

Revision of Indian species of *Phanuromyia* Dodd, 1914 (Platygastroidea, Scelionidae) with descriptions of new species

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Abstract

The species of the genus *Phanuromyia* Dodd, 1914, belonging to the subfamily Telenominae are egg parasitoids of planthoppers belonging to the families Issidae, Flatidae, Fulgoridae and Ricaniidae (Hemiptera: Fulgoroidea). So far eleven species of *Phanuromyia* are known from India. Fifteen new species of *Phanuromyia* Dodd are described here: *P. chalukya* sp. nov., *P. chera* sp. nov., *P. chola* sp. nov., *P. ganga* sp. nov., *P. hoysala* sp. nov., *P. kadamba* sp. nov., *P. kakatiya* sp. nov., *P. kanya* sp. nov., *P. nirvighna* sp. nov., *P. pallava* sp. nov., *P. pandya* sp. nov., *P. rashtrakuta* sp. nov., *P. satavahana* sp. nov., *P. tuluva* sp. nov. and *P. vakataka* sp. nov. A key to females of all the Indian species of *Phanuromyia* is provided.

Key Words

Auchenorrhyncha, Hemiptera, egg parasitoids, Telenominae

Introduction

The genus *Phanuromyia* Dodd was described in 1914 with *P. rufobasalis* Dodd from southern Queensland, Australia as the type species based on a single female with an elongate extruded ovipositor. Dodd (1914) was of the opinion that the elongate extruded ovipositor with valves equal to the length of the metasoma is by itself a key character distinguishing this genus from all other Telenominae. While studying the holotype, Johnson (1988) initially expressed misgivings about the status of the genus. Later Johnson and Musetti (2003) pointed out that the elongate ovipositor was not unique to *Phanuromyia* and redefined the genus distinguishing it from other Telenominae based on a new set of character states – five transverse to quadrate clavomeres; malar sulcus extending perpendicularly to the basal confluence of the anterior and posterior margins of the eye; frons convex; gena bulging; lateral ocelli contiguous with orbits; sternaulus extending from apex of the acetabular pit to the mesopleural pit; T2 with microsculpture; ovipositor frequently exserted. They further noted

that the malar sulcus extending perpendicularly to the basal intersection of the anterior and posterior margins of the eye was a significant character distinguishing this genus from other Telenominae. With Mineo (2006) rejecting the validity of the generic status of *Phanuromyia*, the question remained unsettled till Taekul et al (2014), in their molecular phylogenetic studies of Telenominae established the validity of its generic status. Additionally, they included all the species under the *Telenomus aradi* group of Kozlov and Kononova (1983) as well as the *T. crassiclava* group of Johnson (1984) in this genus. Twenty nine species of *Telenomus* from these two species groups of *Telenomus* were shifted by them to *Phanuromyia*. Their studies also indicated that *Phanuromyia* is the sister group of *Telenomus* + *Trissolcus* along with other satellite genera.

Taxonomic studies of *Phanuromyia* are very scanty. Worldwide sixty six species have been described in this genus. Of these, 26 species are Palearctic, 20 Neotropical, 3 Nearctic, 13 Oriental and 4 Australian. No Afrotropical species of *Phanuromyia* have so far been

described (Johnson 1992; Johnson and Musetti 2003; Veenakumari and Mohanraj 2014, 2019; Nesheim et al. 2017; Nam et al 2020; Ohio State University's Museum of Biological Diversity database 2021). In the Neotropics *Phanuromyia* is the most common genus of Telenominae and it is supposed to be more prevalent and diverse than *Telenomus* s.str. (Nesheim et al. 2017). Among the 13 Oriental species of *Phanuromyia*, one species each was described from Indonesia+Malaysia (Johnson and Musetti 2003) and Vietnam (Nam et al. 2020) and the 11 remaining species from India (Veenakumari and Mohanraj 2014, 2019).

The recorded hosts of *Phanuromyia* are all planthoppers belonging to the families Issidae, Flatidae, Fulgoridae and Ricaniidae (Auchenorrhyncha: Hemiptera) (Ogloblin 1930; Bin 1975; Pélov 1975; Johnson and Musetti 2003; Nesheim et al. 2017; Nam et al. 2020). Two species of *Phanuromyia* were also reared from the eggs of hoppers belonging to unidentified families of Hemiptera (Cameron 1891; Veenakumari and Mohanraj 2014).

This paper deals exclusively with the Indian fauna of *Phanuromyia*. In addition to the 11 species described earlier from India, the Indian fauna of *Phanuromyia* is expanded with the description of 15 new species in this paper. All the new species are illustrated and a key to the females of all Indian species of *Phanuromyia* is provided.

Material and methods

Terminology for morphology follows Masner (1976, 1980) and Mikó et al. (2007, 2010); and for macro and microsculpture Harris (1979). All the specimens were collected using yellow pan traps (**YPT**), Malaise trap (**MT**), sweep nets (**SN**) and suction trap (**ST**).

Specimens were mounted on card-point tips. The descriptions, measurements and imaging were carried out with a Leica M205A stereomicroscope, with 1× objective and Leica DFC-500 digital camera with LED ring light illuminator. The images were stacked using Leica Application Suite (**LAS**) software. All the measurements are taken as per Mikó et al. (2010). Widths of all metasomal tergites were taken anteriorly and lengths medially.

Abbreviations

A1–A11	Antennomeres 1–11 (A1=Scape, A2=Pedicel);
L	Length;
W	Width;
H	Height;
OD	Ocellar diameter;
OOL	Ocular ocellar line;
POL	Posterior ocellar line;
LOL	Lateral ocellar line;
IOS	Interorbital space;
T1–T2	Metasomaltergites 1–2.

The type specimens of all the new species of *Phanuromyia* are deposited at the ICAR-National Bureau of Agricultural Insect Resources, Bengaluru, India.

Results

Phanuromyia Dodd, 1914

Phanuromyia Dodd, 1914: 121. Type species: *Phanuromyia rufobasalis* Dodd, by monotypy and original designation. Kieffer 1926: 16, 131 (description, keyed); Muesebeck and Walkley 1956: 384 (citation of type species); Masner 1976: 79 (taxonomic status); Johnson 1991: 211 (description); Johnson 1992: 564 (catalog of world species); Johnson and Musetti 2003: 139 (description, synonymy, list of included species); Taekul et al. 2014: 30 (diagnosis, phylogenetic relationships within Telenominae); Veenakumari and Mohanraj 2014: 135 (description, key to Indian species, distribution); Nesheim et al. 2017: 663 (description, key to Neotropical species); Veenakumari and Mohanraj 2019: 341 (description, key to Indian species, distribution); Nam et al. 2020: 109 (description).

Issidotelenomus Pélov, 1975: 89. Type species: *Issidotelenomus obscuripes* Pélov, by original designation. Kozlov and Kononova 1983: 137 (junior synonym of *Telenomus* Haliday); Johnson and Musetti 2003: 140 (junior synonym of *Phanuromyia* Dodd).

Diagnosis. (modified from Johnson and Musetti (2003) and Nesheim et al (2017)).

Generally robust species; colour varying from black to brown with metasoma xanthic in some species; eyes either glabrous or with very short setae; frons convex, smooth to highly sculptured; lateral ocelli generally contiguous with orbits, rarely away from orbit; hyperoccipital carina generally absent, indicated in some species; malar sulcus extending perpendicularly to the basal confluence of the anterior and posterior margins of the eye; prominent episternal sulcus indicated by a row of foveae extending from dorsal apex of acetabular carina to mesopleural pit; in some smaller species the episternal sulcus may be weakly developed, indicated by a line; female antenna with five transverse to quadrate clavomeres; notaui absent; mesoscutellum generally smooth, rarely sculptured; T1 transverse, seldom with a medial horn; T2 generally with longitudinal costae and reticulations beyond basal foveae, smooth in some species; ovipositor frequently very long and exserted.

Description of species

Phanuromyia chalukya Veenakumari, sp. nov.

<http://zoobank.org/EA29FCE3-31DF-4C4E-B54B-794DE7B8AC6E>
Fig. 1A–F

Material examined. *Holotype*, female, (ICAR/NBAIR/P4240), INDIA: Karnataka: Bengaluru, Malleshwaram, Aranya Bhavan, Institute of Wood Science and Technology (IWST), 13°01'03"N, 77°57'07"E, 942 m, MT,

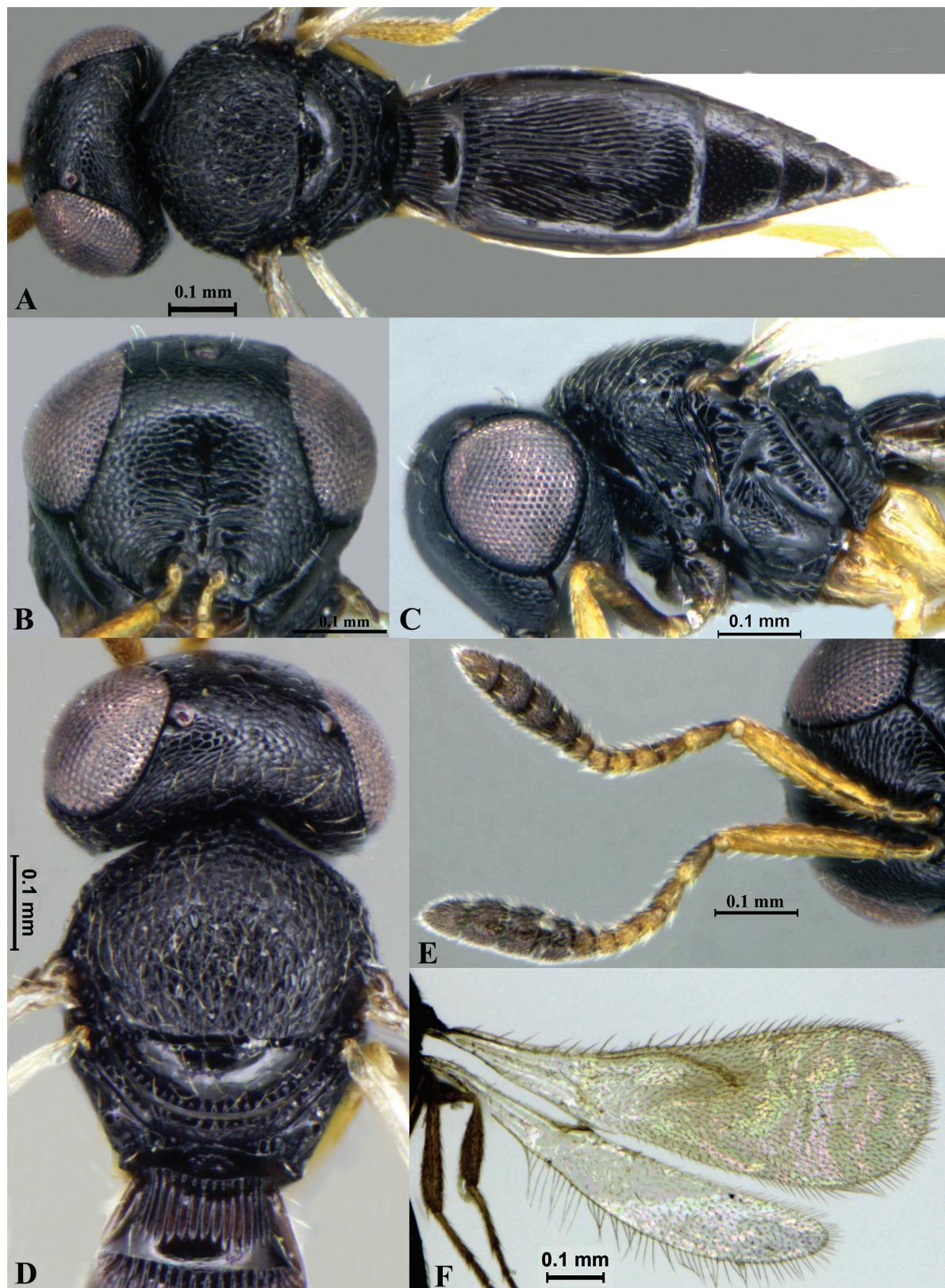


Figure 1. *Phanuromyia chalukya* sp. nov. (♀). A. Habitus (dorsal view); B. Frons; C. Head and pleuron; D. Head and mesonotum; E. Antennae; F. Wings.

28.VII.2012. **Paratypes:** 4 females, (ICAR/NBAIR/P4241–4244), Karnataka: Bengaluru, Malleshwaram, Aranya Bhavan, Institute of Wood Science and Technology (IWST), 13°01'03"N, 77°57'07"E, 942 m, MT,

28.VII.2012; 1 female, (ICAR/NBAIR/P4245), Karnataka: Bengaluru, Hebbal, Veterinary College, 13°02'08"N, 77°35'49"E, 906 m, YPT, 15.XI.2012; 2 females, (ICAR/NBAIR/P4246, P4248), Karnataka: Bengaluru, Hebbal,

National Bureau of Agricultural Insect Resources (NBAIR), terrace of 3rd floor, 13°01'38"N, 77°35'03"E, 927 m, YPT, 31.VIII.2015; 1 female, (ICAR/NBAIR/P4247), Tamil Nadu: Chidambaram, Annamalai University, 11°23'30"N, 79°42'48"E, 7 m, MT, 03.VII.2016.

Diagnosis. This species is close to *P. andamanensis* but differs from it in having an elongate A1 and T2. T3–T6 are clearly visible with punctate sculpture.

Description. Female body length=1.49–1.64 mm (n=9).

Colour. Head and mesosoma black, metasoma black-brown; radicle and A1 yellow-brown, A2–A7 brown with weak yellow patches, remaining antennomeres brown-black; procoxa black, femur black-brown, remainder of fore leg yellow; mid and hind leg entirely yellow with traces of brown towards base of mid coxa.

Head. Head 1.3× as wide as high, 1.3× as high as long; IOS 0.5×head width, 0.8× eye length; entire frons coriaceous reticulate, except for a small smooth patch medially; several transverse carinae are present on either side of imaginary central keel; central keel absent; vertex coriaceous reticulate, sparsely setose; gena coriaceous reticulate, basally smooth; eye (L: W=20.2:18.2) large, with sparse, short setae; POL: LOL in ratio of 13.4:5.8;lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate; A1 5× as long as wide; A1 3.4× as long as A2.

Mesosoma. Mesoscutum (L: W=23.1:32.0) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus foveate; mesoscutal suprahumeral sulcus foveate;lateral pronotal area dorsally tuberculate, remainder obliquely carinate; additional two vertical carinae present postero-dorsally; epomial carina present; pronotal suprahumeral sulcus weakly foveate, setose; netrion sulcus entirely foveate; subacropelural sulcus not foveate; prespecular sulcus indicated with four wide foveae; mesopleural pit distinct; speculum with transverse carinae; episternal sulcus foveate; postacetabular sulcus not foveate; femoral depression smooth to weakly reticulate; ventral mesopleuron smooth with an anterior reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal metapleural area smooth; ventral metapleuron transversely carinate; metapleural epicoxal sulcus with uneven depressions; scutoscutellar sulcus foveate laterally; mesoscutellum semicircular (L: W=8.3:23.3), smooth; posterior mesoscutellar sulcus foveate; metascutellum anteriorly foveate, remainder weakly tuberculate; metanotal trough foveate; lateral propodeal area smooth to weakly tuberculate, with foveae on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=84.6:28.6) and hind wing (L: W=76.6:12.2) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 10.1:14.8:30.0, respectively.

Metasoma. (L: W=74.9:26.5); T1 with basal foveae followed by a narrow smooth patch posterior to which a median band of longitudinal foveae present; T1 posteriorly and laterally smooth; T2 with basal foveae followed by longitudinal costae; remaining tergites finely punctate;

posterior margin of T2 straight; T1 with two lateral and one sublateral setae; T2 3.8× the length of T1.

Male. Not known.

Etymology. The species is named after the Chalukya dynasty that ruled between the 6th and the 12th centuries CE, and in their heyday ruled most of peninsular India. The name is treated as a noun in apposition.

Phanuromyia chera Veenakumari, sp. nov.

<http://zoobank.org/0C2F09A8-2F64-48DC-ACB9-89D1EC5C3303>

Fig. 2A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4256), INDIA: Karnataka: Bengaluru, Hebbal, NBAIR, terrace of 3rd floor, 13°01'38"N, 77°35'03"E, 927 m, YPT, 14.VIII.2015. Paratype: 1 female, (ICAR/NBAIR/P4257), Karnataka: Mudigere, College of Horticulture, arecanut fields, 13°06'54"N, 75°37'57"E, 976 m, MT, 02.X.2015.

Diagnosis. This species can be easily identified with the narrow and elongate metasoma and T2, the latter with longitudinal striae extending 3/4 length of tergite.

Description. Female body length=1.05–1.25 mm (n=2).

Colour. Head and mesosoma black; metasoma black-brown; radicle yellow, A1–A4 brown with weak yellow patches, A5–A7 yellow-brown, remaining antennomeres black-brown; procoxa black-brown, meso- and meta-coxae yellow; remainder of legs yellow-brown.

Head. Head 1.3× as wide as high, 1.3× as high as long; IOS 0.5× head width, 0.8× eye length; frons dorsally weakly reticulate, medially smooth, transversely carinate above toruli, remainder coriaceous reticulate; central keel absent; vertex coriaceous reticulate; gena coriaceous reticulate except for smooth basal patch; eye (L: W=16.7:15.0) large, with short setae; POL: LOL in ratio of 10.4:4.5; lateral ocelli contiguous with orbits; a blunt hyperoccipital carina indicated; occiput coriaceous reticulate with elongate setae; A1 3.6× as long as wide; A1 2.7× as long as A2.

