

**ON SOME ASILIDAE (DIPTERA) PRESENT IN THE B. P. BISHOP
MUSEUM, HONOLULU II**

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INTRODUCTION

Through the courtesy of Dr. Neal L. Evenhuis, Associate Entomologist, B. P. Bishop Museum, Honolulu, Hawaii 96819, we have received a second lot of robber flies from India and Nepal and the result of the study is presented in this paper. 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 (1984a).

Types are deposited in the B. P. Bishop Museum, Honolulu and the Zoological Survey of India, Calcutta.

***Laphria* Meigen**

1803. *Laphria* Meigen, *Magazin insektkde*, 2 : 270.

1. *Laphria frommeri* Joseph and Parui

1981. *Laphria frommeri* Joseph and Parui, *Ent. Scand.*, 12(2) : 219.

Material examined : 1 ♂ (tip of abdomen lost), India. Tamil Nadu, Anamalai Hills, 1050 m., iv. 1956, Coll. P. S. Nathan; 1 ♂, 1067 m., v. 1956, other details as in preceding specimen.

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

***Cyrtopogon* Loew**

1847 *Cyrtopogon* Loew, *Linn. Ent.*, 2 : 516.

2. *Cyrtopogon laphrides* Walker

1851. *Cyrtopogon laphrides* Walker, *Insecta Saundersiana*, 1 : 99.

Material examined : 2 ♂, 1 ♀, Nepal, Langtang Valley, 60 km. N. of Katmandu, 2700 - 3400 m., 12-23. x. 1965, Coll. L. V. Quate.

Remarks : It is reported here for the first time from outside India.

***Microstylum* Macquart**

1838. *Microstylum* Macquart, *Dipt. exot.*, 1 (2) : 26.

3. *Microstylum bhattacharyai* Joseph and Parui

1984. *Microstylum bhattacharyai* Joseph and Parui, *Ent. Scand.*, 15 (4) : 450 - 451.

Material examined : 1 ♀, Tamil Nadu, Coimbatore, 420 m., iv. 1960, Coll. P. S. Nathan. 1 ♀, Pondicherry, Karikal, viii. 1970, Coll. P. S. Nathan.

Remarks : The species is described from Tamil Nadu and Kerala. The present report is the first from Pondicherry.

4. *Microstylum varshneyi* Joseph and Parui

1984. *Microstylum varshneyi* Joseph and Parui, *Ent. Scand.*, 15 (4) : 452 - 453.

Material examined : 2 ♂, Tamil Nadu, Coimbatore, 420 m., ix. 1962, Coll. P. S. Nathan.

Remarks : The species is only known from type locality.

***Saropogon* Loew**

1847. *Saropogon* Loew, *Linn. Ent.*, 2 : 439.

5. *Saropogon hulli* Joseph and Parui

1981. *Saropogon hulli* Joseph and Parui, *Oriental Ins.*, 15 (1) : 27-28.

Material examined : 1 ♀, Kerala, Anamalai Hills, Cinchona, 1067 m., v. 1959, Coll. P. S. Nathan. 1 ♂, Tamil Nadu, Coimbatore, 420 m., xii. 1969, Coll. P. S. Nathan.

Remarks : So far the species is recorded from Kerala and Karnataka. It is recorded here for the first time from Tamil Nadu.

***Stenopogon* Loew**

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

6. *Stenopogon kherai* Joseph and Parui

1976. *Stenopogon kherai* Joseph and Parui, *Ent. Scand.*, 7 : 105 - 106.

Material examined : 1 ♀, 1 ex. (abdomen lost), Kerala, Anamalai Hills, Cinchona, 1067 m., v. 1959, Coll. P. S. Nathan.

Remarks : The species was described from Bihar. This is the second record of the species and the first from Tamil Nadu.

7. *Stenopogon manii* Joseph and Parui

1981. *Stenopogon manii* Joseph and Parui, *Oriental Ins.*, 15 (1) : 106 - 107.

