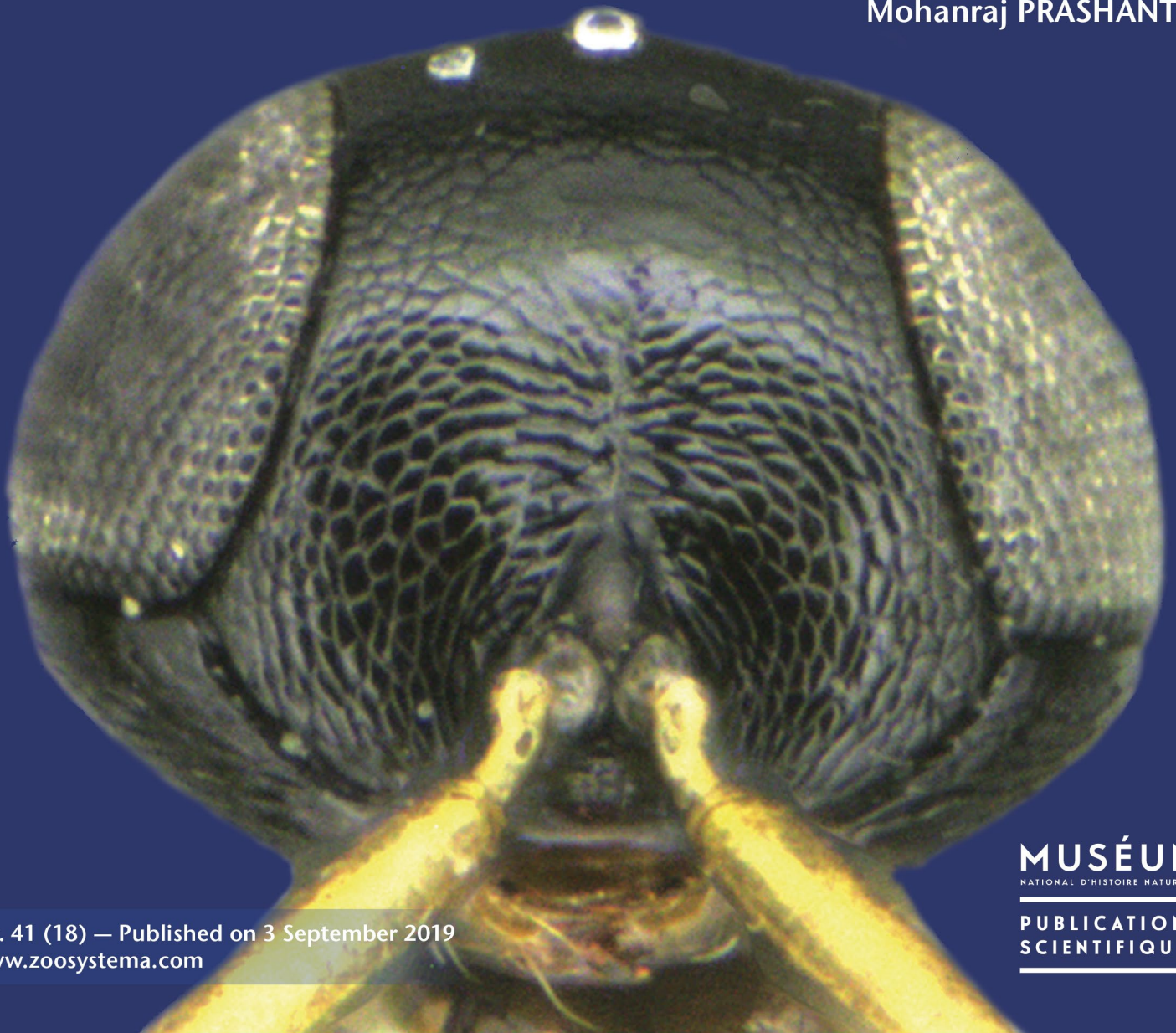


Eight new species of xanthic Telenominae
Thomson, 1860 (Platygastroidea, Scelionidae)
from India

Kamalanathan VEENAKUMARI &
Mohanraj PRASHANTH



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COUVERTURE / *COVER*:

Frons of *Phanuromyia shashikalae* n. sp., female.

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Eight new species of xanthic Telenominae Thomson, 1860 (Platygastroidea, Scelionidae) from India

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Veenakumari K. & Prashanth M. 2019. — Eight new species of xanthic Telenominae Thomson, 1860 (Platygastroidea, Scelionidae) from India. *Zoosystema* 41 (18): 341-358. <https://doi.org/10.5252/zoosystema2019v41a18>. <http://zoosystema.com/41/18>

KEY WORDS

Scelionidae,
Telenominae,
xanthic,
India,
biological control,
new species.

ABSTRACT

Eight new xanthic species of Telenominae Thomson, 1860 – six new species of *Phanuromyia* Dodd, 1914 and two new species of *Telenomus* Haliday, 1833 – are described from India. The new species are *P. flaviabdominalis* n. sp., *P. levigatus* n. sp., *P. reticulata* n. sp., *P. rufocoxalis* n. sp., *P. shashikalae* n. sp., *P. tamaris* n. sp., *T. ekadanta* n. sp. and *T. elegans* n. sp. This is the first time that xanthic *Phanuromyia* are being described from the Oriental region. A key for Indian species is given.

RÉSUMÉ

Huit nouvelles espèces de Telenominae xanthiques (Platygastroidea, Scelionidae) de l'Inde.

Huit nouvelles espèces xanthiques de Telenominae Thomson, 1860 – six nouvelles espèces de *Phanuromyia* Dodd, 1914 et deux nouvelles espèces de *Telenomus* Haliday, 1833 –, sont décrites de l'Inde. Les nouvelles espèces sont *P. flaviabdominalis* n. sp., *P. levigatus* n. sp., *P. reticulata* n. sp., *P. rufocoxalis* n. sp., *P. shashikalae* n. sp., *P. tamaris* n. sp., *T. ekadanta* n. sp. et *T. elegans* n. sp. C'est la première fois que des *Phanuromyia* xanthiques sont décrites de la région orientale. Une clé des espèces indiennes est donnée.

MOTS CLÉS

Scelionidae,
Telenominae,
xanthic,
Inde,
lutte biologique,
espèces nouvelles.

INTRODUCTION

Telenominae Thomson, 1860 is one of the most important subfamilies consisting of promising genera such as *Trissolcus* Ashmead, 1893 and *Telenomus* Haliday, 1833 which have been used to varying degrees of success in biological control programmes (Orr 1988; Mahmood *et al.* 2015; Lara *et al.* 2016). *Telenomus* parasitizes eggs of Lepidoptera, Diptera, Neuroptera and Hemiptera while *Phanuromyia* Dodd, 1914 parasitizes eggs of hoppers belonging to Auchenorrhynchan families such as Issidae Spinola, 1839, Fulgoridae Latreille, 1807 and Flatidae Spinola, 1839 (Johnson & Musetti 2003; Veenakumari & Mohanraj 2014; Nesheim *et al.* 2017).

Six hundred and twenty five species of *Telenomus* have so far been described from the world out of which a meagre 22 species have been described/reported from India (Johnson 2017). With the exception of Nixon (1935) on African Telenominae, Kozlov (1967) and Kozlov & Kononova (1983) on Palaearctic Telenominae, Johnson (1984) on Nearctic *Telenomus* no major revisions of this genus have been attempted. Taxonomic studies of the genus *Phanuromyia* is very scanty in India as well as in the Oriental region with only five described species from the former and six from the latter (Johnson & Musetti 2003; Veenakumari & Mohanraj 2014).

In the subfamily Telenominae xanthism is known to occur in some genera such as *Eumicrosoma* Gahan, 1913, *Paratele-nomus* Dodd, 1914, *Phanuropsis* Girault, 1916, *Phanuromyia* Dodd, 1914 (including members of the former *Telenomus crassiclava* Nixon, 1940 group) and *Phlebiaporus* Kozlov, 1967. In case of *Telenomus*, the majority of the species are black with a few being either entirely or partially yellow as in case of males of *T. tabanivorus* Ashmead, 1895, group, *T. melanogaster* Cameron, 1891, a few species of *T. arzamae* Riley, 1893 and *T. floridanus* Ashmead, 1893, groups. In only four species of *Telenomus* viz. *T. flavus* (Dodd, 1914), *T. flaviventris* Ashmead, 1896, *T. xanthosoma* Johnson, 1980 and *T. chandishae* Veenakumari, 2018 has xanthism been reported. While *T. flavus* is entirely yellow, *T. xanthosoma* and *T. chandishae* have a black head and yellow mesosoma and metasoma, and *T. flaviventris* has a yellow metasoma with the head and mesosoma being black (Johnson 1980, 1984; Veenakumari & Mohanraj 2018). Two species of *Phanuromyia* viz. *P. flavescens* (Dodd, 1915) from North Queensland in Australia and *P. flaviventris* (Kozlov & Kononova, 1978) from Mongolia are known to exhibit xanthism. *Phanuromyia flavescens* has a bright orange body, including A1, with eyes, ocelli, antennae and apex of metasoma being black. *Phanuromyia flaviventris* has a black body with yellow metasoma and short wings (Dodd 1915; Kozlov & Kononova 1978). During recent collections six species of *Phanuromyia* and two species of *Telenomus* which were xanthic were collected from India which are described and illustrated. 118 specimens (113 females and five males) of *Phanuromyia* and 53 specimens (all females) of *Telenomus* were collected.

MATERIAL AND METHODS

Specimens were mounted on point-card tips. The descriptions and imaging including measurements were carried out with a Leica M205A stereomicroscope, with 1 × objective equipped with a Leica DFC-500 digital camera, with ring light illumination and Leica Application Suite (LAS) software. All the specimens were collected using yellow pan traps (YPT), Malaise traps (MT), pitfall traps (PFT), suction traps and sweep nets (SN). The following proportions of specimens collected in each type of trap: YPT (79.14%), SN (10.79%), MT (6.47%), PFT (2.88%) and suction trap (0.72%).

All the primary types are deposited at the ICAR-National Bureau of Agricultural Insect Resources, Bengaluru, India.

Terminology for morphology follows Masner (1976, 1980), Mikó *et al.* (2007, 2010) and for macro and microsculpture Harris (1979).

ABBREVIATIONS

A1-A12	antennomeres 1-12 (A1 = Scape, A2 = Pedicel);
FCI	frontal cephalic index (HW/HH);
H	height;
HH	head height;
HL	head length;
HW	head width;
IOS	interorbital space;
L	length;
LCI	lateral cephalic index (HH/HL);
LOL	lateral ocellar length;
OOL	ocellar ocular length;
POL	posterior ocellar length;
T1 and T2	metasomal tergites 1 to 2. Width of metasomal tergites taken anteriorly.
W	width.

For each species the body measurements are given as mean (m) followed by range, standard deviation (SD), number of specimens (n).

