIES ON THE ASILIDAE (DIPTERA)  
COLLECTIONS MADE BY DR. GHORPADE

By

A. N. T JOSEPH

*Fresh water Biological Station, Hyderabad*

and

P PARUI

*Zoological Survey of India, Calcutta*



सत्यमेव जयते

*Edited by the Director, Zoological Survey of India*

1984

© Copyright, Government of India, 1984.

Published : September, 1984.

**PRICE : Inland : Rs. 26.00**

**Foreign : £ 3.00 \$ 5.00**

RECORDS  
OF THE  
**ZOOLOGICAL SURVEY OF INDIA**

MISCELLANEOUS PUBLICATION

Occasional Paper

---

---

No. 66

1984

Pages : 1—40

---

---

**CONTENTS**

	<i>Pages</i>
I. INTRODUCTION ... ..	1
II. SYSTEMATIC ACCOUGHT ... ..	1
III. SUMMARY ... ..	37
IV. ACKNOWLEDGEMENTS ... ..	37
V. ABBREVIATIONS ... ..	37
VI. REFERENCES ... ..	38

STUDIES ON THE ASILIDAE (DIPTERA)  
COLLECTIONS MADE BY  
DR. GHORPADE

*By*

A. N. T. JOSEPH\* AND P. PARUI  
*Zoological Survey of India, Calcutta*

INTRODUCTION

Through the courtesy of Dr. K. D. Ghorpade, University of Agricultural Sciences, Bangalore, we have received a rich collection of asilids for study, most of which are from South India. Over the last one decade of study of Indian Asilidae by us, it is seen that the speciation is much more intense in South India than North India. Though we have undertaken intensive surveys in Arunachal Pradesh, Sikkim and West Bengal and have collected a large number of robberflies, it has been observed that the intensity of speciation is comparatively low. Same is the case from Uttar Pradesh, Himachal Pradesh, Punjab, etc. Types will be deposited in the University of Agricultural Sciences, Bangalore and Zoological Survey of India, Calcutta.

**Clephyroneura** Becker

*Clephyroneura* Becker, 1925, *Ent. Mitt.* 14 : 68.

- |   |                            |
|---|----------------------------|
| 1. Wings infuscated at tip and along hind margin forming a sharply defined greyish area | 8                          |
| Wings not infuscated, though they may have a yellowish stain                            | 2                          |
| 2. Female with black bristles in moustache and with black abdominal hairs and bristles  | <i>brevipennis</i> Oldroyd |
| Both sexes with moustache entirely white ; most of abdominal hairs and bristles black   | 3                          |

---

\* Present address : F. W. Biological Station Hyderabad.

3. Female with seventh abdominal tergite bare and shining in middle. male with both seventh and eighth tergites shining *gymnura* Oldroyd  
Seventh tergite of both sexes uniform with remaining 4
4. Fore femora with a black stripe in front 5  
Fore femora without a distinct stripe 6
5. Thorax with yellow ground colour and generally a pink tinge, fore femora with a sharply defined longitudinal stripe spreading into a subapical ring, fore femora below (♀ with white bristles *duvaucelii* (Macquart)  
Fore femora with sharply defined longitudinal stripe but no apical ring, ground colour of thorax black, fore femora (♀, ) with black bristles *flavicornis* (Macquart)
6. Tibiae uniformly yellowish-brown, bristles of front black, wings uniformly brown, mystax white *lali* Joseph and Parui  
Tibiae yellow with black apex, bristles of front pale or white 7
7. Fore border of wings dilated, male terminalia yellowish-brown except light coloured apex, first antennal segment about thrice that of second *gravelyi* Joseph & Parui  
Fore border of wings scarcely dilated. male terminalia black, first antennal segment about twice the length of second *mysorensis* n. sp.
8. Legs largely black at least in front 9  
Legs mainly yellowish or reddish 10
9. Femora uniformly dark purpule black, tibiae dark brown but base lighter *pulla* Oldroyd  
Femora black in front, reddish yellow behind and at base, tibiae reddish but darker in front *semirufa* Oldroyd
10. Mediolongitudinal stripe of thorax spreading out laterally behind humeri, abdomen with lateral dark patches which are united to form transverse band in anterior segments *sundaica* (Jaenicke)  
Mediolongitudinal stripe of thorax without lateral expansion 11
11. Moustache entirely pale to white 12  
Moustache entirely black or mixed black and white 19
12. Fore femora yellowish with a trace of black band or short stripe 13  
Fore femora uniformly yellow to yellowish-brown 14
13. Forks and cross-veins of wings with distinct brown spots, first and second antennal segments yellow, third dusky, abdomen with central and lateral rows of brown spots *annulata* (Fabricius)  
Wings without spots, first and third antennal segments black, second yellowish-brown and black, abdomen without any marks *bannerghataensis* n. sp.

14. Femora yellow except black at apex of mid and hind pair 15  
Femora entirely yellow to yellowish-brown, hind femoral tip  
may be slightly blackish 16
15. Scutellum yellow with fine black bristles on disc, and no strong marginal  
bristles, fifth posterior cell largely infuscated, antennae yellow  
except darker third segment .*apicalis* Oldroyd  
Scutellum black with concolourous hairs on disc and a pair of  
weak bristles on margin, fifth posterior cell narrowly infuscated  
upto one-third, antennal segments one and two and base of third  
pale, rest dark brown *karnatakaensis* n. sp.
16. Infuscation in the fifth posterior-cell well marked 17  
Fifth posterior cell hardly infuscated 18
17. Superior forceps bulbous with stout subapical  
projection *bengalensis* (Macquart)  
Superior forceps slender with spine-like subapical  
projection *martini* Joseph & Parui
18. Fore border of wings dilated, scutellum yellowish-brown with sparse  
pale hairs on disc and a pair of pale bristles on border, male terminalia  
yellowish-brown except black proctiger *bangalorensis* n. sp.  
Fore border of wings not dilated, scutellum yellow with black hairs on  
disc and many weak bristles on border, superior forceps  
red and black *minor* Oldroyd
19. First two antennal segments yellow to yellowish-brown 20  
First two antennal segments dusky to black 22
20. Wings distinctly infuscated at apex, rest hyaline, mesonotum without  
mediolongitudinal stripe, male terminalia black with golden  
yellow hairs *robusta* n. sp.  
Wings infuscated at apex which extends upto fifth posterior cell along  
posterior border, mesonotum with usual mediolongitudinal stripes 21
21. Apex of superior forceps pointed, tibiae yellow except for the black  
ring at mid and hind tibiae, scutellum black with fine pale hairs  
on disc *anamaliensis* Joseph & Parui  
Apex of superior forceps broad, tibiae uniformly reddish-yellow,  
scutellum reddish-yellow with black discal hairs *exilis* Oldroyd
22. Superior forceps truncate at apex, fifth posterior cell infuscated in  
triangular shape, mystax yellow except for a few black  
bristles *nelsoni* Joseph & Parui  
Superior forceps not truncate at apex 23
23. Mystax predominantly black with a few white bristles below, eighth  
sternite well projecting with long hairs on the margin, superior forceps  
yellowish-brown basally and black distally *indiana* Joseph & Parui  
Mystax predominantly pale with a few black bristles above 24
24. Aedeagus long whip-like, tibiae and most of the basitarsus reddish-yellow,  
pleura mostly with white hairs and bristles *distincta* Oldroyd  
Aedeagus not whip-like 25

25. Mediolongitudinal stripe of thorax extending the entire length with two spots on sides, wings infuscated but medially hyaline, scutellum pale haired with a pair of black bristles on border *ghorpadei* n. sp.  
Mediolongitudinal stripe of thorax not extending the entire length 26
26. Tibiae uniformly yellowish-brown, infuscation in the fifth posterior cell triangular shaped, tergites marked dark brown which gradually increase posteriorly *nilaparvata* Joseph & Parui  
Tibiae yellow except apex being black on mid and hind tibiae 27
27. Mediolongitudinal stripe of thorax extends upto transverse suture, superior forceps characteristically incurved apically and almost black, clasper reddish yellow *wilcoxi* Joseph & Parui  
Mediolongitudinal stripe of thorax extends upto half way between transverse suture and hind border, male terminalia entirely black, superior forceps apically bifid *mudigorensis* n. sp.

1. *Clephdroneura ghorpadei* n. sp.

(Fig. 1)

A medium-sized black species, with infuscated wings; legs yellowish-brown with black markings. Male: length 13-16 mm, wing 8-9 mm.

*Male*: Head broader than thorax, black, sparsely to densely grey tomentose: mystax black above and pale below, frons along sides above antennae bearing black bristles, ocellar bristles black, upper occiput pale haired, postocular occiput pale haired with a row of black bristles above. Antennae black with the base of segment 2 pale, segments 1 and 2 with black bristles, segment 2 about two-thirds of 1, segment 3 longer than 1. Palpi and proboscis black with pale hairs.

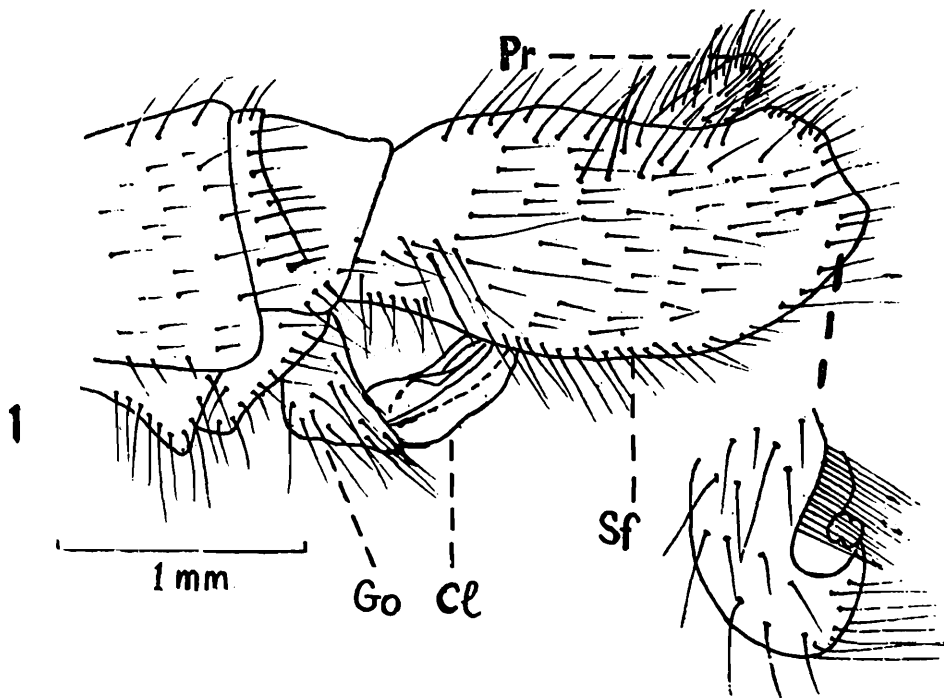


Fig. 1 *Clephdroneura ghorpadei* n. sp. lateral view of male terminalia.

*Thorax* black with sparse to dense grey tomentum; pronotal sides bearing sparse long pale hairs; mesonotum with a mediolongitudinal black and dark brown stripe divided by a narrow grey stripe extending the entire length, two spots present on either side, holotype greasy and hence the stripe and spots not discernible, humeri bare, covering hairs and bristles black; scutellum with the disc sparsely pale haired and hind border bearing a pair of black bristles. Halteres yellowish-brown.

*Legs* yellowish-brown marked with black; coxa and trochanter yellowish-brown, femur yellowish-brown with an anterodorsal black stripe distally, the stripe faint in forefemur, tibia yellowish-brown with the apex dark, basitarsus yellowish-brown with the apex dark, remaining segments black, clothing hairs pale and black, bristles black.

*Wings* infuscated but medially hyaline, fore border not dilated; discal cell somewhat constricted.

*Abdomen* black, grey or greyish-yellow tomentose, tomentum forms transverse stripe at the hind border of tergites 1-4, tergum 1 on sides bearing pale hairs and bristles, some of the bristles black, tergites 2-6 with a pair of pale bristles at the posterolateral, clothing hairs black and pale. Male terminalia (Fig. 1) black and dark brown with black and pale hairs.

*Holotype* ♂, India : Karnataka : Bangalore, 916 m, 28.ix.1980, coll. K. D. Ghorpade (No. A897). *Paratypes* 1♂, 3.vii.1978, remaining details as in preceding (No. A631); 1♂, 17.viii.1978, rest of details as in holotype (No. A646).

*Remarks* :— *Clephroneura ghorpadei* n. sp. is similar to *C. wilcoxi* Joseph and Parui but in the former superior forceps of male terminalia is not so elongate and the femora have anterodorsal black stripe.

## 2. *Clephroneura mysorensis* n. sp.

(Fig. 2)

A medium sized black species mostly covered with dense grey tomentum, wings hyaline, and legs black and yellowish-brown. Male : length 16-21 mm, wing 11-13 mm.

*Males* : *Head* broader than thorax, black, heavily grey tomentose ; mystax pale, frons along sides above antennae bearing pale bristles, ocellar bristles black, occiput pale haired, postocular occiput pale haired, postocular occiput adjoining to upper occiput with a few black and pale bristles in a row. Antennae yellowish-brown, with the style black, bristles on segments 1 and 2 black, segment 2 about half of 1, segment 3 equal to or slightly longer than 1. Palpi and proboscis black, pale haired.

