

ASILIDAE (DIPTERA) FROM RAJASTHAN, INDIA

A. N. T JOSEPH

Zoological Survey of India, 100 Santhome High Road, Madras 600 028
and

P. PARUI

Zoological Survey of India, 535 New Alipore Road, Calcutta 700 053

INTRODUCTION

From 8th September to 7th October 1986 we had surveyed robberflies of Rajasthan in collaboration with the Desert Regional Station, Zoological Survey of India, Jodhpur. The present paper deals with collections made during this survey, and two specimens of *Philodicus sharmai* n. sp. from Gujarat present in the Desert Regional Station. The arrangement of genera followed is based on 'A Review of the Asilidae (Diptera) from the Oriental Region' by Joseph and Parui (1983).

Leptogaster Meigen

1803. *Leptogaster Meigen, Magazin Insektkde, 2 : 269.*

1. **Leptogaster cheriani Bromley**

1938. *Leptogaster cheriani Bromley, Indian J. Agri. Sci. 8 : 863.*

1983. *Leptogaster cheriani : Joseph & Parui, Oriental Ins. 17 : 280.*

Material : 3 ♂, 2 ♀, Rajasthan : Alwar District Sariska, 4.x.1986, Coll. A.N.T Joseph.

Remarks : So far the species has been recorded only from Tamil Nadu. It is the first report from Rajasthan.

Laxenecera Macquart

1838. *Laxenecera Macquart, Dipt. Exot. 1 (2) : 77.*

2. *Laxenecera albibarbis* Macquart

1838. *Laxenecera albibarbis* Macquart, *Dipt. Exot.* 1 (2) : 194.
 1983. *Laxenecera albibarbis* : Joseph & Parui, *Oriental Ins.* 17 : 297.

Material : 1 ♂, 3 ♀, Rajasthan Sirohi District : Abu Road, 375m, 18.ix.1986 ; 1 ♂, 1 ♀, Ranathambore, 25.ix.1986 ; 1 ♂, 10 ♀, Swai Madhopur District : Choru, 26.ix.1986, all Coll. A.N.T. Joseph.

Remarks : It has been recorded from Andaman Islands, Bihar, Gujarat, Himachal Pradesh, Maharashtra, Uttar Pradesh and West Bengal. It is recorded for the first time from Rajasthan.

3. *Laxenecera flavibarbis* Macquart

1838. *Laxenecera flavibarbis* Macquart, *Dipt. Exot.* 1 (2) : 193.
 1983. *Laxenecera flavibarbis* : Joseph & Parui, *Oriental Ins.* 17 : 297.

Material : 1 ♀, Rajasthan : Tonk District : Indergarh, 28.viii.1986 ; 2 ♂, 5 ♀, Jodhpur District : Balsamandh, 14.ix.1986 ; 2 ♂, 2 ♀, Sirohi District : Kiarali, 19.ix.1986 ; 2 ♂, 1 ♀, Swai Madhopur District : Ranathambore, 25.ix.1986 ; 2 ♂, 2 ♀, Swai Madhopur Choru, 26.ix.1986 ; 1 ♂, 3 ♀, Alwar District : Sariska, 4.x.1986, all Coll. A.N.T. Joseph.

Remarks : This species has been recorded from Bihar, Goa, Gujarat, Maharashtra, Tamil Nadu and West Bengal. It is the first report from Rajasthan.

Nusa Walker

1851. *Nusa Walker*, *Insecta Saundersiana*, 1 : 105.

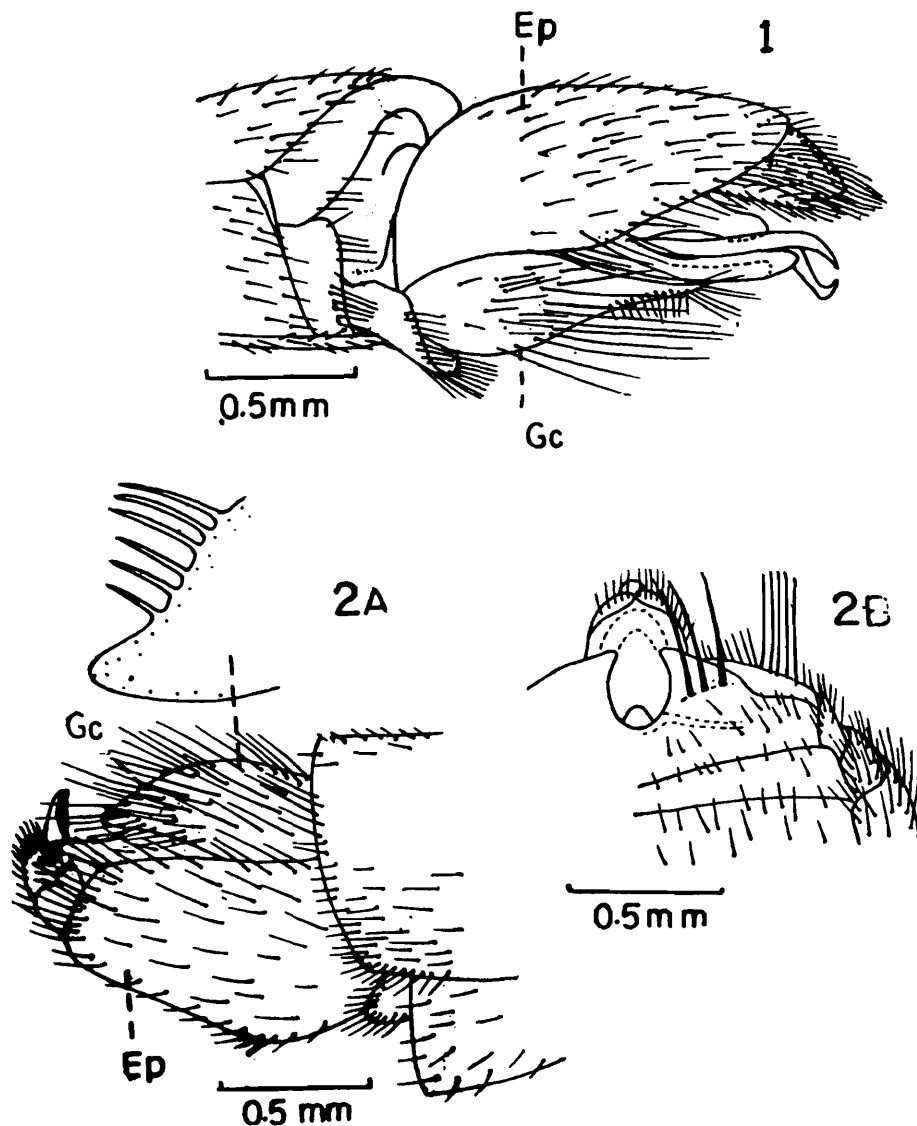
4. *Nusa rajasthanensis* n sp. (Fig. 1)

A small species with black head and thorax, black and yellowish-brown abdomen and legs, and pale yellow wings. Male : Length 9 mm, wing 5 mm.