Institution

ICAR-NBAIR National Bureau of Agricultural Insect Resources, Bengaluru.

SYSTEMATICS

Family SCELIONIDAE (Haliday, 1840)
Subfamily TELENOMINAE Thomson, 1860

Genus *Phanuromyia* Dodd, 1914

Phanuromyia Dodd, 1914: 121.

TYPE SPECIES. — *Phanuromyia rufobasalis* Dodd, 1914.

REMARK

It is difficult to use one set of character states to define the genus *Phanuromyia* as stated by Johnson & Musetti (2003) and Neissem *et al.* (2017). Molecular studies conducted by Taekul *et al.* (2014) indicate that *Phanuromyia* is the sister groups of *Telenomus* + *Trissolcus* in addition to other satellite genera. They also concluded that *Phanuromyia* is a

valid genus after including the species of *crassiclava* group of *Telenomus* into this genus. The following characters can be used to distinguish *Phanuromyia* from *Telenomus*. Generally robust species, eyes either glabrous or with very short setae, frons convex, intersection of malar sulcus with compound eye often perpendicular, T2 generally with striae or reticulations beyond basal foveae; ovipositor frequently long and exerted.

Phanuromyia flaviabdominalis n. sp.
(Fig. 1)

urn:lsid:zoobank.org:act:CC9FE627-84E6-40AC-83B7-CC4C87A9C4C5

TYPE MATERIAL. — **Holotype**. ♀, ICAR/NBAIR/P1985, India: Karnataka: Bengaluru, Jarakabande Kaval, 13°05'41"N, 77°32'35"E, 921 m, MT, 20.VII.2015.

Paratypes. 63 ♀: ICAR/NBAIR/P1986-P1990, 5 ♀, Karnataka: Bengaluru, Kengeri, 12°57'25"N, 77°31'39"E, 857 m, YPT, 05.II.2013; specimens with registration numbers P1991-P2038 were collected in the same locality as P1990 but on different dates. — ICAR/NBAIR/P1991-P1992, 2 ♀, 17.XI.2012. — ICAR/NBAIR/P1993-P1996, 4 ♀, 22.I.2013. — ICAR/NBAIR/P1997-P1999, 3 ♀, 22.X.2012. — ICAR/NBAIR/P2000-P2001, 2 ♀, 17.XII.2012. — ICAR/NBAIR/P2002-P2003, 09.XI.2012. — ICAR/NBAIR/P2004-P2006, 3 ♀, 02.I.2013. — ICAR/NBAIR/P2007-P2010, 4 ♀, 11.I.2013. — ICAR/NBAIR/P2011-P2016, 6 ♀, 30.XI.2012. — ICAR/NBAIR/P2017-P2018, 2 ♀, 22.XI.2012. — ICAR/NBAIR/P2019-P2020, 2 ♀, 21.XII.2012. — ICAR/NBAIR/P2021, 1 ♀, 26.XI.2012. — ICAR/NBAIR/P2022, 1 ♀, 17.XII.2012. — ICAR/NBAIR/P2023, 1 ♀, 01.II.2013. — ICAR/NBAIR/P2024-P2025, 2 ♀, 09.XI.2012. — ICAR/NBAIR/P2026, 1 ♀, 13.XI.2012. — ICAR/NBAIR/P2027-P2028, 2 ♀, 19.II.2013. — ICAR/NBAIR/P2029, 1 ♀, 22.I.2013. — ICAR/NBAIR/P2030, 1 ♀, 03.I.2013. — ICAR/NBAIR/P2031-P2036, 6 ♀, 26.X.2012. — ICAR/NBAIR/P2037, 1 ♀, 18.I.2013. — ICAR/NBAIR/P2038, 1 ♀, 17.XI.2012. — ICAR/NBAIR/P2039, 1 ♀, Karnataka: Gandhi Krishi Vignan Kendra (GKVK), 13°04'25"N, 77°34'49"E, 938 m, YPT, 11.X.2011. — ICAR/NBAIR/P2040, 1 ♀, same as P2038, SN, 18.VIII.2011. — ICAR/NBAIR/P2041, 1 ♀, Karnataka: Bengaluru, Attur, 13°09'25"N, 77°56'41"E, 936 m, PFT, 15.XII.2012. — ICAR/NBAIR/P2042, 1 ♀, Karnataka: Chikkaballapur, Nandi Hills, 13°37'02"N, 77°41'00"E, 1448 m, SN, 04.VIII.2012. — ICAR/NBAIR/P2043, 1 ♀, same as P2042, 11.VIII.2011. — ICAR/NBAIR/P2044-P2045, 2 ♀, same as P2042, 18.IX.2010. — ICAR/NBAIR/P2046, 1 ♀, Tamil Nadu: Dharmapuri, Hosur, Uddanapalli, 12°35'36"N, 77°56'01"E, 758 m, YPT, 02.XII.2014. — ICAR/NBAIR/P2047, 1 ♀, Kerala: Ernakulam, Narakkal, 10°02'29"N, 76°13'08"E, 9 m, SN, 11.I.2012. — ICAR/NBAIR/P2048, 1 ♀, Yelagiri, Pudur, 12°58'42"N, 78°38'29"E, 997 m, YPT, 17.VI.2016.

DIAGNOSIS. — *Phanuromyia flaviabdominalis* n. sp. can be distinguished from *P. levigatus* n. sp. in having entire frons reticulate and T2 with vertical striae beneath basal foveae; whereas in *P. levigatus* n. sp. upper frons is smooth, lower frons striate-reticulate and T2 smooth without vertical striae beneath basal foveae; *P. flaviabdominalis* n. sp. can also be distinguished from *P. rufocoxalis* n. sp. and *P. shashikalae* n. sp. by the absence of central keel, a shorter mesoscutellum and mesopleuron with prespecular and mesepimeral sulci foveate; whereas in the other two species central keel is present, mesoscutellum at least 0.5 × as long as wide and mesopleuron with prespecular and mesepimeral sulci nonfoveate.

ETYMOLOGY. — This species is named 'flaviabdominalis' denoting the yellow metasoma. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 1.11 mm; (m = 1.19 [1.08 to 1.31] mm, SD = 0.09, n = 20).

Colour

Head and mesosoma black; metasoma golden yellow; legs yellow brown except brownish black fore coxae; eyes black; entire antenna yellowish brown, A3-A7 a shade paler, clava a shade darker; mandibles reddish brown (Fig. 1A).

Head (Fig. 1A, B, D, E)

FCI = 1.2; LCI = 1.44; IOS subequal to eye length; entire frons coriaceous reticulate, reticulations wider than long above interantennal process; lower gena smooth remainder weakly reticulate; vertex coriaceous reticulate, sparsely setose; eyes (L: W = 18.5: 16.1) large, bare; POL: LOL in ratio of 17.0: 7.6; lateral ocelli contiguous with orbits; a blunt hyperoccipital carina present beyond which a reticulate preoccipital area present with several long setae; occiput reticulate.

Mesosoma (Fig. 1A, C, E)

Mesoscutum (L: W = 17.5: 30.4) coriaceous reticulate; lateral pronotal area dorsally coriaceous reticulate, remainder smooth; mesopleuron with prespecular sulcus foveate; sternaulus (*sensu* Miko 2007) indicated as a weak carina; mesopleural pit distinct and mesepimeral sulcus foveate; mesopleural carina distinct, mesopleural depression smooth to weakly reticulate; anterior margin of metapleuron foveate; metapleuron pit distinct with sparse striae radiating ventrally; scutoscutellar sulcus wide, foveate only laterally; mesoscutellum semicircular (L: W = 3.2: 11.4), entirely smooth, posterior mesoscutellar sulcus deeply foveate; metascutellum smooth with foveae on anterior margin; metanotal trough smooth with weak foveae on posterior margin; lateral propodeal area smooth; fore wing (L: W = 66.1: 19.7) and hind wing (L: W = 58.5: 8.8) with dense microtrichia; length of fore wing and hind wing marginal cilia 0.23 × and 0.72 × width of their respective wings.

Metasoma (Fig. 1A)

(L: W = 44.6: 24.9); T1 foveate anteromedially, with a sharp carina laterad which extends the entire length of tergite, remainder smooth; T1 with two lateral and one sublateral setae; T2 with anteromedial basal foveae, followed by weak striae some of which extend medially up to ¾ length of tergite, remainder smooth; length and width of tergites T1: T2 in ratio of 5.0: 14.0, 27.6: 23.1, respectively; last tergite with ovipositor upturned.

Male

Not known.

Phanuromyia levigatus n. sp.
(Fig. 2)

urn:lsid:zoobank.org:act:D876CB4C-A64C-47F6-97BD-AA0D9FF377D0

TYPE MATERIAL. — **Holotype**. ♀, ICAR/NBAIR/P2065, India: Karnataka: Bengaluru, Hebbal, National Bureau of Agricultural Insect