Material examined : 1 ♂, Kerala, Anamalai Hills, Cinchona, 1050 m., iv. 1956, Coll. P. S. Nathan.

Remarks : The species is only known from Kerala.

Trigonomima Enderlein

1914. *Trigonomima* Enderlein, *Wien, ent. ztg.*, 33 : 164.

8. *Trigonomima anamaliensis* Joseph and Parui

1980. *Trigonomima anamaliensis* Joseph and Parui, *Bull. zool. Surv. India*, 2 (2 & 3) : 197 - 199.

Material examined : 2 ♂, Kerala, Anamalai Hills, Cinchona, 1067 m., v. 1956, Coll. P. S. Nathan. 10 ♀, v. 1967, other data as in preceding.

Remarks : The species is only known from Tamil Nadu.

Damalis Fabricius

1805. *Damalis* Fabricius, *Systema antliatorum*, : 147

9. *Damalis calicutensis* sp. nov.
(Fig. 1)

A small black species with yellowish-brown legs, and hyaline wings, with brown costal and subcostal cells. Male : length 11 mm, wing 9 mm; female : length 13 mm, wing 10 mm.

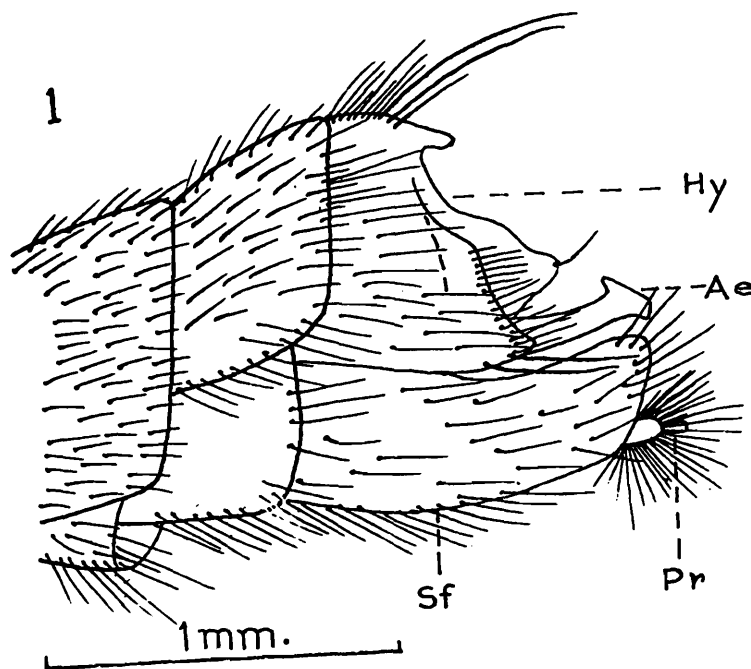


Fig. 1. *Damalis calicutensis* sp. nov., lateral view of male genitalia.

♂ : *Head* broader than thorax, black, tomentum grey or greyish-yellow, sparse; mystax a transverse row of four black bristles; fronto-orbital and ocellar bristles absent; postcranium sparsely grey tomentose with sparse white hairs, a few hairs above black. Antenna black with distal half of style white, scape short, about one-fourth length of pedicel and ventrally bearing an elongate bristle, pedicel globular, bristles of both segments black, style elongate. Palpus and proboscis black, former with black and pale yellow hair, latter with a pair of elongate black hairs.

Thorax black, sparsely grey and greyish-yellow tomentum; pronotum with white hair; mesonotum medially black, laterally and posteriorly grey or greyish-yellow tomentose, humerus brown, vestiture medially black and the remainder white, scutellum with a ridge on hind border which bears a few elongate white hairs; pleuron sparsely grey tomentose. Haltere yellowish-brown, head marked with dark brown.

Leg mostly yellowish-brown, coxa black, remainder yellowish-brown except apices of all femora and apices of all tarsal segments being dark brown, vestiture predominantly black with a few pale yellow hairs, bristles black; apex of hind trochanter with a cluster of black spines apically, hind femur with an anteroventral row of black spines extending the complete length and a posteroventral row of 5-6 black spines on the distal half.