Male : *Head* slightly broader than thorax, black with scarce greyish-yellow or grey tomentum ; *mystax* pale yellow, *fronto-orbital setae* white, *ocellar bristles* pale yellow, *postocular bristles* pale yellow, *postgena* with dense white setae. *Antenna* with *scape* yellowish-brown, *pedicel* black, *first flagellomere* black with its base yellowish-brown, *scape* subequal to *pedicel*, *first flagellomere* elongate. *Palpus* and *proboscis* black with white setae.

Thorax black, grey tomentum on pleura ; pronotum with a transverse row of 4 white bristles amidst white setae ; scutum without stripe ; chaetotaxy : 1 notopleural, 6-7 bristles posterolaterally ; vestiture golden yellow and bristles pale yellow ; scutellum without bristles, disc with vestiture like that of scutum ; katatergite with long, white, bristly setae. Haltere yellowish-brown with dark brown or black on head.

Legs black and yellowish-brown; fore coxa black, trochanter yellowish-brown, femur black with its apex narrowly yellowish-brown, tibia yellowish-brown and dark brown, tarsus dark brown, mid leg similar except coxa being yellowish-brown, hind coxa, trochanter and femur similarly coloured like that of mid leg, tibia basally yellowish-brown and rest black, tarsus black ; vestiture and bristles pale yellow.



1. Lateral view of male genitalia of *Nasa rajasthanensis* n. sp.
2. *Nasa setosa* n. sp., A. lateral view of male genitalia ; B, ventral view of female genitalia.

Wing pale yellow, but medially and along hind border hyaline; R_5 and M_1 united close to the border.

Abdomen black and yellowish-brown, terga 1-3 black with yellowish-brown hind border, tergum 4 yellowish-brown with lateral black marking remaining terga wholly yellowish-brown, tergum 1 laterally with a few pale yellow bristles, terga 2-5 with a pair of pale yellow bristles, vestiture golden yellow. Male genitalia (Fig. 1) yellowish-brown with white setae.

Holotype ♂, Reg. No. 7644/H6, Rajasthan : Jodhpur : Balsamandh, 14.ix.1986, Coll. A.N.T. Joseph & Party, deposited in the Zoological Survey of India, Calcutta.

Using the key to the species of *Nusa* Walker from India and adjoining countries. (Joseph & Parui 1987a), it keys to *N. albibarbis* Ricardo from which it differs in the thorax being without stripe, black and yellowish-brown legs, hind border of scutellum without bristles, abdomen predominantly yellowish-brown and the differences in the shape of epandrium and gonocoxite.

5. *Nusa setosa* n. sp. (Fig. 2)

A small, pilose, yellowish-brown or orange species marked with dark brown or black to varying extent, legs pale yellow or yellowish-brown with dark brown or black, and wings hyaline. Male : length 9 mm, wing 5-6 mm; female : length 8-9 mm, wing 6 mm.

Male *Head* as broad as thorax, yellowish-brown and black with dense grey tomentum; mystax golden yellow, fronto-orbital setae and ocellar bristles white. Antenna with scape and pedicel pale yellow, first flagellomere basally pale yellow and remainder dark brown, scape with white setae and 1 or 2 white bristles, pedicel slightly shorter than or nearly equal to scape, first flagellomere elongate. Palpus yellowish-brown, proboscis yellowish-brown and black, both with white setae.

Thorax yellowish-brown with dark brown or black to varying extent so much so in some examples mostly dark brown or black, short white or golden yellow pollinose; pronotum with white setae; scutum in holotype with a broad mediolongitudinal, black stripe extending from anterior border to midway between transverse suture and hind border, laterally with the black spots united, in one paratype the stripe faint and in the other absent, in both paratypes lateral black spots much smaller and faint; chaetotaxy : 1 notopleural, 2 postalars, a few bristles postero-

laterally ; scutellum with dense pile, but in holotype comparatively less, border without bristles ; katatergite with long, white, bristly setae. Haltere pale yellow, with or without dark brown on head.

Legs pale yellow or yellowish-brown with dorsal dark brown or black marking on femur, the intensity and area of dark brown or black increases from fore to hind tibia so much so in the latter in some examples it occupies the whole of upper side, apex of hind tibia also dark brown or black : vestiture and bristles white.

Wing hyaline with the veins pale yellow basally.

Abdomen yellowish-brown or orange brown with short, white or golden yellow pilose, holotype with faint median and lateral black markings on terga and with sparse setae, tergum 2 laterally with three bristles, terga 3 and 4 and in some examples tergum 5 also with 1 or 2 bristles. Male genitalia (Fig. 2A) with gonocoxite bearing a row of bristles apically.

Females : Similar but with the following differences : comparatively darker specimens ; scutum with the mediolongitudinal stripe and lateral spots larger and distinctly marked ; haltere yellowish-brown ; abdomen mostly black with much less yellowish-brown or orange-brown. Female genitalia (Fig. 2B) figured.

Holotype ♂, Reg. No. 7645/H6, Rajasthan : Jodhpur University Campus, 13.ix.1986, Coll. A.N.T. Joseph and Party. *Paratypes* 1 ♀, Reg. No. 7646/H6, rest of data as in holotype ; 2 ♂, 2 ♀, Reg. No. 7647/H6 to 7650/H6, Jodhpur Bavadchoraya, 15.ix.1986, Coll. A.N.T Joseph and Party, deposited in Zoological Survey of India, Calcutta.

The male genitalia of *Nusa setosa* n. sp. is distinctive and this species can be readily distinguished by the presence of an apical row of bristles on gonocoxite.

Stenopogon Loew

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

6. *Stenopogon roonwali* n. sp. (Fig. 3)

A medium black species with black and pale yellow or yellowish-brown legs, and anteriorly brownish and posteriorly infuscated wing with closed first posterior

cell ; abdomen black in male and orange or yellowish-brown in female. Male : length 18-21 mm, wing 12-13 mm ; female 18-22 mm, wing 12-14 mm.

Males : *Head* narrower than thorax, black with dense greyish-white tomentum ; mystax white, fronto-orbital bristles and ocellar bristles and medially with white setae. Antenna black or scape and pedicel yellowish-brown and remainder black, scape and pedicel with white bristles, scape slightly longer than half to much longer than half of pedicel, first flagellomere longer than the combined length of scape and pedicel, style about half to less than half the length of first flagellomere. Palpus and proboscis black, both with white setae.