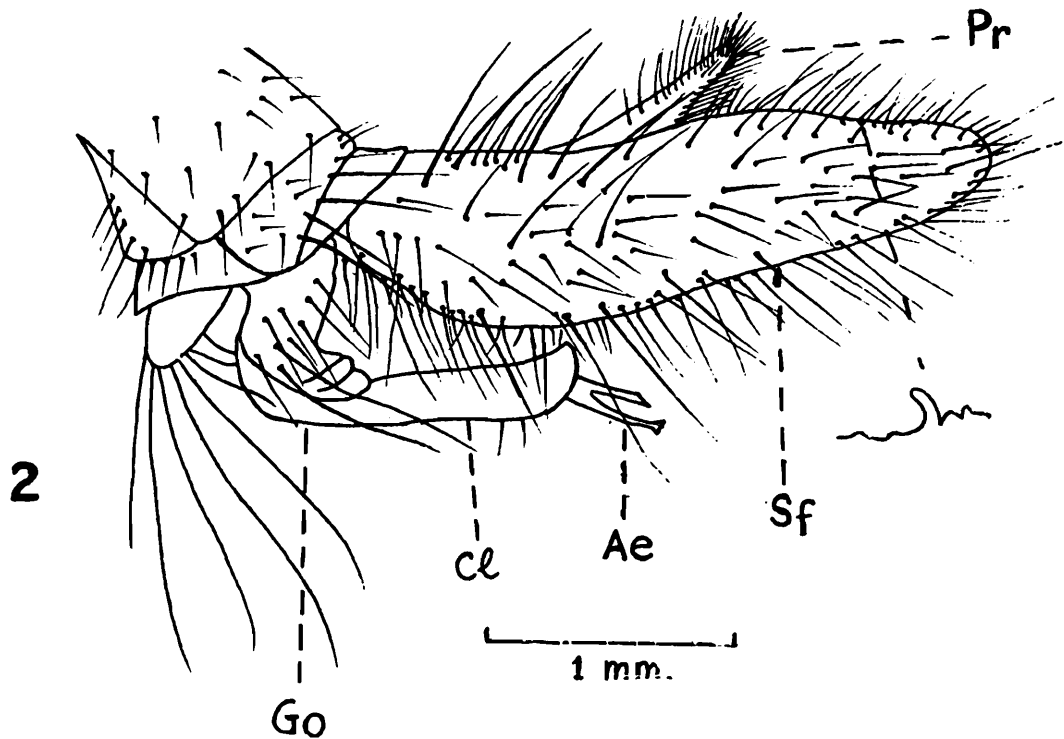


Fig. 2 *Clephyroneura mysorensis* n. sp., lateral view of male terminalia.

*Thorax* black with the sides yellowish-brown, heavily tomentose ; pronotum pale haired ; mesonotum with a black or dark brown mediolongitudinal stripe divided by a median grey stripe, the stripe extending from the anterior border to beyond the transverse suture, sides with two black spots, humeri yellowish-brown with black and pale hairs, covering hairs and bristles black ; scutellum with the disc black haired, sometimes also with a few pale hairs, hind border bearing a pair of long black bristles. Halteres pale, knob marked with dark brown.

*Legs* black and yellowish-brown ; coxa yellowish-brown covered with dense grey tomentum, femur basally yellowish-brown to varying extent while the rest black, tibia yellow with black apex, basitarsus yellowish-brown, while the rest segments dark brown, mid and hind femora with an anteroventral row of black bristles, covering hairs pale and black, bristles black.

*Wings* hyaline, fore border scarcely dilated; discal cell strongly constricted.

*Abdomen* black, densely grey tomentose, tergites 2-7 with a median and two lateral linear black spots, in one paratype these dots laterally united, sides of tergum 1 with a bunch of pale hairs and one or two black and pale bristles, tergites 2 and 3 bearing a pair of pale bristles. Male terminalia (Fig. 2) black with concolourous and pale hairs.

*Holotype* ♂, India : Karnataka : Bangalore, 916 m, 24.iii.1978, coll. K. D. Ghorpade (No. A574). *Paratypes*. 1♂, Karnataka : Bandipur, 1100 m, 13.v.1978, coll. K. D. Ghorpade (No. A609); 9♂, 7-23.v.1980, rest of details as in holotype (No. A887).

*Remarks* : In male terminalia it is generally similar to *Chephydroneura gravelyi* Joseph and Parui but the superior forceps is broader basally. In colouration *C. mysorensis* n. sp. is quite distinct in that it is black including femora.

### 3. *Clephydroneura robusta* n. sp.

(Fig. 3)

A large sized black and yellowish-brown species with wings apically infuscated and anteriorly dilated and legs yellowish-brown. Male : length 26 mm, wing 16 mm.

*Male* : Head as broad as thorax, black; mystax pale, frons along sides above antennae bearing pale hairs, ocellar bristles pale, occiput sparsely grey tomentose, hairs pale which become white at the lower sides. Antennal segments 1 and 2 yellowish brown, 3 dark brown, bristles on segments 1 and 2 black, segment 2 longer than half of 1, segment 3 longer than 2 but shorter than 1. Palpi and proboscis black, the former pale haired while the latter white haired.

*Thorax* black with the sides yellowish-brown, sparsely tomentose; pronotum yellowish-brown with the posterior side black, sides bearing pale hairs; mesonotum without mediolongitudinal stripe, humeri and sides with some pale hairs, clothing hairs and bristles black; scutellum with sparse black hairs but without bristles on hind border. Halteres, dark brown with the stalks pale.

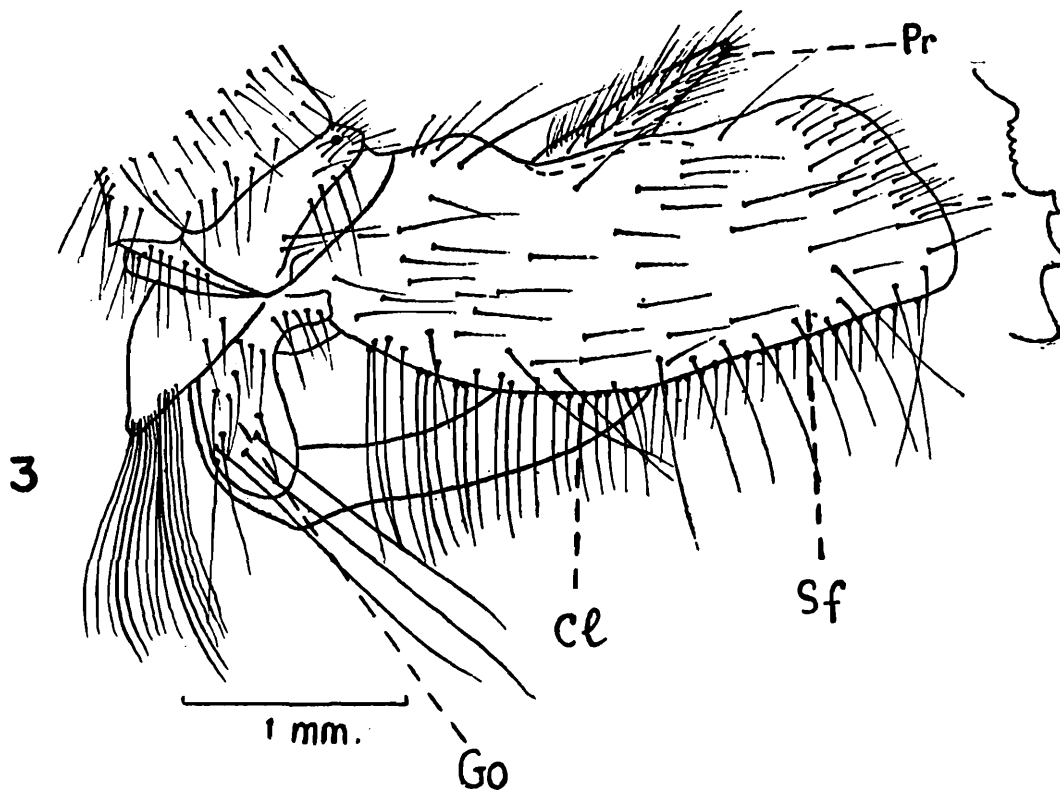


Fig. 3) *Clephyroneura robusta*, n. sp., lateral view of male terminalia.

*Legs* yellowish-brown with the apex of mid and hind femora marked black, tarsal segments of mid and hind femora also apically marked black, mid and hind femora with anteroventral rows of bristles, covering hairs and bristles black and pale.

*Wings* apically infuscated and rest hyaline, fore border dilated; discal cell strongly constricted.

*Abdomen* black with the hind border of tergites yellowish-brown, tergites 1-4 on sides bearing a transverse row of a few long golden yellow hairs, covering hairs golden yellow. Male terminalia (Fig. 3) black with golden yellow hairs.

*Holotype* ♂, India : Karnataka : Mudigore, 970 m, 6.iv.1980, coll. K. D. Ghorpade (No. A881).

*Remarks* :—It is allied to *Clephyroneura apicalis* Oldroyd differing from which in smaller size and differences in male terminalia, especially in the eighth sternite which is well developed and bears dense bristles.

4. *Clephyroneura karnatakaensis* n. sp.

(Fig. 4)

A large black species with apically infuscated and anteriorly dilated wings, and pale yellow legs with black markings. Male : length 24 mm, wing 14-16 mm; female : length 23-26 mm, wing 14-16 mm.

*Males* : *Head* as broad as thorax, black, heavily infuscated with grey tomentum; mystax white, frons along sides above antennae bearing pale hairs, ocellar bristles pale, occiput white haired. Antennae with segments 1 and 2 and base of 3 pale, remaining dark brown, bristles on segments 1 and 2 black, segment 2 about half or slightly longer than half of 1, 3 and 1 nearly equal. Palpi and proboscis black, former pale and the latter white haired.

*Thorax* black, heavily tomentose; pronotum with a transverse row of pale bristles, sides pale haired; mesonotum with a black mediolongitudinal stripe divided by a broad greyish-yellow stripe, the stripe extending from the anterior end to the middle between transverse suture and hind border, sides with two large and one small brownish longitudinal markings, humeri pale haired, covering hairs and bristles black; scutellum with the disc sparsely black haired, hind border bearing a pair of weak bristles. Halteres with the knobs dark brown, stalks pale.

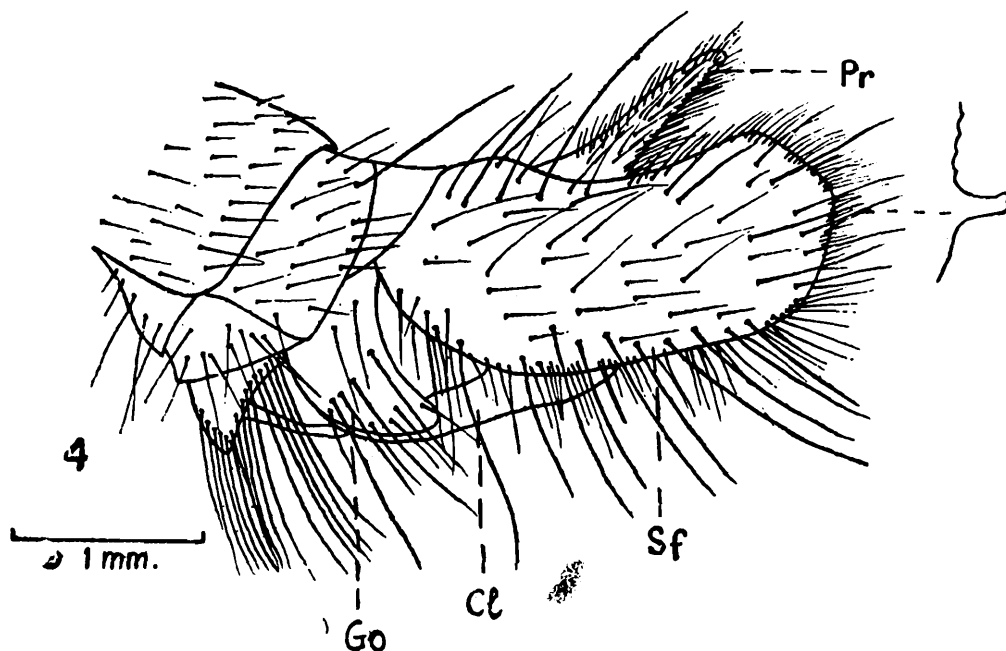


Fig. 4, *Clephyroneura karnatakaensis* n. sp., lateral view of male terminalia.

*Legs* pale yellow, infuscated with black on apex of mid and hind femora and tibia, distinctly so in hindleg, apex of tarsal segments also black, mid and hind femora with an anteroventral row of bristles, clothing hairs pale and black, bristles black.

*Wings* infuscated at apex which extends narrowly along the hind border upto one-third of fifth posterior cell, along anterior and posterior cross-veins and at furcation of third longitudinal vein also infuscated, dilated at the foreborder; discal cell strongly constricted.

*Abdomen* black with pale yellow sides, sides of tergum 1 yellowish-brown, tergites 2-6 uniformly black or black with lateral triangular grey markings, which gradually increase in size posteriorly so much so tergum 6 almost wholly grey, sides of tergum 1 with a bunch of pale hairs and a black bristle, tergites 2-6 with a transverse row of three pale bristles on the sides of hind border, clothing hairs pale. Male terminalia (Fig. 4) black with concolourous and pale hairs.

*Females*: Similar but with the following differences: postocular occiput above with one black and two or three pale bristles or with wholly pale bristles; pronotum bearing a transverse row of four or six pale bristles; abdomen in one paratype uniformly black like male, in rest thickly grey dusted bearing one median and two lateral black marks.