Mesosoma. Mesoscutum (L: W=19.7:25.7) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area dorsally weakly coriaceous reticulate, remainder obliquely striate; epomial carina present; pronotal suprahumeral sulcus not foveate; netrion sulcus entirely foveate; subacropelural sulcus not foveate; prespecular sulcus with four foveae; mesopleural pit distinct with several carinae radiating ventrally; speculum with transverse carinae; episternal sulcus not foveate; postacetabular sulcus weakly foveate; femoral depression smooth; ventral mesopleuron smooth with anterior coriaceous reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus indicated; dorsal metapleural area smooth; ventral metapleuron smooth with sparse, blunt oblique carinae; metapleural epicoxal sulcus indicated with depressions; scutoscutellar sulcus wide, foveate

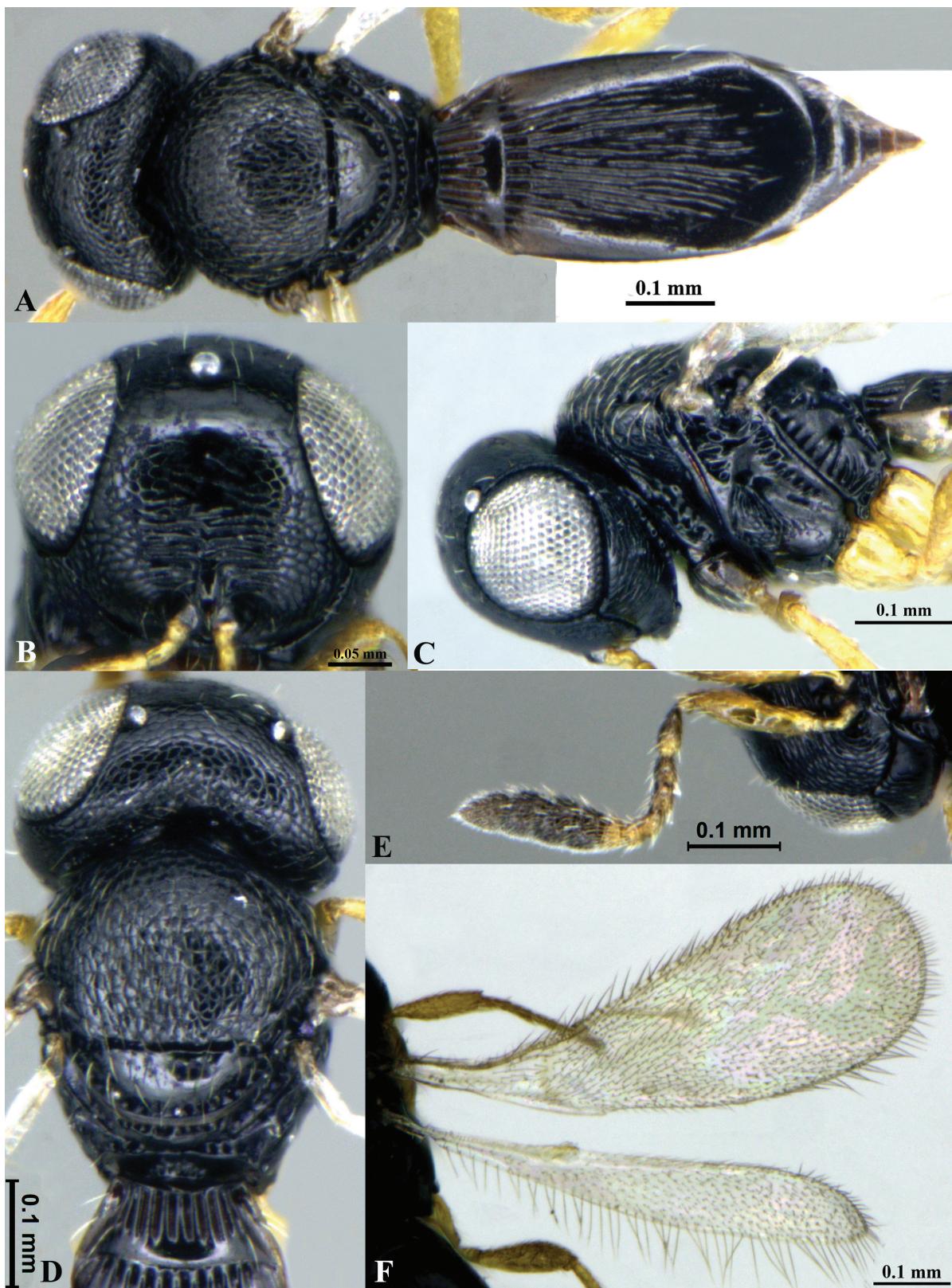


Figure 2. *Phanuromyia chera* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

laterally; mesoscutellum semicircular ($L: W=6.4:20.0$), smooth; posterior mesoscutellar sulcus foveate; metascutellum foveate on anterior margin, remainder smooth; metanotal trough foveate; lateral propodeal area smooth with foveae on inner margin; entire lateral propodeal

carina visible posterior to metascutellum when viewed dorsally; fore wing ($L: W=70.3:24.3$) and hind wing ($L: W=64.9:9.6$) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 6.6:11.2:15.1, respectively.

Metasoma. (L: W=55.3:23.8); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 with elongate basal foveae, followed by longitudinal striae, extending 0.8× length of tergite; remaining tergites smooth; posterior margin of T2 slightly convex; T1 with two lateral and a sublateral setae; T2 4.2× the length of T1.

Male. Not known.

Etymology. The species is named after the ancient Chera kingdom located on the Malabar coast in southwest India. The name is treated as a noun in apposition.

Phanuromyia chola Veenakumari, sp. nov.

<http://zoobank.org/C11B7D19-11C0-4110-AE7D-49D78BAE97AB>

Fig. 3A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4318), INDIA: Tamil Nadu: Lower Pulney Hills, Thadiyankudisai, HRS (orange orchard) 10°17'58"N, 77°42'42"E, 990 m, YPT, 27.XI.2016. **Paratypes:** 2 females, (ICAR/NBAIR/P4319), Tamil Nadu: Dindugul, Thandikudi, RCRS (pepper plantation), 10°18'34"N, 77°38'34"E, 1305 m, YPT, 29.XI.2016; 3 females, (ICAR/NBAIR/P4320–P4322), Tamil Nadu: Dindugul, Thandikudi, RCRS (coffee plantation), 10°18'34"N, 77°38'34"E, 1305 m, YPT, 29.XI.2016.

Diagnosis. This species is unique in having longitudinal carinae in posterior half of mesoscutum.

Description. Female body length=0.85 mm–1.08 mm (n=5).

Colour. Head and mesosoma black; metasoma black-brown; radicle and A1 yellow, A2–A4 brown-black, A5–A7 yellow, A8–A11 brown; procoxa brown-black, meso- and meta-coxae yellow-brown, remainder of all legs yellow-brown.

Head. Head 1.3× as wide as high, 1.1× as high as long; IOS 0.5× head width, 0.9× eye length; frons dorsally smooth, ventrally coriaceous reticulate with sparse transverse striae on either side of imaginary central keel; transverse striae present along ventral malar area; central keel absent; vertex weakly reticulate with sparse punctae; gena striate-reticulate with a smooth basal patch; eye (L: W=14.6:12.0) large, setose; POL: LOL in ratio of 10.3:5.6; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with sparse setae; A1 4.7× as long as wide; A1 3.2× as long as A2.

Mesosoma. Mesoscutum (L: W=14.2:21.2) convex, anteriorly tuberculate, remainder vertically costate; mesoscutal humeral sulcus foveate; mesoscutal suprathumeral sulcus foveate; lateral pronotal area obliquely carinate with distinct space between carinae with a small coriaceous reticulate patch posterodorsally; epomial carina present; pronotal suprathumeral sulcus not foveate; netrion sulcus ventrally foveate; subacropileural sulcus not foveate; prespecular sulcus indicated by four foveae; mesopleural pit distinct with several vertical carinae radiating ventrally; speculum transversely carinate;

episternal sulcus indicated by a carina; postacetabular sulcus not foveate; femoral depression smooth; ventral mesopleuron smooth except for a small weakly reticulate patch anteriorly; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus indicated by wide furrows; dorsal and ventral metapleural area smooth; metapleural epicoxal sulcus indicated by a furrow; scutoscutellar sulcus foveate laterally; mesoscutellum semicircular (L: W=6.5:12.3), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum anteriorly foveate, remainder tuberculate, with a weak projection posteromedially; metanotal trough foveate; lateral propodeal area smooth with foveae on inner margin; medial lateral propodeal carina not visible as hidden beneath metascutellum when viewed dorsally; fore wing (L: W=58.1:17.9) and hind wing (L: W=54.0:7.7) hyaline with dense microtrichia; ratio of length of marginalis: stigmatis: postmarginalis 6.2:7.8:21.4, respectively.

Metasoma. (L: W=32.0:19.5); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 anteromedially smooth, followed by basal foveae, from which several longitudinal striae extend 0.8× length of tergite; posterior margin of T2 slightly convex; T1 with two lateral setae; T2 4.4× the length of T1.

Male. Not known.

Etymology. This species is named after the Cholas, a major dynasty, that ruled for well over a millennium in South India. The name is treated as a noun in apposition.

Phanuromyia ganga Veenakumari, sp. nov.

<http://zoobank.org/AD3F85CD-A50E-4E43-ADF5-3378CE964E46>

Fig. 4A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4249), INDIA: West Bengal: Islampur, Teenpool, 26°15'44"N, 88°11'49"E, 68 m, SN, 06.VI.2008. **Paratypes:** 1 female, (ICAR/NBAIR/P4250), Karnataka: Bengaluru, Hebbal, Veterinary College, 13°02'08"N, 77°35'49"E, 906 m, YPT, 11.XII.2012; 1 female, (ICAR/NBAIR/P4251), Tripura: Dhuptali Kukibari, 23°40'37"N, 91°44'37"E, 42 m, SN, 06.III.2016; 1 female, (ICAR/NBAIR/P4252), Kerala: Thiruvananthapuram, Vellayani, 8°43'50"N, 76°99'14"E, 11 m, YPT, 20.XI.2015; 1 female, (ICAR/NBAIR/P4330), Kerala: Pallakad, Mayiladumpara, 9°58'24"N, 76°31'27"E, 99 m, YPT, 25.III.2017.

Diagnosis. *Phanuromyia ganga* sp. nov. is close to *P. kadamba* sp. nov. but differs from it in the following character states. Posterior row of foveae on T1 ovoid, posterior margin of T2 straight; whereas in *P. kadamba* sp. nov. posterior row of foveae on T1 elongate, posterior margin of T2 convex and T3–T6 punctate.

Description. Female body length=0.91–1.12 mm (n=5).

Colour. Head and mesosoma black; metasoma black-brown; radicle and A1–A7 yellow-brown, remaining antennomeres brown; procoxa brown, meso- and meta coxae yellow, remainder of legs yellow.

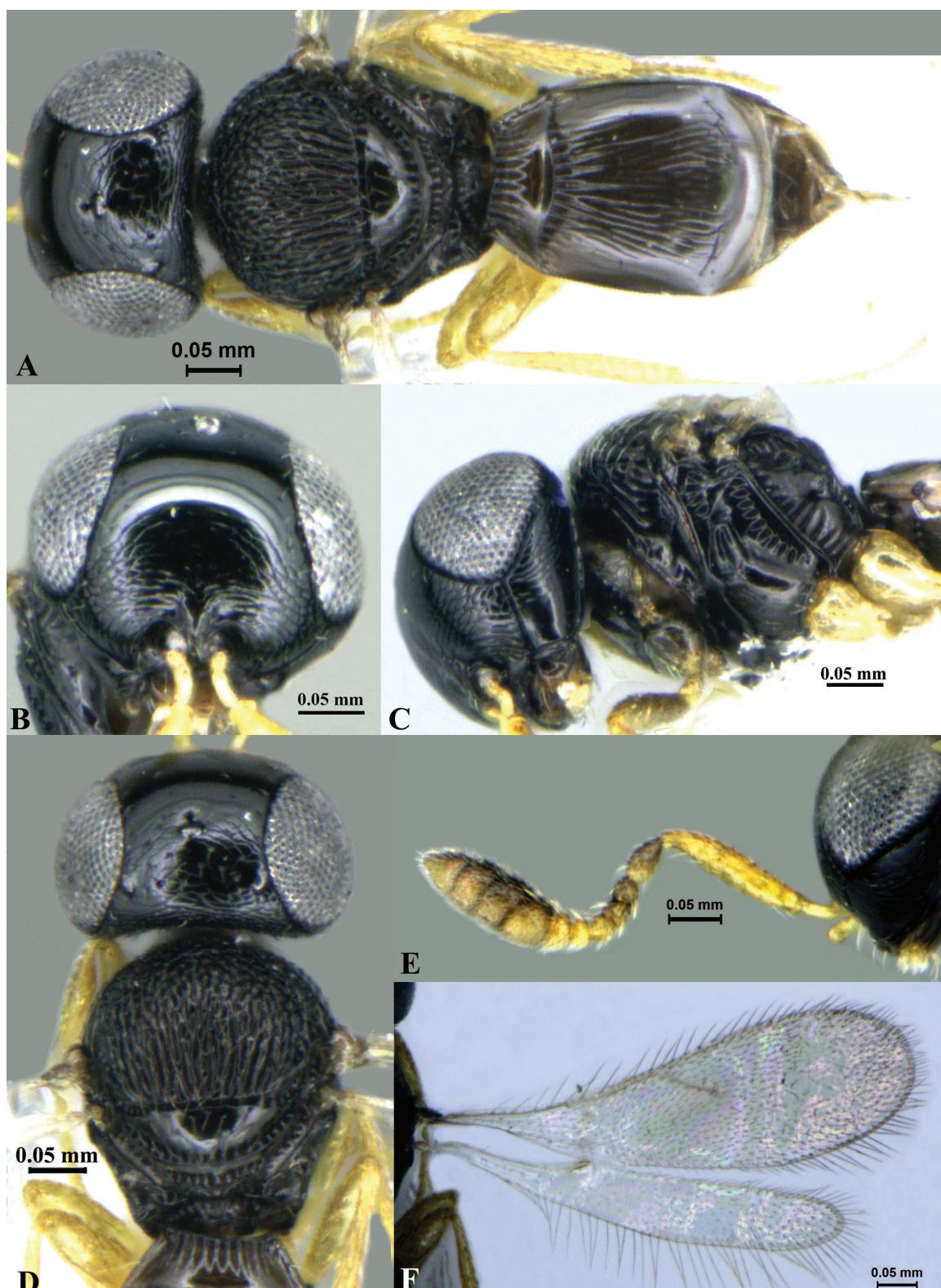


Figure 3. *Phanuromyia chola* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

Head. Head 1.3× as wide as high, 1.1× as high as long; IOS 0.5× head width, 0.9× eye length; entire frons coriaceous reticulate, except for a smooth patch medially; transverse carinae present on either side of imaginary central keel; central keel absent; vertex trans-

versely coriaceous reticulate; gena coriaceous reticulate except for smooth basal area with sparse transverse striae; eyes (L: W=13.2:10.8) large, without setae; POL: LOL in ratio of 8.2:3.9; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous

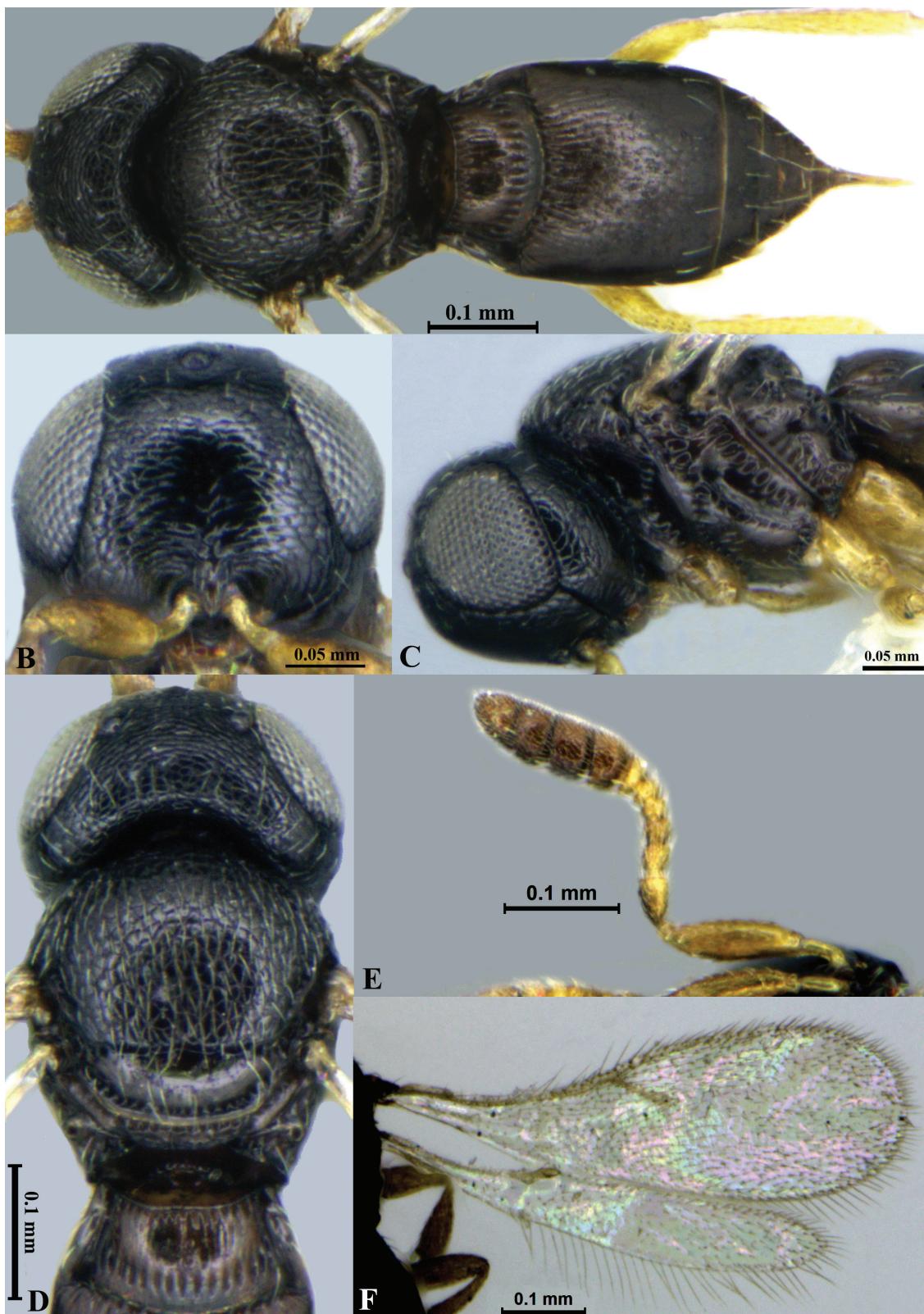


Figure 4. *Phanuromyia ganga* sp. nov. (♀). A. Habitus (dorsal view); B. Frons; C. Head and pleuron; D. Head and mesonotum; E. Antenna; F. Wings.

reticulate with elongate setae; A1 3.2× as long as wide; A1 2.6× as long as A2.