Thorax black, with or without grey tomentum ; pronotum with white or pale yellow, dense bristles and a few setae ; scutum with the humeri sometimes brown, usually with a faintly black mediolongitudinal stripe present extending from anterior border to beyond the transverse suture, the stripe faintly divided by a narrow grey stripe, in most of the cases the stripes black and indistinct to varying extent ; chaetotaxy ; a number of white bristles present laterally and posteriorly, of which postalars (7 or more) and dorsocentrals distinct ; vestiture and bristles white ; scutellum with a row of white bristles apically and sparse white setae laterally. Haltere pale yellow, yellowish-brown or yellowish-orange.

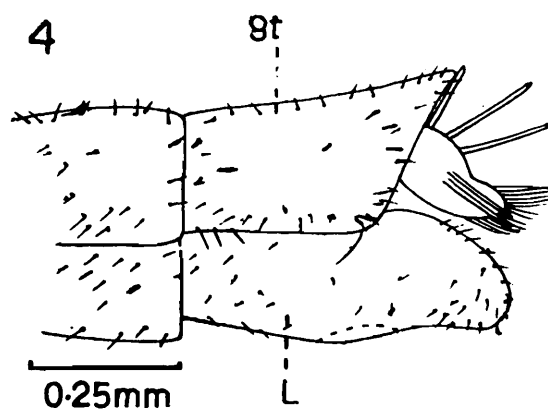
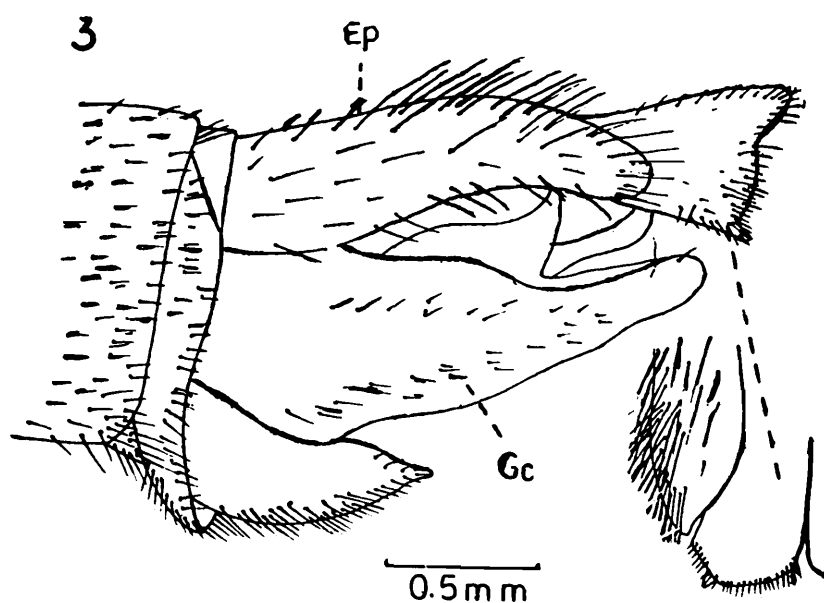
Legs black and pale yellow or yellowish-brown, coxa and trochanter black, fore femur black basally for half or more and remainder pale yellow or yellowish-brown, mid femur similar but black more extensive and occupies two-thirds or more, hind femur wholly black, fore tibia and tarsus pale yellow or yellowish-brown, mid tibia and tarsus similar but tibia apically black, hind tibia wholly black or basally pale yellow upto one-fourth and the remainder black, tarsus pale yellow with basitarsus sometimes black ; fore femur with antero-ventral and posteroventral rows of bristles but in one paratype the latter row absent, mid femur with anterodorsal, anteroventral, ventral (weak) and posteroventral rows of bristles, hind femur with anterior and anteroventral rows of bristles ; vestiture and bristles white.

Wing anteriorly brownish and the remainder infuscated ; first posterior cell closed.

Abdomen black, with or without grey tomentum, tergum 1 posterolaterally with a few white bristles, tergum 2 laterally with a few, white, bristly setae, vestiture white or white and yellow. Male genitalia (Fig. 3) black with white and black setae, gonocoxite long.

Females Similar but with the following differences bristles on upper side of postcranium white or pale yellow ; scutum with humeri in most cases yellowish-orange, in a few paratypes mediolongitudinal stripe bordered by a narrow, yellowish-orange line ; ventral row of bristles on mid femur lesser in number ; abdomen orange or yellowish-brown medially and black laterally, tergum 1, tergum 2 anteriorly, tergum 6 mostly, and terga 7 and 8 completely black, in some examples orange or yellowish-brown more extensive so much so terga 2 and 7 almost wholly orange or yellowish-brown. Genitalia with tergum 9 bearing ten, blunt, spines.

Holotype ♂, Reg. No. 7651/H6, Rajasthan : Abu Road, 375m, 18.ix.1986, Coll. A.N.T. Joseph & Party. **Paratypes** 1 ♂, 3 ♀, Reg. No. 7652/H6 to 7655/H6, rest of details as in holotype ; 5 ♂, 7 ♀, Reg. No. 7656/H6 to 7667/H6, Sirohi District : Kiarali, 19.ix.1986, 1 ♀, Reg. No. 7668/H6, Ajmev : Beer Tank, 22.ix.1986, all Coll. A.N.T. Joseph & Party, deposited in Zoological Survey of India, Calcutta.



3. Lateral view of male genitalia of *Stenopogon roonwali* n. sp.
4. Lateral view of male genitalia of *Stichopogon basiti* n. sp.

It is quite similar to *Stenopogon cinchonaensis* Joseph and Parui (1981b) from which it differs in the white mystax, white bristles on the hind border of scutellum and in the shape of gonocoxite. It is named in honour of Dr. M. L. Roonwal, ex-director, Zoological Survey of India, Calcutta, who recently passed away.

Stichopogon Loew

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

7. *Stichopogon basiti* n. sp. (Fig. 4)

A tiny, densely grey or greyish-yellow tomentose species with pale yellow legs with dark brown or black markings, wings with two brown spots, and abdomen with a broken, mediolongitudinal, black or dark brown stripe; lamella of female without hair tuft.

Females: *Head* broader than thorax, densely greyish-white or greyish-yellow tomentose; mystax white, fronto-orbital plate with white bristles and setae, ocellar setae white, postcranium with white setae, postocular bristles white and confined to above, postgena with white setae. Antennal scape and pedicel pale yellow, remainder black, pedicel bearing a few white bristles, scape very short, about one-fourth the length of pedicel, first flagellomere long, longer than one and-a-half times the combined length of scape and pedicel. Palpus and proboscis black with sparse, white setae.