*Holotype* ♂, India: Karnataka: Bangalore, 916 m, 7-23.v.1980, coll. K. D. Ghorpade (No. A887). *Paratypes* 3 ♀, rest of details as in preceding; 1 ♂, 24-31.v.1980. (No. A889); remaining details as in holotype; 1 ♀, 1-17.vi.1980 (No. A890), rest of data as in preceding.

*Remarks*: *Clephydroneura apicalis* Oldroyd, *C. exilis* Oldroyd, *C. robusta* n. sp. and *C. karnatakaensis* n. sp. are the generally similar regional species, of which the present species is closest to *C. apicalis* Oldroyd in male terminalia. *C. karnatakaensis* n. sp. differs from *C. apicalis* Oldroyd in the smaller size and infuscation of wings—the fifth posterior cell is only very little infuscated but along the cross-veins and at the furcation of third longitudinal vein infuscated.

##### 5. *Clephydroneura bannerghattaensis* n. sp.

(Fig. 5)

A medium sized black species with apically infuscated wings and black and pale yellow legs. Male: length 15-16 mm., wing 10-11 mm; female: length 17 mm, wing 11 mm.

*Males*: *Head* broader than thorax, black, sparsely grey infuscated; mystax pale, frons along sides above antennae with black bristles, ocellar bristles also black, occiput white haired with a row of black bristles above. Antennal segments 1 and 3 black, 2 yellowish-brown and black, bristles on segments 1 and 2 black, segment 2 about two-thirds of 1, segment 3 longer than 1. Palpi and proboscis black, their hairs pale.

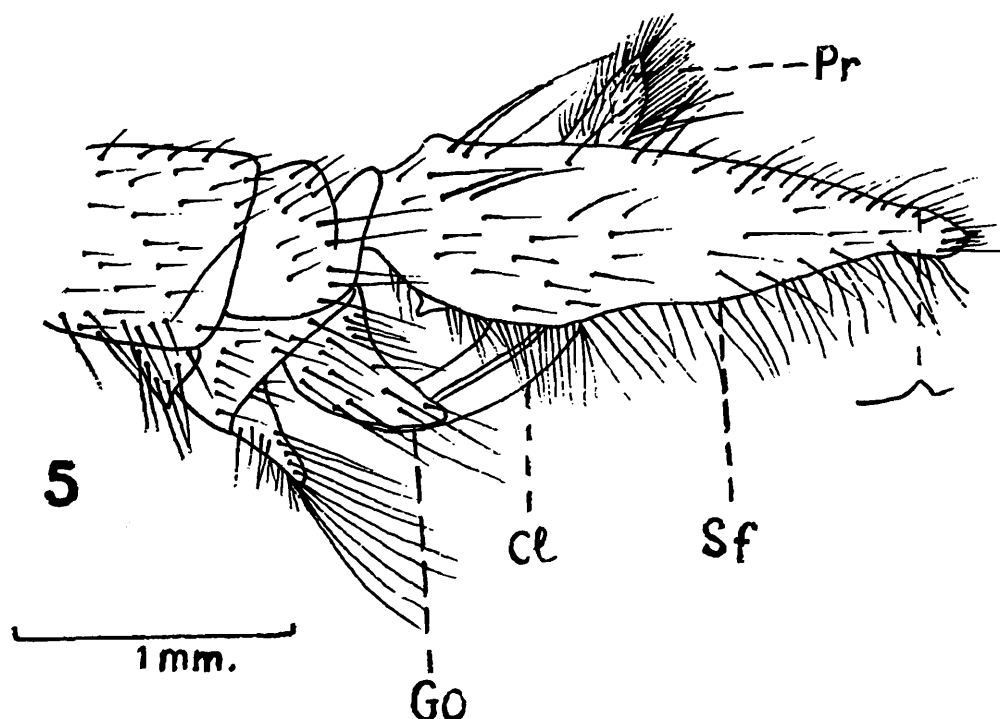


Fig. 5 *Clephydroneura bannerghattaensis* n. sp., lateral view of male terminalia.

*Thorax* black, sparsely grey or greyish-yellow tomentose; pronotum with a pair of black or pale bristles, sides pale haired; mesonotum greasy and the mediolongitudinal stripe cannot be made out, but in holotype faintly marked, clothing hairs and bristles black; scutellum with the disc sparsely black haired, hind border bearing a pair of black bristles. Halteres pale with brownish tinge on stalks.

*Legs* black and pale yellow; coxa black, forefemur pale yellow with a black stripe dorsally from a little beyond the base to apex, in mid and hind femora black stripe anteriorly which at the apex covers the entire leg, foretibia yellowish-brown with its apex black, in mid-tibia the yellowish-brown restricted to the base, hind tibia wholly black, in paratype tibia of all legs almost wholly black, tarsal segments black but in foreleg comparatively lighter coloured; mid and hind femora with the usual anteroventral row of bristles, clothing hairs and bristles black and pale.

*Wings* basally hyaline and distally infuscated, the infuscation extending along the hind border into fifth posterior cell, fore border not dilated; discal cell somewhat constricted.

*Abdomen* black with the hind border of tergites dark brown, being greasy grey tomentum indistinct, sides of tergum 1 with long pale hairs and a pair or more black bristles, sides of tergites 2-6 with pale hairs and 3 black or pale bristles. Male terminalia (Fig. 5) black with pale and a few black hairs.

*Female* : Similar but with the following differences : head densely grey infuscated; mesonotum with a mediolongitudinal dark brown stripe extending from anterior border to the middle between transverse suture and hind border, the stripe divided by a median greyish-yellow stripe; grey tomentum distinct on abdominal tergites.

*Holotype* ♂, India : Karnataka : Bannerghatta Park, 27.x.1977, coll. K. D. Ghorpade (No. A494). *Paratypes* : 1 ♂, 1 ♀, details as in preceding.

*Remarks* : In male terminalia *Clephydroneura bannerghattaensis* n. sp. is similar to *C. brevipennis* Oldroyd, otherwise quite distinct. In leg colouration it closely resembles to *C. flavicornis* (Macquart) but by the differences of male terminalia both the species can be readily separated.

#### 6. *Clephydroneura bangalorensis* n. sp.

(Fig. 6)

A medium sized yellowish-brown species with anteriorly dilated and apically infuscated wings and almost uniformly yellowish-brown legs. Male : length 13-15 mm, wing 7-9 mm.

*Males* : *Head* broader than thorax, black, heavily grey tomentose; mystax white, frons along sides above antennae with pale bristles, ocellar bristles black, occiput white haired with a few black bristles in a row above. Antennal segments 1 and 2 yellowish-brown, 3 dark brown, bristles on segments 1 and 2 black with also a few pale ones on the former, segment 2 about two-thirds of 1, segments 3 and 1 almost equal. Palpi dark brown and proboscis black, hairs of both white.

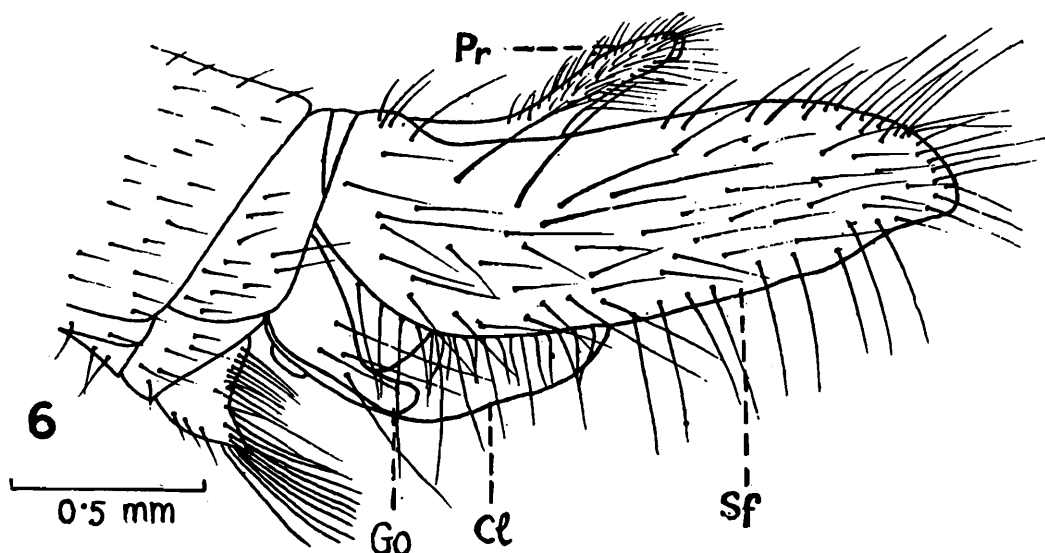


Fig. 6 *Clephyroneura bangalorensis* n. sp., lateral view of male terminalia.

*Thorax* black, heavily infuscated with grey tomentum; pronotum with four pale bristles, sides pale haired; mesonotum yellowish-brown on sides, a black mediolongitudinal stripe present extending from the anterior border to the transverse suture, the stripe longitudinally divided by a greyish-yellow stripe, one paratype devoid of grey tomentum and so the stripe faint, clothing hairs and bristles pale; scutellum yellowish-brown with sparse pale hairs on disc and a pair of pale bristles on hind border. Halteres pale.

*Legs* yellowish brown; femora deeper coloured to a varying extent distally, tarsal segments apically dark brown, mid and hind tibiae with the usual anteroventral row of bristles, covering hairs pale, bristles pale and black.

*Wings* basally hyaline and distally infuscated which extends slightly into fifth posterior cell, fore border dilated; discal cell strongly constricted.

*Abdomen* yellowish-brown covered with grey tomentum, but one paratype devoid of tomentum, tergites 2-5 with a median and two lateral areas devoid of tomentum thus appearing as a median and two lateral spots, in one paratype these spots united and appear as a transverse band, in the retaining paratype spots indistinct due to the lack of tomentum, tergum 1 with dense white hairs on sides between which without or with two or more black bristles, tergites 2-5 on sides bearing white hairs and three white bristles, clothing hairs pale and black. Male terminalia (Fig. 6) yellowish-brown except for the black proctiger-hairs white and also with some black ones.

*Holotype* ♂, India : Karnataka : Bangalore, 916 m, 27.iv.1976, coll *K. D. Ghorpade* (No. A793). *Paratypes* 2♂, (No. A795 in both examples), rest of details as in holotype.

*Remarks* : This robberfly is generally similar to *Clephroneura lali* Joseph and Parui but differing in the entirely white moustache and shape of the superior forceps. In one of the paratypes the shape of superior forceps is slightly different, which is only of intra-specific nature.

#### 7. *Clephroneura mudigorensis* n. sp.

(Fig. 7)

A medium sized black and yellowish-brown species with anteriorly dilated and apically infuscated wings, and pale yellow and black legs. Male : length 17 mm, wing 13 mm.

*Male* : *Head* broader than thorax, black, grey tomentose ; *mystax* pale with some black bristles above, *frons* along sides above antennae with pale and black bristles, *ocellar bristles* black, *occiput* densely white haired with one row of black bristles above. *Antennal segments* 1 and 3 black, 2 yellowish-brown, *bristles* on segments 1 and 2 black, segment 2 shorter than half of 1, 3 shorter than 1. *Palpi* and *proboscis* black, the former with pale and the latter with white hairs.

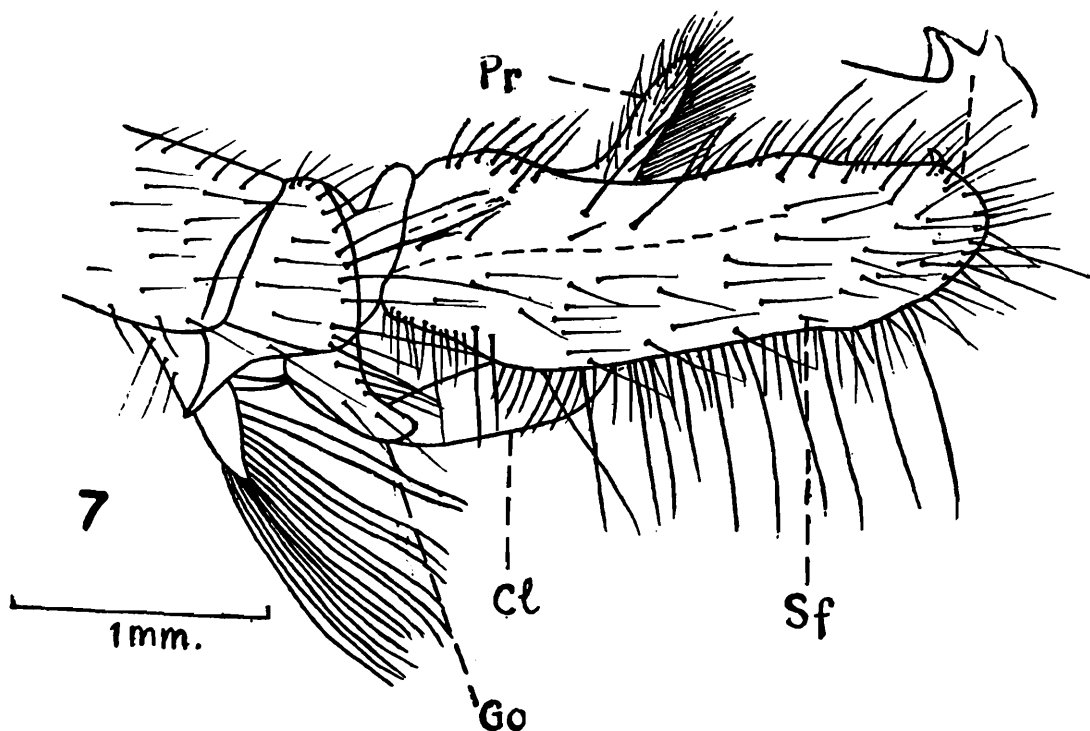


Fig. 7 *Clephroneura mudigorensis* n. sp., lateral view of male terminalia.