Mesosoma. Mesoscutum (L: W=16.1:22.1) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus foveate; mesoscutal suprashumeral sulcus not foveate;

lateral pronotal area posterodorsally transversely striate, anterodorsally weakly coriaceous reticulate, remainder smooth; epomial carina present; pronotal suprashumeral sulcus weakly foveate, setose; netrion sulcus entirely foveate; subacropileural sulcus indicated by two foveae;

prespecular sulcus indicated with three foveae; mesopleural pit distinct; speculum transversely carinate; episternal sulcus indicated by foveae which continue along postacetabular sulcus; femoral depression weakly reticulate; ventral mesopleuron smooth with a weakly reticulate patch anteriorly; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal and ventral metapleural area with intricate sculpture; metapleural epicoxal sulcus indicated by depressions; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular ($L: W=5.4:15.3$), smooth; posterior mesoscutellar sulcus foveate; metascutellum anteriorly foveate, remainder weakly tuberculate with an uneven transverse furrow medially; metanotal trough weakly foveate; lateral propodeal area weakly sculptured, with foveae on inner margin; medial lateral propodeal carina not visible as hidden beneath metascutellum when viewed dorsally; fore wing ($L: W=61.9:20.6$) and hind wing ($L: W=54.4:9.0$) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 5.4:7.4:12.9, respectively.

Metasoma. ($L: W=35.1:20.6$); T1 with basal foveae followed by a wide smooth patch and further by a band of longitudinal foveae; T1 laterally and posteriorly smooth; T2 smooth except for small basal foveae followed by weak longitudinal striae, extending $0.3 \times$ length of tergite submedially; remaining tergites smooth; posterior margin of T2 straight; T1 with several lateral and one sublateral setae; T2 $2 \times$ length of T1.

Male. Not known.

Etymology. This species is named after the Western Gangas, who came to power in the region of erstwhile Mysore after the reign of the emperor Ashoka Maurya. The name is treated as a noun in apposition.

Phanuromyia hoysala Veenakumari, sp. nov.

<http://zoobank.org/5650E9F5-D66C-4D04-9DBD-28A786141167>

Fig. 5A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4253), INDIA: Himachal Pradesh: Chamba, Khajjiar, SN, $32^{\circ}33'20"N$, $76^{\circ}03'56"E$, 1814 m, 24.IX.2014.

Paratypes: 1 female, (ICAR/NBAIR/P4254), Odisha: Bhubaneswar, Orissa University of Agriculture and Technology (OUAT), $20^{\circ}15'52"N$, $85^{\circ}48'50"E$, 45 m, SN, 19.XI.2013; 1 female, (ICAR/NBAIR/P4255), Tamil Nadu: Yercaud, Horticulture Research Station (HRS), $11^{\circ}47'44"N$, $78^{\circ}12'42"E$, 1399 m, YPT, 06.VIII.2016.

Diagnosis. *Phanuromyia hoysala* sp. nov. is close to *P. rashtrakuta* sp. nov. but differs from it in the following character states: In *P. hoysala* sp. nov. head is protruding forward, preoccipital area is distinct and gena and malar area are basally punctate; whereas in *P. rashtrakuta* sp. nov. head is evenly rounded, preoccipital area is absent and gena is basally smooth and malar area is basally reticulate.

Description. Female body length=1.12–1.21 mm (n=3).

Colour. Head and mesosoma black, metasoma black-brown; radicle and A1 yellow-brown, A2–A4 brown-black, A5–A6 yellow-brown, remaining antennomeres black-brown; all coxae dark brown, remainder of leg yellow-brown.

Head. Head $1.2 \times$ as wide as high, $1.1 \times$ as high as long; IOS $0.5 \times$ head width, $0.9 \times$ eye length; frons coriaceous reticulate, except for a small smooth patch medially, surrounded by short transverse striae on all sides except ventrally replaced by transverse carinae; ventral malar area weakly punctate; central keel absent; vertex coriaceous reticulate; gena dorsally reticulate, medially obliquely carinate, ventrally punctate; eye ($L: W=14.1:13.5$) large, with short setae; POL: LOL in ratio of 9.0:5.4; lateral ocelli contiguous with orbits; a blunt hyperoccipital carina indicated; occiput coriaceous reticulate with elongate setae; A1 $3.8 \times$ as long as wide; A1 $2.7 \times$ as long as A2.

Mesosoma. Mesoscutum ($L: W=19.6:24.3$) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus foveate; mesoscutal suprahumeral sulcus foveate; lateral pronotal area obliquely striate; epomial carina present; pronotal suprahumeral sulcus weakly foveate, setose; netrion sulcus entirely foveate; subacropalpal sulcus indicated by a single fovea; prespecular sulcus indicated with five foveae; mesopleural pit distinct; speculum with transverse carinae; episternal sulcus not foveate; postacetabular sulcus foveate; femoral depression smooth; ventral mesopleuron coriaceous reticulate; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal metapleural area unevenly carinate to smooth; ventral metapleuron obliquely carinate interspersed with sparse foveae; metapleural epicoxal sulcus with depressions; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular ($L: W=7.4:15.2$), smooth; posterior mesoscutellar sulcus foveate; metascutellum foveate; metanotal trough foveate; lateral propodeal area unevenly sculptured, with a large depression on inner margin; medial lateral propodeal carina not visible as hidden beneath metascutellum when viewed dorsally; fore wing ($L: W=84.7:29.4$) and hind wing ($L: W=73.7:13.2$) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 2.0:12.0:22.6, respectively.

Metasoma. ($L: W=44.5:27.1$); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 anteromedially smooth followed by large basal foveae, from which longitudinal striae extend culminating in reticulations; remaining tergites smooth; posterior margin of T2 slightly convex; T1 with six lateral and a sublateral setae; T2 $4.4 \times$ the length of T1.

Male. Not known.

Etymology. This species is named Hoysala after the dynasty that grew to become the dominant power in southern India between the 12th and 13th centuries CE. The name is treated as a noun in apposition.

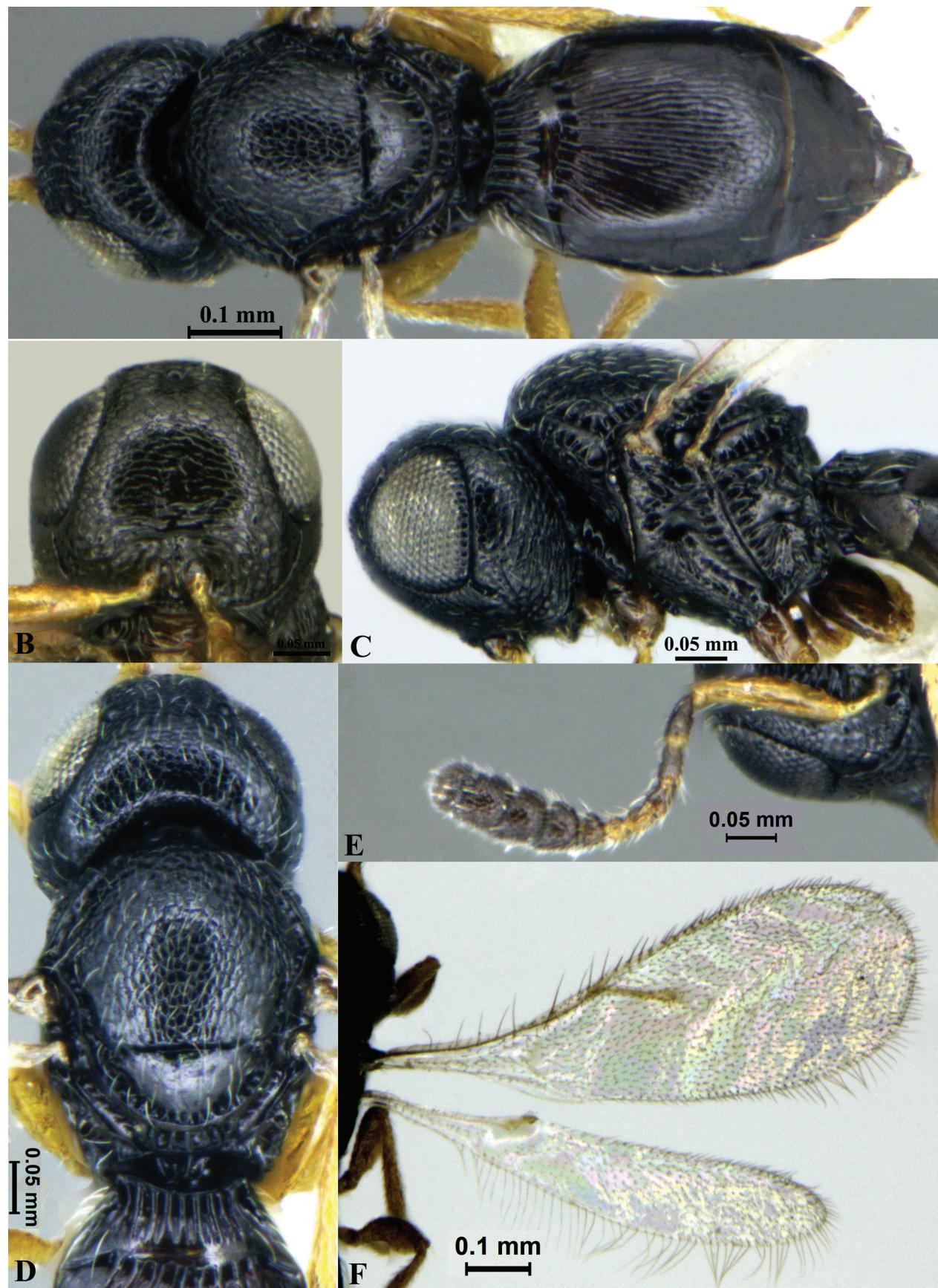


Figure 5. *Phanuromyia hoysala* sp. nov. (♀). A. Habitus (dorsal view); B. Frons; C. Head and pleuron; D. Head and mesonotum; E. Antenna; F. Wings.

***Phanuromyia kadamba* Veenakumari, sp. nov.**

<http://zoobank.org/A75B2EBE-4547-422E-AD42-6799A99CD0C2>
Fig. 6A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4258), INDIA: Karnataka: Bengaluru, Jarakabande Kaval, 13°05'41"N, 77°32'35"E, 921 m, MT, 19.IX.2014. **Paratypes:** 1 female, (ICAR/NBAIR/P4259), Meghalaya: Umiam, ICAR Research Complex for NEH Region, maize crop, 25°40'52"N, 91°54'56"E, 970 m, YPT, 08.VI.2013; 1 female, (ICAR/NBAIR/P4260), Assam: Kamrup, 26°18'57"N, 91°35'54"E, 54 m, SN, 30.X.2008; 1 female, (ICAR/NBAIR/P4261), Tripura: Dhuptali Kukibari, 23°40'37"N, 91°44'37"E, 42 m, SN, 07.III.2016; 1 female, (ICAR/NBAIR/P4262), Tamil Nadu: Kanyakumari, Pechiparai, 8°14'23"N, 76°33'34"E, 17 m, SN, 13.XI.2011; 1 female, (ICAR/NBAIR/P4263), Karnataka: Bengaluru, Hebbal, emerged from an unidentified heteropteran egg on *Ficus* sp., 13°02'08"N, 77°35'49"E, 906 m, 22.IX.2017; 10 females, (ICAR/NBAIR/P4271–P4280), Karnataka: Bengaluru, Hebbal, 13°02'08"N, 77°35'49"E, 906 m, reared from eggs of unidentified heteropteran eggs laid on the midrib of a leaf of *Tabebuia* sp., 16.XI.2015; 1 female, (ICAR/NBAIR/P4281), Karnataka: Bengaluru, Hebbal, 13°02'08"N, 77°35'49"E, 906 m, reared from an egg of unidentified heteropteran eggs laid on the midrib of a leaf of an unidentified plant, 05.X.2016.

Diagnosis. *Phanuromyia kadamba* sp. nov. is close to *P. hoysala* sp. nov. The distinguishing characters are given under the latter species.

Description. Female body length=1.15 mm–1.38 (n=15).

Colour. Head and mesosoma black; metasoma black-brown; radicle yellow, A1–A2 brown-yellow, A3–A7 yellow-brown, remaining antennomeres black-brown; procoxa brown-yellow, meso- and metacoxae yellow; remainder of legs yellow-brown.

Head. Head 1.2× as wide as high, as high as long; IOS 0.5× head width, 0.9× eye length; frons entirely coriaceous reticulate except for a smooth medial patch, ventral to which transverse striae radiate on either side along imaginary central keel; central keel absent; vertex transversely coriaceous reticulate; gena coriaceous reticulate, except for smooth basal patch; eye (L: W=14.2:11.8) large, with short setae; POL: LOL in ratio of 8.4:4.8; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with elongate setae; A1 3.7× as long as wide; A1 3× as long as A2.

Mesosoma. Mesoscutum (L: W=18.3:24.8) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus foveate; mesoscutal suprumeral sulcus not foveate; lateral pronotal area dorsally coriaceous reticulate, remainder obliquely striate; epomial carina present; pronotal suprumeral sulcus not foveate; netrion sulcus entirely foveate; subacropalpal sulcus indicated by two foveae; prespecular sulcus indicated with seven foveae; mesopleural pit distinct; speculum transversely carinate; episternal sulcus foveate; postacetabular sulcus foveate;

femoral depression smooth to weakly reticulate with an additional parallel depression ventrally; ventral mesopleuron smooth with a weak anterior reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal metapleural area smooth; ventral metapleuron smooth with a blunt vertical carina; metapleural epicoxal sulcus weakly foveate; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular (L: W=6.1:16.6), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum with two transverse rows of foveae; metanotal trough weakly foveate; lateral propodeal area smooth with foveae on inner margin; medial lateral propodeal carina not visible as hidden beneath metascutellum when viewed dorsally; fore wing (L: W=63.1:22.6) and hind wing (L: W=55.2:7.8) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 3.5:8.7:17.0, respectively.

Metasoma. (L: W=44.3:22.1); T1 with basal foveae and a band of longitudinal foveae ventrad; between these two bands of foveae several vertical carinae present medially; T1 laterally and posteriorly smooth; T2 with large basal foveae, followed by longitudinal striae, culminating in a small patch of reticulations; remaining tergites punctate; posterior margin of T2 slightly convex; T1 with two lateral and a sublateral setae; T2 2.1× the length of T1.

Male. Not known.

Etymology. This species is named Kadamba after the minor South Indian dynasty that ruled the area northwest of the city of present day Mysore city between the 4th and 6th centuries CE. The name is treated as a noun in apposition.

Host. Reared from unidentified heteropteran eggs laid within the midribs of leaves of *Ficus* sp., *Tabebuia* sp., and an unidentified plant.

***Phanuromyia kakatiya* Veenakumari, sp. nov.**

<http://zoobank.org/EB05A52A-E2F6-4A13-BEB9-D254A3C2D850>
Fig. 7A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4323), INDIA: Himachal Pradesh: Palampur, 76°32'10"N, 32°06'39"E, YPT, 20.IX.2014. **Paratype:** 1 female, (ICAR/NBAIR/P4324), Tamil Nadu: Yercaud, Horticulture Research Station (HRS), 11°47'44"N, 78°12'42"E, 1399 m, YPT, 06.VIII.2016.

Diagnosis. This species is close to *P. satavahana* sp. nov. but differs from it in having entirely coriaceous reticulate mesoscutum and fore wing >6× as long as wide while in *P. satavahana* sp. nov. striae on T2 culminate in reticulations, and fore wing is <4× as long as wide.

Description. Female body length=1.02–1.12 mm (n=2).

Colour. Head and mesosoma black; metasoma black-brown; radicle, A1–A3 brown, A4–A7 yellow, A8 yellow with black patches, A9–A11 black-brown; procoxa brown-black, meso- and metacoxae brown-yellow, remainder of all legs yellow-brown.

