



# *Entomofauna*

ZEITSCHRIFT FÜR ENTOMOLOGIE

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Band 33, Heft 33: 469-480    ISSN 0250-4413    Ansfelden, 30. November 2012

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## **Three new species of Sceliotrachelinae (Hymenoptera: Platygastroidea: Platygastriidae) from South India**

**K. VEENAKUMARI, Peter N. BUHL, K. RAJMOHANA & Prashanth MOHANRAJ**

### **Abstract**

Three new species of Sceliotrachelinae are added to the Indian fauna of Platygastriidae, two species to the genus *Fidiobia* ASHMEAD and one to *Plutomerus* MASNER & HUGGERT. The latter is represented by just two species worldwide. The three new species *F. virakthamati*, *F. nagarajae* and *P. veereshi* are all described from South India. A key to the three known species of *Plutomerus* of the world is provided.

Key words: Hymenoptera, Platygastriidae, Sceliotrachelinae, *Fidiobia*, *Plutomerus*, South India.

### **Zusammenfassung**

Aus den Gattungen *Fidiobia* ASHMEAD und *Plutomerus* MASNER & HUGGERT (Hymenoptera, Platygastriidae, Sceliotrachelinae) konnten drei neue Arten aus Süd-Indien beschrieben und illustriert werden: *Fidiobia virakthamati*, *Fidiobia nagarajae* und *Plutomerus veereshi*. Ein Schlüssel zur Trennung der drei weltweit bekannten Arten der Gattung *Plutomerus* ergänzt die Arbeit.

## Introduction

The subfamily Sceliotrachelinae, one of the five subfamilies of Platygasteridae is represented by just four genera viz. *Allotrappa*, *Amitus*, *Fidiobia* and *Plutomerus* in India (MANI & MUKERJEE 1981; RAJMOHANA 2011). The genus *Fidiobia* is represented by twenty species worldwide (JOHNSON 2011). So far no species of *Fidiobia* have been described from India except for the brief description of an undescribed species of *Fidiobia* by MANI & SHARMA (1982). This description does not match with the two species described in this paper. *Plutomerus*, an Oriental genus is represented by just two species worldwide viz. *P. indicus* (MUKERJEE) with the type species from India and *P. japonicus* YAMAGISHI from Japan (MASNER & HUGGERT 1989; VLOG 1995 and YAMAGISHI 1997). The type species was initially placed under *Platygastrinoides* by MUKERJEE (1981). Later in 1989 MASNER & HUGGERT erected a new genus *Plutomerus* under the *Fidiobia* cluster and placed *indicus* under it. The type of *P. indicus* is represented by one antenna and one pair of wings on a slide in the United States National Museum of Natural History, Washington DC. The descriptions made by MASNER & HUGGERT of *P. indicus* are based on a female collected from Nepal. They also state that the body size of the holotype as mentioned by MUKERJEE (1981) is 1.88 mm as against the Nepal specimen of 1.20 mm. A third species of *Plutomerus* is now described from South India.

## Material and Methods

Abbreviations and morphological terminology used in the text follow MASNER (1979), HARRIS (1979), MASNER & HUGGERT (1989), MIKÓ et al. (2007). Measurements and digital images were made using AutoMontage version 3.6 using Leica DFC 425 camera, Leica M205A stereomicroscope and 1X objective lens. The holotype and paratypes are deposited at the National Bureau of Agriculturally Important Insects, Bangalore, India and one paratype each at National Pusa Collection, IARI, New Delhi and the National Zoological Collection, at Zoological Survey of India, Calicut.

**A b b r e v i a t i o n s :** Head width (HW), Head height (HH), Head length (HL), Interorbital space (IOS), Length of transscutal line (TSL), Maximum length of mesoscutum (ML), Forewing width (WW), Hind wing width (HWW); length of hind wing cilia (HWS); Length (L), Width (W), Ocular ocellar line (OOL), Length of posterior ocellar line (POL), Lateral ocellar line (LOL); Distance between posterior end of notauli (DPN); Frontal cephalic index (FCI) a ratio of HW/HH, Lateral cephalic index (LCI) a ratio of HH/HL, A1-A9 Antennal segments 1-9, A1 being scape; T1-T6 – Metasomal tergites 1 to 6; S1-S3 – Metasomal sternites.