*Thorax* black and yellowish-brown, heavily grey or greyish-yellow tomentose; pronotum with a transverse row of four pale bristles, densely white haired; mesonotum with a black mediolongitudinal stripe extending from anterior end to the halfway between transverse suture and hind border, the stripe longitudinally divided by a greyish-yellow stripe, sides with three spots, the posterior being small, humeri pale haired, clothing hairs and bristles black; scutellum black haired with a pair of black bristles on the hind border. Halteres pale with their stalks dark brown.

*Legs* pale yellow and black; coxa pale yellow, fore and mid femora pale yellow with black dorsally and anterodorsally, in hind femur black more extensive and pale yellow restricted to ventral side, tibia pale yellow with the apex black, basitarsus pale yellow in fore and mid legs, rest of segments and all the segments in hind leg black, fore and mid femora with the usual row of anteroventral bristles, clothing hairs pale and black, bristles black.

*Wings* basally hyaline and apically infuscated, the infuscation slightly extending into the fifth posterior cell, fore border dilated; discal cell strongly constricted.

*Abdomen* uniformly black except for tergum 1 being yellowish-brown, sides of tergum 1 with pale hairs and a pair of black bristles, sides of tergites 2-5 with pale hairs and two or three pale bristles, clothing hairs pale and black. Male terminalia (Fig. 7) black with concolourous and a few pale hairs.

*Holotype* ♂, India : Karnataka : 19 Km. W Mudigore, 900 m, 6.iv.1980, coll. K. D. Ghorpade (No. A880).

*Remarks* : In general appearance it is somewhat similar to *Clephydroneura lali* Joseph and Parui, but in leg colouration and male terminalia *C. mudigorensis* n. sp. is allied to *C. graveleyi* Joseph and Parui from which it can be readily told by the distinctive shape of apex of superior forceps.

#### 8. *Clephydroneura gymnura* Oldroyd

1938. *Clephydroneura gymnura* Oldroyd, *Ann. Mag. nat. Hist.* (11) 1 : 470.

*Material* : 1♂, India : Karnataka : Bandipur, 1100 m, 13.v.1978, Coll. K. D. Ghorpade.

*Distribution* : Madhya Pradesh and West Bengal.

*Remarks* :—This is the first record of the species from Karnataka.

#### 9. *Clephydroneura pulla* Oldroyd

1938. *Clephydroneura pulla* Oldroyd, *Ann. Mag. nat. Hist.* (11) 1 : 467.

*Material* : 3♂, India : Andhra Pradesh : Naguldevpudu, 7.ix.1975, coll. K. D. Ghorpade; 1♂, Karnataka : Bannerghata Park, 27.x.1977, coll. K. D. Ghorpade.

*Distribution* : India : Tamil Nadu.

*Remarks* :—This is the first record of the species from Andhra Pradesh and Karnataka.

#### 10. *Clephydroneura wilcoxi* Joseph and Parui

1979. *Clephydroneura wilcoxi* Joseph and Parui, *Ent. scand.* 10 (1) : 35.

*Material* : 1♂, India : Karnataka : Bangalore, 916 m, 20.vi.1978, coll. K. D. Ghorpade; 1♂, Karnataka : Bangalore, 916 m, 25.v.1980, coll. K. D. Ghorpade.

*Distribution* :—India : Tamil Nadu, Karnataka and Andhra Pradesh.

#### 11. *Clephydroneura nelsoni* Joseph and Parui

1979. *Clephydroneura nelsoni* Joseph and Parui *Ent. scand.* 10(1) : 36.

*Material* : 1♂, India : Karnataka : Bangalore, 976 m, 20.x.1979, coll. K. D. Ghorpade.

*Distribution* : India : Tamil Nadu.

*Remarks* :—This is the first record from Karnataka.

#### 12. *Clephydroneura exilis* Oldroyd

1938. *Clephydroneura exilis* Oldroyd, *Ann. mag. nat. Hist.* (11) 1 : 468.

*Material* : 2♂, India : Kerala : Thekkady, 884 m, 27.iii.1977, coll. K. D. Ghorpade.

*Distribution* : India : Tamil Nadu.

*Remarks* : It is the first record from Kerala.

**Heligmoneura** Bigot*Heligmoneura* Bigot, 1858, *Arch. ent.* 2 : 356.13. ***Heligmoneura bigoti*** n. sp.

(Fig. 8)

A large black species with golden yellow haired abdomen, yellowish-brown legs infuscated with black, and apically infuscated wings. Male : length 27m, wing 19 mm.

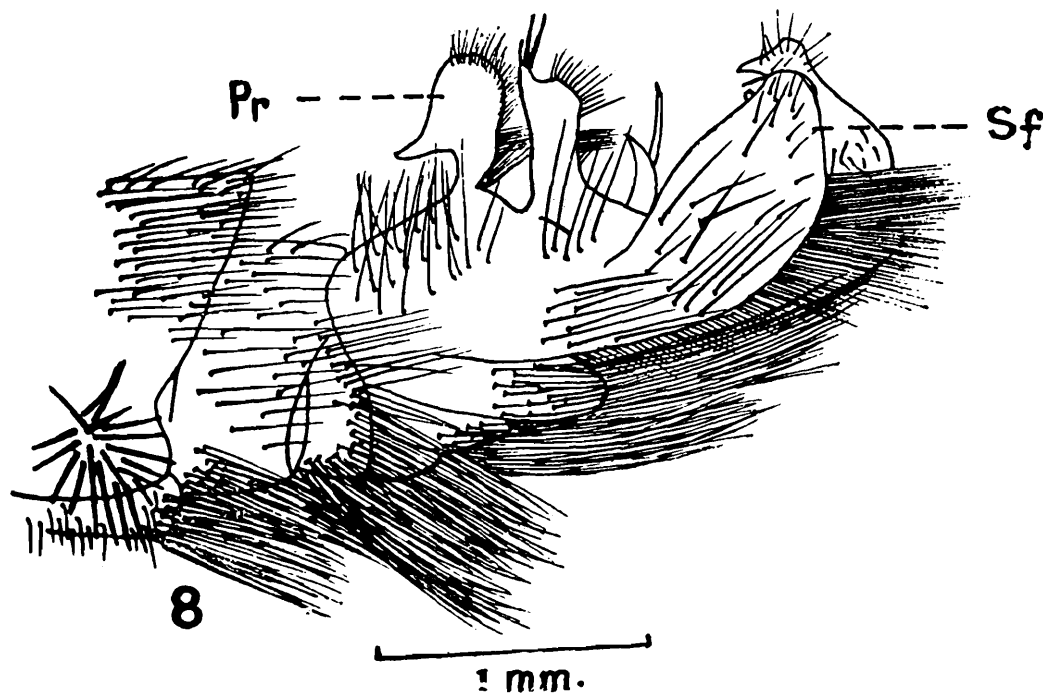


Fig. 8 *Heligmoneura bigoti* n. sp., lateral view of male terminalia.

*Male* : *Head* as wide as thorax, black, heavily greyish-yellow tomentose ; facial tubercle well developed, mystax black above and golden yellow below, frons along sides above antennae bearing pale and black bristles, ocellar bristles pale, upper occiput golden yellow haired, postocular occiput yellow haired with a few black bristles above. Antennal segments 1 and 2 yellowish-brown, 3 dark brown with a yellowish-brown ring on base, bristles on segments 1 and 2 black, segment 2 about half of preceding, segment 3 longer than 2 but shorter than 1, arista long. Palpi and proboscis black, the former black and pale haired while the latter entirely pale haired.

*Thorax* black, greyish-yellow and grey tomentose ; pronotum pale haired with a transverse row of median black bristles ; mesonotum devoid of stripe, clothing hairs black and golden yellow, bristles black ;

scutellum with the disc golden yellow and black hairs, border bearing four black bristles and some long concolourous hairs. Halteres with the knobs black, and stalks pale.

*Legs* yellowish-brown infuscated with black; coxa and trochanter black, femora yellowish-brown with an anterior black stripe extending from the base to well beyond the middle, the stripe increasing in length and breadth from the fore to the hind leg, tibia wholly yellowish-brown, tarsus yellowish-brown with the apical segments black, clothing hairs and bristles golden yellow or black.

*Wings* apically infuscated and along the hind border extending upto third posterior cell.

*Abdomen* black, golden yellow tomentose, the tomentum dense on posterior segments, sides of tergites 1 to 4 with golden yellow hairs, tergite 6 on sides with a bunch of short black bristles. Male terminalia (Fig. 8) black with concolourous hairs and bristles.

*Holotype* ♂, India : Karnataka : Mudigore, 700 m, 22-23.v.1976, coll. K. D. Ghorpade (No. A312).

This is the second species from India under the *Oligoschema* group, the earlier one was described by us from Andaman. It can be readily told from *Heligmoneura andamanensis* Joseph and Parui by the distinctive male terminalia together with the presence of a bunch of short black bristles on either side of the fifth abdominal tergite.

#### 14. *Heligmoneura ricardoi* Joseph and Parui

1980. *Heligmoneura ricardoi* Joseph and Parui, *Ent. scand.* **11** (3) : 283.

*Material* : 1♂, India : West Bengal : Kalimpong Deleo Hills, 2352 m, 5.vi.1976, coll. S. Biswas.

*Distribution* : West Bengal.

*Remarks* : So far the species is only recorded from West Bengal.

#### *Ommatius* Wiedemann

*Ommatius* Wiedemann, 1821, *Dip. exot.* : 213.

15. *Ommatius truncatus* n. sp.

(Fig. 9)

A medium sized black species with black and yellowish-brown legs and distally infuscated wings. Male : length 12 mm, wing 9 mm, females : length 12-13 mm, wing 10 mm.

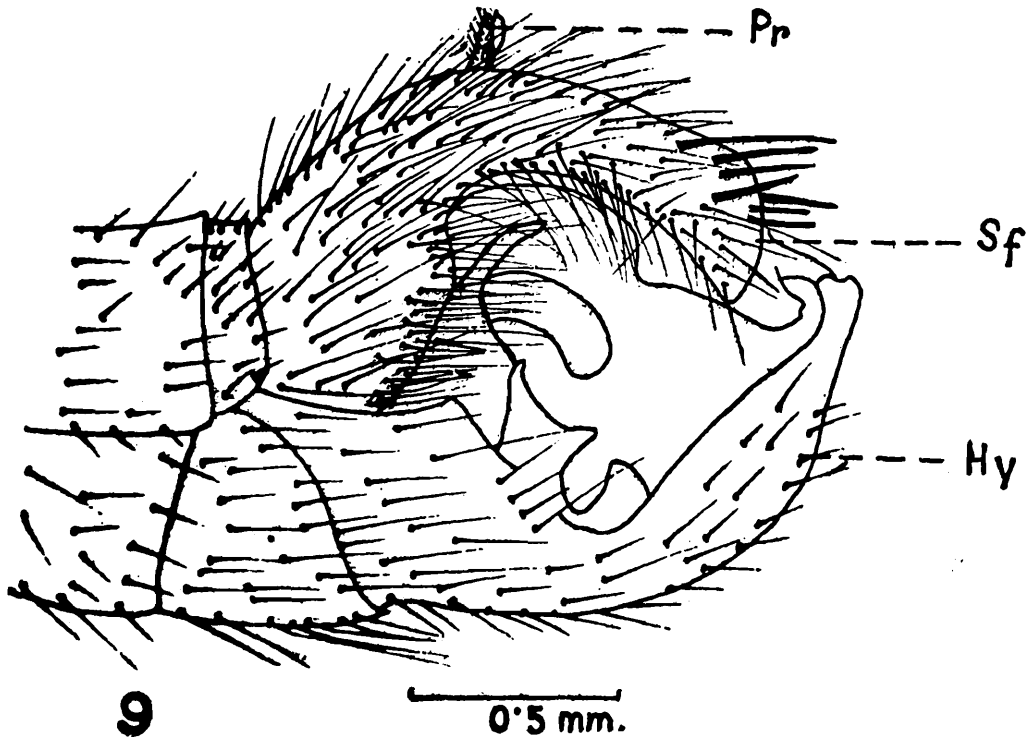


Fig 9 *Ommatius truncatus* n. sp., lateral view of male terminalia.

*Males*: *Head* black, heavily infuscated with grey tomentum; mystax black above and white below; frons above antennae and ocellarium with black bristles; postocular occiput white haired with a few black bristles above. Antennae black, segments 1 and 2 with concolourous bristles, segments 1 and 2 nearly equal, 3 slightly longer than the others. Palpi and proboscis black, the former with black and a few pale hairs while the latter wholly white haired.

*Thorax* black, heavily grey tomentose; pronotum with 4 black bristles in a transverse row, hairs white, dense on sides; mesonotum devoid of mediolongitudinal stripe, humeri with dense, long white hairs, posterolateral sides with a few pale hairs, covering hairs and bristles black; scutellum with the disc pale haired, hind border bearing a pair of black bristles; metapleuron with elongate pale and a few black bristles. Halteres with the knobs yellowish-brown, stalks white.

*Legs* black and yellowish-brown; coxa, trochanter and femur black, tibia yellowish-brown with dark brown apex, tarsal segments

dark brown but comparatively lighter in fore and mid legs; hindfemur with a row of anteroventral pale bristles and another row of posteroventral black bristles, clothing hairs pale and black, bristles black.