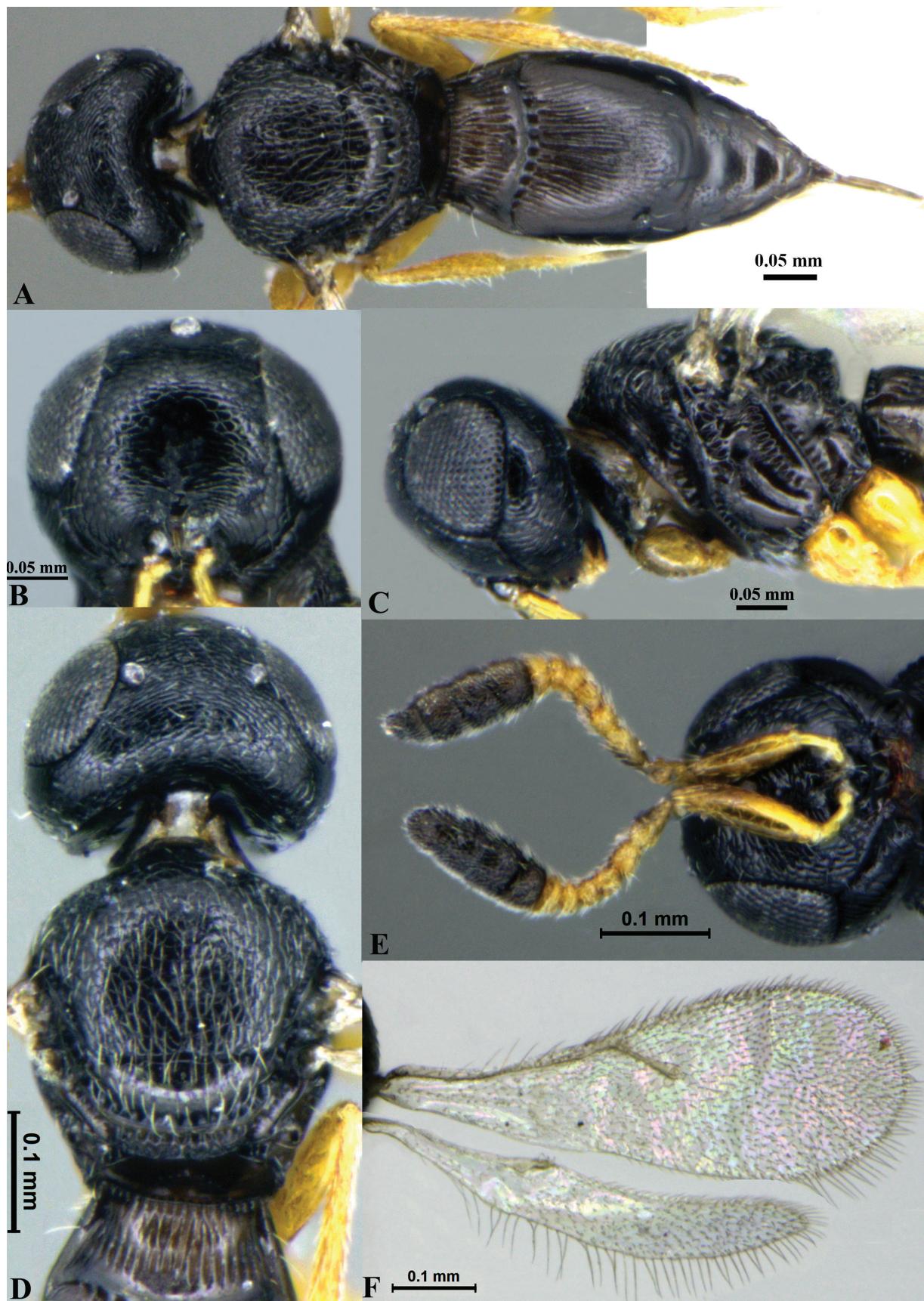


Figure 6. *Phanuromyia kadamba* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antennae; **F.** Wings.

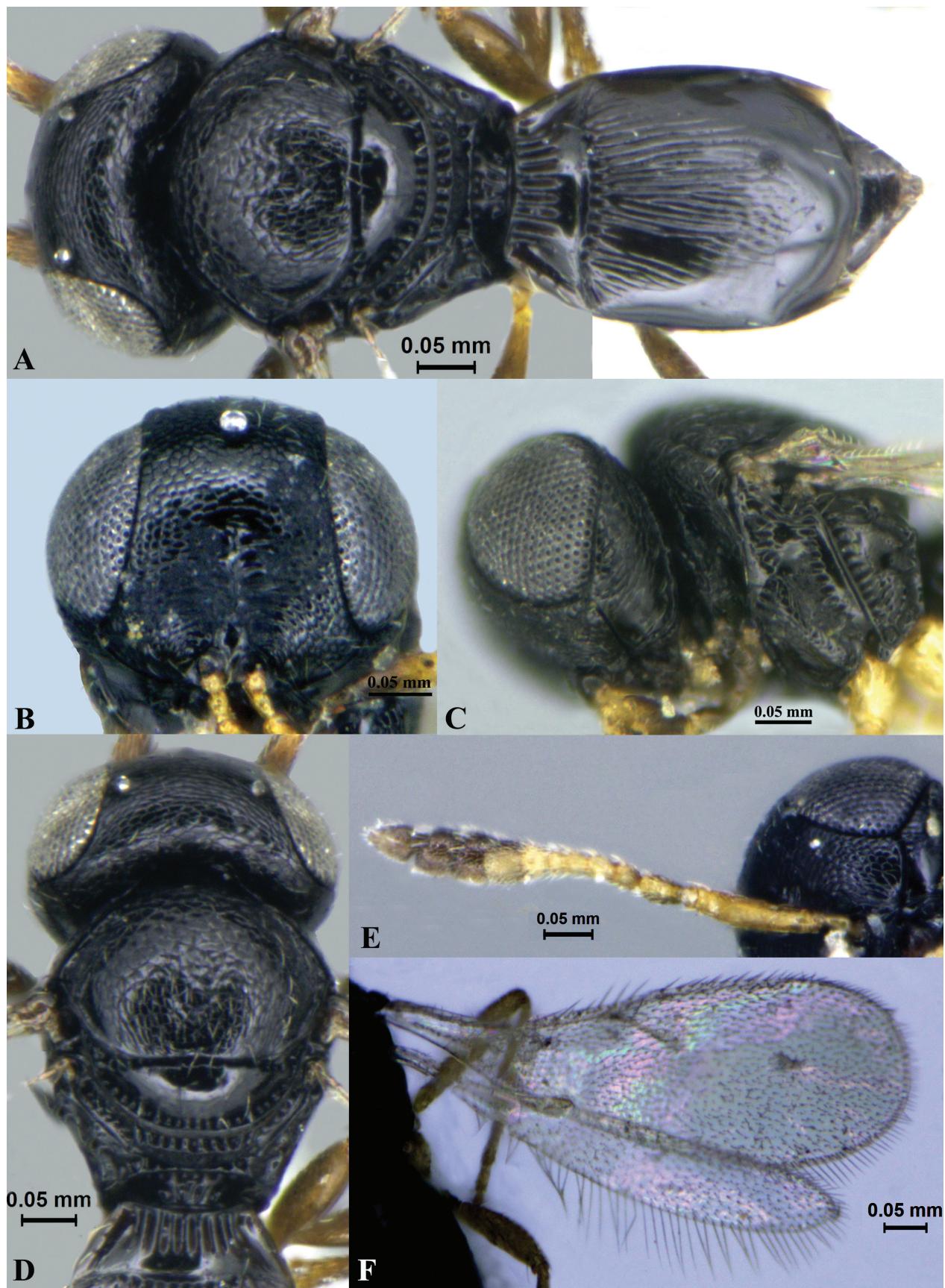


Figure 7. *Phanuromyia kakatiya* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

Head. Head $1.3 \times$ as wide as high, $1.3 \times$ as high as long; IOS $0.5 \times$ head width, $0.9 \times$ eye length; frons coriaceous reticulate with a smooth patch medially; central keel present (discontinuous, weakly indicated, with transverse carinae radiating on either side); vertex weakly transversely reticulate; gena weakly reticulate, with a smooth patch basally; eye (L: W=15.5:13.0) large, setose; POL: LOL in ratio of 11.3:5.2; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate, with sparse setae; A1 $4.7 \times$ as long as wide; A1 $2.3 \times$ as long as A2.

Mesosoma. Mesoscutum (L: W=16.9:25.3) convex, entirely coriaceous reticulate, reticulations longitudinal posterosublaterally; mesoscutal humeral sulcus not foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area dorsally coriaceous reticulate, remainder obliquely striate-reticulate; epomial carina present; pronotal suprahumeral sulcus weakly foveate, setose; netrion sulcus foveate, foveae weakly impressed; subacropileural sulcus with two foveae; prespecular sulcus with seven foveae; mesopleural pit shallow; weak striae and a row of foveae are present ventral to mesopleural pit; speculum transversely carinate; episternal sulcus foveate; postacetabular sulcus not foveate; femoral depression smooth; ventral mesopleuron reticulate; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal metapleural area smooth; ventral metapleuron punctate; metapleural epicoxal sulcus with large depressions; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular (L: W=6.8:14.6), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum anteriorly foveate, remainder weakly rugose; metanotal trough foveate; lateral propodeal area sparsely punctate with a large depression; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=61.6:22.3) and hind wing (L: W=55.6:8.5) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 2.2:8.7:17.4 respectively.

Metasoma. (L: W=37.6:22.1); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 anteromedially smooth, basal foveae present, followed by several longitudinal striae culminating in weak punctae; remaining tergites weakly punctate to smooth; posterior margin of T2 slightly convex; T1 with two lateral and one sublateral setae; T2 $4.3 \times$ the length of T1.

Male. Not known.

Etymology. This species is named after the Kakatiya dynasty that flourished in parts of what is today Andhra Pradesh in the 12th century CE. The name is treated as a noun in apposition.

Phanuromyia kanya Veenakumari, sp. nov.

<http://zoobank.org/8FB63C02-843B-498E-BEAF-84EE6B402F0F>

Fig. 8A–F

Material examined. *Holotype*, female, (ICAR/NBAIR/P4264), INDIA: Karnataka: Bengaluru, Hessaraghatta,

13°08'01"N, 77°29'27"E, 859 m, SN, 03.VI.2010. **Paratypes:** 1 female (ICAR/NBAIR/P4265), Tamil Nadu: Yercaud, HRS, 11°47'44"N, 78°12'42"E, 1399 m, ST, 05.VIII.2016; 1 female, (ICAR/NBAIR/P4266), Karnataka: Bengaluru, Attur, 13°05'48"N, 77°33'59"E, 936 m, YPT, 10.VI.2013.

Diagnosis. *Phanuromyia kanya* sp. nov. is close to *P. nirvighna* sp. nov. but differs from it in having short foveae on T1 and a convex mesoscutum, while in *P. nirvighna* sp. nov. foveae on T1 are elongate and the mesoscutum is not convex.

Description. Female body length=0.83–1.03 mm (n=3).

Colour. Head and mesosoma black; metasoma black-brown; radicle yellow-brown, A1–A4 brown with weak yellow patches, A5–A7 yellow, remaining antennomeres brown-black; procoxa brown-black, meso- and metacoxae brown-yellow, remainder of all legs yellow-brown.

Head. Head $1.3 \times$ as wide as high, $1.2 \times$ as high as long; IOS $0.5 \times$ head width, subequal to eye length; frons weakly reticulate with a medial smooth patch, ventrally with transverse striae radiating on either side of imaginary central keel; central keel absent; vertex transversely coriaceous reticulate; gena weakly reticulate with smooth basal patch, setose; eye (L: W=11.4:9.7) large, densely setose, setae long; POL: LOL in ratio of 10.0:5.7; lateral ocelli contiguous with orbits; a blunt hyperoccipital carina indicated; occiput coriaceous reticulate with elongate setae; A1 $4.1 \times$ as long as wide; A1 $2.4 \times$ as long as A2.

Mesosoma. Mesoscutum (L: W=15.2:19.8) convex, coriaceous reticulate, setose; mesoscutal humeral sulcus indicated not foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area dorsally coriaceous reticulate, remainder transversely striate; epomial carina absent; pronotal suprahumeral sulcus not foveate; netrion sulcus foveate dorsally; subacropileural sulcus indicated by two large foveae; prespecular sulcus not foveate; mesopleural pit distinct; speculum without transverse carinae; episternal sulcus not foveate; postacetabular sulcus not foveate; femoral depression smooth; ventral mesopleuron smooth except for a weak anterior reticulate patch; mesepimeral sulcus indicated by a carina; mesepimeral area smooth, wider than width of mesepimeral sulcus; metapleural sulcus not foveate; paracoxal sulcus not foveate; dorsal metapleural area smooth; ventral metapleuron smooth with sparse foveae ventrally; posteroventral metapleuron with dense setae; metapleural epicoxal sulcus not foveate; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular (L: W=5.1:12.9), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum foveate on anterior margin, smooth posteriorly; metanotal trough weakly foveate; lateral propodeal area smooth with a large fovea on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=52.3:16.9) and hind wing (L: W=44.4:6.6) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 5.1:6.6:15.0, respectively.

Metasoma. (L: W=31.5:17.9); T1 smooth except for basal foveae; T2 with weak basal foveae, followed by lon-

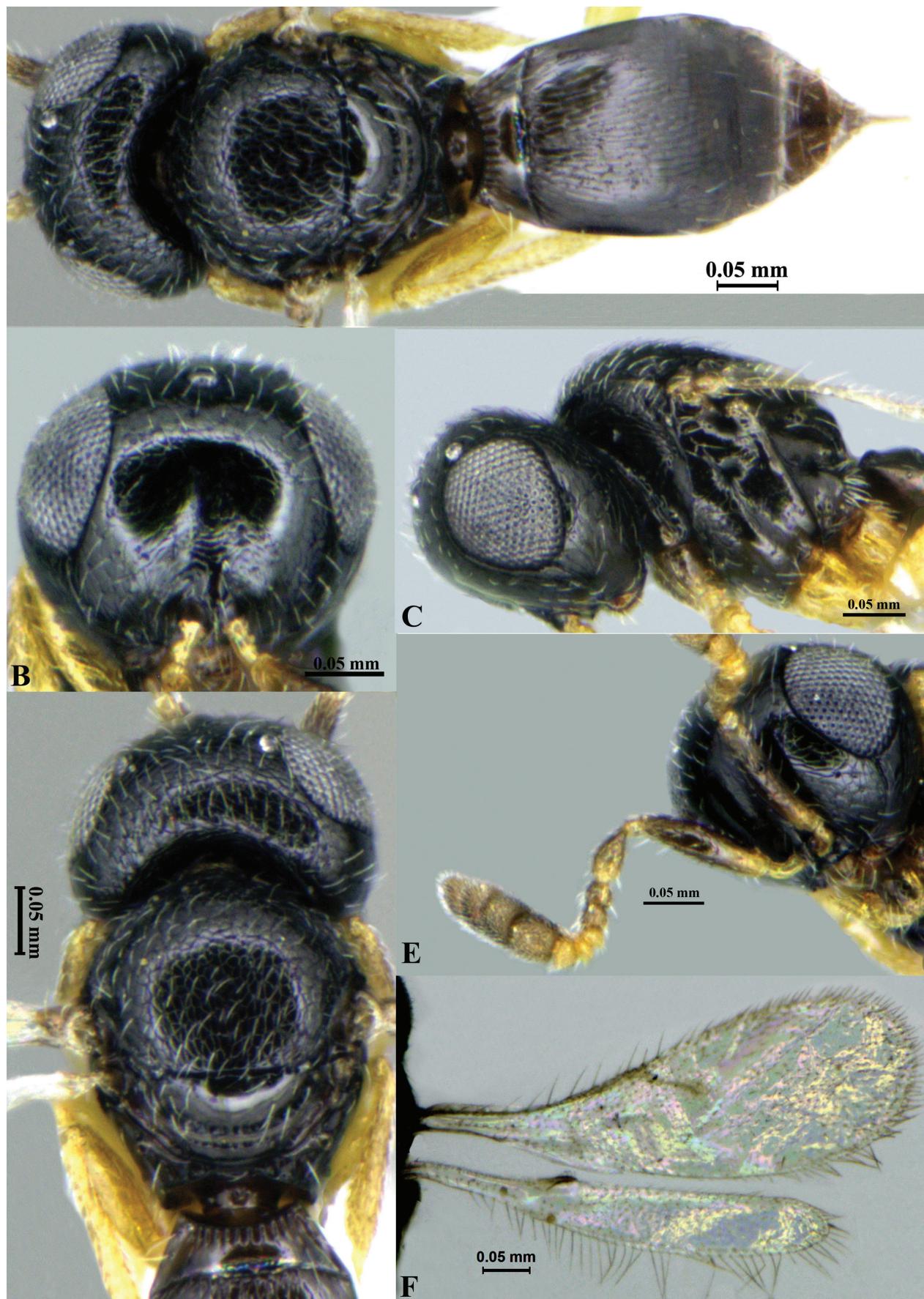


Figure 8. *Phanuromyia kanva* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

itudinal striae, extending $0.9\times$ length of tergite; remaining tergites smooth; posterior margin of T2 straight; T1 with two lateral and two sublateral setae; T2 $4.9\times$ length of T1.

Male. Not known.

Etymology. This species is named after the Kanva dynasty that ruled in the region of Magadha (now a part of Bihar) in North India for a brief period between 72 and 28 BCE. The name is treated as a noun in apposition.

Phanuromyia nirvighna Veenakumari, sp. nov.

<http://zoobank.org/EADD6F20-C0CF-49F2-844F-941E90D49AB6>

Figs 9A–F, 10A, B

Material examined. **Holotype**, female, (ICAR/NBAIR/P4267), INDIA: Karnataka: Mandya, paddy crop, $12^{\circ}33'51"N$, $76^{\circ}44'01"E$, 749 m, SN, 06.III.2014. **Paratypes:** 1 female, (ICAR/NBAIR/P4268), Assam: Jorhat, Assam Agriculture University, (near pond), $26^{\circ}43'20"N$, $94^{\circ}11'33"E$, 98 m, MT, 02.III.2017; 1 female, (ICAR/NBAIR/P4269), Kerala: Pallakad, Mayiladumpara, $9^{\circ}58'24"N$, $76^{\circ}31'27"E$, 99 m, YPT, 25.III.2017; 1 male, (ICAR/NBAIR/P4270), Karnataka: Bengaluru, Hebbal, NBAIR, terrace of 2nd floor, $13^{\circ}01'38"N$, $77^{\circ}35'03"E$, 927 m, YPT, 24.VIII.2015.

Diagnosis. *Phanuromyia nirvighna* sp. nov. is close to *P. kanva* sp. nov. The distinguishing characters are given under the latter species.

Description. Female body length=0.96–1.21 mm (n=3); male: body length=1.02 mm (n=1)

Colour. Head and mesosoma black; metasoma black-brown; radicle and A1 yellow-brown, A2–A4 brown, A5–A7 yellow, remaining antennomeres brown-black; procoxa brown-black, meso- and metacoxae brown-yellow, remainder of all legs yellow-brown.