Wing hyaline with costal and subcostal cells brown.

Abdomen black, sparsely grey tomentose; terga 1 and 2 laterally with a few elongate white hairs, vestiture black. Genitalia (Fig. 1) black with black and a few white hairs. Hypandrium with a pair of long black hairs dorsally and one short and two long bristly hairs at apical corners.

♀ : Differs from male as follows: head rather densely grey tomentose; scape long, slightly longer than half the length of pedicel; hairs on proboscis pale yellow. Thorax densely grey tomentose; mesonotum with a broad, mediolongitudinal black stripe extending from anterior border to midway between transverse suture and hind border, remainder grey and greyish-yellow tomentose with two mediolateral black areas on each side. Haltere pale yellow, head marked black. Wing with brown colour extending along border into the 1st posterior cell. From abdominal tergum 3 to hind terga with white hairs.

It is very similar to *Damalis indica* (Joseph and Parui) but differs in the details of male genitalia : hypandrium devoid of spine medially and with one short and two long spiny bristles in the apical corner, and in the shapes of the aedeagus and of superior forceps.

Holotype : ♂, South India : Kerala State : Calicut District : Chembra Peak Area, 1067 m, coll. T. R. S. Nathan.

10. *Damalis cederholmi* (Joseph and Parui) new combination1984. *Xenomyza cederholmi* Joseph and Parui, *Ent. Scand.*, 15 (4) : 448-449.*Material examined* : 1 ♂, Kerala, Trivandrum District, Poonmudi Range, 900 m., iv - v. 1971, Coll. P. S. Nathan.*Remarks* : This is the second record of the species from the type locality.11. *Damalis indica* (Joseph and Parui) new combination1984. *Xenomyza indica* Joseph and Parui, *Ent. Scand.*, 15 (4) : 444.*Material examined* : 1 ♂, 1 ♀, Kerala, Anamalai Hills, Cinchona, 1050 m., i. 1967, Coll. P. S. Nathan.*Remarks* : The species was described from Kerala, Karnataka and Tamil Nadu. This is the second record of the species.12. *Damalis rufoabdominalis* (Joseph and Parui) new combination1984. *Xenomyza rufoabdominalis* Joseph and Parui, *Ent. Scand.*, 15 (4) : 445-447.*Material examined* : 1 ♀, Kerala, Calicut District, Chembra Peak Area, v. 1970. Coll. T. R. S. Nathan. 1 ♂, Tamil Nadu, 420 m., iii - iv. 1971, Coll. P. S. Nathan.*Remarks* : It was described from Kerala and Karnataka and subsequently reported from Tamil Nadu (Joseph and Parui, in press).*Cophinopoda* Hull1958. *Cophinopoda* Hull, *Proc. Ent. Soc. Washington*, 60 : 251.13. *Cophinopoda chinensis* (Fabricius)1794. *Asilus chinensis* Fabricius, *Ent. Syst.*, 4 : 383.1975. *Cophinopoda chinensis* (Fabricius) : Oldroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 129.*Material examined* : 1 ♀, Tamil Nadu, Coimbatore, 420 m., x. 1962, Coll. P. S. Nathan.*Remarks* : It is a cosmopolitan species. Its detailed distribution in India is given by Joseph and Parui (in press).*Michotamia* Macquart1838. *Michotamia* Macquart, *Dipt. Expt.*, 1 (2) : 72.14. *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 examined* : 2 ♂, 2 ♀, Madhya Pradesh, Jabalpur, 480 m., x. 1957, Coll. P. S. Nathan. 1 ♀, Tamil Nadu, Coimbatore, 420 m., x. 1962, Coll. P. S. Nathan.

Remarks : It is widely distributed in India.

Ommatius Wiedemann

1821. *Ommatius* Wiedemann, *Dipt. Exot.*, 1 : 213.