*Wings* infuscated distally, but lesser than one-third of base hyaline.

*Abdomen* black, sides of tergite 1 with long pale hairs and a few pale bristles and tergites 2-4 with long pale hairs, 5 and 6 with a few black bristles, clothing hairs pale and black. Male terminalia (Fig. 9) black with concolourous and pale hairs, superior forceps subapically bearing a bunch of short black bristles.

*Females*: Similar but with the following differences mystax almost wholly black, pale hairs on the sides of tergites restricted to 1 and 2; hindfemur without posteroventral row of bristles.

*Holotype* ♂, India: Karnataka. Devarayadurga, 1187 m, 8.vii.1979, coll. K. D. Ghorpade (No. A811). Paratypes. 1♂, details as in holotype, (No. A811); 1 ♀, details as in holotype (No. 811); 1 ♀ Karnataka: Namadachilume, 1000 m, 8.vii.1979, coll. K. D. Ghorpade (No. A812).

*Remarks*:--It is generally similar to *Ommatius pseudodraavidicus* Joseph and Parui from which it differs in the robust body and the structural details of male terminalia, especially in the presence of apical bristles on the superior forceps and the truncate apex of hypandrium.

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

1983. *Ommatius indicus* Joseph and Parui, *Ent. Scand.* **14** : 86.

*Material*: 1 ♀ India: Karnataka: Bannerghata Park, 12.ix.1976, coll. K. D. Ghorpade; 5 ♂, 8 ♀, Karnataka: Banlipur, 1100 m, 13.v.1978, coll. K. D. Ghorpade; 1♂, Karnataka: Bangalore, 916 m, 4.ix.1978. coll. K. D. Ghorpade; 1♂, Tamil Nadu 8 km. S. Yercaud, 1060 m, 21.ix.1978, coll. K. D. Ghorpade.

*Distribution*: India: Tamil Nadu and Kerala.

*Remarks*:--This is the first record of the species from Karnataka.

#### 17. *Ommatius hulli* Joseph and Parui

1983. *Ommatius hulli* Joseph and Parui, *Ent. Scand.* **14** ; 88.

*Material*: 1 ♀, India: Karnataka: Mudigore, 700 m, 23.v.1967,

coll. K. D. Ghorpade; 1♂, 2 ♀, 21-22. v. 1976, other details as in preceding.

*Distribution* India : Kerala and Karnataka.

**Neoitamus** Osten Sacken

*Neoitamus* Osten Sacken, 1878, *Smithson. misc. Collns.* 16 : 82, 235.

18. **Neoitamus mussooriensis** n. sp.

(Fig. 10)

A well built black species with black and pale yellow legs and infuscated wings. Male : length 18-21 mm, wing. 12-13 mm.

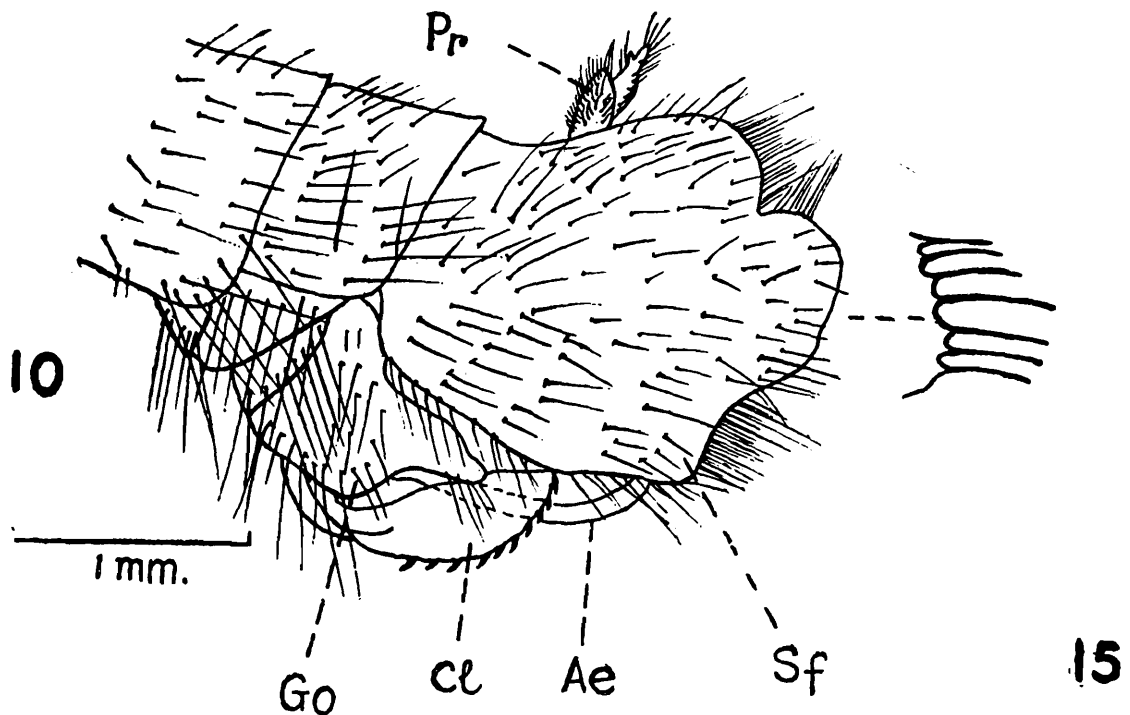


Fig. 10 *Neoitamus mussooriensis* n.sp., lateral view of male terminalia.

*Male* : Head broader than thorax, black, sparsely grey tomentose ; mystax golden yellow, frons along sides above antennae bearing wholly black or golden yellow and black hairs, ocellar bristles black, upper occiput bare, postocular occiput with black hairs and bristles above and pale hairs below. Antennae black except the base of third segment being pale, bristles on segment 1 concolourous except for one or two pale ones basally, bristles on segment 2 concolourous except for a few pale ones at apex ventrally, segment 2 longer than half of 1, segment 3 about as long as or longer than the combined length of segments 1 and 2. Palpi and proboscis black, former with pale and latter with wholly pale or pale and black hairs.

*Thorax* black, sparsely grey tomentose; pronotum with a pair of median black or one to three pairs of pale bristles, hairs pale; mesonotum with clothing hairs and bristles black, on sides with some pale hairs; scutellum with the disc pale haired, also with a few long black hairs posteriorly, hind border bearing two or three pairs of black bristles; pleura faintly grey tomentose. Halteres uniformly pale yellow or yellowish-brown with pale stalks.

*Legs* black and pale yellow; coxa, trochanter and femur black, tibia wholly pale in foreleg, in subsequent legs apex black, tarsal segments basally pale and distally dark brown; forefemur ventrally on basal half with black hairs and midfemur with black bristles, hind femora postero-ventrally with a row of white bristles, clothing hairs and bristles black and pale or white.

*Wings* infuscated distally and along the hind border upto axillary cell.

*Abdomen* wholly black or to a varying extent covered with grey tomentum so much so only a median black spot is clearly visible, sides of tergites 1-4 bearing pale hairs and bristles, clothing hairs pale and black. Male terminalia (Fig. 10) black with concolourous and pale hairs.

*Holotype* ♂, India : U. P. : Mussoorie, 2005 m, 7.vi.1974, coll. Ghorpade (No. A125). *Paratypes* 3♂, details as in preceding (No. A125).

*Remarks* : *Neoitamus mussooriensis* n. sp. is generally similar to *N. himalayensis* Joseph and Parui. It differs from the latter in the wholly white mystax and in the structural details of the superior forceps of male terminalia.

#### 19. *Neoitamus barsilensis* n. sp.

(Fig. 11)

A medium sized black species with black and pale yellow legs and apically infuscated wings. Male : length 14 mm, wing 11 mm.

*Male*. *Head* broader than thorax, black, grey tomentose; mystax white surrounded by black bristles, frons along sides above antennae bearing black bristles, ocellar bristles black, upper occiput bare, postocular occiput with black bristles above and pale bristles below.

Antennae black with segment 2 to a large extent and base of segment 3 yellowish-brown, bristles on segments 1 and 2 black, segment 2 longer than half of 1, segment 3 slightly longer than the combined length of segments 1 and 2. Palpi and proboscis black, the former with black and some pale hairs and the latter wholly pale haired.

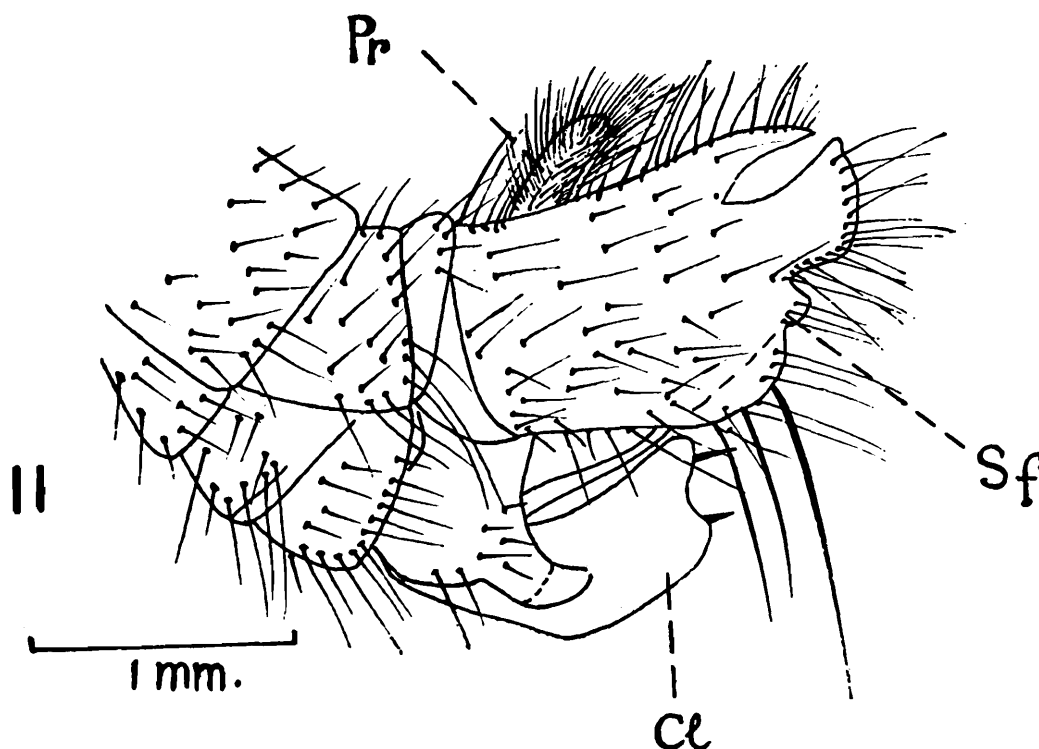


Fig. 11 *Neoitamus barsilensis* n. sp., lateral view of male terminalia.

*Thorax* black, grey tomentose; pronotum with a median row of pale bristles, hairs pale; mesonotum with a faintly marked medio-longitudinal stripe divided by a line, the stripe extending upto between the middle of the transverse suture and hind border, clothing hairs and bristles black; scutellum with the disc sparsely black haired and the border bearing three, long, black bristles, pleura grey tomentose. Halteres pale yellowish-brown.

*Legs* black and pale yellow; coxa, trochanter and femur black, foretibia uniformly pale yellow, mid and hind femora apically dark brown, tarsus pale yellow but in hindleg apex of segments dark brown; fore and mid femora with black bristles ventrally from base to three-fourths, hind femur with a row of posteroventral bristles, clothing hairs and bristles black and pale.

*Wings* apically infuscated which extends posteriorly into fifth posterior cell.

*Abdomen* black, grey infuscated, sides of tergites 1-4 with pale bristles which decrease in number posteriorly, clothing hairs pale and black. Male terminalia (Fig. 11) black with concolourous hairs except for the golden yellow hairs of the proctiger.

*Holotype* ♂, India : U.P. : Barsil, 2550 m, 12.vi.1977, coll. Dr. Gupta (No. 77.3,9).

*Remarks* :—By the distinctive superior forceps this fly can be readily separated from the remaining members of the genus *Neoitamus* from India.

### **Stenopogon** Loew

*Stenopogon* Loew, 1847, *Linn. Ent.* 2 : 453.

#### 20. *Stenopogon loewi* n. sp.

(Fig. 12)

A small black and yellowish-brown or black species with a second microsegment of antennae, lightly infuscated wings and open first posterior cell. Male : length 12 mm, wing 7 mm ; female : 14 mm, wing 8 mm.