Head. Head $1.3\times$ as wide as high, $1.3\times$ as high as long; IOS $0.5\times$ head width, subequal to eye length; frons entirely coriaceous reticulate except for a medial smooth patch, and sparse striae above toruli; central keel absent; vertex coriaceous reticulate; gena weakly reticulate, except for smooth patch ventrally; eye (L: W=12.7:10.7) large, densely setose, setae long; POL: LOL in ratio of 11.2:6.0; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with elongate setae; A1 $4\times$ as long as wide; A1 $2.7\times$ as long as A2.

Mesosoma. Mesoscutum (L: W=17.1:21.3) not convex, coriaceous reticulate, setose; mesoscutal humeral sulcus not foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area coriaceous reticulate; epomial carina present; pronotal suprahumeral sulcus not foveate; netrion sulcus weakly foveate dorsally; pronotal cervical sulcus foveate; subacropileural sulcus with two foveae, ventral to which an oblique furrow extends towards mesopleural pit; prespecular sulcus not foveate; mesopleural pit distinct with several vertical striae ventrally; speculum with weak transverse carinae; episternal sulcus not foveate; postacetabular sulcus not foveate; femoral

depression smooth; ventral mesopleuron smooth except for anterior reticulate patch; mesepimeral sulcus indicated by a blunt carina; mesepimeral area smooth, wider than width of mesepimeral sulcus; metapleural sulcus indicated by three foveae dorsally; paracoxal sulcus not foveate; dorsal metapleural area smooth to weakly tuberculate; ventral metapleuron smooth; metapleural epicoxal sulcus with weak depressions; scutoscutellar sulcus foveate laterally; mesoscutellum semicircular (L: W=5.6:12.0), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum with a weak projection posteromedially, with small foveae on anterior margin, remainder smooth to weakly tuberculate; metanotal trough not foveate; lateral propodeal area smooth with large depressions on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=57.4:21.3) and hind wing (L: W=54.6:8.3) hyaline with dense microtrichia; ratio of length of marginalis: stigmatis: postmarginalis 6.4:8.9:15.1, respectively.

Metasoma. (L: W=33.4:21.2); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 with large basal foveae, followed by longitudinal striae culminating in weak reticulations; remaining tergites smooth; posterior margin of T2 slightly convex; T1 with three lateral setae and one sublateral seta; T2 $4.8\times$ the length of T1.

Male. Similar to female.

Etymology. This species is named ‘nirvighna’, one of the numerous names of the Hindu God Ganesha. The name is treated as a noun in apposition.

Phanuromyia pallava Veenakumari, sp. nov.

<http://zoobank.org/C89B0217-7BD7-4582-B479-C29F0652453B>

Fig. 11A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4282), INDIA: Tamil Nadu: Yercaud, HRS, $11^{\circ}47'44"N$, $78^{\circ}12'42"E$, 1399 m, YPT, 06.VIII.2016. **Paratypes:** 13 females (ICAR/NBAIR/P4283–P4295), Tamil Nadu: Yercaud, HRS, $11^{\circ}47'44"N$, $78^{\circ}12'42"E$, 1399 m, YPT, 04.VIII.2016.

Diagnosis. This species is different from the others in having the following combination of characters viz., head $1.6\times$ as wide as high, metanotal trough not foveate and mesoscutum not convex.

Description. Female body length=0.69–0.98 mm (n=14).

Colour. Head, mesosoma and metasoma black; radicle yellow-brown, A1 pale yellow, A2–A3 brown, A4–A7 pale yellow, A8–A11 brown; procoxa brown-black, meso- and meta-coxae brown-yellow, remainder of all legs yellow-brown.

Head. Head $1.6\times$ as wide as high, $0.9\times$ as high as long; IOS $0.5\times$ head width, $1.1\times$ eye length; frons dorsally weakly reticulate, medially smooth, remainder coriaceous reticulate, reticulations elongate and oblique adjacent to imaginary central keel; central keel absent (instead uneven smooth area present); vertex weakly reticulate

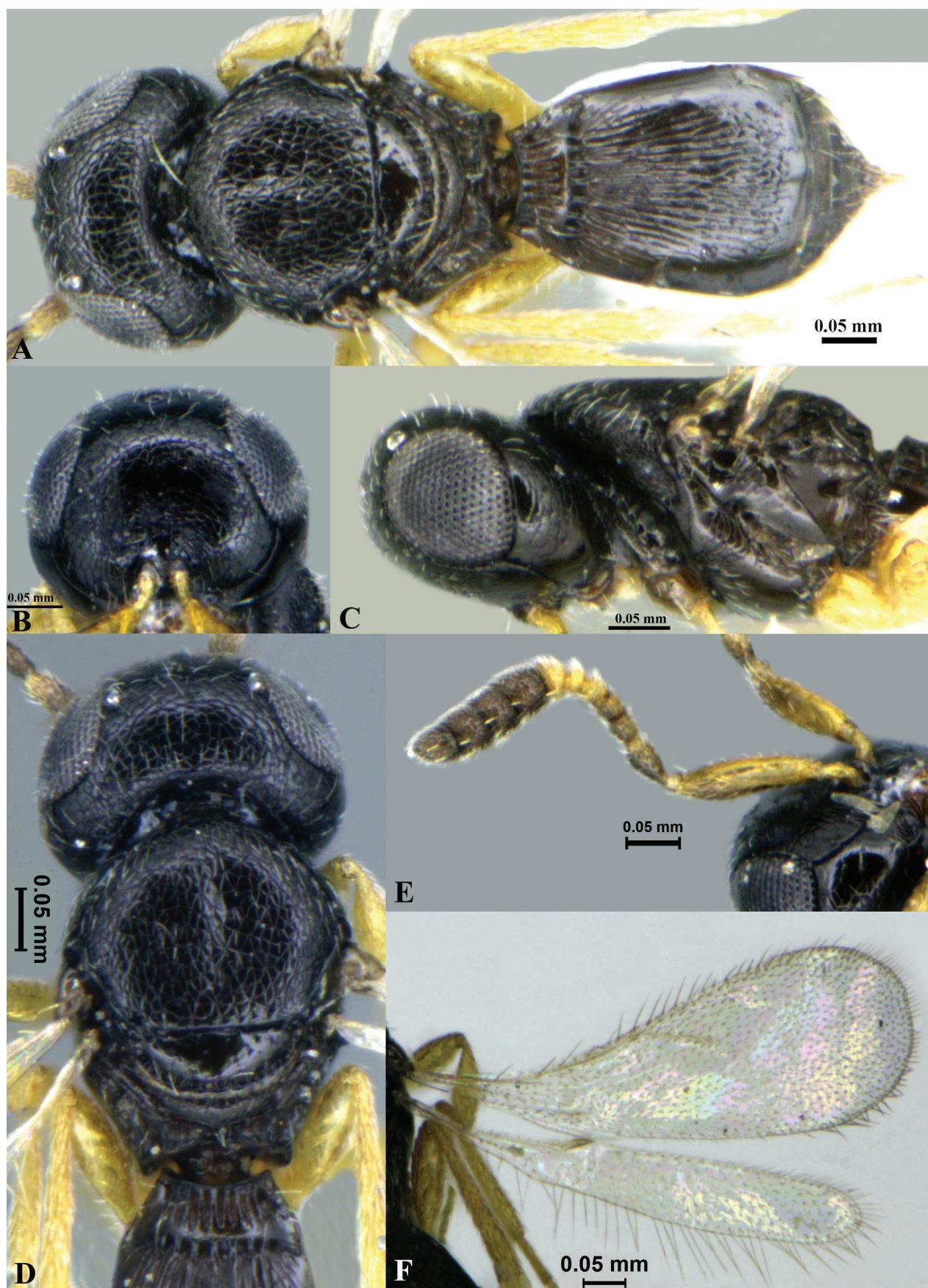


Figure 9. *Phanuromyia nirvighna* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

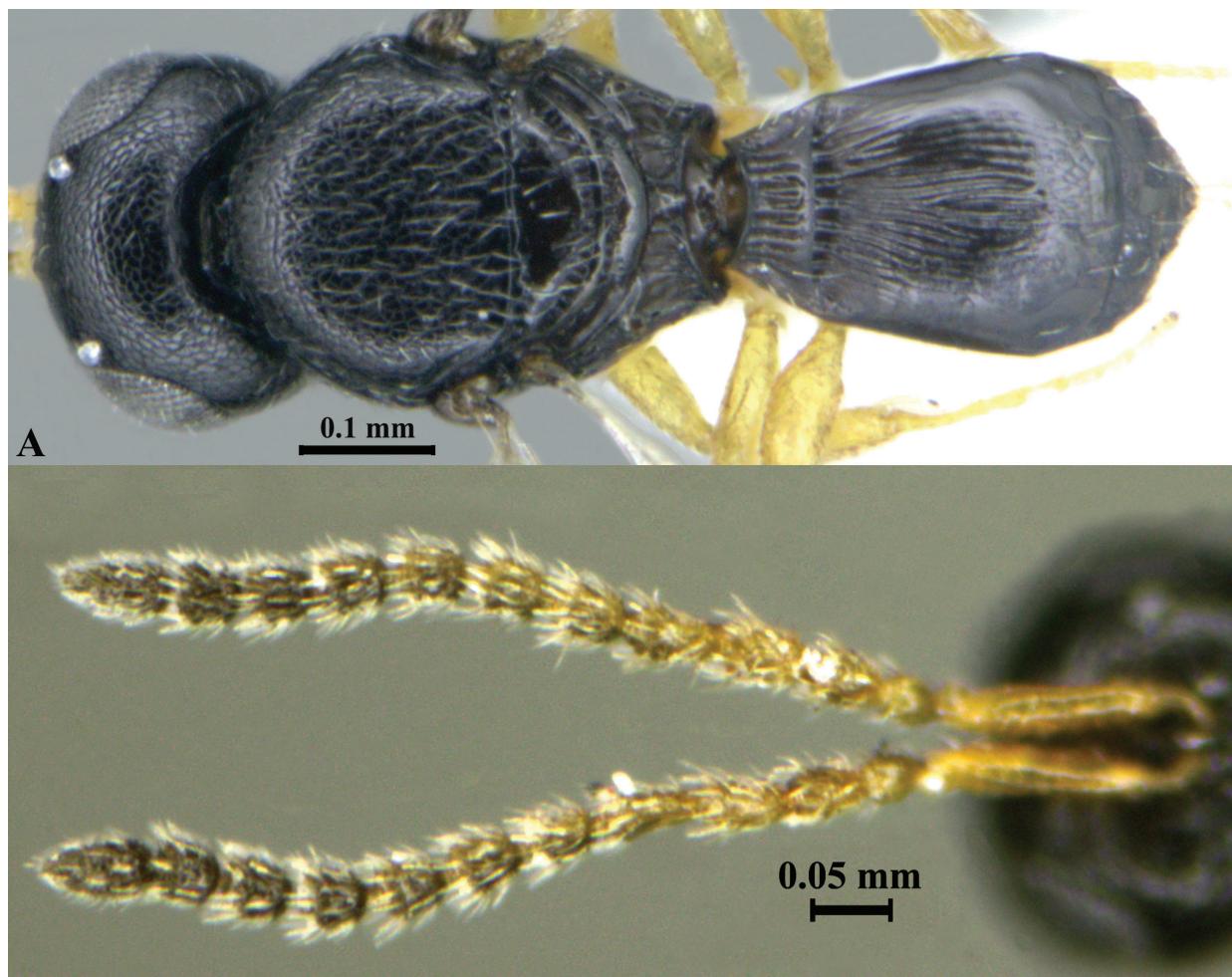


Figure 10. *Phanuromyia nirvighna* sp. nov. (♂). A. Habitus (dorsal view); B. Antennae.

to smooth; gena weakly coriaceous reticulate; eye (L: W=13.4:12.4) large, sparsely setose; POL: LOL: OOL in ratio of 12.1:6.9:0.3; OOL 0.2× MOD; hyperoccipital carina absent; occiput coriaceous reticulate with elongate setae; A1 4.1× as long as wide; A1 2.8× as long as A2.

Mesosoma. Mesoscutum (L: W=15.7:24.3) not convex, weakly reticulate; mesoscutal humeral sulcus indicated not foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area obliquely striate-reticulate; epomial carina present; pronotal suprahumeral sulcus not foveate; netrion sulcus entirely foveate; subacropopleural sulcus indicated by three foveae; prespecular sulcus with five foveae; mesopleural pit distinct; speculum with weak transverse carinae; episternal sulcus not foveate; postacetabular sulcus not foveate; femoral depression smooth; ventral mesopleuron smooth except for a weak anterior reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus not foveate; dorsal metapleural area smooth; ventral metapleuron smooth; metapleural epicoxal sulcus with shallow depressions; scutoscutellar sulcus narrow, foveate laterally; mesoscutellum semicircular (L: W=5.6:17.3), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum anteriorly foveate, remainder weakly rugose; metanotal trough not foveate; lateral propodeal area

with a medial transverse carina with a fovea on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=63.1:17.6) and hind wing (L: W=56.6:7.3) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 5.8:8.2:18.2, respectively.

Metasoma. (L: W=37.0:25.6); T1 longitudinally foveate, smooth laterally and posteriorly; T2 with basal foveae, followed by longitudinal striae extending 0.7× length of tergite; remaining tergites smooth; posterior margin of T2 slightly convex; T1 with three lateral setae and one sublateral seta; T2 5.1× length of T1.

Male. Not known.

Etymology. This species is named ‘Pallava’, after an early South Indian dynasty that ruled between the 4th and 9th centuries CE. The name is treated as a noun in apposition.

Phanuromyia pandya Veenakumari, sp. nov.

<http://zoobank.org/70C03476-1EE0-4412-8BDF-4C93A3F4D0A9>
Fig. 12A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4296), INDIA: Tamil Nadu: Dindugul, Thandikudi, Regional Coffee Research Station (RCRS), 10°18'34"N, 77°38'34"E, 1305 m, YPT, 29.XI.2016. **Paratype:** 1 female,

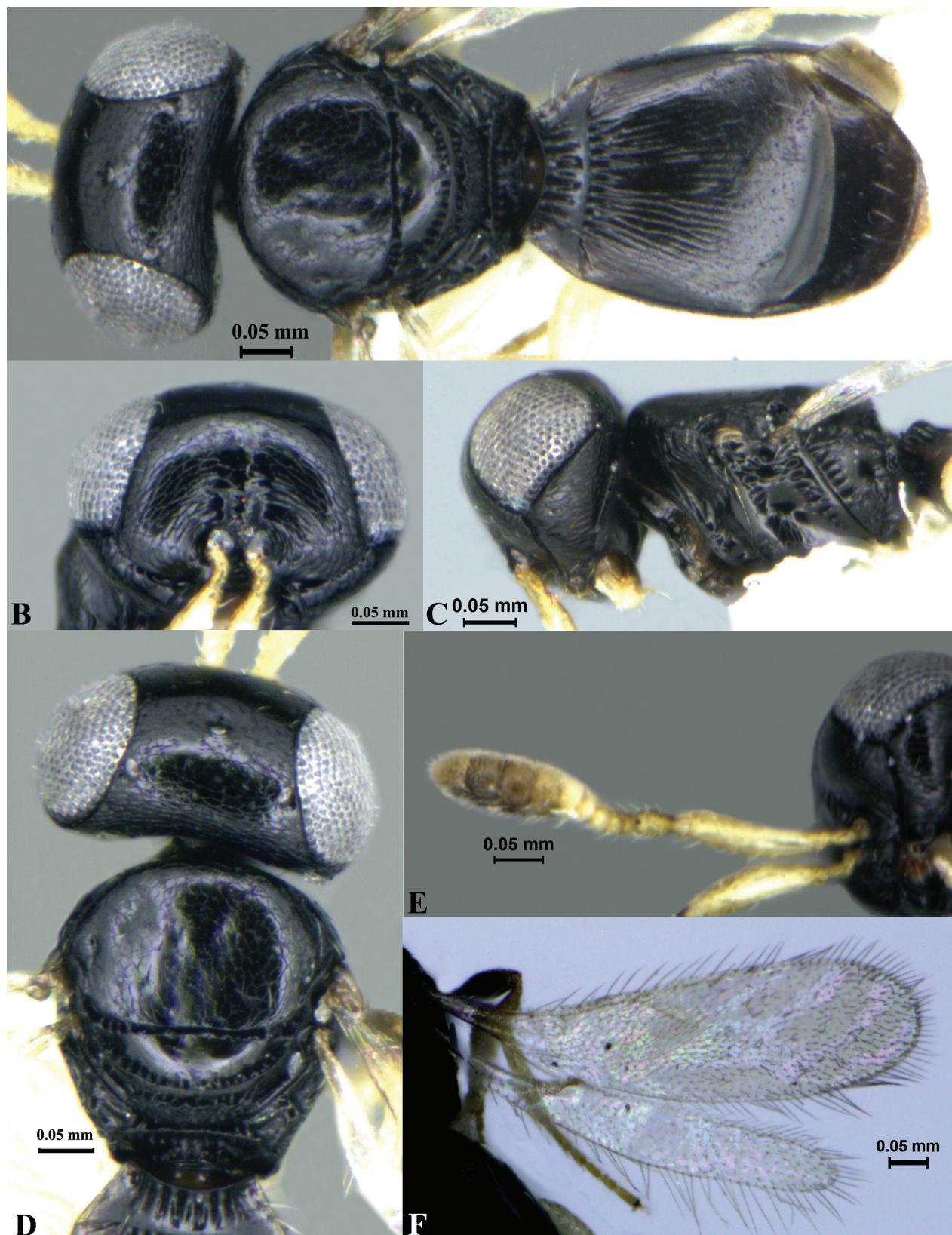


Figure 11. *Phanuromyia pallava* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

(ICAR/NBAIR/P4297), Tamil Nadu: Dindugul, Thandikudi, RCRS, 10°18'34"N, 77°38'34"E, 1305 m, YPT, 29.XI.2016.