Thorax black, greyish-yellow and grey tomentose; pronotum with a median transverse row of white, bristly hairs; scutum without mediolongitudinal stripe and lateral spots in holotype but with a faint, black mediolongitudinal stripe extending from anterior border to transverse suture in paratype; chaetotaxy: 1 notopleural, 1 postalar, 1 supra-alar, 1 dorsocentral; vestiture and bristles white; scutellar disc

bare, hind border with a few, long, white setae and 8 white bristles; katatergite with a row of elongate bristly setae. Haltere yellowish-brown or pale yellow.

Legs pale yellow with dark brown or black marking, fore and mid femora pale yellow or pale yellow with dark infuscation medially for about one-third length, hind tibia basally pale yellow and distally black or dark brown for about half or lesser than that, tarsal segments yellowish-brown with apical 1 or 2 segments black, vestiture and bristles white.

Wing lightly infuscated with two brown spots : one at the origin of R_4 , and the other at the junction between discal, 2nd posterior and 3rd posterior cells.

Abdomen black or dark brown with grey and greyish-yellow tomentum, medially with a broken, black or dark brown stripe from terga 1 to 6, tergum 7 with the stripe faint, and succeeding tergum without it, tergum 7 mostly and tergum 8 wholly tomentose, hind border of terga with a narrow grey or yellowish-brown border, tergum 1 posterolaterally with a few, long, white setae. Female genitalia (Fig. 4) with tergum 8 bearing a circlet of ten spines ; lamella without hair tuft.

Holotype ♀, Reg. No. 7669/H6, Rajasthan : Jaipur, 3.x.1986, Coll. A.N.T. Joseph and Party. *Paratype* ♀, Reg. No. 7670/H6, rest of details as in holotype, deposited in Zoological Survey of India, Calcutta.

Of all the known regional species of *Stichopogon*, *S. basiti* n. sp. is closer to *S. ramakrishnai* Joseph and Parui (1988) from which it can be separated by the presence of marginal row of white bristles on scutellum, wing with only two brown spots, and in the difference in the shape of lamella. It is named in honour of Mr. Abdul Basit, our colleague in Jodhpur, who has taken some excellent photographs of insects.

8. *Stichopogon biharilali* n. sp. (Fig. 5)

A tiny black species with greyish-white tomentum, black and pale yellow or yellowish-orange legs, and faintly infuscated wings ; in female lamella with closely matted setae in a spindle-like tuft. Female : length 4.0-5.0 mm, wing 3.0-3.5 mm ; male : length 3.0 mm, wing 2.5 mm.

Females *Head* broader than thorax, black, grey tomentose, specimens with dense grey tomentum with a mediolongitudinal black line extending from ocellar triangle to occipital foramen ; mystax white except in one paratype it being pale yellow, fronto-orbital setae and ocellar bristles white, postcranium with white setae, postocular bristles white and confined to above, postgena with white setae. Antennal scape and pedicel pale yellow to yellowish-brown with sparse white setae, remainder black, scape less than half to slightly more than half of pedicel, first flagellomere long, about one and-a-half times the length of scape and pedicel combined. Palpus and proboscis black, latter with sparse white setae.

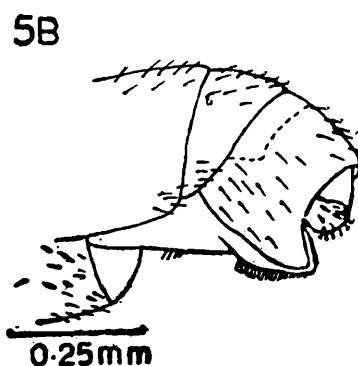
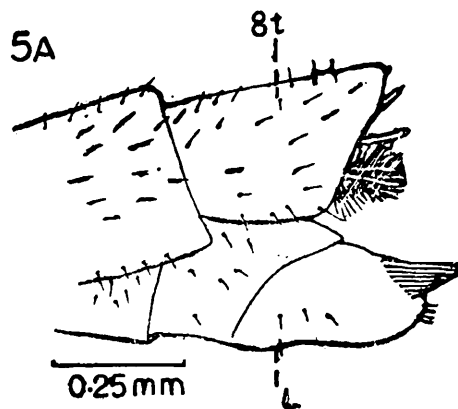
Thorax black with grey and greyish-yellow pollinose ; pronotum with sparse

white setae ; scutum with a narrow mediolongitudinal stripe extending from anterior border to transverse suture, the length and breadth of which quite variable, laterally with or without 2 black spots ; chaetotaxy : 1 notopleural, 1 postalar, 1 supra-alar ; vestiture sparse, white, bristles white or pale yellow ; scutellar disc bare, border with a few elongate setae, 2 or 4 of which may form bristly setae ; katatergite with a few, elongate, white bristly setae. Haltere pale yellow in most of the cases, but in one example yellowish-brown and in the other white.

Legs black and yellowish-orange or pale yellow, coxa, trochanter and femur black, tibia yellow with black apex, the black colouration increases from fore to hind tibiae so much so in the latter one-third or more black, vestiture and bristles white.

Wing faintly infuscated.

Abdomen black, greyish-white pollinose, in typical case as in holotype tergum 1 greyish-white pollinose with a median black mark, terga 2-6 black, on anterior border with a medially incomplete greyish-white stripe and laterally greyish-white,



5. *Stichopogon biharilali* n. sp., A, lateral view of female genitalia ; B, lateral view of male genitalia.

tergum 7 similar but hind border also greyish-white so much so the black area much reduced, tergum 8 completely greyish-white, the extent of black and greyish-white areas quite variable from specimen to specimen. Female genitalia (Fig. 5A) figured, tergum 8 with a circlet of ten spines, lamella with closely matted setae in spindle-like tuft.

Male Similar except the border of scutellum with 6 bristly hairs ; abdomen with much less greyish-white pollinose so much so terga 4-6 almost wholly black, tergum 7 with greyish-white restricted to hind border, terga 8 and 9 almost wholly greyish-white. Male genitalia (Fig. 5B) illustrated.

Holotype ♀, Reg. No. 7671/H6, Rajasthan : Alwar District : Prathagarh, 1.x.1986, Coll. A.N.T Joseph & Party. *Paratypes* 3 ♀, Reg. No. 7672/H6 to 7674/H6, rest of details as in holotype ; 2 ♀ 1 ♂, Reg. No. 7675/H6 to 7677/H6, Ajmer : Beer Tank, 20.ix.1986, Coll. A.N.T Joseph, deposited in Zoological Survey of India, Calcutta.