15. *Ommatius minor* Doleschall

1857. *Ommatius minor* Doleschall, *Natuurk. Tijdschr. Ned. Indie*, 14 : 394.

Material examined : 2 ♂, 2 ♀, Kerala : Anamalai Hills, Cinchona, 1050 m., i. 1967, Coll. P. S. Nathan.

Remarks : The type locality of this species is Moluccas and subsequently recorded from Borneo, India, and New Guinea (Oldroyd, 1975). The species is only known from Kerala and Tamil Nadu (Joseph and Parui, 1984 d).

16. *Ommatius tuberculatus* Joseph and Parui

1983. *Ommatius tuberculatus* Joseph and Parui, *Ent. Scand.*, 14 (1) ; 87.

Material examined : 3 ♂, 1050 m., iv. 1956; 1 ♂, 1967 m., v. 1956; and 4 ♂♂, 1 ♀, v. 1970; all from Kerala, Anamalai Hills, Cinchona, Coll. P. S. Nathan.

Remarks : The species is only known from Kerala and Tamil Nadu.

Astochia Becker

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

17. *Astochia indica* Joseph and Parui

1984. *Astochia indica* Joseph and Parui, *Rec. zool. Surv. India*, Occ. paper No. 66 : 30 - 31.

Material examined : 1 ♂, Pondicherry, Karikal, xi. 1961, Coll. P. S. Nathan.

Remarks : The species was described from Karnataka. This is the second record of the species and for the first time from Pondicherry.

18. *Astochia karikalensis* sp. nov.

(Fig. 2)

A medium sized black species with yellowish-brown and dark brown legs and apically fuscous wings. Male : length 16 mm, wing 9 mm.

♂ : *Head* as broad as throx, black with dense greyish-white and greyish-yellow tomentum; mystax white, fronto-orbital plate bearing white and black hairs, ocellar bristles black, postcranium white haired, postocular bristles black or pale yellow and four on each side, postgena densely white haired. Antenna black, bristles black and present on basal two segments both dorsally and ventrally, bristles on segment 1 ventrally dense and a few of them elongate, segment 2 subequal to length of segment 1, segment 3 subequal to combined length of segments 1 and 2, style subequal in length to flagellum. Palpus and proboscis black, their hairs white.

Thorax black with grey tomentum; pronotum white haired with a median transverse row of pale yellow bristles; mesonotum with a mediolongitudinal black stripe divided by a narrow greyish-yellow stripe, stripe extending from anterior border to transverse suture, laterally with two large and one small black spots in a longitudinal row, vestiture black with a few white hairs anterolaterally and posterolaterally, bristles black; scutellum densely grey tomentose with long white hairs, hind border with a pair of black bristles; pleura grey tomentose with white hairs. Haltere pale yellow with dark brown mark on head.

Leg yellowish-brown and dark brown; coxa black with dense grey tomentum, trochanter black, femora yellowish-brown and dark brown, fore femur yellowish-brown with basal one-third and apex dark brown, mid femur similar but basal dark brown colour a little more extended, hind femur dark brown leaving a yellowish-brown subapical ring, tibiae yellowish-brown with dark brown tip, in hind tibia dark brown colour more extensive, tarsi dark brown, fore tibia with a ventral row of six, long black hairs, vestiture predominantly white with some black hairs, bristles black.

Wing infuscated distally, which continues posteriorly into the 5th posterior cell, remainder hyaline.