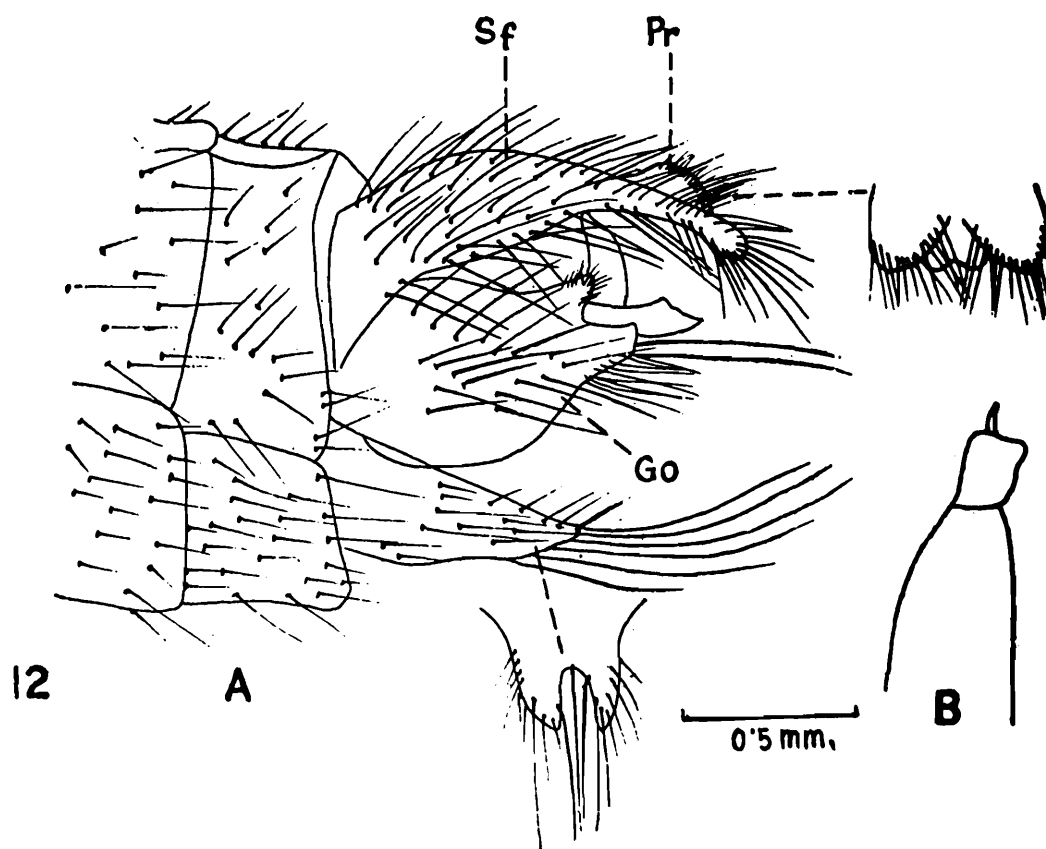


Fig. 12 *Stenopogon loewi* n. sp., A, lateral view of male terminalia ; B, tip of antenna showing microsegment.

*Male* : *Head* broader than thorax, sparsely grey tomentose ; mystax white ; frontal and ocellar bristles pale ; upper occiput and postocular occiput adjoining to upper occiput with pale yellow bristles while the rest bearing still paler bristles which become white at lower side. Antennae black but segment 2 yellowish-brown ; segment 1 with white bristles while 2 bare, segment 2 about half of 1, 3 longer than twice the combined length of 1 and 2, second micro-segment characteristic (Fig. 12B). Proboscis and palpi black, the former bearing white hairs while the latter white and pale haired.

*Thorax* black and yellowish-brown ; pronotum black anteriorly and yellowish-brown posteriorly, the latter divided by a narrow median black stripe, clothing hairs pale, which become dense on sides, mesonotum black but humeri and posterolateral sides yellowish-brown, hairs and bristles pale yellow ; scutellum with the disc bare, hind border with one pair of well developed and two pairs of short bristles ; pleura black and yellowish-brown, sparsely grey tomentose. Halteres pale.

*Legs* yellowish-brown and dark brown ; coxa, trochanter, femur and part of tibia yellowish-brown while the remaining dark brown, clothing hairs white, bristles white and yellowish-brown.

*Wings* lightly infuscated, first posterior cell open.

*Abdomen* yellowish-brown with sides black forming more or less an unbroken stripe, tergite 1 also black, sides of tergite 1 with dense pale hairs. Male terminalia (Fig. 12A) yellowish-brown with the apex of gonopod dark brown.

*Female* : Similar, but almost wholly black except legs which are yellowish-brown and black ; femur yellowish-brown infuscated with dark brown anterodorsally to a varying extent, tibia dark brown with varying degree of yellowish-brown colour, tarsus completely dark brown.

*Holotype* ♂, India : Karnataka : 30 kms. S. Kanakapura, 20.v.1978, coll. K. D. Ghorpade (No. A613). *Paratype* ♀, details as in preceding (No. A613).

*Remarks* :—Of all the known Indian species of *Stenopogon*, the present species can be readily told by the distinctive second micro-segment of antenna together with the details of male terminalia.

21. *Stenopogon subtus* Bromley

1935. *Stenopogon subtus* Bromley, *Rec. Indian Mus.* 37 : 229.

*Material* : 1♂, India : Uttar Pradesh : Barsil, 2550 m, 10.vi.1977, coll V K. Gupta.

*Distribution* : India : Punjab, Uttar Pradesh, Himachal Pradesh and Kashmir.

*Remarks* :—It is a common species of the genus.

*Michotamia* Macquart

*Michotamia* Macquart, 1838, *Dipt. exot.* 1(2) : 188.

22. *Michotamia fuscifemorata* n. sp.

(Fig. 13)

A small species with black thorax, black and yellowish-brown abdomen, almost wholly yellowish-brown legs and lightly infuscated wings. Male : length 9-12 mm, wing 7-9 mm ; female : length 9 mm. wing 8 mm.

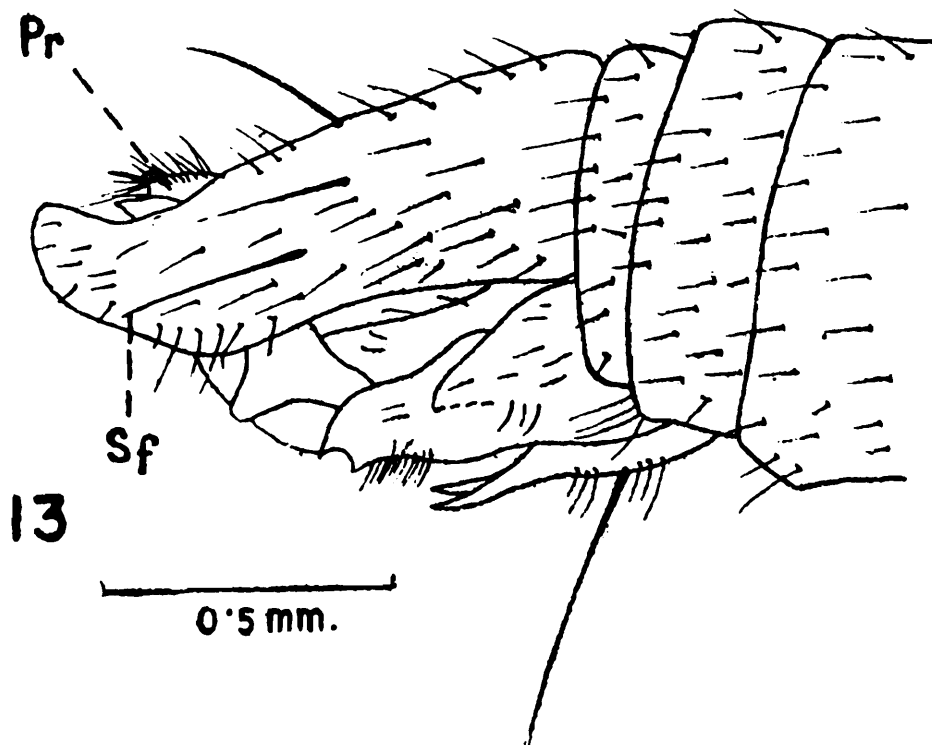


Fig. 13. *Michotamia fuscifemorata* n. sp., lateral, view of male terminalia.

*Male* : Head broader than thorax, black with sparse grey tomentum ; mystax pale yellow, sometimes one or two bristles black above ;

frontal and ocellar bristles pale yellow, upper occiput bare, postocular occiput on upper side with a row of pale yellow or black bristles, lower side bearing dense white hairs. Antennae black but for the yellowish-brown segment 2, bristles on segments 1 and 2 black, segment 2 about two-thirds of 1, segment 3 more than twice the combined length of 1 and 2 as well as style. Proboscis and palpi black, the former bearing pale hairs while the latter bearing black hairs and black bristles and some basal pale hairs.

*Thorax* black with greyish-yellow tomentum; pronotum with one or two pairs of pale bristles, sides bearing a few pale hairs; mesonotum with the humeri yellowish-brown, mediolongitudinal stripe absent or faintly marked, greyish-yellow, extending beyond the transverse suture, the stripe medially separated by the bare black background, clothing hairs pale, bristles black; scutellum greyish-yellow tomentose, hairs on disc sparse, pale, border devoid of bristles; pleura sparsely covered with greyish-yellow tomentum, metapleuron bearing a longitudinal row of three to five black bristles. Halteres pale.

*Legs* pale, but mid-coxa black, hind femur with a dorsal black brown mark or a V-shaped black mark near the middle, and tarsal segments distally yellowish-brown, clothing hairs predominantly dark, also with some pale hairs, bristles black.

*Wings* lightly infuscated, basal one-third or lesser than that hyaline.

*Abdomen* pale to yellowish-brown, tergite 1 medially on either side with a dark brown spot, segment 2 without or with a pair of median black spots, segments from 5 or from the middle of 5 to middle of 7 black, clothing hairs black with some pale ones also. Male terminalia (Fig. 13) pale to yellowish-brown with the apex of superior forceps light brown, hypandrium ending in two narrow projections.

*Female* : Similar to male but comparatively darker coloured.

*Holotype* ♂, India : Kerala : Walayar, 305 m, 31.xii.1973, coll. Ghorpade (No. A74). *Paratypes*. 1♂, Karnataka : Bangalore, 916 m, 2.xi.1973, coll. Ghorpade (No. A35); 1♀, Karnataka : Bannerghata Park, 6.i.1974, coll. Ghorpade (No. A85); 1♂, Kerala : Thekkady, 884 m, 27.iii.1977, coll. Ghorpade (No. A427); 1♂, Karnataka : Bangalore, 916 m, 7-9.x.1977, coll. K. D. Ghorpade (No. A484); 1♂, 1♀, Karnataka, Mudigore, 900 m, 6.iv.1980, coll. K. D. Ghorpade (No. A880); 1♂, Karnataka, 2-11 Km. N. Kottogahar, 950 m, coll. K. D. Ghorpade (No. A882).

*Remarks* :— It is generally similar to *Michotamia analis* Macquart from which it differs in the smaller size, dark brown marking of hind femur and the colouration of basal two segments of antennae, first segment being dark brown and the other yellowish-brown. Male of *M. analis* Macquart is not available for comparison of terminalia.

23. *Michotamia macquarti* n. sp.

(Fig. 14)

A medium sized species with black thorax, black and yellowish-brown abdomen, pale and black legs, and wholly infuscated wings. Male : length 14 mm, wing 11 mm.

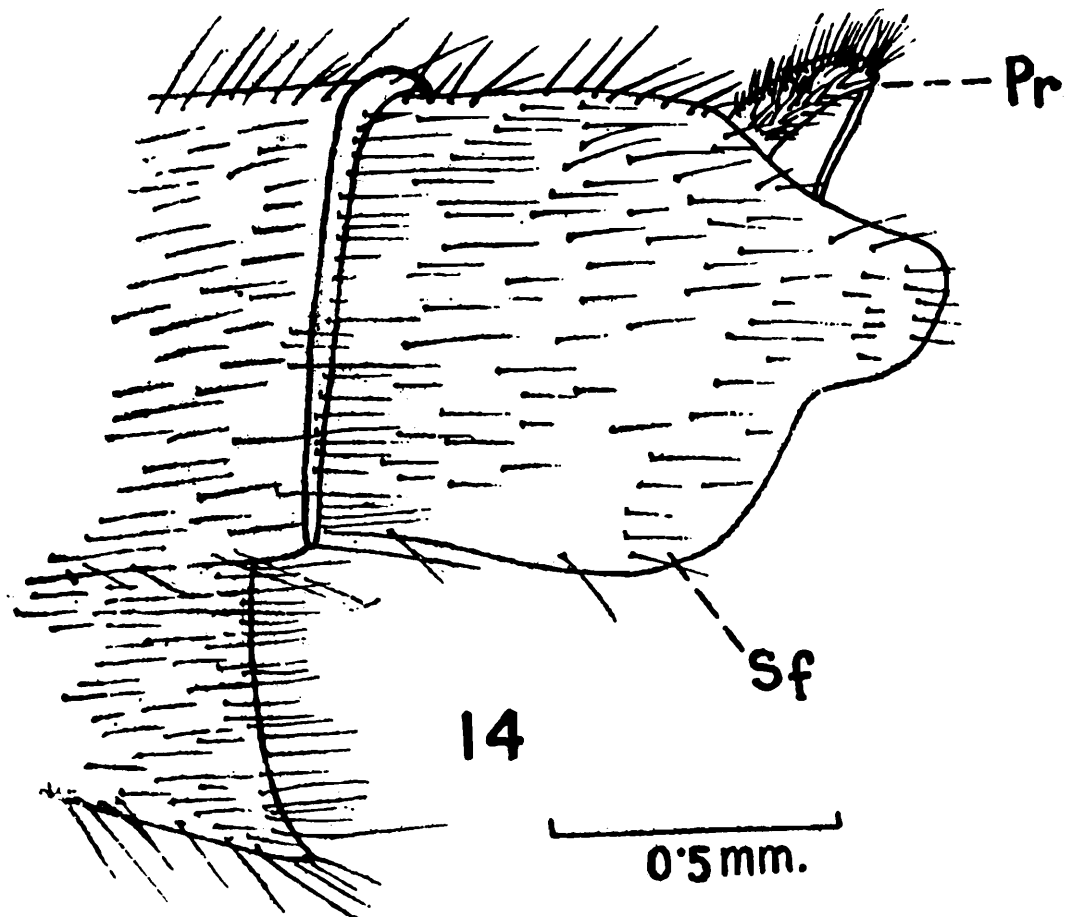


Fig. 14 *Michotamia macquarti* n.sp., lateral view of male terminalia

*Male* : Head broader than thorax, black with sparse grey tomentum, mystax pale yellow, frontal and ocellar bristles black; upper occiput on upper side with a row of black and pale bristles, lower side bearing dense pale hairs. Antennal segments 1 and 2 yellowish-brown, 3 black, bristles on basal two segments black, segment 2 slightly shorter than 1, combined length of segments 1 and 2 shorter than half of 3, style longer than half of segment 3. Proboscis and palpi black, the former bearing pale hairs while the latter black bristles and hairs.