Female of *Stichopogon biharilali* n. sp. is similar to *S. meridionalis* Oldroyd (1948) in the spindle-shaped tuft of setae on lamella, otherwise a quite distinct species with black fore and mid femora and in the shape of lamella. It is named in honour of our colleague Mr Biharilal, who had helped us in several ways to make our Rajasthan collection trip successful.

9. *Stichopogon inaequalis* Loew

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

1983. *Stichopogon inaequalis* : Joseph & Parui, *Oriental Ins.* 17 : 325.

Material : 1 ♂, 1 ♀, Rajasthan : Ajmer District : Gogal, 23.ix.1986 ; 4 ♂, 18 ♀, Swai Madhopur District : Pali : Chambal River bed, 27.ix.1986, all Coll. A.N.T. Joseph.

Remarks : From India it is reported from Andaman Islands, Andhra Pradesh, Bihar, Maharashtra and Tamil Nadu. Here it is recorded for the first time from Rajasthan. Outside India it is known to occur in Sri Lanka.

10. *Stichopogon indicus* Joseph & Parui

1984. *Stichopogon indicus* Joseph & Parui, *Bull. zool. Surv. India* 6 (1-3) : 249.

Material : 1 ♂, 2 ♀, Swai Madhopur District : Pali : Chambal River bed, 27.ix.1986, Coll. A.N.T Joseph.

Remarks : The species was described from Maharashtra, and subsequently recorded from Andhra Pradesh. It is the first report from Rajasthan.

11. *Stichopogon meridionalis* Oldroyd

1948. *Stichopogon meridionalis* Oldroyd, *Ent. Month. Mag.* 84 : 261.

1983. *Stichopogon meridionalis* : Joseph & Parui, *Oriental Ins.* 17 : 325.

Material : 1 ♂, 1 ♀, Rajasthan : Jodhpur District : Akhir Sagar, 12.ix.1986 ; 2 ♂, Ajmer District Gogal, 23.ix.1986 ; 3 ♂, 1 ♀, Swai Madhopur District : Pali : Chambal River bed, 27.ix.1986, all Coll. A.N.T Joseph.

Remarks : In India this species has been recorded from Andhra Pradesh, Gujarat, Karnataka, Kerala, Tamil Nadu and West Bengal. It is recorded here for the first time from Rajasthan. It has also been recorded from Sri Lanka.

12. *Stichopogon tomentosus* Oldroyd

1948. *Stichopogon tomentosus* Oldroyd, *Ent. Month. Mag.* 84 : 263.

1983. *Stichopogon tomentosus* : Joseph & Parui, *Oriental Ins.* 17 : 326.

Material : 2 ♀, Alwar, 2.x.1986 ; 1 ♀, Jaipur, 3.x.1986, all Coll. A.N.T. Joseph.

Remarks : Distributed in Andaman Islands, Bihar, Karnataka and West Bengal. Here it is recorded for the first time from Rajasthan.

Cophinopoda Hull

1958. *Cophinopoda* Hull, *Proc. Ent. Soc. Washington* 60 : 251.

13. *Cophinopoda chinensis* (Fabricius)

1794. *Asilus chinensis* Fabricius, *Ent. Syst.* 4 : 383 (for detailed synonyms refer Joseph & Parui, 1983).

1983. *Cophinopoda chinensis* : Joseph & Parui, *Oriental Ins.* 17 : 326.

Material 2 ♂, 1 ♀, Rajasthan : Jodhpur District : Balsamandh, 14.ix.1986 ; 8 ♂, 9 ♀, Sirohi District : Kiarali, 19.ix.1986, all Coll. A.N.T Joseph.

Remarks : It is reported from Andaman Islands, Andhra Pradesh, Assam, Bihar, Orissa, Sikkim, Tamil Nadu, Uttar Pradesh and West Bengal. It is recorded for the first time from Rajasthan.

Michotamia Macquart

1838. *Michotamia* Macquart, *Dipt. exot.* 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 ;
1983. Joseph & Parui, *Oriental Ins.* 17 : 327.

Material : 1 ♂, Rajasthan : Jodhpur District : Mandore Garden, 11.ix.1986 ; 1 ♂, Sirohi District : Mount Abu, 840m, 17.ix.1986 ; 2 ♂, Ajmer District : Beer Tank, 22.ix.1986 ; 3 ♂, 1 ♀, Tonk District : Indergarh, 28.ix.1986 ; 3 ♀, Alwar District : Alwar, 2.x.1986, all Coll. A.N.T. Joseph.

Remarks : This species has been reported from Andhra Pradesh, Bihar, Karnataka, Kerala, Madhya Pradesh, Orissa, Pondicherry, and West Bengal. It is the first record from Rajasthan.

Ommatius Wiedemann

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

15. Ommatius ponti Joseph & Parui

1984. *Ommatius ponti* Joseph & Parui, *Oriental Ins.* 18 : 58.

Material : 1 ♂, Rajasthan : Sirohi District : Kiarali, 19.ix.1986, Coll. A.N.T. Joseph.

Remarks : It was described from Pakistan. From India this species has been recorded from Uttar Pradesh (Joseph & Parui, 1987b). It is reported for the first time from Rajasthan.

16. Ommatius pseudokempi Joseph & Parui

1987. *Ommatius pseudokempi* Joseph & Parui, *Bull. zool. Surv. India* 8 (1-3) : 210-211.

Material : 1 ♂, 1 ♀, Rajasthan : Sirohi District Kiarali, 19.ix.1986, Coll. A.N.T Joseph.

Remarks : The species was described from Orissa and subsequently reported from South India. This is the first report from Rajasthan.

17. *Ommatius singhi* n. sp. (Fig. 6)

A very small black species with black and yellowish-brown legs, and distally infuscated wings. Male : length 4.0-5.6 mm, wing 4.0 mm ; female : 6.00 mm, wing 5.00 mm.

Males : *Head* black, grey tomentose ; mystax white with 2-3 to the whole of upper half with black bristles, fronto-orbital setae black and white or wholly black, ocellar bristles white or black, postocular bristles black above and white below, postcranium bare above and with a few white setae below. Antenna black, scape and pedicel with black bristles, scape subequal to pedicel, first flagellomere and pedicel nearly equal in length. Palpus and proboscis black with white setae.

Thorax black with grey tomentum ; pronotum with white setae and with or without 1 or 2 pairs of pale yellow bristly setae in a transverse row ; scutum with the mediolongitudinal stripe black, faintly marked, and extending from anterior border to beyond transverse suture ; chaetotaxy : 1 notopleural, 1 postalar, 2 supra-alar, 1 or 2 dorso-centrals ; vestiture white, bristles white with one or more pairs black ; scutellum with a pair of white or black bristles on border, disc with a few white setae ; katatergite with a few, long, bristly white setae, meron also with a pair of similar setae. Haltere pale yellow or white.