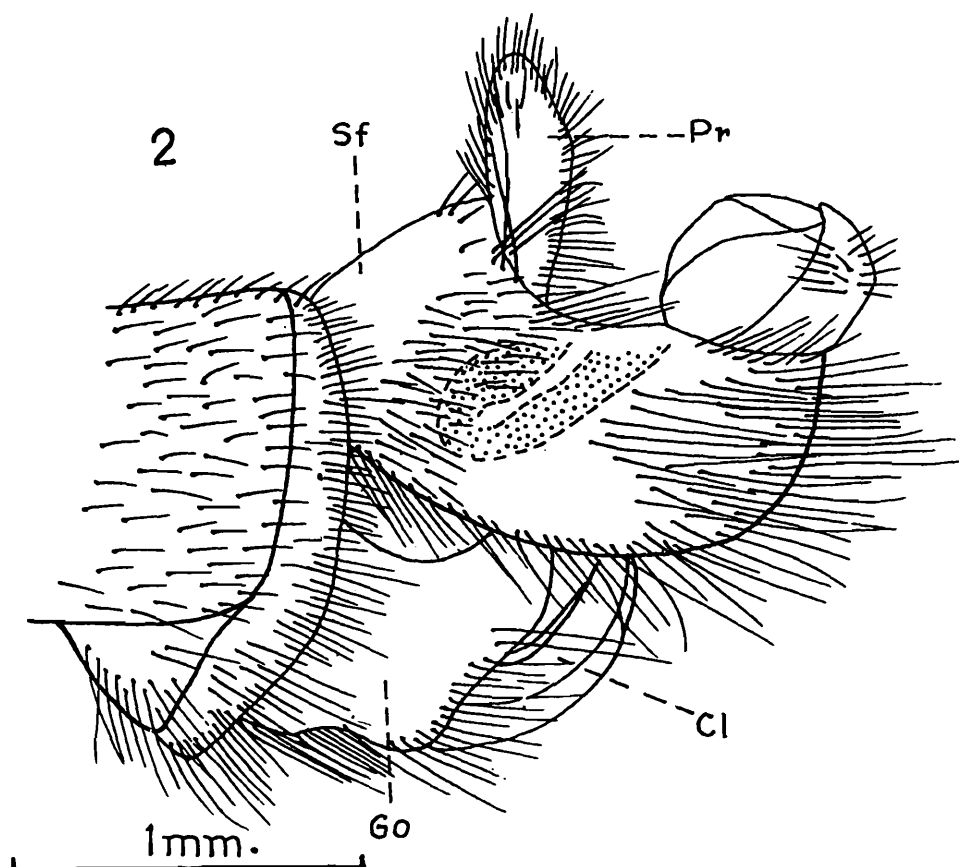


Fig. 2. *Astochia karikalensis* sp. nov., lateral view of male genitalia.

Abdomen black with grey tomentum, tergum 1 wholly grey tomentose, tergum 2 and beyond grey laterally and posteriorly leaving an anterior black area, terga 2 and 3 with posterior grey band abruptly narrows near middle leaving a small, median, triangular black area at posterior border, terga 1 and 2 and to some extent 3 laterally with long, white hairs, tergum 1 also bears a few black and white bristles, vestiture white. Genitalia (Fig. 2) black with black and white hairs.

Of all the known Indian species of the genus *Astochia*, *A. karikalensis* n. sp. is close to *A. bromleyi* Joseph and Parui from which the former can be readily separated by the leg colouration and the shape of superior forceps.

Holotype : ♂, South India : Pondicherry : Karikal, xi. 1962, Coll. P. S. Nathan.

Clephydroneura Becker

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

19. *Clephydroneura karnatakaensis* Joseph and Parui

1984. *Clephydroneura karnatakaensis* Joseph and Parui, *Rec. zool. Surv. India, Occ. paper No.66* : 9 - 10.

Material examined : 1 ♂, Pondicherry, Karikal, xi. 1962, Coll. P. S. Nathan.

Remarks : This is the second record of the species and first time from Pondicherry.

Heligmoneura Bigot

1858. *Heligmoneura* Bigot, in Thomson, *Arch. ent.*, 2 : 356.

20. *Heligmoneura cheriani* Joseph and Parui

1980. *Heligmoneura cheriani* Joseph and Parui, *Ent. Scand.*, 11 (3) : 286 - 287.

Material examined : 1 ♀, Kerala, Anamalai Hills, Cinchona, 1067 m., v. 1956, Coll. P. S. Nathan.

Remarks : So far this species is recorded only from Kerala.

Machimus Loew

1849. *Machimus* Loew, *Linn. Ent.*, 4 : 1.