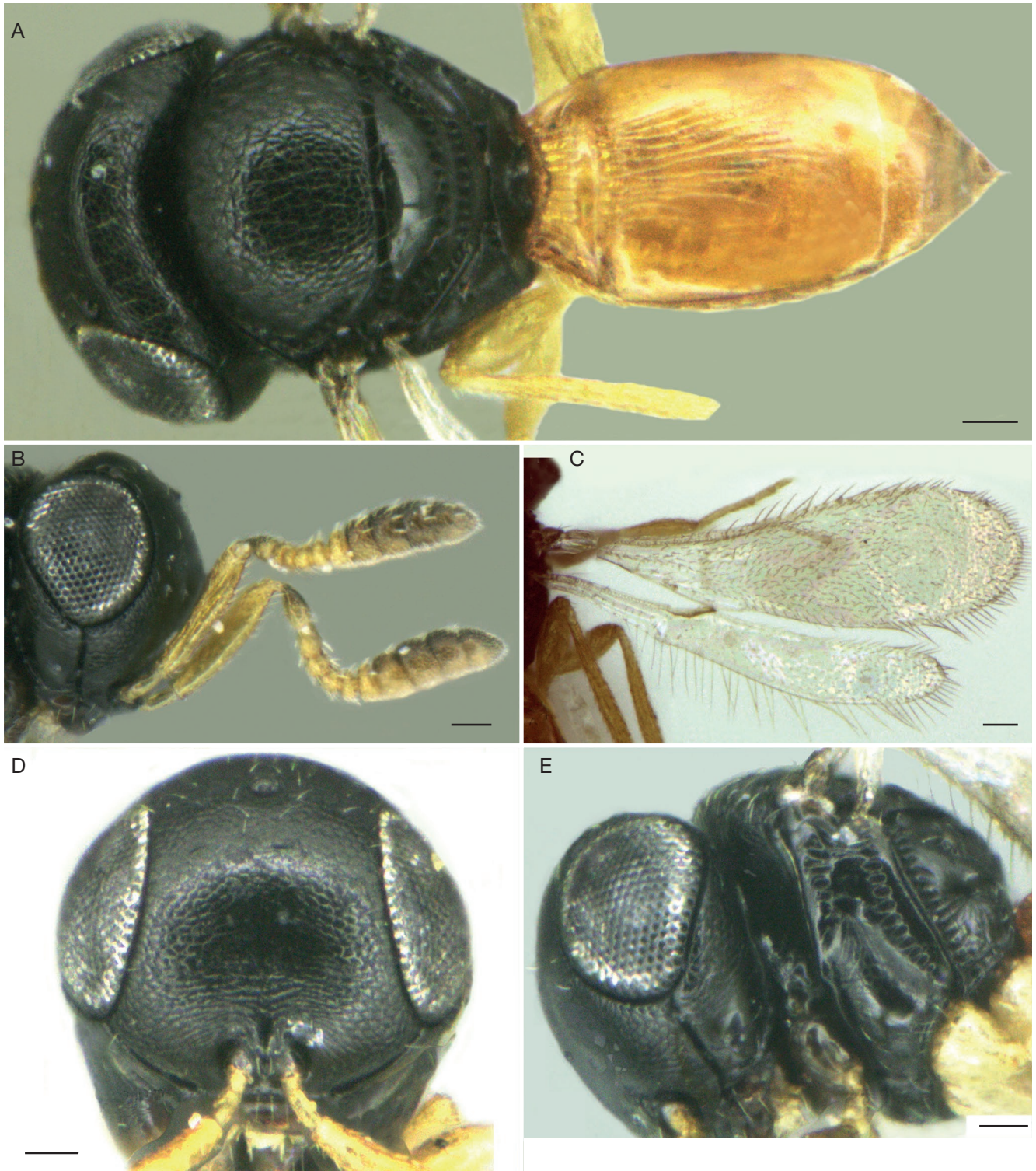


FIG. 1. — *Phanuromyia flaviabdominalis* n. sp., female: **A**, habitus (dorsal view); **B**, head and antennae; **C**, wings; **D**, frons; **E**, head and pleuron. Scale bars: 0.05 mm.

Resources (NBAIR), 13°02'36"N, 77°58'42"E, 927 m, MT, 03.IV.2012.
Paratypes. 2 ♀: ICAR/NBAIR/P2066, 1 ♀, Karnataka: Bengaluru, Hesaraghatta, 13°13'02"N, 77°48'54"E, 859 m, SN, 22.VIII.2013. — ICAR/NBAIR/P2067, 1 ♀, Karnataka: Bengaluru, Jarakabande Kaval, 13°05'41"N, 77°32'35"E, 921 m, MT, 12.VIII.2013.

DIAGNOSIS. — *Phanuromyia levigatus* n. sp. is similar to *P. flaviabdominalis* n. sp. but differs from it in the following characters. In *P. levigatus* n. sp. upper frons is smooth, lower frons striate-reticulate and T2 smooth without vertical striae beneath basal foveae whereas in *P. flaviabdominalis* n. sp. entire frons is reticulate and vertical striae are present beneath basal foveae on T2.

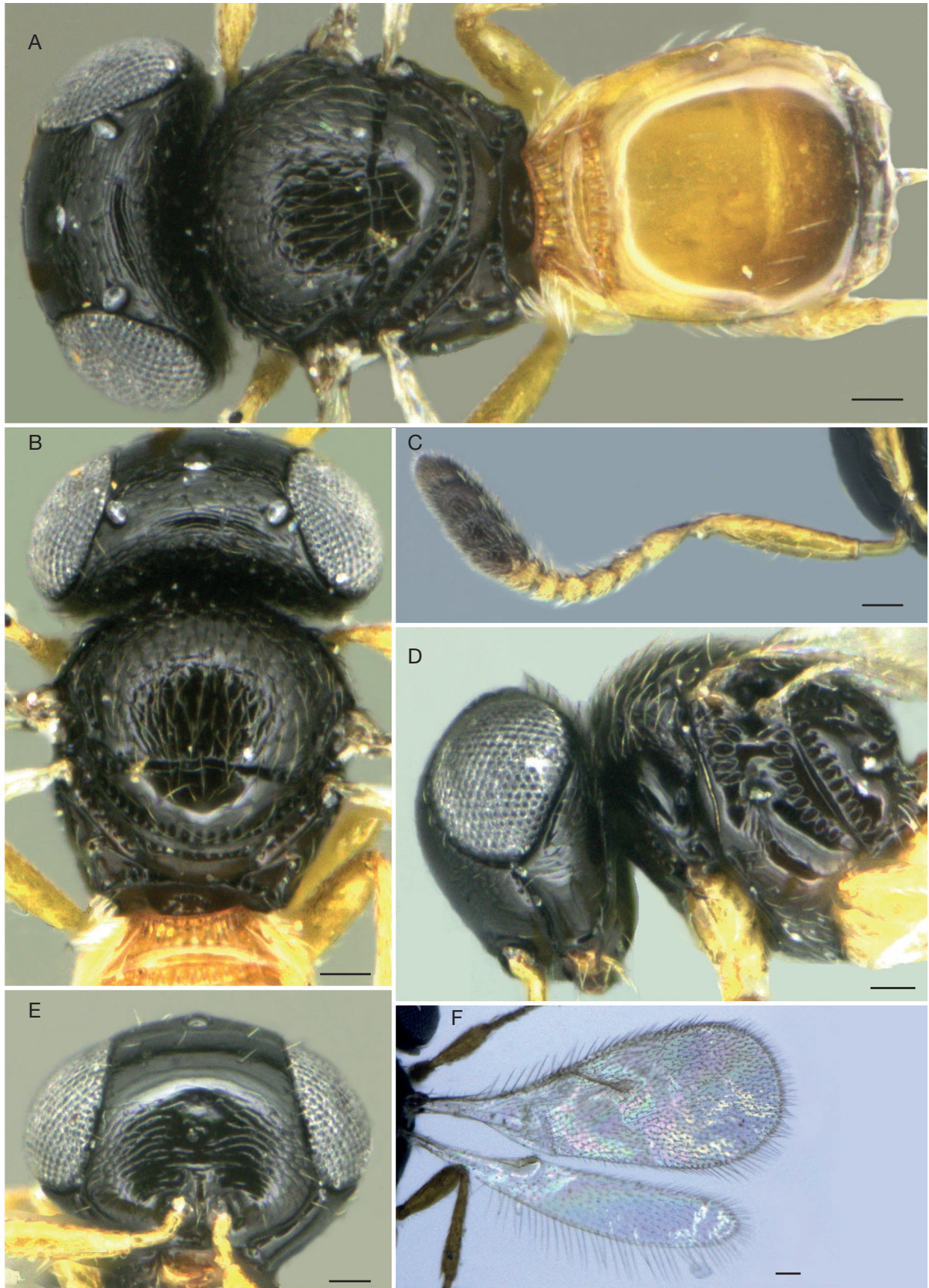


FIG. 2. — *Phanuromyia levigatus* n. sp., female: **A**, habitus (dorsal view); **B**, head and mesonotum; **C**, antenna; **D**, head and pleuron; **E**, frons; **F**, wings. Scale bars: 0.05 mm.

ETYMOLOGY. — This species is named 'levigatus' referring to the smooth metasoma. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 0.99 mm; (m = 0.89 [0.83 to 0.99] mm, SD = 0.08, n = 3)

Colour

Head and mesosoma black; metasoma honey brown except blackish brown posterior T2 and remaining tergites; legs yellow brown; eyes silvery; entire antenna yellowish brown except blackish brown clava; mandibles reddish brown (Fig. 2A).

Head (Fig. 2A-E)

FCI = 1.47; LCI = 1.31; IOS subequal to eye length; frons smooth above mid eye level, remainder laterally reticulate and medially with uneven striae; gena weakly reticulate except for a lower smooth area; vertex densely setose, finely striate with a few large punctae; eyes (L: W = 19.4: 15.8) large, bare; POL: LOL in ratio of 13.6:7.0; lateral ocelli contiguous with orbits; hyperoccipital carina and preoccipital area not distinct; occiput transversely reticulate.

Mesosoma (Fig. 2A, B, D, F)

Mesoscutum (L: W = 27.0: 16.7) coriaceous reticulate, densely setose; lateral pronotal area dorsally coriaceous reticulate, remainder smooth; mesopleuron with prespecular sulcus foveate; sternaulus not indicated; mesopleural pit distinct and mesepimeral sulcus foveate; mesopleural carina distinct, mesopleural depression smooth; ventral mesopleuron weakly striate-reticulate; metapleuron smooth except for foveae on anterior margin; metapleuron pit distinct without radiating striae but with dense setae ventrally; scutoscuteellar sulcus medially narrow and laterally wide; mesoscutellum semicircular (L: W = 8.6: 21.6), entirely smooth, sparsely setose; posterior mesoscutellar sulcus deeply foveate; metascutellum rectangular, smooth with foveae on anterior margin; metanotal trough foveate; lateral propodeal area smooth, with foveae on posterior margin; fore wing (L: W = 69.6: 28.2) and hind wing (L: W = 67.7: 12.3) with dense microtrichia; length of fore wing and hind wing marginal cilia $0.17 \times$ and $0.68 \times$ width of their respective wings.

Metasoma (Fig. 2A)

(L: W = 30.2: 24.2); T1 foveate anteromedially, with a sharp carina laterad which extends the entire length of the tergite, remainder smooth; T1 with a lateral setose patch and a transverse carina posterad below basal foveae; T2 with basal foveae anteromedially, remainder smooth without vertical striae; length and width of tergites T1: T2 in ratio of 3.9: 11.5, 23.5: 20.5, respectively; ovipositor visible, straight.

Male

Not known.

Phanuromyia reticulata n. sp.

(Figs 3; 4)

urn:lsid:zoobank.org:act:BFBDE1A9-E8CB-423D-82B4-0427B1E294D8

TYPE MATERIAL. — **Holotype.** ♀, ICAR/NBAIR/P1970, India: Karnataka: Bengaluru, Hebbal, 13°02'08"N, 77°58'42"E, 927 m, YPT, 24.IV.2014.