Legs black and yellowish-brown, coxa, trochanter and femur black, tibia yellowish-brown with black apex or wholly yellowish-brown, remainder of tarsus black, hind femur with anteroventral and postero-ventral row of weak bristles, vestiture predominantly white with some black setae, bristles white and black.

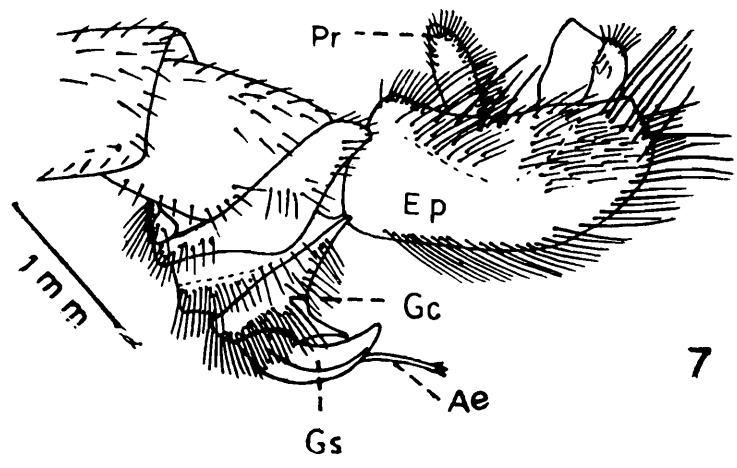
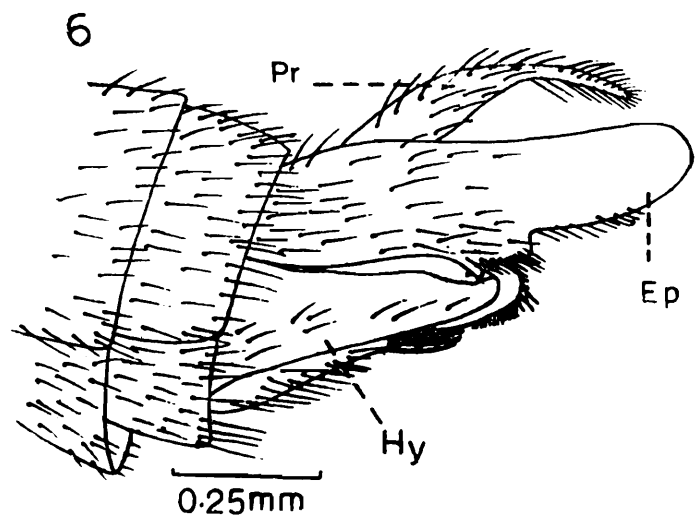
Wing more than half infuscated distally, the remainder hyaline.

Abdomen club-shaped, black, tergum 1 posterolaterally with a few, white bristles and setae, tergum 2 laterally with a few, long, white setae, vestiture white. Male genitalia (Fig. 6) black with black setae and bristles, epandrium ventrally with a nearly rectangular projection.

Female : Similar to the males. Female genitalia black with black and white setae, sternum 8 depressed medially, shallowly concave apically, and with a pair of long bristles laterally, proctiger narrow at apex.

Holotype ♂, Reg. No. 7678/H6, Rajasthan : Jodhpur : Mandore Garden, 11.ix.1986, Coll. A.N.T. Joseph. *Paratypes* 2 ♂, Reg. No. 7679/H6 and 7680/H6, rest of data as in holotype ; 1 ♀, Reg. No. 7681/H6, Jodhpur : Balsamandh, 14.ix.1986, Coll. A.N.T. Joseph and Party, deposited in Zoological Survey of India, Calcutta.

It is typical of the genus *Ommatius* with black colouration and club-shaped abdomen, which can be separated from all the other known Indian species by the distinctive male genitalia. It is named in honour of Sri R. K. Singh, our colleague at Jabalpur, who collected some interesting robberflies for us.



6. Lateral view of male genitalia of *Ommatius singhi* n. sp.
 7. Lateral view of male genitalia of *Astochia rami* n. sp.

Astochia Becker

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

18. *Astochia pseudoguptai* Joseph & Parui

1987. *Astochia pseudoguptai* Joseph & Parui, *Bull. zool. Surv. India* 8 (1-3) : 100.

Material 1 ♂, Rajasthan : Jodhpur District : Mandore Garden, 11.ix.1986 ; 1 ♂, Jodhpur District : Mogra pumping station, 13.ix.1986 ; 6 ♂, 2 ♀, Jodhpur District : Balsamandh, 14.ix.1986 ; 1 ♂, Ajmer District : Saradhana, 21.ix.1986 ; 1 ♂, 1 ♀, Ajmer District : Beer Tank, 22.ix.1986, all Coll. A.N.T. Joseph.

Remarks : The species was described from Sikkim, and subsequently recorded from Karnataka. It is the first report from Rajasthan.

19. *Astochia rami* n. sp. (Fig. 7)

A medium, black species with sparse grey tomentum, black and yellowish-brown or pale yellow legs, and distally infuscated wing. Male : length 13-16 mm, wing 9-10 mm ; female : length 16-18 mm, wing 11-13 mm.

Males : *Head* slightly broader than thorax, black with or without grey tomentum ; mystax white, fronto-orbital setae wholly white or black and white, ocellar bristles wholly black or rarely black and white, postocular bristles pale yellow or white, a few, and confined to above, postgena with white setae. Antenna black with first flagellomere to varying extent yellowish-brown or dark brown, scape and pedicel with black and white setae and bristles, pedicel more than two-thirds to slightly shorter than scape, first flagellomere shorter to longer than the combined length of scape and pedicel. Palpus and proboscis black with white setae.

Thorax black with sparse grey tomentum ; pronotum with white or white and pale yellow setae, medially with 2 or 4 weak bristles in a transverse row ; scutum without stripe or spots ; chaetotaxy : 1 notopleural, 2-3 postalars, 2 supra-alars, 1 intra-alar ; scutellar disc with long setae, border with 2 bristles ; katatergite with elongate, white, bristly setae, vestiture and bristles black and white. Haltere pale yellow with its head yellowish-brown, orange brown or dark brown.

Legs black, except tibia being mainly yellowish-brown or pale yellow with apically black to varying extent, fore and mid tibiae with black apex, hind tibia distally black for about half or more ; vestiture white and black, bristles black.

Wing distally infuscated, but lighter or hyaline medially and posterobasally.

Abdomen black with transverse band of light grey on hind border of terga, tergum 1 with a few white bristles laterally, vestiture white. Male genitalia (Fig. 7) black with black and white setae.