21. *Machimus angularis* (Ricardo)

1923. *Tolmerus angularis* Ricardo, *Ann. Mag. nat. Hist.*, (9) 10 : 64.

1975. *Machimus angularis* (Ricardo) : Olyroyd, *A Catalog of Diptera of the Oriental Region*, 2 : 144.

Material examined : 4 ♂, 1 ♀, Nepal, Langtang valley, 60 Km. N. of Katmandu, 2700 - 3400., 13 - 25, x. 1965, Coll. L. W. Quate.

Remarks : This Indian species was recorded earlier from Nepal by Joseph and Parui (in press).

22. *Machimus smithi* Joseph and Parui

1986. *Machimus smithi* Joseph and Parui, *Rec. zool. Surv. India*. Occasional paper No.96 : 51.

Material examined : 1 ♂, Kerala, Anamalai Hills, Cinchona, 1067 m., v. 1956, Coll. P. S. Nathan. 1 ♂, Kerala Calicut District, Chembra Peak Area, 1067 m., v. 1970, Coll. T. R. S. Nathan.

Remarks : This is the first record from Kerala. It was described from Tamil Nadu.

Philodicus Loew

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

23. *Philodicus ceylanicus* Schiner

1868. *Philodicus ceylanicus* Schiner, *Diptera Novara Reise*, : 179.

Material examined : 1 ♂, Kerala, Calicut District, Chembra Peak Area, 1067 m., Coll. T. R. S. Nathan. 1 ♂, Pondicherry, Karikal, ii - iv. 1971, Coll. P. S. Nathan.

Remarks : The species was described from Sri Lanka. Subsequently it has been recorded from Andaman Islands (Lal, 1960) and Nepal (Joseph and Parui 1984 d). It is recorded here for the first time from Kerala and Pondicherry.

24. *Philodicus pruthii* Bromley

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

Material examined : 1 ♀, Tamil Nadu, Coimbatore, 420 m., x. 1962, Coll. P. S. Nathan; 2 ♂, 1 ♀, xi. 1967, rest of data as in preceding.

Remarks : The species was described from Tamil Nadu and subsequently has been recorded from Andhra Pradesh, Karnataka and Madhya Pradesh.

25. *Philodicus raoi* sp. nov.

(Fig. 3)

A medium sized dark brown and yellowish-brown fly with grey or greyish-yellow tomentum or black with grey, greyish-white or greyish-yellow tomentum, yellowish-brown with varying infuscated or black legs, and distally light brown wings with closed first posterior cell. Male : length 16-19 mm, wing 10-12 mm; female : length 17-20 mm, wing 9-11 mm.

♂ : *Head* narrower than thorax, black, heavily greyish-yellow to greyish-white tomentose; mystax white, fronto-orbital plate white haired, ocellar bristles white, postocular bristles white, occipital hairs white, postgena densely white haired. Antenna yellowish-brown with dark brown style but in some specimens segment 3 also distally or wholly dark brown, segments 1 and 2 with white bristles both ventrally and dorsally, segment 2 two-thirds to three-fourths length of segment 1, length of segment 3 variable, from subequal to segment 1 to the combined length of segments 1 and 2. Palpus dark brown or black, proboscis black, their hairs white.