Paratypes. 9 ♀, 5 ♂: ICAR/NBAIR/P1971, 1 ♀, Karnataka: Bengaluru, Attur, 13°09'25"N, 77°56'41"E, 936 m, MT, 30.IV.2011. — ICAR/NBAIR/P1972, 1 ♀, same as P1971, 07.V.2011. — ICAR/NBAIR/P1973, 1 ♀, Karnataka: Chikkaballapur, Nandi Hills, 13°37'02"N, 77°41'00"E, 1448 m, SN, 18.IX.2010. — ICAR/NBAIR/P1974, 1 ♀, Karnataka: Mandya, Madduru, 12°58'41"N, 77°04'34"E, 646 m, YPT, 14.VI.2016. — ICAR/NBAIR/P1975, 1 ♀, Karnataka: Kolar, 13°07'51"N, 78°08'18"E, 829 m, SN, 26.VII.2012. — ICAR/NBAIR/P1976, 1 ♀, Tamil Nadu: Dharmapuri, Hosur, Uddanapalli, 12°35'36"N, 77°56'01"E, 758 m, MT, 02.XII.2014. — ICAR/NBAIR/P1977, 1 ♀, Tamil Nadu: Vellore, Yelagiri, Pudur, 12°58'42"N, 78°38'29"E, 997 m, YPT, 16.VI.2016. — ICAR/NBAIR/P1978, 1 ♂, same as P1971, 31.V.2011. — ICAR/NBAIR/P1979, 1 ♂, same as P1971, 25.IV.2011. — ICAR/NBAIR/P1980, 1 ♂, same as P1971, 07.V.2011. — ICAR/NBAIR/P1981, 1 ♂, Tamil Nadu: Krishnagiri, Kelamangalam, Jakkeri, YPT, 12°42'17"N, 77°48'37"E, 899 m, 03.III.2015. — ICAR/NBAIR/P1982, 1 ♂, same as P1974, SN, 04.I.2012. — ICAR/NBAIR/P1983, 1 ♀, Tamil Nadu: Lower Pulney Hills, Thadiyankudisai, Horticulture Research Station, 10°17'58"N, 77°42'42"E, 990 m, YPT, 28.XI.2016. — ICAR/NBAIR/P1984, 1 ♀, Karnataka: Chintamani, College of Sericulture, 13°20'07"N, 78°04'56"E, 862 m, YPT, 13.I.2016.

DIAGNOSIS. — This species is different from all other species of Indian *Phanuromyia* in having a reticulate mesoscutellum.

ETYMOLOGY. — This species is named 'reticulata' highlighting the reticulate sculpture of the mesoscutellum. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 0.96 mm; (m = 0.98 [0.91 to 1.19] mm, SD = 0.08, n = 8).

Colour

Head and mesosoma black; metasoma golden yellow; legs yellow brown except brown fore coxae; eyes black; radicle, A1, A5-A7 yellowish brown, remaining antennomeres blackish brown; mandibles reddish brown (Fig. 3A).

Head (Fig. 3A, B, D, E)

FCI = 1.31; LCI = 1.40; IOS subequal to eye length; entire frons and gena coriaceous reticulate; three vertical striae arise on either side of toruli and converge in the middle of frons; vertex finely reticulate, sparsely setose; eyes (L: W = 17.4: 16.3) large, bare; POL: LOL in ratio of 15.7: 7.6; lateral ocelli contiguous with orbits; hyperoccipital carina and preoccipital area indistinct; occiput reticulate.

Mesosoma (Fig. 3A, C, E)

Mesoscutum (L: W = 18.9: 26.6) finely reticulate, reticulations postero-medially longer than wide; lateral pronotal area predominantly reticulate; mesopleuron reticulate; mesopleural depression vertically striate; prespecular sulcus and mesepime-

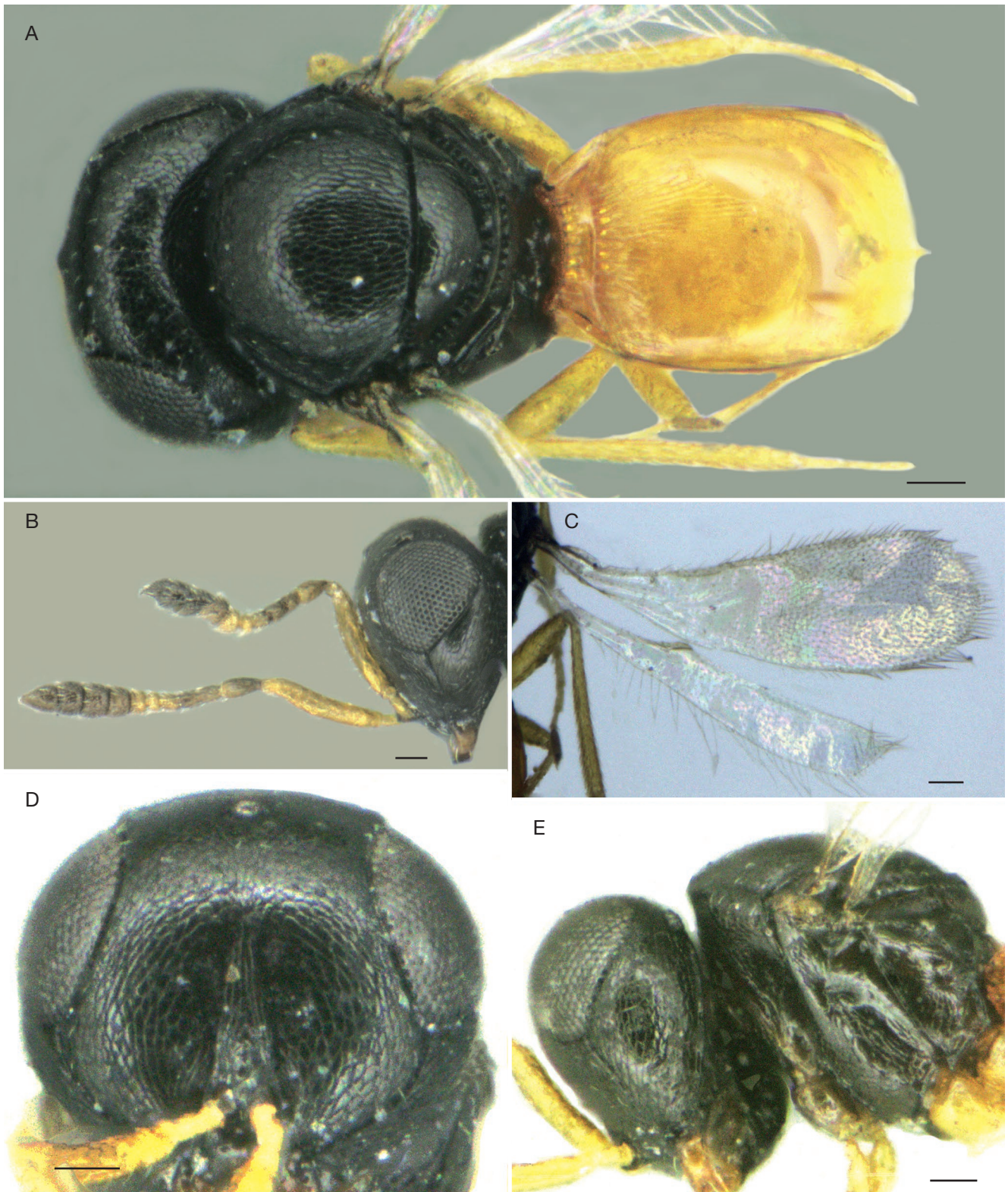


FIG. 3. — *Phanuromyia reticulata* n. sp., female: **A**, habitus (dorsal view); **B**, head and antennae; **C**, wings; **D**, frons; **E**, head and pleuron. Scale bars: 0.05 mm.

ral sulci not foveate; sternaulus not indicated; mesopleural pit distinct; mesopleural carina distinct; metapleuron coarsely sculptured with a distinct metapleural pit; scutoscutellar sulcus narrow, foveate only laterally; mesoscutellum (L: W = 7.5:

2.0) semicircular, finely reticulate, posterior margin uniformly rounded; posterior mesoscutellar sulcus deeply foveate; metascutellum rectangular, smooth with foveae on anterior margin; metanotal trough smooth; lateral propodeal area smooth; fore



FIG. 4. — *Phanuromyia reticulata* n. sp., male: habitus (dorsal view). Scale bar: 0.05 mm.

wing (L: W = 62.7: 16.8) and hind wing (L: W = 56.0: 8.0) with dense microtrichia; length of fore wing marginal cilia $0.25 \times$ width of wing; hind wing marginal cilia subequal to width of wing.

Metasoma (Fig. 3A)

(L: W = 29.8: 22.6); T1 foveate anteromedially, with a sharp carina laterad extending the entire length of tergite, remainder smooth; T1 with 2 lateral setae; T2 with antero-medial basal foveae, followed by weak striae some of which extend medially up to half the length of tergite, remainder smooth; length and width of tergites T1: T2 in ratio of 2.9: 10.2, 27.0: 18.9, respectively; ovipositor visible, straight.

Male (Fig. 4A)

Body length = 0.94 mm; male similar to female except for the following characters: metasoma dark brown with T1 and anterior T2 orangish brown; mesoscutellum weakly reticulate and medially almost smooth.

Phanuromyia rufocoxalis n. sp.
(Fig. 5)

[urn:lsid:zoobank.org:act:C8E16D64-CE73-44D6-8094-23E082A61DB8](https://zoobank.org/act:C8E16D64-CE73-44D6-8094-23E082A61DB8)

TYPE MATERIAL. — **Holotype**. ♀, ICAR/NBAIR/2057, India: Nagaland: Medziphema, 25°45'23"N, 93°52'05"E, 457 m, YPT, 27.II.2015.

Paratypes. 2 ♀: ICAR/NBAIR/P2058-P2059, same data as holotype; A. Gupta leg.

DIAGNOSIS. — This species is closer to *P. shashikalae* n. sp. but differs from it in the following combination of character states. In *P. rufocoxalis* n. sp. preoccipital area is distinct, posterior margin of mesoscutellum angular and metapleuron entirely smooth except for

a few foveae ventrally; whereas in *P. shashikalae* n. sp. preoccipital area absent, posterior margin of mesoscutellum uniformly rounded and metapleuron coarsely sculptured with ventrally radiating striae from metapleural pit.

ETYMOLOGY. — This species is named 'rufocoxalis' referring to the brown fore coxa. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 1.06 mm (m = 1.08 (1.06 to 1.12) mm, SD = 0.03, n = 3)

Colour

Head and mesosoma black; metasoma brownish yellow, T2 with dark lateral margins; legs yellow brown except for brown fore coxae; eyes black; radicle, A1, yellowish brown, A3-A4 brown, A5-A7 yellow, clava blackish brown; mandibles reddish brown (Fig. 5A).

Head (Fig. 5A-D)

FCI = 1.24; LCI = 1.26; IOS $0.83 \times$ eye length; entire frons and gena coriaceous reticulate, reticulations on gena transverse; a central keel extends up to half the length of frons; vertex coriaceous reticulate, sparsely setose; eyes (L: W = 22.3: 20.3) large, bare; POL: LOL in ratio of 14.7: 6.9; lateral ocelli contiguous with orbits; hyperoccipital carina distinct with a preoccipital area covered with sparse long setae; occiput coriaceous reticulate.