Females : Similar but with the following differences : scutellar border with 2 or 4 bristles ; tergum 1 of abdomen with white or white and black bristles. Genitalia black, elongate, tergum 8 long and two and-a-half to thrice the length of tergum 9, proctiger about two-thirds the length to slightly shorter than tergum 9.

Holotype ♂, Reg. No. 7682/H6, Rajasthan : Jodhpur : Balsamandh, 14.ix.1986, Coll. A.N.T Joseph & Party. *Paratypes* 6♂, 2♀, Reg. No. 7683/H6 to 7690/H6, rest of details as in holotype ; 2♀, Reg. No. 7691/H6 and 7692/H6 ; Jodhpur : Bavadchoraya, 15.ix.1986, Coll. A.N.T. Joseph and Party ; 1♀, Reg. No. 7693/H6, 16.ix.1986, rest of details as in preceding ; 1♂, 1♀, Reg. No. 7694/H6 and 7695/H6, Sirohi District Kiarali, 19.ix.1986, Coll. A.N.T Joseph and Party ; 4♀, 2♂, Reg. No. 7696/H6 to 7701/H6 ; Ajmer : Beer Tank, 22.ix.1986, all Coll. A.N.T Joseph and Party, deposited in Zoological Survey of India, Calcutta.

Male genitalia of *Astochia rami* n. sp., *A. guptai* Joseph & Parui (1981a) and *A. pseudoguptai* Joseph & Parui (1987c) are quite similar. Of these, *A. rami* n. sp. is closer to *A. pseudoguptai* Joseph & Parui from which it can be recognised by the black femur and predominantly black and comparatively thinner abdomen. It is named in honour of Mr Girdari Ram, our colleague from Jodhpur, who accompanied us in our collection trip of asilids in Rajasthan.

Philodicus Loew

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

20 Philodicus femoralis Ricardo

1921. *Philodicens femoralis* Ricardo, *Ann. Mag. nat. Hist.* (9) 8 : 190.

1983. *Philodicus femoralis* : Joseph & Parui, *Oriental Ins.* 17 : 361.

Material : 10♂, 9♀, Rajasthan : Ajmer District : Saradhana, 21.ix.1986 ; 2♂, 4♀, Ajmer : Beer Tank, 22.ix.1986 ; 5♂, 2♀, Ajmer District : Gogal, 23.ix.1986 ; 2♂, 1♀, Swai Madhopur District : Choru, 26.ix.1986 ; 3♂, 2♀, Tonk District : Indergarh, 28.ix.1986 ; 1♂, Swai Madhopur, 29.ix.1986 ; 3♀, 2♂, Alwar District :

Pratapgarh, 1.x.1986 ; 4 ♂ , 4 ♀ , Jaipur, 3.x.1986, all Coll. A.N.T. Joseph.

Remarks : The species has been recorded from Arunachal Pradesh, Bihar, Goa, Kerala, Maghalaya and West Bengal. It is the first report from Rajasthan.

21. *Philodicus javanus* (Wiedemann)

1819. *Asilus javanus* Wiedemann, *Zool. Mag.* (Wied.) 1 (3) : 4. (for detailed synonyms refer to Joseph & Parui 1983 : 362).

1983. *Philodicus javanus* : Joseph & Parui, *Oriental Ins.* 17 : 362.

Material : 2 ♂ , Rajasthan : Sirohi District : Mount Abu, 840 m, 17.ix.1986, Coll. A.N.T. Joseph,

Remarks : In India it has been recorded from Assam, Arunachal Pradesh, Bihar, Himachal Pradesh, Karnataka, Tamil Nadu, Uttar Pradesh, and West Bengal. This is the first report from Rajasthan.

22. *Philodicus pruthii* Bromley

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

1983. *Philodicus pruthii* : Joseph & Parui, *Oriental Ins.* 17 : 362.

Material : 1 ♂ , Rajasthan : Alwar District : Pratapgarh, 19.ix.1986 ; 2 ♂ , Ajmer District : Beer Tank, 22.ix.1986 ; 1 ♀ , Swai Madhopur District Choru, 26.ix.1986, all Coll. A.N.T. Joseph.

Remarks : So far it is known to occur in Andhra Pradesh, Karnataka, Kerala and Tamil Nadu. This is the first record from Rajasthan.

23. *Philodicus raoi* Joseph & Parui

(in press a.) *Philodicus raoi* Joseph & Parui, *Rec. zool. Surv. India.*

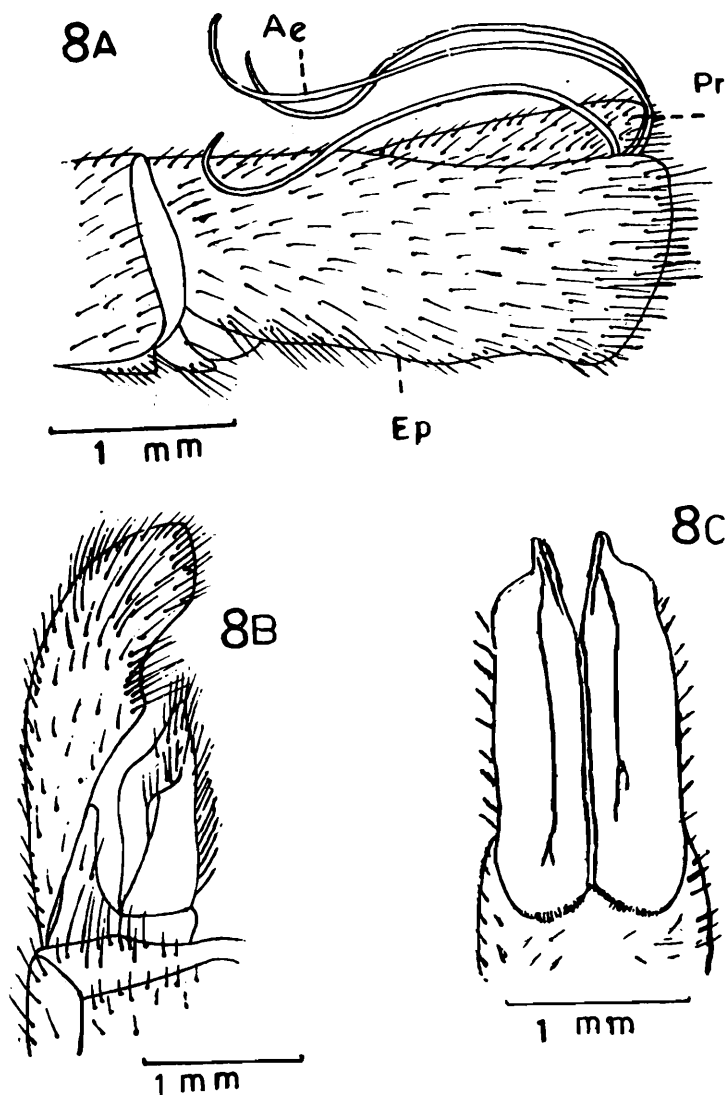
Material : 4 ♂ , 1 ♀ , Rajasthan : Jodhpur District : Bavad Choraya, 15.ix.1986 ; 4 ♂ , 2 ♀ , Swai Madhopur, 29.ix.1986, all Coll. A.N.T. Joseph.