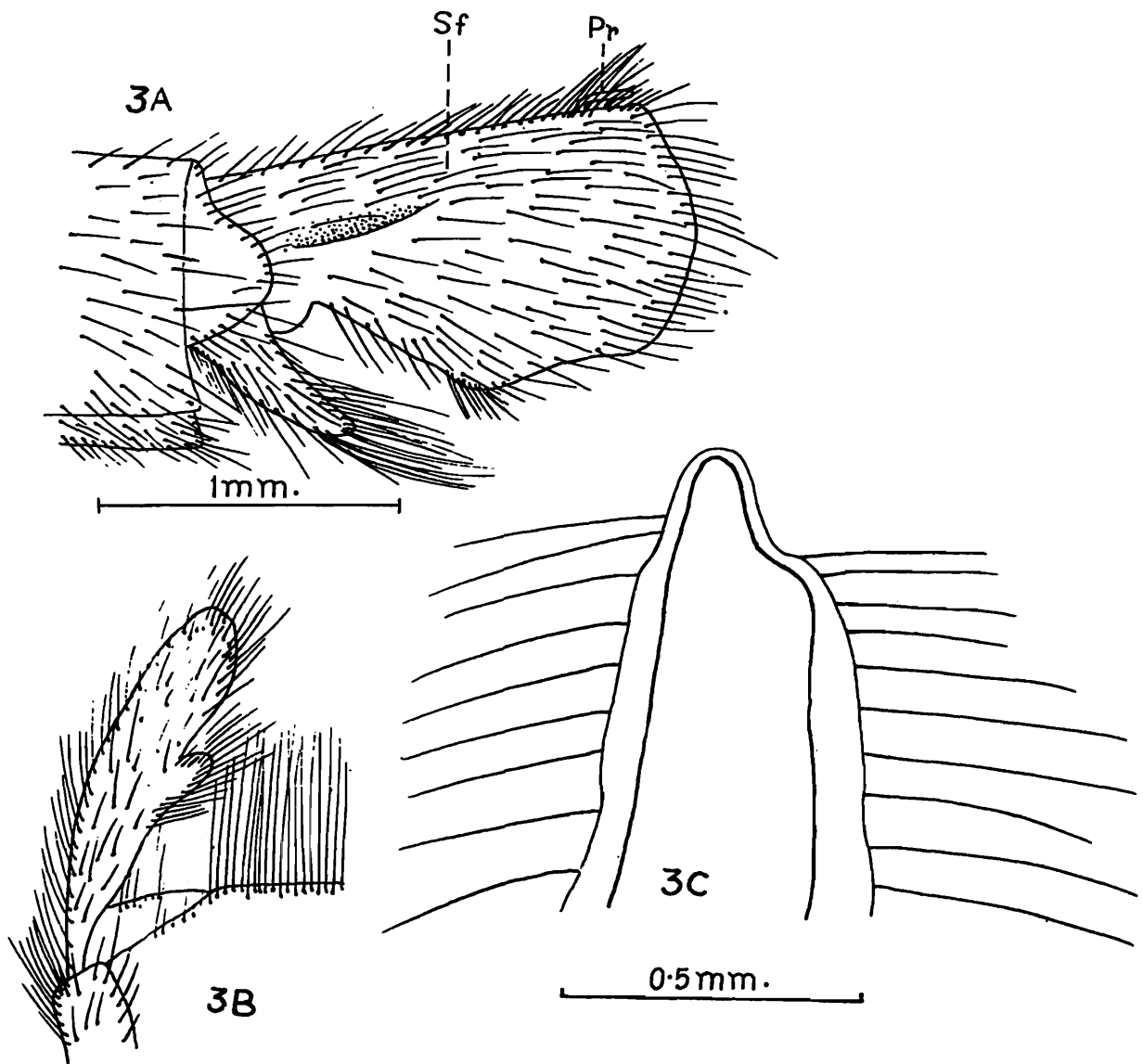


Fig. 3. *Philodicus raoi* sp. nov., A lateral view of male genitalia; B, ventral view of male genitalia; C, ventral view of eighth sternum of female.

Thorax dark brown and black with dense greyish-yellow tomentum or black with sparse grey tomentum; pronotum with a transverse row of white bristles, densely white haired laterally; mesonotum with a mediolongitudinal black stripe extending entire length which is divided by a median greyish-yellow or grey stripe extending from anterior border to midway between transverse suture and hind border, in black specimens the mediolongitudinal dividing stripe faint, laterally with two indistinct dark brown or black spots, vestiture black with some white hairs anterolaterally and posterolaterally, bristles white with some black ones on either side of mediolongitudinal stripe behind transverse suture, in black specimens all bristles white; scutellum greyish-yellow or grey tomentose with a median dark brown marking, disc white haired, hind borders with

two or four white bristles; metapleuron with a tuft of white hairs and bristles. Haltere completely pale yellow or to a varying extent dark brown.