***Fidiobia virakthamati* nov.sp. VEENAKUMARI, BUHL & RAJMOHANA**

**Material examined:** Holotype ♀, (Reg.No.ICAR/NBAIL/P41) INDIA: Karnataka: Bengaluru: Attur, 13.IX.2010, yellow pan trap, N 13°04'36.49", E 77°33'54.71"; Paratypes: (Reg.No.ICAR/NBAIL/P42) INDIA: Karnataka: Bengaluru: Dodballapur, 8.XII.2009 sweep net 1 ♀, N13°18'18", E 77°31'24"; (Reg.No.ICAR/NBAIL/P43) Karnataka: Bengaluru: Attur, 16.VIII.2011, 1 ♀ malaise trap, N13°04'36.49", E77°33'54.71"; (Reg.No.ICAR/NBAIL/44) Karnataka: Bengaluru: Attur, 3.XII.2011, 1 ♀ yellow pan trap, N 13°04'36.49", E 77°33'54.71"; (Reg.No.ICAR/NBAIL/45) Karnataka: Bengaluru: Hebbal, 10.XI.2009, sweep net, 1 ♂, N 13°2'34", E77°35'9"; (Reg.No.ICAR/NBAIL/46) Karnataka: Mandya: Maddur, 26.XI.2009, sweep net, 1 ♀, N12°34'47", E72°2'7".

**Diagnosis:** Notauli broad, subparallel, almost uniformly broad, complete, reaching lateral margin of mesoscutum which is distinctly reticulate.

**Description:** Female (Holotype): Length = 1.10 mm

Black, antennae, mandible dark brown with extremities black, tegula brownish black, legs including coxae honey brown; foamy structures on metanotum, propodeum off-white.

**Head:** FCI=1.47; LCI = 1.25; HW/IOS = 2.07; head transverse 1.2 times wider than transscutal line; frons slightly bulging; vertex sloping posteriorly with occiput transverse; hyperoccipital carina not sharp, blunt; eyes very large (L:B=16.4 :13.3); temples almost absent; entire head with gofferred sculpture; head and eyes with very few sparse white setae; ocelli in a triangle with POL>LOL>OOL (8.5:4.3:1); mandible bidentate (with an additional small tooth-like structure at the base) with long white setae; clypeus very small; antenna nine segmented with a three segmented clava; A1 longest of all segments with a narrow ventral lamella throughout its length; the anterior end of scape flexed slightly dorsally; A1 including ventral lamella with reticulate sculpture; A3–A6 clothed with long white setae while remaining antennal segments clothed with short white setae; relative length and width of antennal segments 18.6:5.8; 6.1:2.6; 2.3:1.8; 2.4:1.8; 1.6:2; 2:3.7; 5.2:6.2; 4.2:5.7; 5.2:3.9

**Mesonotum:** L: B (26:23); (TSL/ML=1.35); epomial carina present; pronotum clearly visible dorsally, subangular, with linear reticulations; cervical pronotal area smooth; lateral pronotal area linear reticulate anteriorly, smooth in middle irregularly punctate posteriorly; short white setae present on the anterior rim of pronotum; mesopleura basally smooth, shining, with four unequal transverse ridges in the upper half; metapleura smooth and shining anteriorly followed by rich thick white decumbent pilosity and copious foamy structures; foamy structures extended and present in between hind coxae; notauli broad, subparallel, almost uniformly broad, reaching lateral margin of mesoscutum; inter notaular area foveate reticulate; lateral notaular area reticulate; DPN=0.134; anterior region of mesoscutum sloping forward; scutoscutellar sulcus deep, not foveate; mesoscutellum rectangular, 2.34 times as wide as long, glabrous; laterally confined by a lateral keels on either side which extend further into a spine; thick white evenly spaced setae present basally; interior to lateral keel a elongate fovea present on either side; a triangular foamy structure (base : height =148:71) present at base of mesoscutellum with a medial depression; propodeum also covered with rich foamy structures with a inverted 'J' shaped depression laterally; mesonotum with very sparse white setae;

Fore wings fully transparent with uniform distribution of microtrichia; tegula reticulate; fore wing wider than mesoscutum (TSL/WW=0.86); relative proportions of length and breadth of fore wing and hind wing are 72:30 and 65:14 respectively; marginal vein short, 0.18x of fore wing ending with a knob; hind wing about 3.7 times as wide as marginal ciliary length (HWW/HWS=3.71); frenal gutter well developed on fore wing and hind wing with two hamuli.