*Thorax* black, sparsely grey tomentose; pronotum with a transverse row of median black bristles sides almost bare; mesonotum devoid of mediolongitudinal stripe, clothing hairs pale and bristles black; scutellum black, grey tomentose, hairs on disc pale, sparse, hind border devoid of bristles; metapleuron with a longitudinal row of black bristles. Halteres yellowish-brown, stalks pale.

*Legs* pale and black; forecoxa anteriorly pale while the rest black, forefemur pale except for a dorsal dark brown mark at base, tibia uniformly pale, tarsal segment 1 basally yellowish-brown and distally dark brown, remaining segments dark brown; midcoxa completely black, midfemur pale but dorsally black from base to more than two-thirds, tibia and tarsus similar to the preceding; hindcoxa uniformly black, hind femur pale with a broad black ring from the middle to near apex, hind tibia bristles black.

*Wings* infuscated, deeper apically and lighter basally, at the border in the cells with hyaline marks.

*Abdomen* pale and black; segment 1 and from segment 5 to tip black, tergite 2 pale yellow, tergites 3 and 4 yellowish-brown. Male terminalia (Fig. 14) black with concolourous and pale hairs.

*Holotype* ♂, India : U.P. : Pilibhit, 450 m, 6.iv.1977, Coll. M. Rathore (No. R32).

*Michotamia macquarti* n. sp. is allied to *M. aurata* (Fabricius) but differing in the structural details of male terminalia together with the median black ring of hindfemora.

#### 24. *Michotamia aurata* (Fabricius)

1794. *Asilus aurata* Fabricius, *Ent. syst.* 4 : 387.

1975. *Michotamia aurata* (Fabricius) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 130.

*Material* : 1♂, India : Kerala : Thekkady, 884 m, 27.iii.1977, coll. K. D. Ghorpade, 1♂, Karnataka : Bangalore, 916 m, 11.x.1978, coll. K. D. Ghorpade.

*Distribution* : India : West Bengal, Kerala, Karnataka, Tsmil Nadu, Madhya Pradesh, Delhi and Bihar. It is also recorded from Pakistan.

#### *Astochia* Becker

*Astochia* Becker, 1913, *Ann. Mus. zool. Acad. St. Petersburg* 17 : 538.

25. *Astochia indica* n. sp.

(Fig. 15)

A medium sized black species with black and pale yellow legs, medially infuscated wings and densely haired male terminalia, especially the gonopod. Male : length, 19 mm, wing 10 mm.

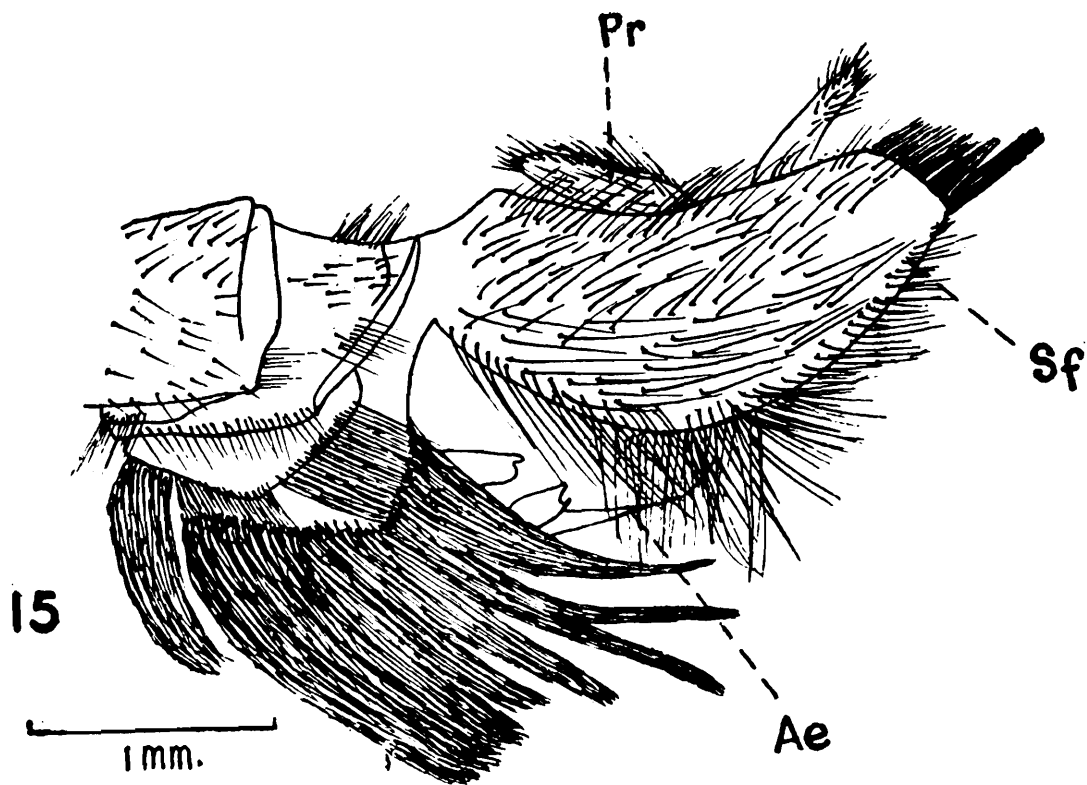


Fig. 15 *Astochia indica* n.sp., lateral view of male terminalia.

**Male :** *Head* broader than thorax. black, densely grey and greyish-yellow tomentose ; mystax pale, bristles sparse, frons along the sides above antennae with pale bristles. ocellar bristles black, upper occiput bare, postocular occiput pale haired with a row of about six black bristles above. Antennae black. bristles on segments 1 and 2 black, segment 2 about two-thirds of 1, segment 3 longer than the combined length of segments 1 and 2, style subequal to 3. Palpi and proboscis black, the former pale haired while the latter white haired.

*Thorax* black, grey tomentose ; pronotum with sparse pale hair and medially bearing a transverse row of four black bristles ; mesonotum devoid of mediolongitudinal stripe, covering hairs and bristles black with some of the hairs at the posterolateral sides pale ; scutellum faintly grey tomentose, disc bare, hind border bearing a pair of black bristles, pleura grey tomentose with sparse white hairs. Halteres yellowish-brown.

*Legs* black and pale yellow; coxa, trochanter, femur and tarsus black, tibia dark brown in fore leg, pale yellow with black apex in mid and hind legs, hindfemur with four basal pale posteroventral bristles, covering hairs pale or white, bristles black, fore and mid femora with dense white hairs from base to three-fourths distance.

*Wings* medially infuscated at the anterior side, apex and lower side hyaline.

*Abdomen* black, sides of tergite 1 with a few pale hairs and one pale bristle, covering hairs sparse, pale. Male terminalia (Fig. 15) black with dense hairs especially on gonopod, hairs black and golden yellow.

*Holotype* ♂, India : Karnataka : 30 kms S. Kanakapura, 13.xii. 1978, coll. K. D. Ghorpade (No. A738).

*Remarks* : This species can be readily recognised from all the remaining Indian species of the genus by the densely haired male terminalia, especially gonopod, the shape of superior forceps and sparse mystax.

#### 26. *Astochia guptai* Joseph and Parui

1981. *Astochia guptai* Joseph and Parui, *Oriental Ins.* **15** (1) : 20-21.

*Material* : 2♂, India : Andhra Pradesh : Rayudapalem, 24.vii.1975, coll. K. Durgaprasad.

*Distribution* : India : Delhi.

*Remarks* : It is the first report from South India.

#### 27. *Astochia bromleyi* Joseph and Parui

*Oriental Ins.* (in press)

*Material* : 1 ♂, India : Karnataka : 30 km. S. Kanakapura, 20.v. 1978, coll. K. D. Ghorpade.

*Distribution* : India : Tamil Nadu.

*Remarks* : It is being reported for the first time from Karnataka.

#### 28. *Astochia hindostani* (Ricardo)

1919. *Neoitamus hindostani* Ricardo, *Ann. Mag. nat. Hist.* (9) **3** : 63.

1975. *Astochia hindostani* (Ricardo) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, **2** : 139.

*Material* : 2 ♂, India : West Bengal : Darjeeling, 2176 m, 29.iv. 1974, coll. M. L. Gupta.

*Distribution* : India : West Bengal and Uttar Pradesh.

**Merodontina Enderlein**

*Merodontina* Enderlein, 1914, *Zool. Anz.* **44** : 262.

29. ***Merodontina indiana* n. sp.**

(Fig. 16)

A black species with pale yellow and black legs and distally infuscated wings. Male : length 18-19 mm, wing 14-16 mm.

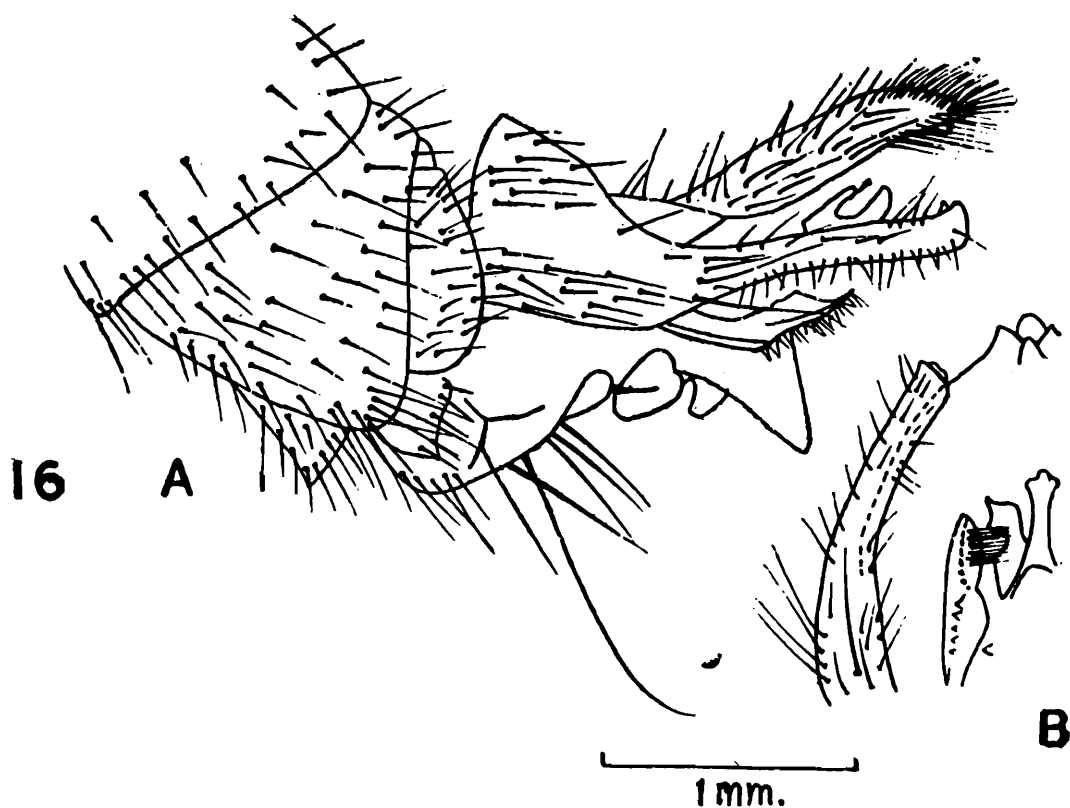


Fig. 16 *Merodontina indiana* n.sp., A, lateral view of male terminalia; B, ventral view of male terminalia.

*Males* : *Head* broader than thorax, black with sparse grey and greyish-yellow tomentum; mystax pale with one or two brown bristles above, frons along sides above antennae bearing pale hairs, ocellar bristles black, upper occiput bare, postocular occiput with black hairs above and white hairs below. Antennae black, bristles on segments 1 and 2 black and also with a few pale hairs, segment 2 subequal to 1, segment 3 tapering distally, about one-and-half times of 2, arista long and bearing a ventral row of long filaments. Palpi and proboscis

black, the former with black and some pale hairs while the latter wholly pale haired.

*Thorax* black, grey tomentose ; pronotum with a median transverse row of six black bristles, sides pale haired ; mesonotum devoid of mediolongitudinal stripe, clothing hairs and bristles black but for some pale hairs on humeri ; scutellum with the disc black haired and hind border bearing three to five black bristles. Halteres pale yellow.

*Legs* black and pale yellow, paratype comparatively lighter coloured ; coxa and trochanter black, femur pale yellow with a dorsal black stripe, apex also black, tibia pale yellow, basitarsus pale yellow with black apex, rest of tarsal segments black, hind coxa, trochanter and femur black, tibia pale yellow with blackened apex, tarsal segments black, hind femur with the usual basal projection and also with a ventral row of black bristles, clothing hairs and bristles pale and black.

*Wings* basally hyaline and distally infuscated with its anterior border medially deeply coloured, comparatively lighter coloured in paratype.