Remarks : The species was described from Rajasthan. It is the second record of the species and from the same state.

24. *Philodicus sharmai* n. sp. (Fig. 8)

A large black species with dense grey or-greyish-yellow tomentum, black legs and light brown wings with yellowish-brown veins. Male : length 26-28 mm, wing 19 mm ; female : length 28-29 mm, wing 19 mm.

Males : *Head* narrower than thorax, black, greyish-yellow tomentose ; mystax white, fronto-orbital plate with white and one or more black setae, ocellar bristles black, postocular bristles white or pale yellow with one or more of them being black, postcranium with white setae, postgena with dense white setae. Antenna wholly black or scape black and remainder dark brown or yellowish-brown, scape and pedicel with black bristles, scape about one-third longer than pedicel, first flagellomere nearly equal in length to scape. Palpus and proboscis black with white setae.



8. *Philodicus sharmai* n. sp., A, lateral view of male genitalia ; B, ventral view of male genitalia ; C, ventral view of female eighth sternum.

Thorax black with dense greyish-yellow or grey tomentum ; pronotum with a transverse row of white or pale yellow bristles, and with dense white setae, scutum with a mediolongitudinal stripe extending from anterior border to midway between transverse suture and hind border, the stripes divided by a greyish-yellow stripe, posterior to the longitudinal stripe with three, longitudinal, grey marks, lateral three black spots faintly marked or distinct ; chaetotaxy : 1 notopleural, 2 postalars, 2 supra-alars, 1 intra-alar, 1-5 dorsocentrals : vestiture black with some white setae laterally, bristles black ; scutellar disc with white setae, border with 2, and in one paratype 3, black bristles ; katatergite and meron with white or pale yellow, long, bristly setae. Haltere pale yellow or stalk pale yellow with orange or dark brown head.

Legs black, hind femur with an anteroventral row of black bristles, vestiture white, bristles black, fore tibia and tarsus anteriorly with mat of golden yellow setae, in hind tibia and tarsus similar setae present posteriorly.

Wing light brown with cells along hind border still lighter coloured, veins yellowish-brown.

Abdomen black, grey tomentose to varying extent, in typical case as in holotype tergum 1 completely grey, terga 2-6 anteromedially black, and laterally and posteriorly grey tomentose, terga 7 and 8 medially black and laterally grey tomentose, terga posterolaterally with a few white or pale yellow bristles which decrease in number and size in succeeding terga, tergum 2 mediolaterally with 2 additional bristles, vestiture predominantly white. Genitalia (Fig. 8A, B) black.

Females : Similar but with the following differences : chaetotaxy : 2 paratypes with 1 supernumerary seta outer to the posterior postalar ; bristles on abdomen confined to terga 1 and 2, tergum 1 similar to that of male, tergum 2 with 2-4 mediolateral bristles (which in one paratype black) but without posterolateral bristles. Genitalia (Fig. 8C) black, tergum 9 with 8 or 10 spines.

Holotype ♂ Reg. No. 7702/H6, Rajasthan : Sirohi District : Kiarali, 19.ix.1986, Coll. A.N.T Joseph & Party. *Paratypes* 2♂, Reg. No. 7703/H6 and 7704/H6, Gujarat : 3.5 Km West of Deesa, 15.x.1964, Coll. V.C. Agrawal ; 4♀, Reg. No. 7705/H6 to 7708/H6, rest of details as in holotype, deposited in Zoological Survey of India, Calcutta.

It is generally similar to *Philodicus chinensis* Schiner (1868) and *P. indicus* Joseph & Parui (in press b) from both of these it can be recognised by the larger size together with the shape of female genitalia. The new species is affectionately dedicated in honour of our long time friend and colleague, Dr. R. C. Sharma, Scientist 'SE', without whose generous help it could not have been possible to undertake the Rajasthan Survey of Asilidae successfully.

Promaehus Loew

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

25. *Promachus duvaucelii* (Macquart)

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

1975. *Promachus duvaucelii* (Macquart) : Oldroyd, *A Catalog of Diptera of the Oriental Region* 2 : 152 ; 1983. Joseph & Parui, *Oriental Ins.* 17 : 366.

Material : 4 ♀, Rajasthan : Jodhpur District Mandore Garden, 11.ix.1986 ; 13 ♂, 5 ♀, Jodhpur District : Bhim Dadak, 12.ix.1986 ; 1 ♂, 1 ♀, Jodhpur District : Balsamandh, 14.ix.1986 ; 4 ♂, 15 ♀, Sirohi District : Abu Road, 375m, 18.ix.1986 ; 6 ♂, 16 ♀, Sirohi District : Kiarali, 19.ix.1986 ; 8 ♂, 4 ♀, Swai Madhopur District : Ranathambore, 25.ix.1986 ; 1 ♂, Swai Madhopur District : Choru, 26.ix.1986 ; 1 ♂, 5 ♀, Swai Madhopur District : Pali, 27.ix.1986 ; 7 ♂, 2 ♀, Tonk District : Indergarh, 28 ix.1986 ; 5 ♂, 4 ♀, Swai Madhopur, 29.ix.1986 ; 2 ♂, 2 ♀, Alwar District : Pratapgarh, 1.x.1986 ; 2 ♂, 1 ♀, Alwar District : Sariska, 4.x 1986, all Coll. A.N.T Joseph.

Remarks : It has been recorded from Andhra Pradesh, Delhi, Gujarat, Madhya Pradesh, Maharashtra, Punjab, Uttar Pradesh and West Bengal. It is the first time record from Rajasthan.

SUMMARY

This paper reports 25 species of robberflies under 11 genera, of which 8 are new species, viz., *Nusa rajasthanensis*, *N. setosa*, *Stenopogon roonwali*, *Stichopogon basiti*, *S. biharilali*, *Ommatius singhi*, *Astochia rami* and *Philodicus sharmai* ; 16 are new records ; and the remaining 1, *Philodicus raoi* Joseph and Parui, being reported earlier.

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Abbreviations used in text-figures

Ae, aedeagus ; Ep, epandrium ; Gc, gonocoxite ; Gs, gonostylus ; Hy, hypandrium ; L, lamella ; Pr, proctiger ; 8 t, eighth tergum.

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