Mesosoma (Fig. 5A, B, E)

Mesoscutum (L: W = 20.0: 26.3) coriaceous reticulate, reticulations almost as long as wide; dorsal lateral pronotal area coriaceous reticulate, antero-ventrally with broad reticulations, remainder smooth; mesopleuron dorsally smooth ventrally reticulate, prespecular and mesepimeral sulci nonfoveate; sternaulus not indicated; mesopleural pit and mesopleural carina

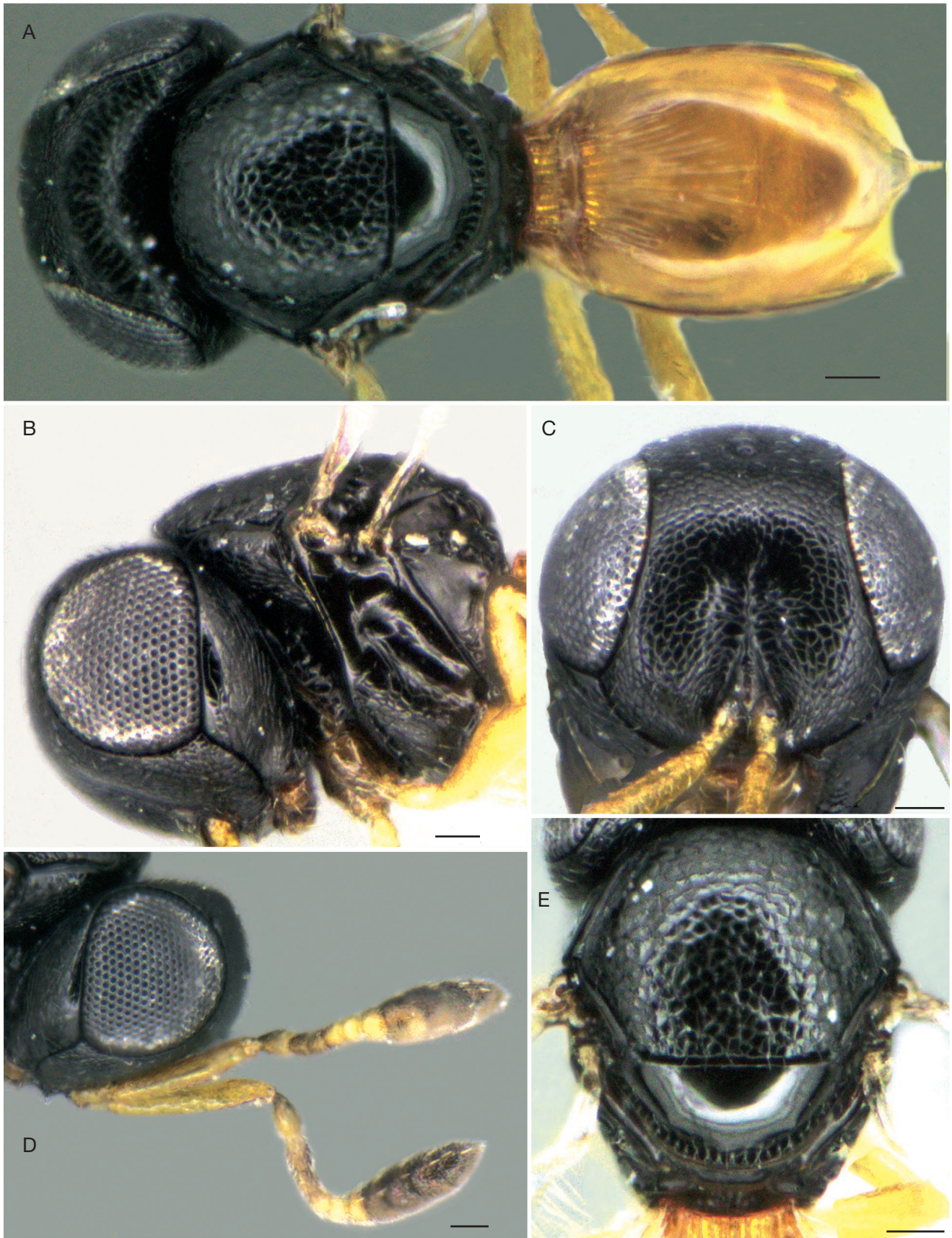


FIG. 5. — *Phanuromyia rufocoxalis* n. sp., female: **A**, habitus (dorsal view); **B**, head and pleuron; **C**, frons; **D**, head and antennae; **E**, mesonotum. Scale bars: 0.05 mm.

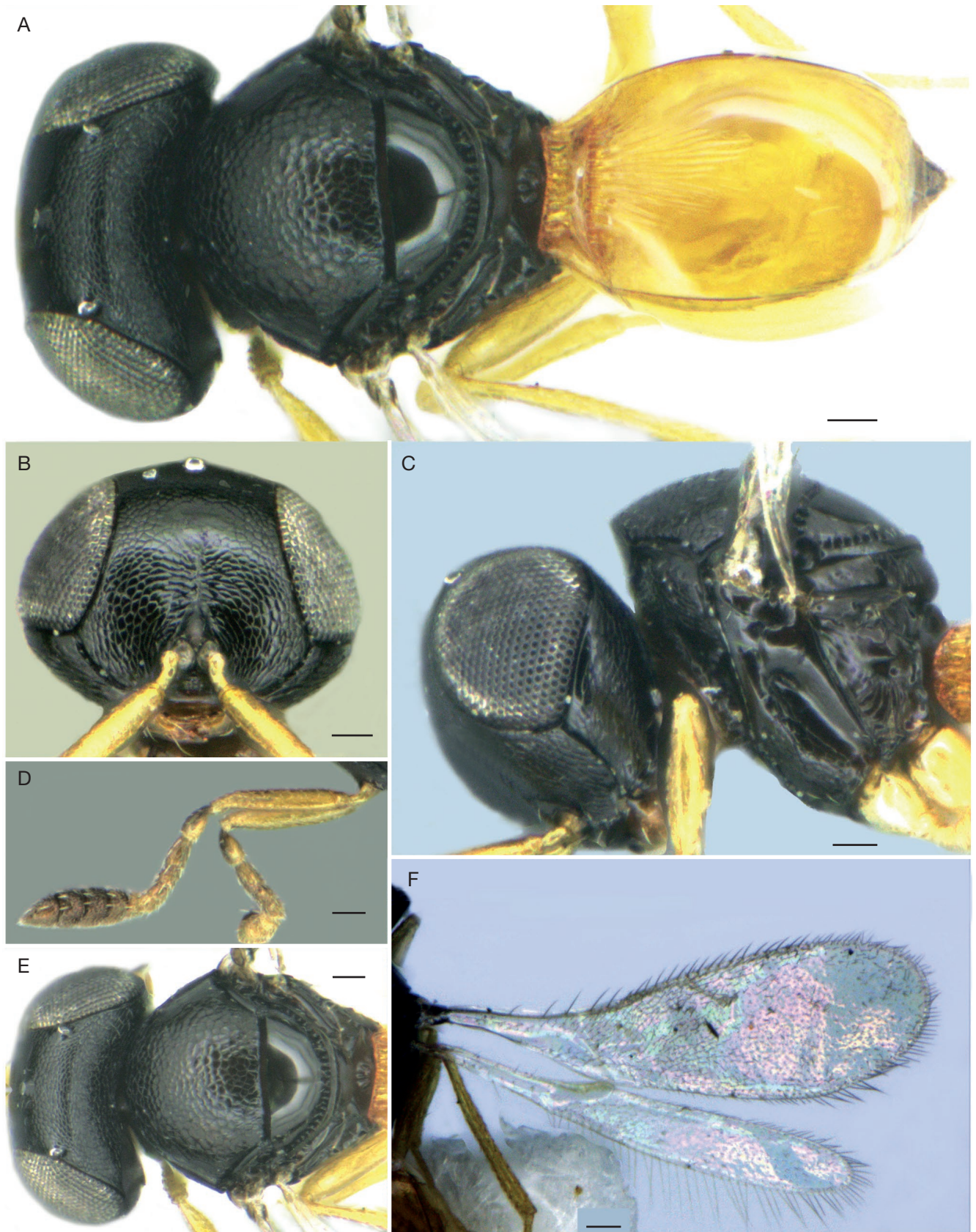


FIG. 6. — *Phanuromyia shashikalae* n. sp., female: **A**, habitus (dorsal view); **B**, frons; **C**, head and pleuron; **D**, antennae; **E**, head and mesonotum; **F**, wings. Scale bars: 0.05 mm.

distinct; mesopleural depression smooth; anterior margin of metapleuron foveate ventrally; metapleuron entirely smooth except for sparse foveae ventrally; metapleural pit distinct; scutoscutellar sulcus narrow, non-foveate; mesoscutellum semicircular (L: W = 8.9: 18.2), smooth, with posterior margins angled and not curving or rounded smoothly; posterior mesoscutellar sulcus deeply foveate; metascutellum smooth with no foveae on anterior margin; metanotal trough smooth; lateral propodeal area smooth; fore wing (L: W = 75.4: 23.3) and hind wing (L: W = 66.1: 9.3) with dense microtrichia; length of fore wing and hind wing marginal cilia $0.19 \times$ and $0.91 \times$ width of their respective wings; a row of stout cilia present on submarginalis, marginalis and post marginalis. Metasoma (Fig. 5A): (L: W = 37.8: 27.0); T1 foveate anteromedially, remainder smooth; Lateral carina on T1 not distinct; T1 with two lateral setae; T2 with basal foveae anteromedially, followed by weak striae some of which extend medially more than half the length of tergite, remainder smooth; T1 with two lateral setae; length and width of tergites T1: T2 in ratio of 4.6: 12.0, 33.4: 22.6, respectively; ovipositor visible, straight.

Male

Not known.

Phanuromyia shashikalae n. sp. (Fig. 6)

[urn:lsid:zoobank.org:act:2A78C2C5-BF99-451F-8340-BC375AF7FBD3](https://doi.org/10.21203/rs.3.rs-1234567/v1)

TYPE MATERIAL. — **Holotype**. ♀, ICAR/NBAIR/2070, India: Karnataka: Chikkaballapur, Nandi Hills, 13°37'02"N, 77°41'00"E, 1448 m, SN, 18.IX.2010.

DIAGNOSIS. — This species is closer to *Phanuromyia rufocoxalis* n. sp. but differs from it in the following combination of character states. In *P. shashikalae* n. sp. preoccipital area absent, posterior margin of mesoscutellum uniformly rounded and metapleuron coarsely sculptured with ventrally radiating striae from metapleural pit. Whereas in *P. rufocoxalis* n. sp. preoccipital area is distinct, posterior margin of mesoscutellum angular and metapleuron entirely smooth except for a few foveae ventrally.

ETYMOLOGY. — This species is named 'shashikalae' after B. Shashikala in recognition of her invaluable assistance in the laboratory. The name is treated as a noun in the genitive case.

DESCRIPTION

Measurement

Body length = 1.08 mm.