*Abdomen* black, sides of tergite 1 with long pale hairs and a few black bristles, 2 and 3 and even 4 also bearing pale hairs on sides, in paratype hairs longer and denser, clothing hairs pale and black. Male terminalia (Fig. 16) black haired with some pale ones at apex.

*Holotype* ♂, India : U.P. : Almora, 1680 m, 29.vi.1976, coll. G. Chandra (No. G 81). *Paratype* ♂, India : Kalimpong Road, 1470 m, 6.vi.1976, coll. S. Biswas (No. B 35a).

*Remarks* :—In male terminalia the species under report is similar to *Merodontina sikkimensis* Enderlein but differing in structural details. The specimen from Kalimpong (paratype) is comparatively lighter coloured.

#### Philodicus Loew

*Philodicus* Loew, 1848, *Linn. Ent.* 3 : 391.

#### 30. *Philodicus pruthii* Bromley

1935. *Philodicus pruthii* Bromley, *Rec. Indian Mus.* 37 : 224.

*Material* : 2♂, India : Andhra Pradesh : Rayudupalem, 24.vii.1975, coll. K. Durgaprasad. 1♀, Andhra Pradesh : Naguldevapadu, 17.ix.1975, coll. Durgaprasad. 1♂, Karnataka : 30 km. S. Kanakapura,

12.xii.1978, coll. K. D. Ghorpade, 1 ♂, 2 ♀, Karnataka, 30 km. S. Kanakapur, 13.xii. 1978, coll. K. D. Ghorpade. 1 ♂, rest of details as in preceding.

*Distribution* : India : Tamil Nadu.

*Remarks* :—This is the first record from Andhra Pradesh and Karnataka.

### 31. *Philodicus javanus* (Wiedemann)

1819. *Asilus javanus* Wiedemann, *Zool. Mag.* 1 (3) : 4.

1975. *Philodicus javanus* (Wiedemann) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 149.

*Material* : 1♂, India : Karnataka : Bangalore, 916 m, 16.ii.1978, coll. K. D. Ghorpade ; 1♂, 2.iii.1979, rest of details as in preceding.

*Distribution* : India : Tamil Nadu, West Bengal, Sikkim and Assam. It is also recorded from Ceylon, Timor Islands, Java, Borneo, Sumatra, Pakistan and Bangla Desh.

*Remarks* :—It is the first record from Karnataka,

### *Promachus* Loew

*Promachus* Loew, 1848, *Linn. Ent.* 3 : 390.

### 32. *Promachus maculatus* (Fabricius)

1775. *Asilus maculatus* Fabricius, *Syst. Ent.* : 794.

1975. *Promachus maculatus* (Fabricius) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 153.

*Material* : 1♂, India : Karnataka : Bangalore, 916 m, 30.iii.1978 ; 1 ♀, Bangalore, 916 m, 28.iv.1978 ; 1 ♀ Bangalore, 916 m, 2.iv.1979 ; 1 ♀, Bangalore, 916 m, 16.iv.1979 ; all specimens collected by K. D. Ghorpade.

*Distribution* : National Zoological Collection, Calcutta, contain specimens from Uttar Pradesh and Karnataka.

### 33. *Promachus duvaucelii* (Macquart)

1838. *Trupanea duvaucelii* Macquart, *Dipt. exot.* 1(2) : 213.

1975. *Promachus duvaucelii* (Macquart) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 152.

*Material* : 1♂, India : Karnataka : Bannerghata Park, 27.x.1977, coll. K. D. Ghorpade ; 1♂, Tamil Nadu : 12 km. N. Salem, 22.ix.1978, coll. Virakiamath ; 1 ♀, Delhi University, 7.x.1979, coll. K. D. Ghorpade.

*Distribution* : India : West Bengal, Madhya Pradesh, Punjab, Gujarat and Delhi.

*Remarks* :—This species is reported for the first time from Karnataka and Tamil Nadu.

#### 34. *Promachus yerburiensis* Ricardo

1920. *Promachus yerburiensis* Ricardo, *Ann. Mag. nat. Hist.* (9) 5 : 200.

*Material* : 1♂, 1 ♀, India : Karnataka : Mudigore, 900 m, 6.iv.1980, coll. K. D. Ghorpade.

*Distribution* : India : Kerala, Tamil Nadu and Karnataka. This species was originally described from Ceylon.

#### *Microstylum* Macquart

*Microstylum* Macquart, 1838, *Dipt.* : 1(2) : 142.

#### 35. *Microstylum bhattacharyai* Joseph and Parui

*Ent. scand.* (in press)

*Material* : 1♂, India : Karnataka : Bangalore, 916 m, 7.v.1975 ; 1♂, Bangalore, 916 m, 28.iv.1978 ; 1♂, Bangalore, 916 m, 22.iv.1979 ; 1♂, Bangalore, 916 m, 27.iv.1979 ; 5♂, 2 ♀, Bangalore, 916 m, 16.v.1979 ; 1♂, Bangalore, 916 m, 20.v.1979 ; 1♂, 2 ♀, Bangalore, 916 m, 25.v.1980 ; all the specimens collected by K. D. Ghorpade.

*Distribution* : India : Kerala and Tamil Nadu.

*Remarks* :—It is recorded for the first time from Karnataka.

#### *Trigonomima* Enderlein

*Trigonemima* Enderlein, 1914,, *Wien. ent. Ztg.* 33 : 164.

#### 36. *Trigonomima anamaliensis* Joseph and Parui

1980. *Trigonomima anamaliensis* Joseph and Parui, *Bull. Zool. surv. India*, 2(2 and 3) : 197-199.

*Material* : 2 ♂, 1 ♀, India ; Karnataka : Mudigore, 700 m, 22.v.1976, coll. K. D. Ghorpade ; 1 ♂, 3 ♀, Karnataka : Jog Falls, 534 m, 18.xi.1976, coll. K. D. Ghorpade ; 1 ♀, Karnataka : Mudigore, 970 m, 6.iv.1980 ; 1 ♂, 2 ♀, Mudigore, 970 m, 7.iv.1980, all collected by K. D. Ghorpade.

*Distribution* : India : Tamil Nadu.

*Remarks* :--This is the first record from Karnataka.

### Stichopogon Loew

*Stichopogon* Loew, 1847, *Linn. Ent.* 2 : 499.

#### 37. *Stichopogon inaequalis* (Loew)

1847. *Dasyopogon inaequalis* Loew, *Linn. Ent.* 2 : 505.

1975. *Stichopogon inaequalis* (Loew) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 129.

*Material* : 3 ♂, 3 ♀, India : Karnataka, 30 km. S. Kanakapura, 20.v.1978, coll. K. D. Ghorpade.

*Distribution* : India. Ceylon. Palearctic Region.

#### 38. *Stichopogon meridionalis* Oldroyd

1948. *Stichopogon meridionalis* Oldroyd, *Entomologist's mon. Mag.* 84 : 261.

*Material* : 1 ♀ India : Karnataka : Bangalore, 916 m, 1.iii.1979, coll. K. D. Ghorpade.

*Distribution* : India : Tamil Nadu and Karnataka. It is also recorded from Ceylon.

### Neolaparus Williston

*Neolaparus* Williston, 1889, *Psyche*, Camb. 5 : 255.

#### 39. *Neolaparus volcatus* (Walker)

1849. *Dasyopogon volcatus* Walker, *List. Dipt. Colln. Br. Mus.* 2 : 345.

1975. *Neolaparus volcatus* (Walker) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 122.

*Material* : 1 ♂, India : Assam : Gauhati, 18.v.1962, coll. Gupta. 1 ♂, Garhwal Himalaya : Dehra Dun, 13.vi.1962, coll. Gupta. 1 ♀, North-West Himalaya : Bajaura, 21.vi.1970, coll. Kamath. 1 ♂ Sikkim : Melli, 235 m, 4.vi.1976, coll. L. K. Sharma, 1 ♀, Karnataka Bangalore, 916 m, 6.v.1979, coll. K. D. Ghorpade.

*Distribution* : India : West Bengal, Assam, Sikkim, Uttar Pradesh and Karnataka.

*Remarks* :—This is the only species of the genus so far reported from India.

#### SUMMARY

A total of 39 species under 14 genera are reported here, which include the description of 16 new species :

*Clephydronera ghorpadei* n. sp., *C. mysorensis* n. sp., *C. robusta* n. sp., *C. karnatakaensis* n. sp., *C. bannerghattaensis* n. sp., *C. bangalorensis* n. sp., *C. mudigorensis* n. sp., *Heligmoneura bigoti* n. sp., *Ommatius truncatus* n. sp., *Neoitamus mussooriensis* n. sp., *N. barsilensis* n. sp., *Stenopogon loewi* n. sp., *Michotamia fuscifemorata* n. sp., *M. macquarti* n. sp., *Astochia indica* n. sp., and *Merodontina indiana* n. sp.

#### ACKNOWLEDGEMENTS

We are indebted to Dr. K. D. Ghorpade of University of Agricultural Science, Bangalore, for placing the material at our disposal for study. Our grateful thanks are also due to Dr. B. K. Tikadar, Director and Dr. S. K. Bhattacharyya, Deputy Director, of Zoological Survey of India, Calcutta, for the facilities and encouragements.

Abbreviations used in text-figures : Ae, aedeagus ; Cl, clasper ; Go, gonopod ; Hy, hypandrium ; Pr, proctiger ; Sf, superior forceps.

## REFERENCES

- BECKER, T. 1913. In Becker and Stein : Persische Dipteren von den Expeditionen des Herrn N. A. Zarudny 1898 und 1901. *Ann. Mus. Zool. Acad. St. Petersburg*, **17** (1912) : 503-564.
- BIGOT, J. M. F. 1858. Diptera, in M. James Thomson, Voyage au Gabon, Histoire naturelle des insectes et des arachnides. *Arch. ent.* **2** : 1-469, 14 pls.
- BROMLEY, S. W. 1935. New Asilidae from India. *Rec. Indian Mus.* **37** : 219-230.
- ENDERLEIN, G. 1914. Dipterologische Studien. XI. Zur Kenntnis tropischer Asiliden. *Zool. Anz.* **44** : 262-263.
- ENDERLEIN, G. 1914. Dipterologische Studien XII. Zur Kenntnis der Asiliden subfamilien Dasypogoninae und Archilaphriinae. *Wien. ent. Ztg.* **33** : 151-174.
- FABRICIUS, J. C. 1775. *Syst. ent. Flensburgi et Lipsiae* : 1-832.
- FABRICIUS, J. C. 1794. *Ent. Syst.* **4** : 1-472. \*
- JOSEPH, A. N. T. and PARUI, P. 1979. New and little-known Indian Asilidae (Diptera) III. Key to Indian *Clephydroneura* Becker with descriptions of eight new species. *Ent. scand.* **10** : 33-41.
- JOSEPH, A. N. T. and PARUI, P. 1980. New and little-known Indian Asilidae (Diptera) IV. Key to Indian *Heligmoneura* Bigot with descriptions of ten new species. *Ent. scand.* **11** : 281-290.
- JOSEPH, A. N. T. and PARUI, 1981. *Astochia* Becker, *Promachus* Loew and *Saropogon* Loew (Diptera : Asilidae) from India. *Oriental Ins.* **15** : 17-29.

- JOSEPH, A. N. T. and PARUI, P. New and little-known Indian Asilidae (Diptera) VI. Key to Indian *Ommatius* Wiedemann with descriptions of fourteen new species. *Ent. scand.* (in press).
- JOSEPH, A. N. T. and PARUI, P. On some Asilidae (Diptera) from India and adjoining countries present in the British Museum (Natural History). *Oriental Ins.* (in press).
- LOEW, H. 1847. Ueber die europäischen Raubfliegen (Diptera : Asilica) *Linn. ent.*, Stettin 2 : 384-568.
- LOEW, H. 1848. Ueber die europäischen Raubfliegen (Diptera : Asilica). *Linn. ent.* Stettin 3 : 386-495.
- MACQUART, P. J. M. 1838. *Dipteres exotiques nouveaux ou peu connus.* 1(2) : 130-272.
- OLDROYD, H. 1938. Notes on the genus *Clephroneura* Becker (Diptera : Asilidae), *Ann. Mag. nat. Hist.* (11) 1 : 450-471.
- OLDROYD, H. 1948. Some Indian species of the genus *Stichopogon* (Diptera : Asilidae). *Entomologist's mon. Mag.* 84 : 261-263.
- OLDROYD, H. 1975. *A Catalog of the Diptera of the Oriental Region.* 2 : 99-156. The university Press of Hawaii, Honolulu.
- OSTEN-SACKEN, C. R. 1878. Catalogue of the described Diptera of North America, Second Edition. *Smithson. misc. Collns.* 16 : 1-276.
- RICARDO, G. 1919. Notes on the Asilidae : subdivision Asilinae. *Ann. Mag. nat. Hist.* (9) 3 : 44-79.
- RICARDO, G. 1920. Notes on the Asilidae : subdivision Asilinae. *Ann. Mag. nat. Hist.* (9) 5 : 211-241.
- WALKER, F. 1849. *List of the specimens of dipterous insects in the Collection of the British Museum,* 2 : 231-484.

WIEDEMANN, C. R. W. 1819. Beschreibung neuer Zweiflügler aus Ostindien und Afrika. *Zool. Mag.* 1(3) : 3-39.

WIEDEMANN, C. R. W. 1821. *Dipt. exot. Kiliae* Part I : 1-44\*

WILLISTON, S. W. 1889. Notes on Asilidae. *Psyche*, 5 : 255-259.

\* Original reference not seen