Diagnosis. *Phanuromyia pandya* sp. nov. is close to *P. koenigi* but differs from it in having an entirely cori-

aceous frons without smooth medial patch and posterior ocelli away from orbits; while in *P. koenigi* frons has an elongate smooth patch above interantennal process and posterior ocelli are adjacent to orbits.

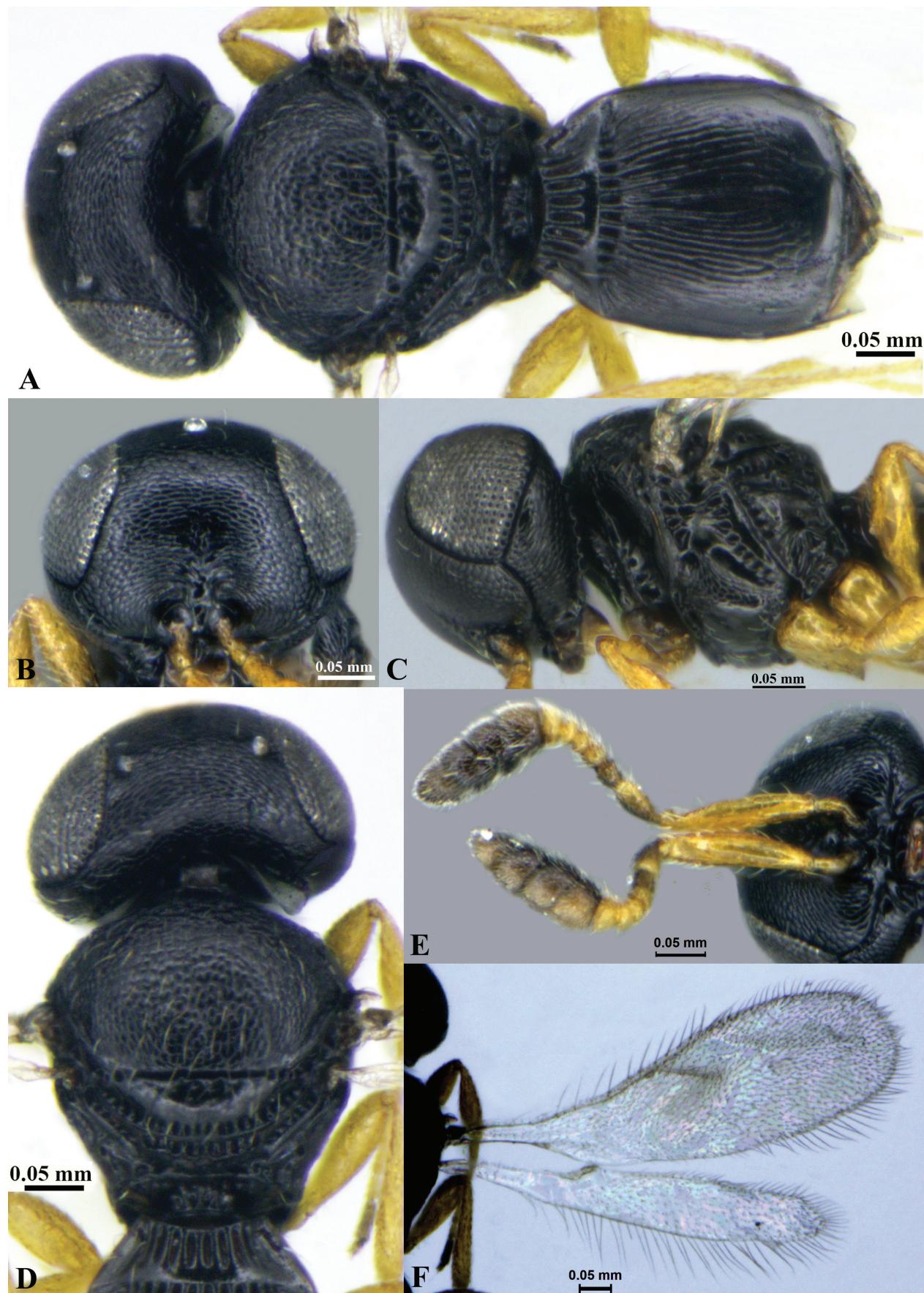


Figure 12. *Phanuromyia pandya* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antennae; **F.** Wings.

Description. Female body length=0.92–1.30 mm (n=2).

Colour. Head, mesosoma and metasoma black; radicle yellow-brown, A1 yellow, A2–A3 brown, A4–A7 yellow, A8–A11 brown-black; procoxa brown-black, meso- and meta-coxae brown-yellow, remainder of all legs yellow-brown.

Head. Head 1.2× as wide as high, 1.2× as high as long; IOS 0.5× head width, subequal to eye length; frons entirely coriaceous reticulate without medial smooth patch, reticulations medially transverse, uneven short carinae present medially above toruli; central keel absent; vertex coriaceous reticulate, reticulations transverse; gena coriaceous reticulate; eye (L: W=14.1:12.9) large, setose; POL:LOL:OOL in ratio of 10.2:5.8:0.06; lateral ocelli slightly away from orbits, OOL 0.3× MOD; hyperoccipital carina absent; occiput coriaceous reticulate with elongate setae; A1 4× as long as wide; A1 2.9× as long as A2.

Mesosoma. Mesoscutum (L: W=15.2:25.0) convex, entirely coriaceous reticulate, except for punctate sculpture medially; mesoscutal humeral sulcus not foveate; mesoscutal suprahumeral sulcus not foveate; lateral pronotal area dorsally obliquely striate, remainder smooth; epomial carina present; pronotal suprahumeral sulcus foveate, setose; netrion sulcus entirely foveate; subacropileural sulcus indicated by five foveae; prespecular sulcus indicated by a single fovea; mesopleural pit not distinct; speculum with weak transverse carinae; episternal sulcus indicated by a large fovea; postacetabular sulcus not foveate; femoral depression smooth to weakly reticulate; ventral mesopleuron smooth except for dorsal reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus not foveate; dorsal metapleural area smooth; ventral metapleuron obliquely carinate; metapleural epicoxal sulcus with shallow depressions; scutoscutellar sulcus foveate laterally; mesoscutellum semicircular (L: W=5.2:16.5), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum foveate; metanotal trough foveate; lateral propodeal area with a medial carina and a large fovea on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=67.1:20.3) and hind wing (L: W=10.2:5.7) hyaline with dense microtrichia; ratio of length of marginalis: stigmalis: postmarginalis 8.5:10.9:12.0, respectively.

Metasoma. (L: W=28.6:22.2); T1 with longitudinal foveae, smooth laterally and posteriorly; T2 with basal foveae, followed by longitudinal striae extending 0.8× length of tergite; posterior margin of T2 slightly convex; remaining tergites smooth; T1 with two lateral and two sublateral setae; T2 4.5× length of T1.

Male. Not known.

Etymology. This species is named after the Pandya, a dynasty of Tamil rulers, who, for centuries, ruled the extreme South of India. The name is treated as a noun in apposition.

***Phanuromyia rashtrakuta* Veenakumari, sp. nov.**

<http://zoobank.org/6ADF5EF3-B77F-44A0-8C71-B49D76E83DDC>

Fig. 13A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4298), INDIA: Tamil Nadu: Kanyakumari, Pechiparai, 8°14'23"N, 76°33'34"E, 17 m, YPT, 05.I.2012;

Paratypes: 2 females, (ICAR/NBAIR/P4299, P4315), Tamil Nadu: Dindugul, Thandikudi, RCRS, 10°18'34"N, 77°38'34"E, 1305 m, YPT, 29.XI.2016; 1 female, (ICAR/NBAIR/P4316), Tripura: Agartala, Tripura University (TU), 23°76'28"N, 91°26'33"E, 17 m, YPT, 09.III.2016; 1 female, (ICAR/NBAIR/P4317), Odisha: Bhubaneswar, OUAT, 20°15'52"N, 85°48'50"E, 45 m, YPT, 29.I.2015.

Diagnosis. *Phanuromyia rashtrakuta* sp. nov. is close to *P. hoysala* sp. nov. The distinguishing characters are given under the latter species.

Description. Female body length=1.02–1.18 mm (n=5).

Colour. Head and mesosoma black, metasoma black-brown; radicle, A1 black-brown with uneven yellow patches; A2 basally ¾ black-brown; remainder of A2, A3–A6 yellow-brown; A7–A11 black-brown; all coxae dark brown, remainder of all legs yellow-brown.

Head. Head 1.3× as wide as high, 1.2× as high as long; IOS 0.5× head width, subequal to eye length; frons entirely coriaceous reticulate without medial smooth patch, instead with transverse carinae; central keel absent, instead a discontinuous longitudinal carina present with transverse carinae on either side; vertex coriaceous reticulate, reticulations transverse; gena entirely coriaceous reticulate, except for smooth basal patch; eye (L: W=18.0:15.5) large; POL: LOL in ratio of 13.4:7.9; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with elongate setae; A1 4.8× as long as wide; A1 2.9× as long as A2.

Mesosoma. Mesoscutum (L: W=22.3:29.0) not convex, entirely coriaceous reticulate; mesoscutal humeral sulcus not foveate; mesoscutal suprahumeral sulcus indicated by small rugae; lateral pronotal area obliquely striate; epomial carina present; pronotal suprahumeral sulcus not foveate, setose; netrion sulcus entirely foveate; subacropileural sulcus indicated by three foveae; prespecular sulcus indicated by seven foveae; mesopleural pit distinct; speculum transversely carinate; episternal sulcus not foveate; postacetabular sulcus indicated by small rugae; femoral depression smooth; ventral mesopleuron smooth with anterior reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth, subequal to width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus foveate; dorsal metapleural area weakly carinate; ventral metapleural area carinate; metapleural epicoxal sulcus with large depressions; scutoscutellar sulcus narrow, foveate laterally; mesoscutellum semicircular (L: W=8.0:17.5), smooth; posterior mesoscutellar sulcus foveate; metascutellum foveate; metanotal trough foveate; lateral propodeal area smooth with a fovea on inner margin; medial lateral propodeal carina not visible, hidden beneath metascutellum

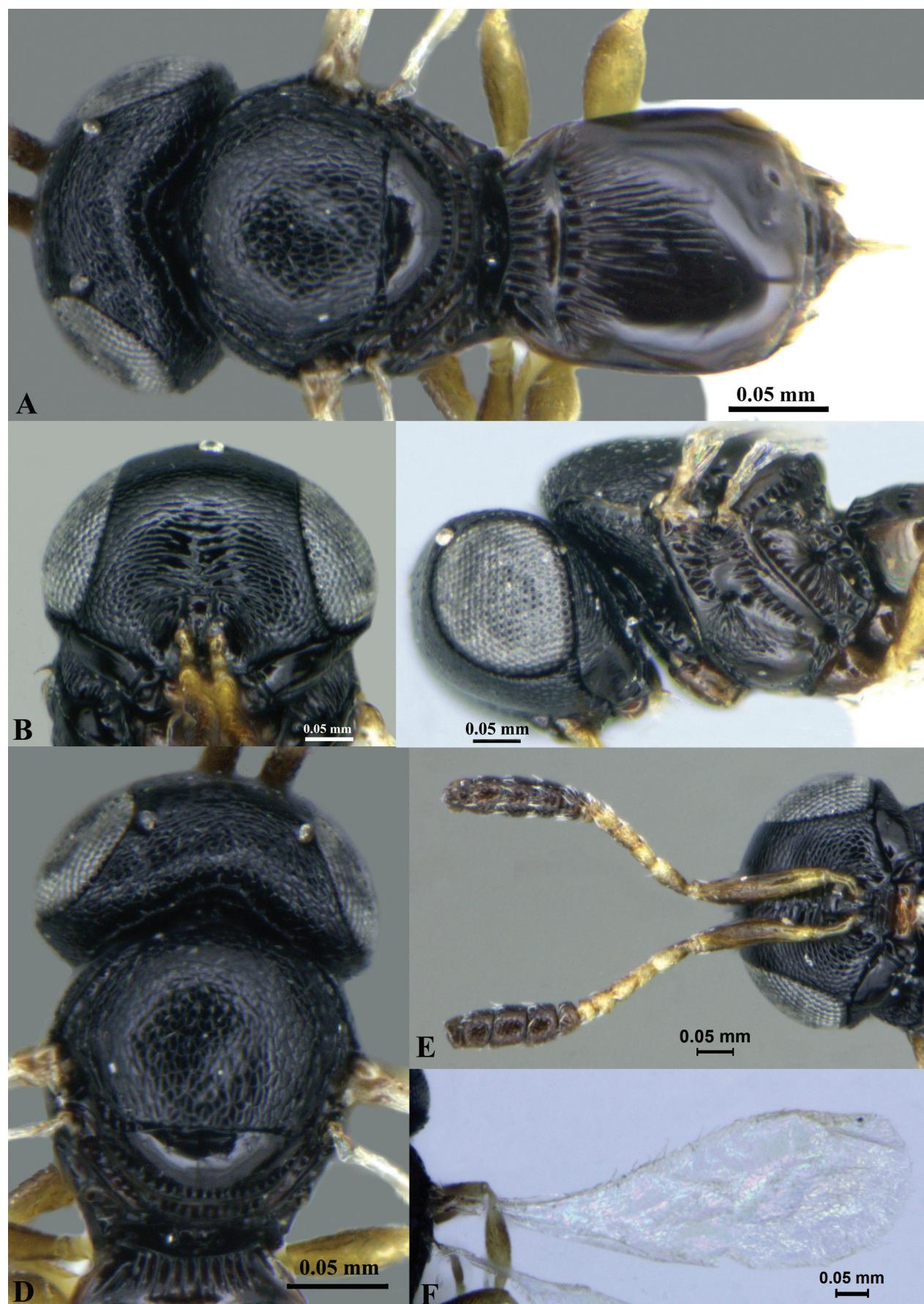


Figure 13. *Phanuromyia rashtrakuta* sp. nov. (♀). A. Habitus (dorsal view); B. Frons; C. Head and pleuron; D. Head and mesonotum; E. Antennae; F. Fore wing.

when viewed dorsally; fore wing (L: W=70.4:23.6) and hind wing (L: W=46.7:9.4) sculptured with reticulations, microtrichia sparse; ratio of length of marginalis: stigmatis: postmarginalis 4.7:11.6:22.2, respectively.

Metasoma. (L: W=34.7:26.7); T1 with longitudinal foveae and with an oblique costa extending towards posterolateral margin of tergite, remainder smooth; T2 with basal foveae, followed by longitudinal striae, striae elongate medially, progressively decreasing in length laterad; remainder of T2 and other tergites smooth; posterior margin of T2 slightly convex; T1 with two lateral setae and one sublateral seta; T2 4.9× the length of T1.

Male. Not known.

Etymology. This species is named after the Rashtrakuta dynasty that ruled an area stretching from central India to parts of South India, during whose reign the famed Kailasa temple at Ellora was built. The name is treated as a noun in apposition.

Phanuromyia satavahana Veenakumari, sp. nov.

<http://zoobank.org/522B009E-6B41-481B-BED0-4AEEBF498718>

Fig. 14A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4327, 2308), INDIA: Tripura: Agartala, Tripura University (TU), 23°7'28"N, 91°26'33"E, 17 m, YPT, 09.III.2016.

Paratypes: 2 females, (ICAR/NBAIR/P4328, P4331), Tripura: Agartala, TU, 23°7'28"N, 91°26'33"E, 17 m, YPT, 09.III.2016.

Diagnosis. *Phanuromyia satavahana* sp. nov. is close to *P. kakatiya* sp. nov. The distinguishing characters are given under the latter species.

Description. Female body length=0.75–0.92 mm (n=3).

Colour. Head and mesosoma black; metasoma brown-black; radicle, A1–A11 yellow-brown; procoxa brown-black, meso- and meta-coxae pale yellow, remainder of all legs yellow-brown.

Head. Head 1.5× as wide as high, 1.2× as high as long; IOS 0.5× head width, subequal to eye length; frons with sparse long setae, coriaceous reticulate with no medial smooth patch; central keel present, with transverse carinae on either side; vertex weakly transversely coriaceous reticulate; gena weakly reticulate with a smooth patch basally; eye (L: W=12.5:10.7) large, setose; POL: LOL in ratio of 9.0:4.7; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with sparse setae; A1 3.8× as long as wide; A1 2.5× as long as A2.

Mesosoma. Mesoscutum (L: W=13.0:20.0) convex, entirely coriaceous reticulate, except for punctate sculpture posteromedially; mesoscutal humeral sulcus not foveate; mesoscutal suprathumeral sulcus indicated by a furrow; lateral pronotal area dorsally coriaceous reticulate, remainder smooth; epomial carina present, indicated by a large fovea; pronotal suprathumeral sulcus not foveate; netrion sulcus ventrally foveate; subacropileural sulcus indicated by two small foveae; prespecular sulcus indicated by five foveae; mesopleural pit distinct; speculum with transverse carinae;

episternal sulcus not foveate; postacetabular sulcus indicated by uneven shallow depressions; femoral depression smooth; ventral mesopleuron reticulate in dorsal half and remainder smooth; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus not foveate; dorsal metapleural area smooth; ventral metapleuron weakly carinate; metapleural epicoxal sulcus indicated as shallow depressions; scutoscutellar sulcus laterally foveate; mesoscutellum semicircular (L: W=5.0:13.2), smooth, setose; posterior mesoscutellar sulcus foveate; metascutellum with a weak posteromedial projection; metascutellum anteriorly with depressions, posteromedially rugose, remainder smooth; metanotal trough weakly foveate; lateral propodeal area smooth with two large foveae on inner margin; entire lateral propodeal carina visible posterior to metascutellum when viewed dorsally; fore wing (L: W=51.5:13.8) and hind wing (L: W=46.4:5.9) hyaline with dense microtrichia; ratio of length of marginalis: stigmatis: postmarginalis 4.3:5.4:7.6, respectively.