Colour

Head and mesosoma black; metasoma golden yellow with dark lateral margins; legs yellowish brown except brownish yellow fore coxae; eyes black; radicle, A1, yellowish brown, A2-A7 brownish yellow, clava blackish brown; mandibles reddish brown (Fig. 6A).

Head (Fig. 6A-E)

FCI = 1.25; LCI = 1.41; IOS $0.92 \times$ eye length; entire frons coriaceous reticulate, reticulations longer than wide basally; gena

coriaceous reticulate; vertex coriaceous reticulate, not setose; eyes (L: W = 20.2: 19.7) large, bare; POL: LOL in ratio of 17.4: 9.5; a central keel extends up to half the length of frons; lateral ocelli contiguous with orbits; a weak hyperoccipital carina present; preoccipital area reticulate; occiput weakly coriaceous reticulate.

Mesosoma (Fig. 6A, C, E, F)

Mesoscutum (L: W = 20.5: 28.6) coriaceous reticulate, reticulations as long as wide; dorsal lateral pronotal area coriaceous reticulate, remainder smooth; mesopleuron entirely smooth except for reticulations antero-ventrally, prespecular and mesepimeral sulci nonfoveate; sternaulus not foveate; mesopleural pit and mesopleural carina distinct; mesopleural depression smooth; metapleuron coarsely sculptured with weak striae radiating ventrally from the metapleural pit; scutoscutellar sulcus uniformly wide, non-foveate; mesoscutellum semicircular (L: W = 8.4: 17.9), smooth, with posterior margins almost curving smoothly; posterior mesoscutellar sulcus foveate; metascutellum smooth with weak vertical costae laterally and with no foveae on anterior margin; metanotal trough smooth; lateral propodeal area smooth; fore wing (L: W = 69.6: 22.3) and hind wing (L: W = 63.3: 9.2) with dense microtrichia; length of fore wing and hind wing marginal cilia $0.18 \times$ and $0.8 \times$ width of their respective wings; a row of stout cilia present on submarginalis, marginalis and post marginalis. Metasoma (Fig. 6A): (L: W = 37.3: 25.0); T1 foveate anteromedially, remainder smooth; T1 with distinct lateral carina and two lateral setae; T2 with basal foveae anteromedially, followed by weak striae extending medially $0.4 \times$ length of tergite, remainder smooth; length and width of tergites T1: T2 in ratio of 3.9: 12.7, 29.8: 20.4, respectively; ovipositor short.

Male

Not known.

Phanuromyia tamaris n. sp. (Fig. 7)

[urn:lsid:zoobank.org:act:73FDAADE-5C62-4301-B1A1-82B979943CF9](https://doi.org/10.21203/rs.3.rs-1234567/v1)

TYPE MATERIAL. — **Holotype**. ♀, ICAR/NBAIR/P2120, India: Andaman Islands: South Andaman, 11°36'41"N, 92°42'56"E, 56 m, 12.XI.2001.

Paratypes. 31 ♀, ICAR/NBAIR/P2021-2051, same data as holotype. All the specimens were preserved in ethanol in a vial and labeled 'Sample 1' along with locality data. No other data was appended with the specimens. It appears to be reared material.

DIAGNOSIS. — This species is very unique among xanthic *Phanuromyia* due to the absence of basal foveae on both T1 and T2.

ETYMOLOGY. — This species is named 'tamaris'; 'tamara' in Kannada means copper referring to the unique body colour. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 0.96 mm; (m = 1.05 [0.93 to 1.21] mm, SD = 0.04, n = 20).

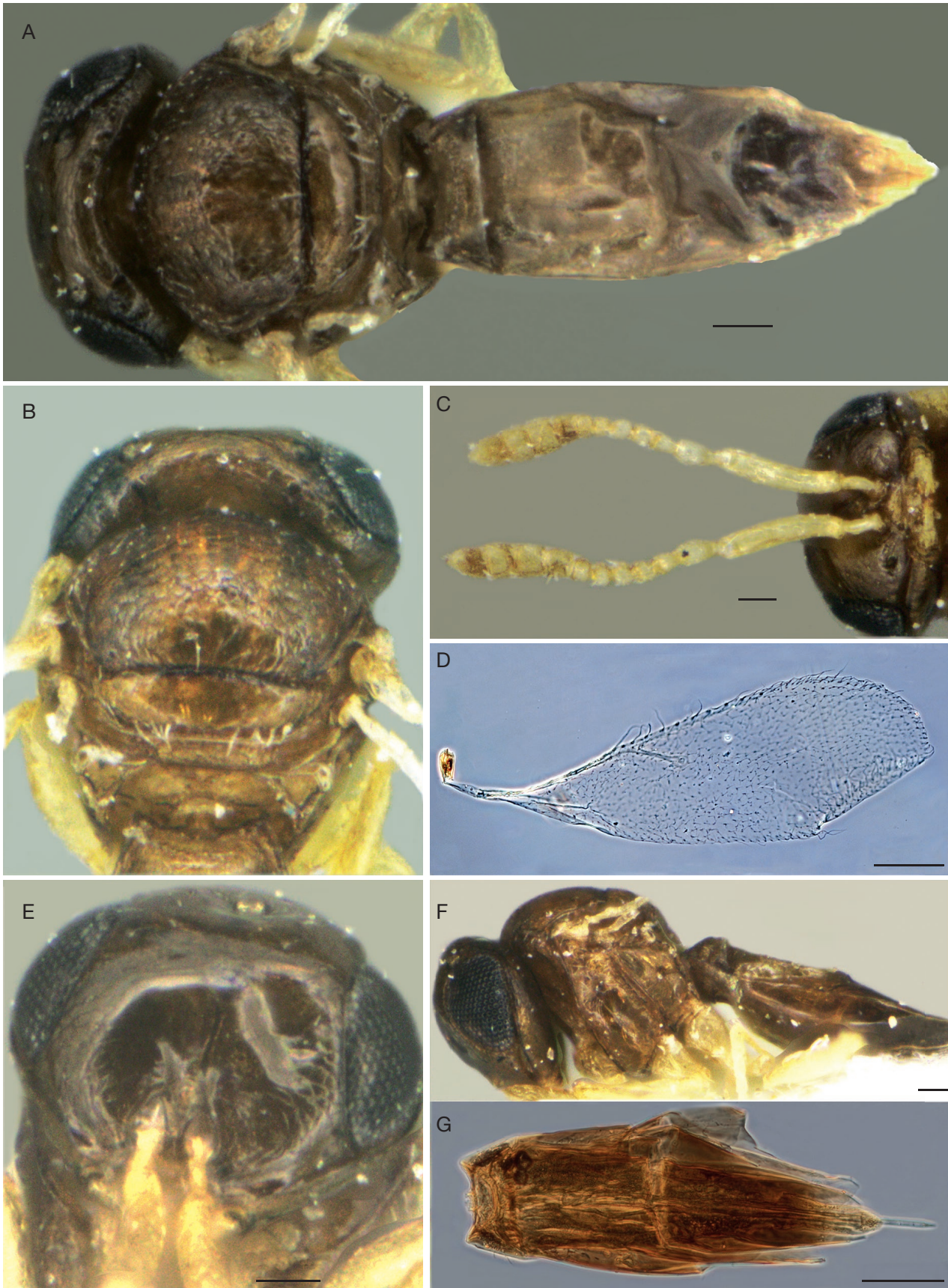


FIG. 7. — *Phanuromyia tamaris* n. sp., female: **A**, habitus (dorsal view); **B**, head and mesonotum, **C**, antennae; **D**, wing; **E**, frons; **F**, habitus (lateral view); **G**, Metasoma. Scale bars: A-C, E, F, 0.05 mm; D, G, 100 μ m.

Colour

Entire body coppery brown; eyes black; legs pale yellow; entire antenna pale yellow; mandibles reddish brown (Fig. 7A). Head (Fig. 7A–C, E): FCI = 1.42; LCI = 1.60; IOS 1.15 × eye length; upper and median frons smooth, remaining finely reticulate; gena weakly reticulate to smooth; vertex transversely reticulate, not setose; eyes (L: W = 15.9: 10.1) with short sparse white setae; POL: LOL in ratio of 14.4: 7.5; lateral ocelli contiguous with orbits; hyperoccipital carina and preoccipital area absent; occiput reticulate.

Mesosoma (Fig. 7A, B, D, F)

Mesoscutum (L: W = 15.3: 24.2), 1.6 × as long as wide, sparsely setose, weakly reticulate; upper lateral pronotal area reticulate, remainder smooth; mesopleuron predominantly reticulate, prespecular sulcus and sternaulus not foveate; mesopleural pit distinct, mesepimeral sulcus foveate, foveae shallow; mesopleural carina distinct; mesopleural depression predominantly smooth; anterior margin of metapleuron nonfoveate; metapleuron coarsely unevenly sculptured, metapleuron pit distinct; scutoscuteellar sulcus narrow and laterally foveate; mesoscutellum > 4 × as wide as long, entirely smooth, posteriorly setose; posterior mesoscutellar sulcus weakly foveate and with a row of thick setae; metascutellum rectangular (L: W = 2.7: 11.1) entirely smooth, with no foveae on anterior margin; metanotal trough smooth; lateral propodeal area wide apart, smooth; fore wing (L: W = 58.4: 23.6) and hind wing (L: W = 53.9: 8.6) with dense microtrichia.

Metasoma (Fig. 7A, G)

(L: W = 43.1: 16.8); T1 medially concave, smooth without basal foveae; lateral carina on T1 present; T2 entirely smooth without basal foveae; length and width of tergites T1: T2 in ratio of 3.9: 10.5, 21.1: 15.0, respectively; ovipositor not visible externally.

Male

Not known.

Family SCELIONIDAE (Haliday, 1840)
Subfamily TELENOMINAE Thomson, 1860

Genus *Telenomus* Haliday, 1833

Telenomus Haliday, 1833 1: 271.

TYPE SPECIES. — *Telenomus brachialis* Haliday, 1833.

REMARK

The genus *Telenomus* in general can be characterized by the following set of character states: female antenna with 11 and basiconic sensilla present on apical four antennomeres; males with 12 antennomeres; frons predominantly smooth and shining without facial striae; eyes setose; notauli absent; scutellum smooth; T2 as long as or longer than wide. Though all the character states mentioned above have some exceptions, absence of facial striae and T2 as long as or longer than wide are consistent in most species of *Telenomus* (Johnson 1984; Talamas *et al.* 2015).

Telenomus ekadanta n. sp.

(Fig. 8)

urn:lsid:zoobank.org:act:7C1F0408-2251-4516-BD32-28BB76D0E04F

TYPE MATERIAL. — **Holotype.** ♀, ICAR/NBAIR/P2071, India: Karnataka: Mandya, Madduru, 12°58'41"N, 77°04'34"E, 646 m, YPT, 14.VI.2016.