Leg yellowish-brown with varying extent of infuscation or black on femora and tibiae; in holotype fore femur anteriorly infuscated but for some distance basally and at apex yellowish-brown, mid femur similarly coloured but the infuscation lighter and smaller, hind femur infuscated for distal one-third length, fore tibia uniformly yellowish-brown, mid and hind tibiae apically infuscated, infuscation more distinct and occupying larger area on the latter, hairs and bristles white except for a few black bristles on tarsus; in paratypes fore and mid femora black anteriorly, dorsally and posteriorly but in one example extreme base yellowish-brown, basal one-fourth of hind femur or more yellowish-brown with the remainder black anteriorly, dorsally and posteriorly, fore tibia also infuscated, hairs and bristles similar to that of holotype.

Wing hyaline, distally light brown; 1st posterior cell closed.

Abdomen heavily greyish-yellow tomentose or black, tergum 1 laterally with a tuft of white hairs and bristles, tergum 2 laterally with two anterior and three posterior white bristles, terga 3-5 or beyond with three to four posterior white bristles, vestiture white. Male genitalia (Fig. 3) dark brown or black with white hairs.

♀ : Similar but with the following differences: in two examples even though mesonotum is black, it is with some black bristles on either side of the mediolongitudinal black stripe posterior to the transverse suture; leg colouration quite variable, one specimen with apex of fore tibia infuscated, another female with all legs yellowish-brown with apex of tibiae infuscated, the remaining paratypes like those of paratype males but showing much variation in the extent of infuscation or black colouration; one female with abdomen laterally yellowish-brown.

Genital black, spines on tergum 9 arranged more or less in two rows, anterior row with 8-12 large spines and posterior row with 4-7 small spines along with additional 1-4 still smaller spine in some cases.

Of all the known species in the genus *Philiodicus*, it is similar to *P. grandissimus* Ricardo from which it differs in the closed 1st posterior cell and the shape of superior forceps. *P. jagannathi* Rao is the only other known Indian species with a closed 1st posterior cell but *P. raoi* differs from it in the mixed black and yellowish brown legs and presence of two rows of spines on the ninth tergum. The species is named in honour of Dr. K. R. Rao, our colleague and the well known worker on cicadellids.

Holotype : ♂, India : Thar Desert : Banmucl, 1.viii.1955, Coll. P. S. Nathan.

Paratypes 2 ♂♂, 1 ♀, data as in holotype; 1 ♂ and 6 ♀♀, India Thar Desert : Balmer, viii.1955, Coll. P. S. Nathan.

Promachus Loew

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

26. ***Promachus jabalpurensis*** Joseph and Parui

1981. *Promachus jabalpurensis* Joseph and Parui, *Oriental Ins.*, 15 (1) : 25-26.

Material examined : 2 ♂, 1 ♀, Madhya Pradesh, Jabalpur, 480 m., x.1957, Coll. P. S. Nathan.

Remarks : It is the third report from the type locality, Jabalpur. It is not known from any other locality.

SUMMARY

The paper deals with 26 species of 16 genera of Asilidae from India and Nepal. Of these, three are new species, i.e., *Damalis calicutensis* sp. nov., *Astochia kariikalensis* sp. nov. and *Philodicus raoi* sp. nov.

ACKNOWLEDGEMENTS

We are indebted to Dr. Neal L. Evenhuis, Associate Entomologist of B. P. Bishop Museum, Honolulu, Hawaii, for giving on loan the robberflies dealt with in this paper. Our thanks are also due to Direction, Zoological Survey of India, Calcutta, for according the permission to study the material.

Abbreviations used in text figures

Ae, aedeagus; Cl, Clasper; Go, Gonopod (gonocoxite); Hy, hypandrium; Pr, proctigèr; Sf, superior forceps (enandrium).

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