Metasoma. (L: W=26.2:19.1); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 with basal foveae, followed by longitudinal striae culminating in coriaceous reticulations; remaining tergites smooth; posterior margin of T2 slightly convex; T1 with two lateral setae and one sublateral seta; T2 4.4× length of T1.

Male. Not known.

Etymology. This species is named after the Satavahanas, who ruled a vast empire from their capital in South India for four and a half centuries starting from c. 230 BCE. The name is treated as a noun in apposition.

Phanuromyia tuluva Veenakumari, sp. nov.

<http://zoobank.org/696630FF-2536-4A71-971E-4643C645A581>

Fig. 15A–F

Material examined. **Holotype**, female, (ICAR/NBAIR/P4325), INDIA: Andaman and Nicobar Islands: Great Nicobar: Campbell Bay, 7°00'77"N, 93°91'47"E, 13 m, SN, 18.III.2016. **Paratype:** 1 female, (ICAR/NBAIR/P4326), Andaman and Nicobar Islands: Great Nicobar: Campbell Bay, 7°00'77"N, 93°91'47"E, 13 m, SN, 18.III.2016.

Diagnosis. *Phanuromyia tuluva* sp. nov. is close to *P. jarawa* but differs from it in the following character states. In *P. tuluva* sp. nov. central keel is indicated, metasoma wide posteriorly and mesepimeral area wider than mesepimeral sulcus; while in *P. jarawa* central keel absent, metasoma is ovoid and mesepimeral area is narrower than mesepimeral sulcus

Description. Female body length=0.70–0.89 mm (n=2).

Colour. Head and mesosoma black; metasoma black-brown; radicle brown, A1 and A4–A7 pale yellow, A2–A3 and A8–A11 light brown; procoxa brown-black, meso- and meta-coxae brown-yellow, remainder of all legs yellow-brown.

Head. Head 1.3× as wide as high, 1.2× as high as long; IOS 0.5× head width, 0.8× eye length; frons coriaceous

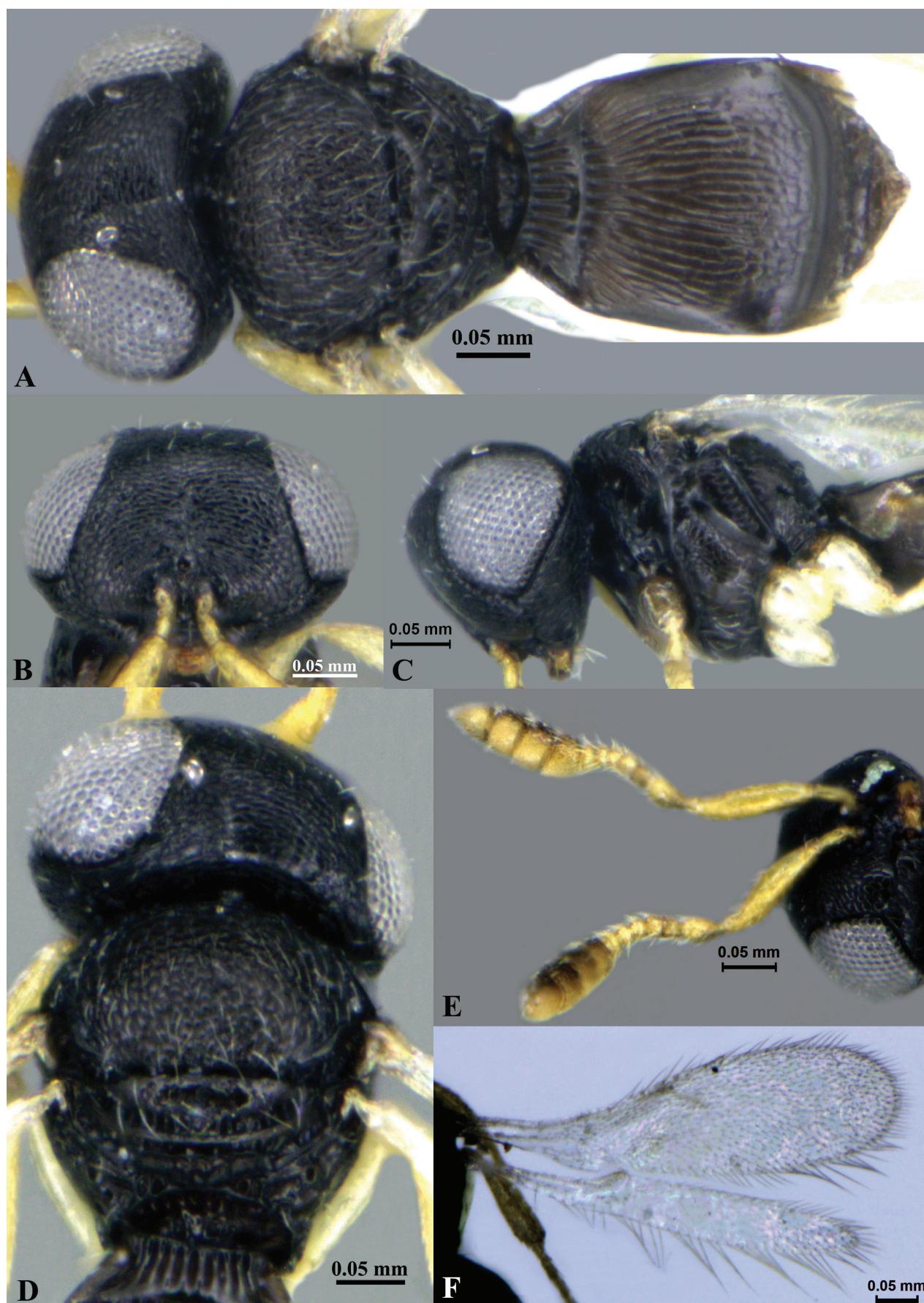


Figure 14. *Phanuromyia satavahana* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antennae; **F.** Wings.

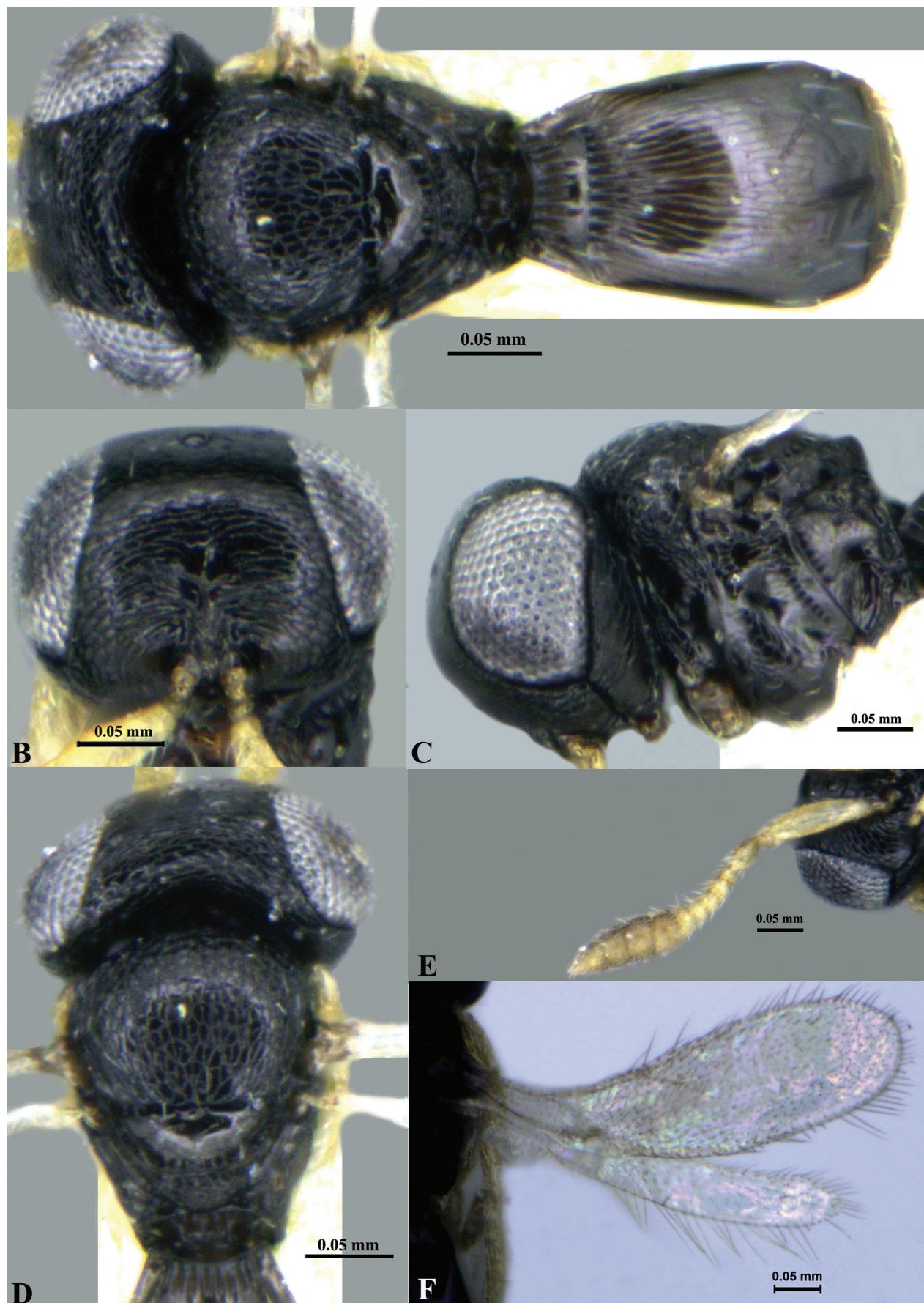


Figure 15. *Phanuromyia tuluva* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

reticulate with medial smooth patches, dorsal to which several transverse striae present; central keel present (with transverse carinae on either side in addition to several transverse striae ventrally); vertex weakly transversely reticulate; gena entirely weakly reticulate with a smooth basal patch; eye (L: W=13.6:11.2) large, setose; POL: LOL in ratio of 8.1:4.7; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with sparse setae; A1 3.4× as long as wide and 3× as long as A2.

Mesosoma. Mesoscutum (L: W=12.6:16.0) convex, entirely coriaceous reticulate, reticulations longitudinal; mesoscutal humeral sulcus not foveate; mesoscutal suprahumerale sulcus not foveate; lateral pronotal area dorsally coriaceous reticulate, remainder smooth; epomial carina present; pronotal suprahumerale sulcus foveate, setose; netrion sulcus entirely foveate; subacropileural sulcus indicated by two large depressions; prespecular sulcus indicated by six closely placed foveae; mesopleural pit distinct with weak striae radiating ventrally; speculum with transverse carinae; episternal sulcus not foveate; postacetabular sulcus not foveate; femoral depression smooth; ventral mesopleuron smooth except for a large anterior reticulate patch; mesepimeral sulcus foveate; mesepimeral area smooth and wider than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus not foveate; dorsal metapleural area smooth; ventral metapleuron with oblique carinae; metapleural epicoxal sulcus with shallow depressions; scutoscutellar sulcus medially narrow, laterally wide and foveate; mesoscutellum semicircular (L: W=5.1:10.2), smooth, setose; posterior mesoscutteral sulcus foveate; metascutellum anteriorly foveate, remainder rugose-punctate; metanotal trough weakly foveate; lateral propodeal area with intricate sculpture with foveae on inner margin; medial lateral propodeal carina barely perceptible as hidden beneath metascutellum when viewed dorsally; fore wing (L: W=49.4:12.9) and hind wing (L: W=43.6:5.5) hyaline with dense microtrichia; ratio of length of *marginalis*: *stigmatis*: *postmarginalis* 5.0:5.8:10.8, respectively.

Metasoma. (L: W=24.6:16.7); T1 with longitudinal foveae, laterally and posteriorly smooth; T2 with elongate basal foveae, followed by several longitudinal striae extending 0.8× length of tergite; posterior margin of T2 almost straight; T1 with two lateral and one sublateral setae; T2 4.3× length of T1.

Male. Not known.

Etymology. This species is named after the Tuluva dynasty, the third of the four dynasties, that in the first half of the sixteenth century, ruled the legendary South Indian Vijayanagar empire. The name is treated as a noun in apposition.

Phanuromyia vakataka Veenakumari, sp. nov.

<http://zoobank.org/307AED1A-26DB-404A-B940-6AD879917FF8>

Fig. 16A–F

Material examined. *Holotype*, female, (ICAR/NBAIR/P4329), INDIA: Uttar Pradesh: Aligarh, Aligarh Muslim

University, Agriculture Farm, 27°54'57"N, 78°04'43"E, 189 m, SN, 13.IX.2006.

Diagnosis. *Phanuromyia vakataka* sp. nov. is close to *P. nabakovi* but differs from it in the following character states. In *P. vakataka* sp. nov. foveae on anterior margin of T1 are elongate, (half the length of tergite) and area adjacent to medial smooth space on frons is coriaceous reticulate; whereas in *P. nabakovi* foveae on anterior margin of T1 is short, at most 0.2× the length of tergite and transverse striae are present adjacent to the smooth medial area of frons.

Description. Female body length=0.75 mm (n=1).

Colour. Head and mesoscutum black; mesoscutellum, metascutellum, propodeum and metasoma brown-black; radicle, A1–A5 yellow with uneven brown patches, A6–A7 yellow, remaining antennomeres brown; all coxae yellow with brown patches, remainder of legs yellow.

Head. Head 1.2× as wide as high, 1.5× as high as long; IOS 0.5× head width, 1.1× eye length; frons coriaceous reticulate with a smooth medial patch; central keel absent (short transverse striae present on either side of imaginary central keel); vertex transversely coriaceous reticulate; gena entirely weakly coriaceous reticulate with a smooth basal patch; eye (L: W=10.2:6.7) large, with no setae; POL: LOL in ratio of 9.8:5.8; lateral ocelli contiguous with orbits; hyperoccipital carina absent; occiput coriaceous reticulate with sparse setae; A1 3.7× as long as wide and 2.2× as long as A2.

Mesosoma. Mesoscutum (L: W=11.4:15.3) convex, entirely coriaceous reticulate; mesoscutal humeral sulcus foveate; mesoscutal suprahumerale sulcus foveate; lateral pronotal area dorsally coriaceous reticulate followed by two oblique carinae, remainder smooth; epomial carina absent; pronotal suprahumerale sulcus not foveate; netrion sulcus entirely foveate; subacropileural sulcus indicated by a large depression; prespecular sulcus indicated by five weak foveae; mesopleural pit distinct; speculum with transverse carinae; episternal sulcus foveate; postacetabular sulcus foveate; femoral depression smooth; ventral mesopleuron reticulate; mesepimeral sulcus foveate; mesepimeral area smooth, narrower than width of mesepimeral sulcus; metapleural sulcus foveate; paracoxal sulcus weakly foveate; dorsal metapleural area and ventral metapleural area smooth; metapleural epicoxal sulcus with shallow depressions; scutoscutellar sulcus medially narrow, laterally wide and foveate; mesoscutellum semicircular (L: W=4.3:12.5), smooth, setose; posterior mesoscutteral sulcus foveate; metascutellum anteriorly foveate, remainder smooth; metanotal trough weakly foveate; lateral propodeal area smooth with foveae on inner margin; medial lateral propodeal carina hidden beneath metascutellum when viewed dorsally; fore wing (L: W=54.4:17.3) and hind wing (L: W=48.0:6.8) hyaline with dense microtrichia; ratio of length of *marginalis*: *stigmatis*: *postmarginalis* 6.0:4.8:10.7, respectively.

Metasoma. (L: W=27.9:15.4); T1 with longitudinal foveae, extending half the length of tergite; T1 laterally and posteriorly smooth; T2 with basal foveae, short lon-

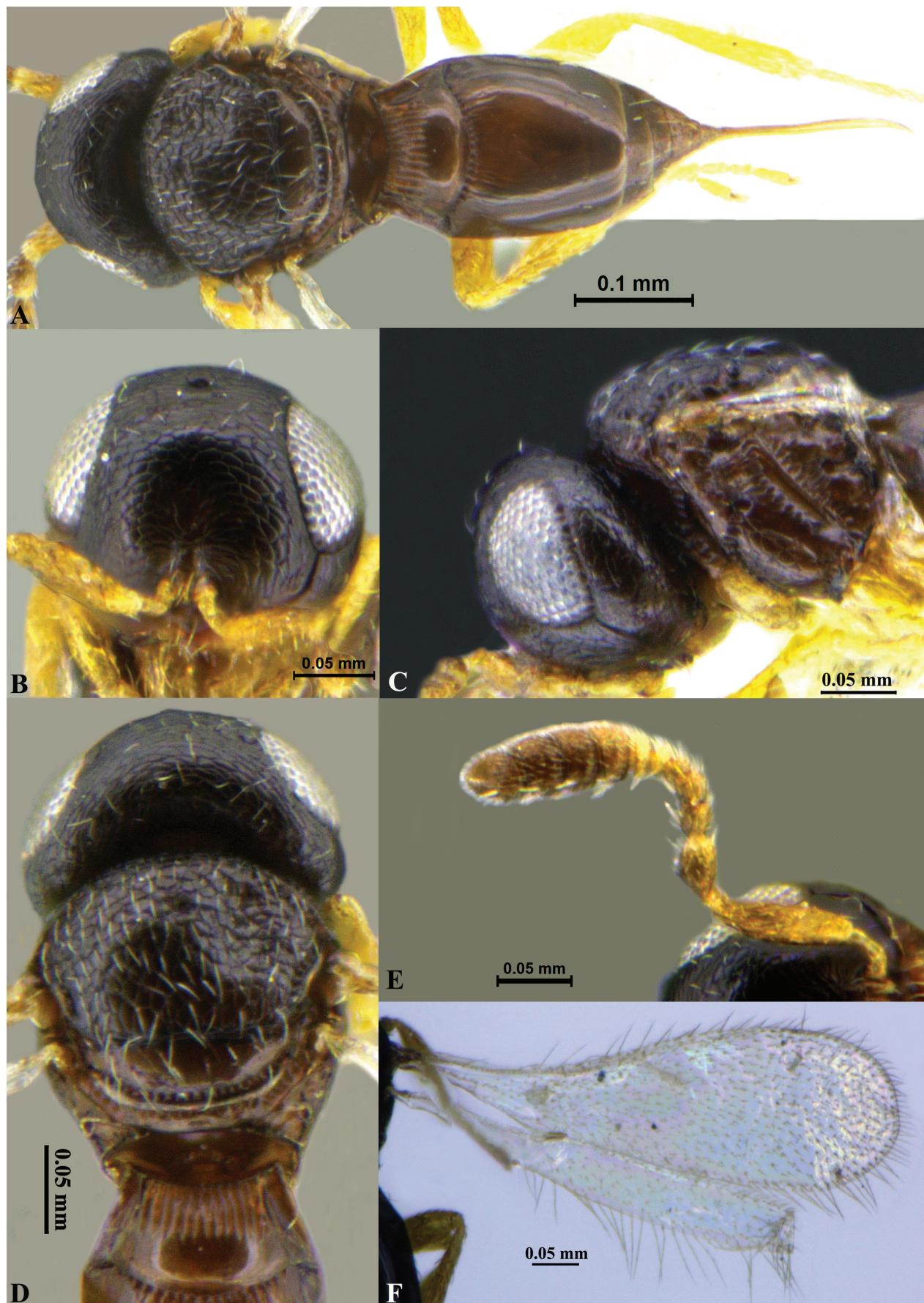


Figure 16. *Phanuromyia vakataka* sp. nov. (♀). **A.** Habitus (dorsal view); **B.** Frons; **C.** Head and pleuron; **D.** Head and mesonotum; **E.** Antenna; **F.** Wings.

itudinal striae present submedially, remainder smooth; posterior margin of T2 straight; T1 with two lateral setae and one sublateral seta; T2 $1.9 \times$ length of T1.