Paratypes. 46 ♀, ICAR/NBAIR/P2072–P2086, 15 ♀, same data as holotype. — ICAR/NBAIR/P2087–P2096, 10 ♀, Madhya Pradesh: Bhopal, Central Institute of Agricultural Engineering (CIAE), 23°18'48"N, 77°24'27"E, 499 m, YPT, 15.VI.2011. — ICAR/NBAIR/P2097, 1 ♀, Karnataka: Bengaluru, Hebbal, 13°02'08"N, 77°58'42"E, 927 m, YPT, 29.XII.2007. — ICAR/NBAIR/P2098, 1 ♀, same as P2097, PFT, 10.V.2011. — ICAR/NBAIR/P2099, 1 ♀, same as P2098, 29.I.2010. — ICAR/NBAIR/P2100, 1 ♀, same as P2098, 20.III.2010. — ICAR/NBAIR/P2101–P2104, 4 ♀, Karnataka: Bengaluru, Attur, 13°09'25"N, 77°56'41"E 936 m, YPT, 01.VIII.2015. — ICAR/NBAIR/P2105, 1 ♀, Karnataka: GKVK, 13°04'25"N, 77°34'49"E, 938 m, YPT, 20.VII.2015. — ICAR/NBAIR/P2106, 1 ♀, Karnataka: Bengaluru, Jarakabande Kaval, 13°05'41"N, 77°32'35"E, 921 m, YPT, 19.IV.2013. — ICAR/NBAIR/P2107, 1 ♀, Karnataka: Bengaluru, Lal Bagh Botanical Garden, 12°57'02"N, 77°35'05"E, 907 m, SN, 12.IV.2010. — ICAR/NBAIR/P2108, 1 ♀, Karnataka: Mandya, Madduru, 12°58'41"N, 77°04'34"E, 646 m, YPT, 19.IV.2012. — ICAR/NBAIR/P2109, 1 ♀, same as P2108, SN, 16.IX.2010. — ICAR/NBAIR/P2110, P2111, 2 ♀, Odisha: Bhubaneswar, Orissa University of Agricultural Technology (OUAT), YPT, 29.I.2016. — ICAR/NBAIR/P2112, 1 ♀, Goa: Ela, Farmers' Training Centre, 15°29'29"N, 73°55'01"E, 16 m, YPT, 14.VII.2015. — ICAR/NBAIR/P2113, 1 ♀, Tamil Nadu: Kodaikanal, Shenbaganur, 10°14'01"N, 77°30'47"E, 1865 m, YPT, 02.IV.2014. — ICAR/NBAIR/P2114, 1 ♀, Tamil Nadu: Krishnagiri, Kelamangalam, Jakkeri, 12°42'17"N, 77°48'37"E, 899 m, YPT, 12.XI.2015. — ICAR/NBAIR/P2115, 1 ♀, Tamil Nadu: Yercaud, Horticulture Research Station, 11°46'30"N, 78°12'33"E, 1399 m, Suction trap, 05.VIII.2016. — ICAR/NBAIR/P2116, 1 ♀, Rajasthan: Ajmer, Tabiji, National Research Centre on Seed Spices (NRCSS), 26°21'56"N, 74°35'36"E, 445 m, YPT, 27.XI.2016. — ICAR/NBAIR/P2116, 1 ♀, Tamil Nadu: Hogenakkal, 12°06'57"N 77°46'38"E, 250 m, SN, 06.II.2015.

DIAGNOSIS. — This species is closer to *T. flaviventris* but differs from it in the following combination of character states. In *T. flaviventris* frons predominantly smooth, hyperoccipital carina present, occiput smooth and mesoscutum smooth, IOS half the width of head and subequal to eye length, T2 wider than long, entirely smooth; whereas in *T. ekadanta* n. sp. frons laterally and ventrally reticulate, occipital carina invaginate as an inverted 'v' shaped carina, hyperoccipital carina absent, occiput and mesoscutum coriaceous reticulate, IOS at most 0.35 × width of head and at most 0.65 × eye length, T2 at least 1.4 × as long as wide, with short striae on anterior margin.

ETYMOLOGY. — This species is named 'ekadanta' after the Hindu God Lord Ganesha. The name is treated as a noun in the genitive case.

DESCRIPTION

Measurement

Body length = 0.98 mm; (m = 1.08 [0.85 to 1.20] mm, SD = 0.09, n = 25).

Colour

Head and mesosoma black; metasoma golden brown with posterior tergites dark brown; legs yellow brown except for brown fore coxae; eyes silvery; entire antenna dark brown; mandibles reddish brown (Fig. 8A).

Head (Fig. 8A-F)

FCI = 1.44; LCI = 1.25; IOS 0.63 × eye length; frons dorsally and medially smooth, in (some paratypes medially with sparse foveae) remainder coriaceous reticulate, setose; gena predominantly smooth except for weak reticulations towards posterior orbit; vertex coriaceous reticulate, densely setose; eyes (L: W = 19.4: 16.8) large, with dense setae; POL: LOL in ratio of 8.1:5.3; lateral ocelli contiguous with orbits; hyperocipital carina and preoccipital area absent; occiput coriaceous reticulate; occipital carina invaginating into occiput.

Mesosoma (Fig. 8A-C, F)

Mesoscutum (L: W = 19.3: 24.4) coriaceous reticulate, setose; lateral pronotal area dorsally and antero-ventrally coriaceous reticulate, remainder smooth; mesopleuron anteriorly smooth, remainder weakly reticulate, prespecular and mesepimeral sulci nonfoveate; sternaulus non foveate; mesopleural pit distinct; mesopleural carina distinct, mesopleural depression smooth; antero-ventral margin of metapleuron weakly rugose, remainder smooth; metapleuron pit distinct; scutoscutellar sulcus narrow; mesoscutellum semicircular, entirely smooth, setose; posterior mesoscutellar sulcus deeply foveate; metascutellum rectangular, smooth (in some paratypes weakly striate) with no foveae on anterior margin; metanotal trough smooth; lateral propodeal area smooth; fore wing (L: W = 66.1: 21.0) and hind wing (L: W = 59.3: 9.7) with dense microtrichia; length of fore wing and hind wing marginal cilia 0.14 × and 0.57 × width of their respective wings.

Metasoma (Fig. 8A)

(L: W = 37.8: 23.4); T1 weakly foveate anteriorly, remainder smooth; in some paratypes the basal foveae are strongly indicated; T1 with a weak lateral carina; T1 with two lateral and one sublateral setae; T2 with basal foveae anteromedially, followed by short weak striae, remainder smooth; length and width of tergites T1: T2 in ratio of 3.5: 11.7, 24.8: 17.5, respectively; ovipositor not visible externally.

Male

Not known.

Telenomus elegans n. sp.

(Fig. 9)

urn:lsid:zoobank.org:act:FCA3325F-DA74-4689-9E05-B5A69C880153

TYPE MATERIAL. — **Holotype.** ♀, ICAR/NBAIR/P2050, India: Tamil Nadu: Lower Pulney Hills, Thadiyankudisai, Horticulture Research Station, 10°17'58"N, 77°42'42"E, 990 m, YPT, 27.XI.2016.

Paratypes. 5 ♀: ICAR/NBAIR/P2051, 1 ♀, Karnataka: Bengaluru, Hesaraghatta, 13°13'02"N, 77°48'54"E, 859 m, SN, 18.III.2014. — ICAR/NBAIR/P2052, 1 ♀, Karnataka: Bengaluru, Attur, 13°09'25"N, 77°56'41"E, 936 m, YPT, 05.II.2015. — ICAR/NBAIR/P2053, 1 ♀, same as P2052, 28.III.2015. — ICAR/NBAIR/P2054, 1 ♀, Karnataka: Bengaluru, Jarakabande Kaval, 13°05'41"N, 77°32'35"E, 921 m, YPT, 31.VII.2013. — ICAR/NBAIR/P2055, 1 ♀, same as P2054, YPT, 30.III.2015.

DIAGNOSIS. — This species is very unique among xanthic *Telenomus* because of the elongate habitus, an additional sulcus beneath malar sulcus, unusually long and narrow wings with very long microtrichia.

ETYMOLOGY. — This species is named 'elegans' because of the beautiful or graceful nature of the habitus. The name is treated as an adjective.

DESCRIPTION

Measurement

Body length = 1.33 mm; (m = 1.36 [1.33 to 1.41] mm, SD = 0.03, n = 6).

Colour

Elongate species; Head and mesosoma black; T1 golden yellow; T2 golden yellow with lateral and posterior margins dark brownish black; remaining tergites brownish black; legs pale yellow; radicle, A1-A4 yellow, remainder brown, clava darker than preceding antennomeres; mandibles reddish brown (Fig. 9A).

Head (Fig. 9A, B, D-F)

FCI = 1.17; LCI = 1.05; cuboidal; IOS subequal to eye length; upper and lower frons smooth; frons laterally reticulate and medially weakly striate; gena smooth; an additional sulcus found beneath malar sulcus extending towards gena; vertex weakly reticulate, sparsely setose; eyes almost as wide as long, bare; POL: LOL in ratio of 8.7: 5.2; lateral ocelli contiguous with orbits; anterior pit present beneath median ocellus; hyperocipital carina and preoccipital area absent; occiput reticulate.

Mesosoma (Fig. 9A, C, E)

Mesoscutum (L: W = 20.0: 22.4) setose and predominantly reticulate except for smooth areas posterolaterally; lateral pronotal area anteriorly reticulate, postero-dorsally striate, remainder weakly reticulate to smooth; mesopleuron predominantly smooth, prespecular and mesepimeral sulci nonfoveate; sternaulus nonfoveate; mesopleural pit distinct; mesopleural carina weak, mesopleural depression predominantly smooth with weak punctae medially; metapleuron smooth with sparse foveae on posterior margin; metapleuron pit distinct; scutoscutellar sulcus medially narrow and laterally wide and foveate; mesoscutellum semicircular, entirely smooth, setose, posterior mesoscutellar sulcus deeply foveate; metascutellum medially smooth, vertically costate laterally without anterior foveae; metanotal trough smooth; lateral propodeal area not wide apart, smooth with sparse uneven vertical carinae; wings narrow; fore wing (L: W = 89.2: 20.1) and hind wing (L: W = 80.0: 8.2) with dense microtrichia; length of fore wing and hind wing marginal cilia 0.40 × and 1.23 × width of their respective wings.

Metasoma (Fig. 9A)

(L: W = 56.4: 19.8); metasoma as long as head and mesosoma; T1 as long as wide, costate the entire length and with two lateral setae with no anterior foveae; T1 with two lateral setae; T2 with basal foveae and striate, striae extending $\frac{3}{4}$ length of tergite, remainder smooth; T2 3 × × as long as wide; remaining tergites smooth; length and width of tergites T1: T2 in ratio of 9.6: 9.1, 37.8: 12.2, respectively; ovipositor not visible externally.

Male

Not known.

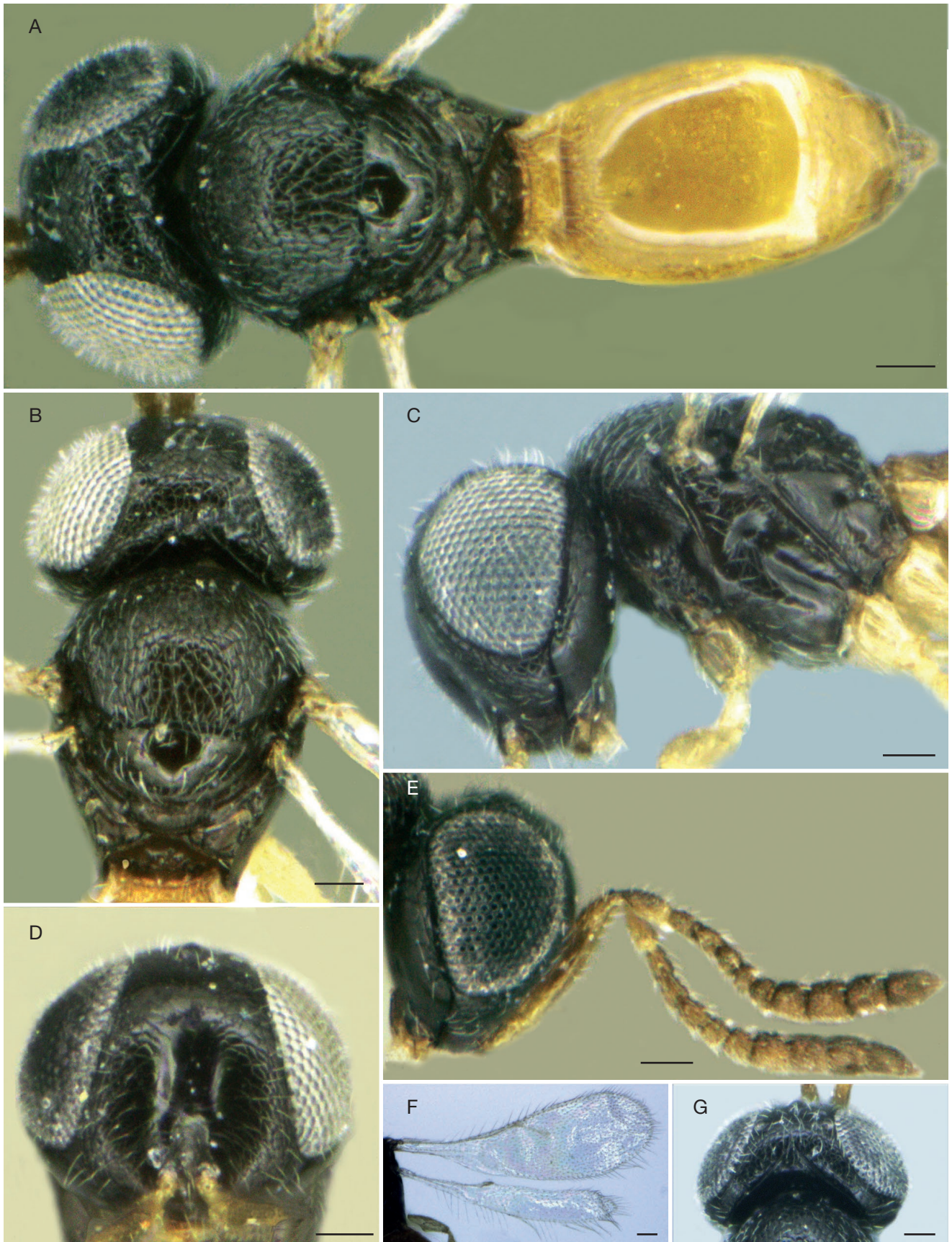


FIG. 8. — *Telenomus ekadanta* n. sp., female: **A**, habitus (dorsal view); **B**, head and mesonotum; **C**, head and pleuron; **D**, frons; **E**, head and antennae; **F**, wings; **G**, head showing occipital carina. Scale bars: 0.05 mm.

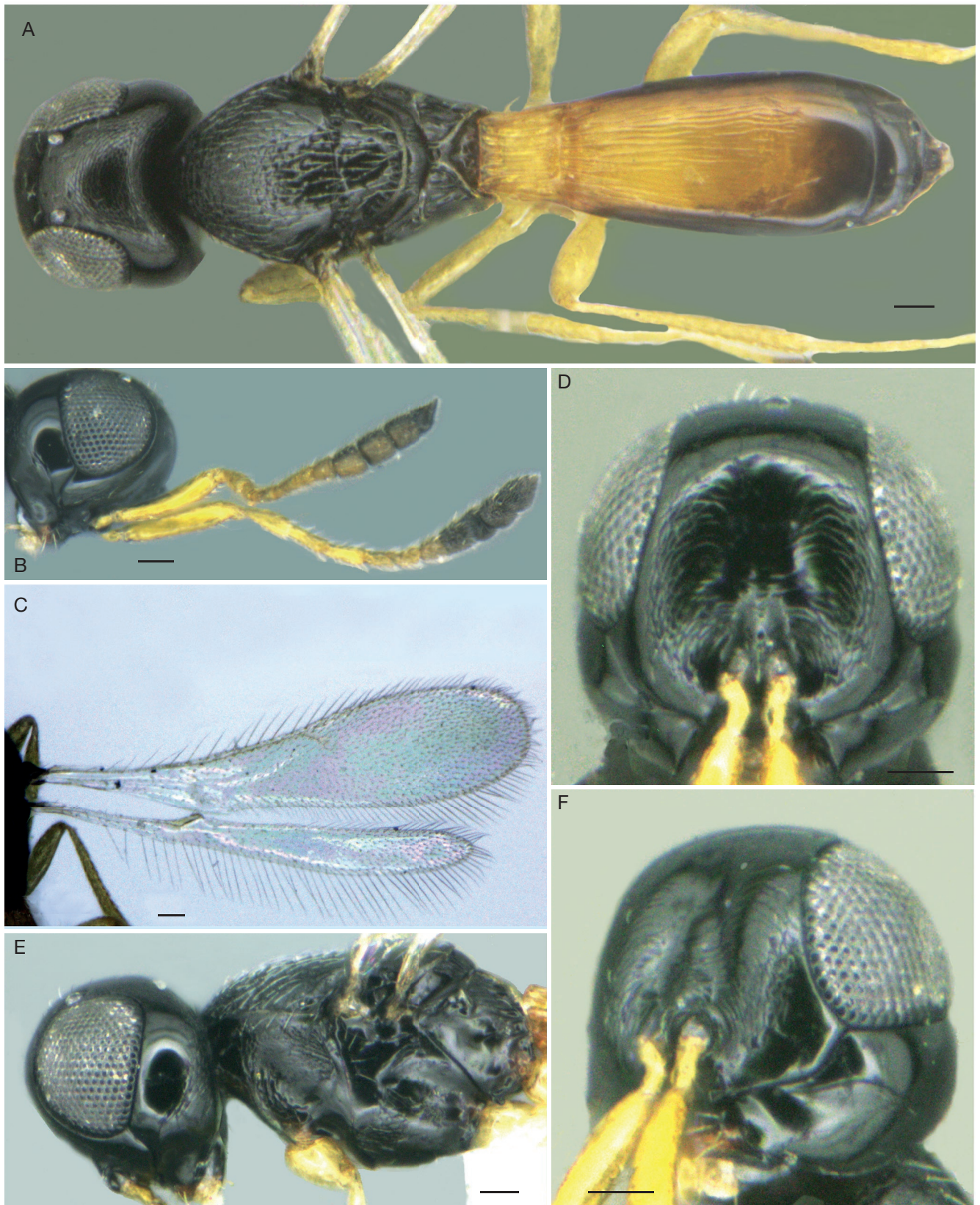


FIG. 9. — *Telenomus elegans* n. sp., female: **A**, habitus (dorsal view); **B**, head and antennae; **C**, wings; **D**, frons; **E**, head and pleuron; **F**, head showing additional sulcus beneath malar sulcus. Scale bars: 0.05 mm.

KEY TO THE INDIAN SPECIES OF *PHANUROMYIA* DODD, 1914 (FEMALES)

1. Entire habitus black 2
— Head and Mesosoma black or coppery brown, metasoma either fully or partially xanthic or coppery 5
2. Fore wing marginal cilia at least $0.6 \times$ width of wing *P. koenigi* Veenakumari, 2014
— Fore wing marginal cilia at most $0.3 \times$ width of wing 3
3. T2 at least $5.0 \times$ length of T1; T1 at most $0.25 \times$ as long as wide; mesoscutum sparsely setose; medial frons finely reticulate, reticulations wide *P. jarawa* Veenakumari, 2014
— T2 at most $2.8 \times$ length of T1; T1 at least $0.4 \times$ as long as wide; mesoscutum densely setose; reticulations on medial frons narrow 4
4. Reticulations on frons vertical; antennal scrobe distinct; T1 with additional row of foveae beneath basal foveae; metascutellum anteriorly foveate and posteriorly with uneven cells *P. andamanensis* Veenakumari, 2014
— Reticulations on frons transverse; antennal scrobe not distinct; T1 only with short basal foveae, medially smooth and laterally obliquely striate; metascutellum predominantly smooth *P. nabakovi* Veenakumari, 2014
5. Metasoma either entirely coppery or with only T1 orangish brown 6
— Entire metasoma xanthic 7
6. T1 orangish brown, entirely costate; T2 entirely striate except for reticulations posteriorly; frons strongly reticulate; length and width of T2 subequal *P. kapilae* Veenakumari, 2014
— Entire metasoma coppery; T2 smooth; frons weakly reticulate; T2 at least $1.4 \times$ as long as wide *P. tamaris* n. sp.
7. Mesoscutellum reticulate *P. reticulata* n. sp.
— Mesoscutellum smooth 8
8. Upper frons smooth, lower frons striate-reticulate; T2 without vertical striae beneath basal foveae; fore wing at most $2.4 \times$ as long as wide *P. levigatus* n. sp.
— Entire frons reticulate; T2 with vertical striae beneath basal foveae; fore wing at least $3.1 \times$ as long as wide ... 9
9. Central keel on frons absent; mesoscutellum at most $0.2 \times$ as long as wide; mesopleuron with prespecular and mesepimeral sulci indicated as foveae *P. flaviabdominalis* n. sp.
— Central keel on frons present; mesoscutellum at least $0.45 \times$ as long as wide; mesopleuron almost smooth without sulci 10
10. Preoccipital area distinct; posterior margin of mesoscutellum not smoothly curved, angular; metapleuron entirely smooth except for sparse foveae ventrally *P. rufocoxalis* n. sp.
— Preoccipital area absent; posterior margin of mesoscutellum smoothly curved; metapleuron coarsely sculptured with ventrally radiating striae from metapleural pit *P. shashikalae* n. sp.

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