Male. Not known.

Etymology. This species is named after the Vakataka dynasty, which rose to power in Berar in the central Deccan in peninsular India in the mid-third century CE. The name is treated as a noun in apposition.

Key to females of Indian species of *Phanuromyia* Dodd, 1914

- 1 Head and mesosoma black, metasoma black-brown (Figs 1A–9A, 11A–16A) or at most T1 orange-brown (figs 11–13 in VK & MP 2014) 2
- Head, mesosoma black and metasoma xanthic (figs 1A–4A, 6A in VK & MP 2019) or entire body coppery brown (fig. 7A in VK & MP 2019) 21
- 2 T1 with two transverse rows of foveae (Figs 1A, 4A, 6A; fig. 2 in VK & MP 2014) 3
- T1 with a single transverse row of foveae (Figs 2A, 3A, 5A, 7A–9A, 11A–16A; figs 12, 19, 25, 34 in VK & MP 2014) 6
- 3 Anterior and posterior rows of foveae on T1 closely spaced (Fig. 1A; fig. 2 in VK & MP 2014) 4
- Anterior and posterior rows of foveae on T1 spaced widely, space between rows of foveae either smooth or striate (Figs 4A, 6A) 5
- 4 Reticulations on frons elongate and longitudinal; transverse striae above interantennal process absent (fig. 4 in VK & MP 2014); A1 short, $<3.3 \times$ as long as wide (fig. 3 in VK & MP 2014); T2 short, $<2.7 \times$ length of T1; posterior tergites barely visible, smooth (fig. 2 in VK & MP 2014); width of mesepimeral area subequal to that of mesepimeral sulcus; episternal sulcus and postacetabular sulcus foveate; ventral metapleuron smooth (fig. 6 in VK & MP 2014) *Phanuromyia andamanensis* Veenakumari
- Reticulations on frons almost polygonal; transverse striae above interantennal process present (Fig. 1B); A1 elongate, $>4.9 \times$ as long as wide (Fig. 1E); T2 elongate, $>3.7 \times$ length of T1; posterior tergites T3–T7 clearly visible with punctate sculpture (Fig. 1A); mesepimeral area narrower than width of mesepimeral sulcus; episternal sulcus indicated by a single fovea and postacetabular sulcus not foveate; ventral metapleuron transversely carinate (Fig. 1C) *Phanuromyia chalukya* sp. nov.
- 5 Metascutellum with two transverse rows of foveae (Fig. 6D); posterior row of foveae on T1 elongate; basal foveae on T2 as long as wide; space between both rows of foveae on T1 longitudinally striate medially; posterior margin of T2 weakly convex (Fig. 6A); prespecular sulcus indicated by seven foveae (Fig. 6C) *Phanuromyia kadamba* sp. nov.
- Metascutellum anteriorly foveate, remainder smooth with an uneven transverse furrow medially (Fig. 4D); posterior row of foveae on T1 short and ovoid; basal foveae on T2 wider than long; space between both rows of foveae on T1 smooth medially; posterior margin of T2 straight (Fig. 4A); prespecular sulcus indicated by three foveae (Fig. 4C) *Phanuromyia ganga* sp. nov.
- 6 Dorsal half of frons smooth, ventrally sculptured (Fig. 3B); mesoscutum anteriorly tuberculate and posteriorly longitudinally carinate (Fig. 3A, D) *Phanuromyia chola* sp. nov.
- Entire frons sculptured, at most with a small smooth patch medially (Figs 2B, 5B, 7B, 8B, 9B, 11B–16B); mesoscutum predominantly either reticulate or coriaceous reticulate (Figs 2D, 5D, 7D, 8D, 9D, 11D–16D) 7
- 7 Prespecular sulcus not foveate; mesepimeral sulcus indicated as a carina with 1–2 foveae dorsally; metapleuron posteroventrally with tuft of setae; paracoxal sulcus not foveate (Figs 8C, 9C) 8
- Prespecular sulcus foveate; mesepimeral sulcus foveate; metapleuron posteroventrally without setae; dorsal paracoxal furrow foveate (Figs 2C, 5C, 7C, 11C–16C; figs 16, 18, 29, 35 in KV & MP 2014) 9
- 8 Foveae on T1 short, less than half length of tergite; basal foveae of T2 small, wider than long (Fig. 8A); metascutellum evenly rounded posteromedially (Fig. 8D); mesoscutum convex (Fig. 8C); lateral pronotal area obliquely striate; dorsal metapleural sulcus not foveate, indicated as a furrow extending towards metapleural pit (Fig. 8C) *Phanuromyia kanya* sp. nov.
- Foveae on T1 elongate at least $0.9 \times$ length of tergite; basal foveae of T2 large, longer than wide (Fig. 9A); metascutellum weakly projecting posteromedially (Fig. 9D); mesoscutum not convex (Fig. 9C); lateral pronotal area coriaceous reticulate; metapleural sulcus dorsally indicated with a few foveae (Fig. 9C) *Phanuromyia nirvighna* sp. nov.
- 9 Lateral propodeal carina medially not visible when viewed dorsally; hidden beneath metascutellum (Figs 5D, 13D, 15D, 16D; figs 13, 28, 32 in VK & MP 2014) 10
- Lateral propodeal carina distinctly visible when viewed dorsally; metascutellum well above, not hiding lateral propodeal carina (Figs 2D, 7D, 11D, 12D, 14D; fig. 17 in KV & MP 2014) 16
- 10 T1 elongate, at least $0.4 \times$ length of T2 (Fig. 16A; figs 24, 25 in KV & MP 2014; episternal sulcus indicated with a distinct row of foveae (Fig. 16C; fig. 29 in KV & MP 2014) 11
- T1 short, at most $0.2 \times$ length of T2 (Figs 5A, 13A, 15A; figs 12, 34 in KV & MP 2014); episternal sulcus without a distinct row of foveae, at most indicated with a shallow fovea (Figs 5C, 13C, 15C; figs 16, 35 in KV & MP 2014) 12

- 11 Foveae on anterior margin of T1 small, at most $0.2 \times$ length of tergite; T1 medially smooth with striae sublaterally; anterior margin of T1 almost straight; T2 with lateral margins parallel; T2 with uneven short longitudinal striae posterior to basal foveae (figs 24, 25 in KV & MP 2014); frons with transverse striae adjacent to medial smooth patch (fig. 27 in KV & MP 2014)..... *Phanuromyia nabakovi* Veenakumari
- Foveae on anterior margin of T1 elongate, at least $0.5 \times$ length of tergite; T1 with uniformly elongate foveae anteriorly; anterior margin of T1 convex; T2 tapering posterad; T2 medially smooth, sublaterally with longitudinal striae posterior to basal foveae (Fig. 16A); frons with coriaceous reticulate sculpture adjacent to medial smooth patch (Fig. 16B)..... *Phanuromyia vakataka* sp. nov.
- 12 All coxae brown-black (Figs 5C, 13C); A3 elongate, longer than wide (Figs 5E, 13E)..... 13
- Fore coxa brown-black, meso and metacoxae yellow to yellow-brown (Fig. 15C); A3 globular, subequal in length and width (Fig. 15E; figs 14, 31 in KV & MP 2014) 14
- 13 Head when viewed dorsally protruding forward; preoccipital area distinct (Fig. 5A); gena and malar area basally punctate (Fig. 5C); frons transversely striate, surrounding medial smooth area and transversely carinate above interantennal process; frons without longitudinal carina medially (Fig. 5B); T2 entirely sculptured with longitudinal striae culminating in reticulations (Fig. 5A); fore wing with dense microtrichia and without reticulate sculpture (Fig. 5F) *Phanuromyia hoysala* sp. nov.
- Head when viewed dorsally round, not protruding; preoccipital area absent (Fig. 13A); gena basally smooth (Fig. 13C); malar area basally reticulate (Fig. 13C); frons medially with transverse carinae and a discontinuous longitudinal carina (Fig. 13B); T2 with short longitudinal carinae extending $0.6 \times$ length of tergite, remainder smooth (Fig. 13A); fore wing with sparse microtrichia and with reticulate sculpture (Fig. 13F) *Phanuromyia rashtrakuta* sp. nov.
- 14 Temples wide, as posterior margin of eye far away from occipital carina (figs 11, 13 in KV & MP 2014); reticulations of occiput not transverse (fig. 11 in KV & MP 2014); gena basally finely carinate (fig. 15 in KV & MP 2014); mesepimeral sulcus foveate only dorsally (fig. 16 in KV & MP 2014); malar sulcus joining the anterior margin of eye (fig. 14 in KV & MP 2014); striae on T2 culminating in coriaceous reticulations; T1 orange (fig. 12 in KV & MP 2014) *Phanuromyia kapilae* Veenakumari
- Temples narrow (Figs 15A, D; figs 30, 32 in KV & MP 2014); reticulations of occiput transverse (Fig. 15D; fig. 32 in KV & MP 2014); gena basally either reticulate or smooth (Fig. 15C; fig. 35 in KV & MP 2014); mesepimeral sulcus entirely foveate; malar sulcus joining the junction of anterior and posterior margin of eye (Fig. 15C; figs 35 in KV & MP 2014); striae on T2 not culminating into coriaceous reticulations; T1 black (Fig. 15A; fig. 34 in KV & MP 2014) 15
- 15 Frons dorsally finely reticulate, ventrally transversely striate above toruli; central keel absent (figs 31, 33 in KV & MP 2014); mesoscutum finely reticulate (fig. 32 in KV & MP 2014); metasoma ovoid (fig. 30 in KV & MP 2014); mesepimeral area narrower than width of mesepimeral sulcus (fig. 35 in KV & MP 2014) *Phanuromyia jarawa* Veenakumari
- Frons coriaceous reticulate with medial smooth patches, dorsal to which transverse striae present; a central keel with transverse carinae on either side present (Fig. 15B); mesoscutum coriaceous reticulate (Fig. 15D); metasoma wide posteriorly (Fig. 15A); mesepimeral area wider than width of mesepimeral sulcus (Fig. 15C) *Phanuromyia tuluva* sp. nov.
- 16 Frons with several transverse carinae above toruli (Fig. 2B); metasoma narrow and elongate, at least $2.3 \times$ as long as wide; T2 elongate, at least $1.5 \times$ as long as wide (Fig. 2A) *Phanuromyia chera* sp. nov.
- Frons at most with sparse transverse striae above toruli (Figs 7B, 11B, 12B, 14B; fig. 22 in VK and MP 2014); metasoma wide, at most $1.7 \times$ as long as wide; width of T2 either equal to or less than length (Figs 7A, 11A, 12A, 14A; figs 17, 19 in VK and MP 2014) 17
- 17 Central keel present (Figs 7B, 14B) 18
- Central keel absent (Figs 11B, 12B; fig. 22 in VK and MP 2014) 19
- 18 Head at least $1.5 \times$ as wide as high (Fig. 14B); longitudinal striae on T2 culminating in reticulations (Fig. 14A); mesoscutum entirely coriaceous reticulate, except for punctate sculpture posteromedially; fore wing at most $3.7 \times$ as long as wide (Fig. 14F); mesoscutellum at least $4.4 \times$ as wide as long (Fig. 14D) *Phanuromyia satavahana* sp. nov.
- Head at most $1.1 \times$ as wide as high (Fig. 7B); longitudinal striae on T2 culminating in sparse punctae (Fig. 7A); mesoscutum entirely coriaceous reticulate (Fig. 7D); fore wing at least $6.5 \times$ as long as wide; mesoscutellum at most $3.4 \times$ as wide as long (Fig. 7F) *Phanuromyia kakatiya* sp. nov.
- 19 Dorsal frons weakly reticulate, ventrally coriaceous reticulate (Fig. 11B); vertex and mesoscutum weakly reticulate (Fig. 11D); head $>1.6 \times$ as wide as high (Fig. 11B); head longer than high; metanotal trough not foveate (Fig. 11D); mesoscutum not convex when viewed laterally (Fig. 11C) *Phanuromyia pallava* sp. nov.
- Entire frons coriaceous reticulate at most with a medial smooth area and semicircular striae above toruli (Fig. 12B; fig. 22 in VK & MP 2014); vertex coriaceous reticulate; mesoscutum either entirely coriaceous reticulate or coriaceous reticulate with punctate medial patch (Fig. 12D; fig. 21 in VK & MP 2014); head at most $1.3 \times$ as wide as high (Fig. 12B; fig. 22 in VK & MP 2014); head higher than long; metanotal trough foveate (Fig. 12D; fig. 21 in VK & MP 2014); mesoscutum convex when viewed laterally (Fig. 12C; fig. 18 in VK & MP 2014) 20

- 20 Frons with a longitudinal smooth patch above interantennal process extending up to mid level with transverse striae on either side; semicircular striae present above toruli (fig. 22 in VK & MP 2014); marginal cilia on posterior margin of forewing elongate, 0.6× width of wing (fig. 23 in VK & MP 2014); mesoscutum entirely coriaceous reticulate (fig. 21 in VK & MP 2014)..... *Phanuromyia koenigi* Veenakumari
- Frons without medial smooth patch, short uneven carinae present medially above interantennal process; semicircular striae absent above toruli (Fig. 12B); marginal cilia on posterior margin of forewing short, 0.3× width of wing (Fig. 12F); mesoscutum coriaceous reticulate with a medial punctate patch (Fig. 12D) *Phanuromyia pandya* sp. nov.
- 21 Entire body coppery brown (fig. 7A in VK & MP 2019); metasoma at least 1.3× longer than head and mesosoma (fig. 7A in VK & MP 2019); posterior mesoscutellar sulcus not foveate (fig. 7B in VK & MP 2019); T1 smooth; T2 without basal foveae; posterior margin of T2 concave (fig. 7A in VK & MP 2019) *Phanuromyia tamaris* Veenakumari
- Head and mesosoma black, metasoma xanthic; metasoma shorter than head and mesosoma; posterior mesoscutellar sulcus foveate; T1 foveate; T2 with distinct basal foveae; posterior margin of T2 either straight or weakly convex (figs 1A, 2A, 3A, 5A, 6A in VK & MP 2019) 22
- 22 Mesoscutellum reticulate (fig. 3A in VK & MP 2019) *Phanuromyia reticulata* Veenakumari
- Mesoscutellum smooth (figs 1A, 2A, 5A, 6A in VK & MP 2019) 23
- 23 Prespecular sulcus, mesepimeral sulcus, dorsal metapleural sulcus foveate 24
- Prespecular sulcus, mesepimeral sulcus, dorsal metapleural sulcus not foveate 25
- 24 Dorsal frons smooth, ventrally striate-reticulate (fig. 2E in VK & MP 2019); vertex smooth with setigerous punctae; occiput transversely striate (fig. 2B in VK & MP 2019); occiput, dorsal lateral pronotal area, mesoscutum densely setose (fig. 2D in VK & MP 2019); T2 without longitudinal carinae beyond basal foveae (fig. 2A in VK & MP 2019); fore wing < 2.4× as long as wide (fig. 2F in VK & MP 2019) *Phanuromyia levigatus* Veenakumari
- Entire frons reticulate with a small smooth medial patch (fig. 1D in VK & MP 2019); vertex and occiput coriaceous reticulate (fig. 1A in VK & MP 2019); occiput, dorsal lateral pronotal area, mesoscutum sparsely setose (fig. 1E in VK & MP 2019); T2 with longitudinal carinae beyond basal foveae (fig. 1A in VK & MP 2019); fore wing >3.4× as long as wide (fig. 1C in VK & MP 2019) *Phanuromyia flaviabdominalis* Veenakumari
- 25 Preoccipital area distinct with longitudinal striae (fig. 5A in VK & MP 2019); head 1.2× as long as wide (Fig. 5C in VK & MP 2019); dorsal metapleuron smooth (fig. 5B in VK & MP 2019); posterior margin of mesoscutellum not smoothly curved, angular (fig. 5A in VK & MP 2019) *Phanuromyia rufocoxalis* Veenakumari
- Preoccipital area absent (fig. 6A in VK & MP 2019); head 1.5× as long as wide (fig. 6B in VK & MP 2019); dorsal metapleuron sculptured (fig. 6C in VK & MP 2019); posterior margin of mesoscutellum almost smoothly curved (fig. 6E in VK & MP 2019) *Phanuromyia shashikala* Veenakumari

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