**Metasoma** : L:B (41:28); rectangular, dorsally flattened, with parallel sides; T1 smooth, shining, trapezoidal with a small blunt protuberance medially with a shallow depression on either side of the protuberance; 2 lateral setae present on T1; T2 broad, rectangular, with two basal pits; a shallow lateral depression on each side up to 1/3<sup>rd</sup> of anterior abdomen; laterotergites very long, with minute punctures and extending beyond the length of abdomen; other tergites not visible, retracted; S1 with a basal band of foamy structure which extends into three linear bands along the length of S1; white setae present on either side of foamy structure on S1; yellowish white setae present on laterotergite 1; S2 with unevenly rugosity anteriorly, rest smooth, shining; remaining sternites finely punctate; proportions of length and width of T1 and T2 are 9:22 and 28:25 respectively.

Male: Length: 0.975 mm

Similar to female except for the following characters; antenna nine segmented with claval segments more compact; proportions of length and width of antennal segments are 16.6:6.5; 5.7:3; 2.6:2; 2.4:1.8; 1.7:1.8; 1.7:2.8; 2.6:3.8; 3:3.9; 6.7:3.6; T3, T4, T5 and T6 visible and the proportions of length and width of these tergites are 11:107; 10:78; 10:52 and 15:38 respectively; one white setae found laterally on T5 and T6 on either side.

**Comments** : A characteristic species of *Fidiobia* on account of the shape and length of notauli. Neotropical *F. asina* (LOIACONO 1982) has them also complete, but thinner and much more converging. In Neotropical *F. flava* BUHL 2011 notauli also are also complete but very thin and inconspicuous, and this is a smoother and much paler species than *F. virakthamati*.

**Etymology** : Named after Dr. C.A. Virakthamath, a well known leaf hopper taxonomist.

### ***Fidiobia nagarajae* nov.sp. VEENAKUMARI, BUHL & RAJMOHANA**

**Material examined** : Holotype: ♀, (Reg.No.ICAR/NBII/P33) INDIA: Karnataka: Bengaluru: Attur, 5.IX.2011, yellow pan trap, N13°04'36.49", E77°33'54.71"; Paratypes: (Reg.No.ICAR/NBII/P34) INDIA: Karnataka: Chikkaballapur: Nandi Hills, 31.VIII.2010, 1 ♀, sweep net altitude 1132m, N13°21'39.17", E77°40'49.23"; (Reg.No.ICAR/NBII/P35) Karnataka: Bengaluru: Hebbal, 10.XI.2009, 1 ♂ sweep net, N 13°2'34", E77°35'9".

**Diagnosis** : Head 1.17 times as wide as mesosoma; mesonotum scaly reticulate; notauli broad, cone shaped, reaching half of mesonotum, with five longitudinal striae in each notaulus; female metasoma slightly wider than mesosoma.

**Description** : Female: (Holotype): Length =0.987 mm

Body fully black except for T1; T1 brownish black; antenna honey brown with antennal club dark brown; tegula brownish black; foamy structures on metanotum and propodeum whitish; mandibles brownish black; legs including coxae yellowish brown.

**H e a d** : FCI= 1.62; LCI= 1.22; HW/IOS= 2.22; Head transverse 1.17 times wider than mesosoma; frons slightly bulging, vertex sloping, hyperoccipital carina blunt, eyes oval large (L:B= 15.1:12.8) with very sparse short white setae; temples absent; entire head with goffered sculpture; ocelli very prominent in a triangle, POL: LOL: OOL is 79:33:10; clypeus very small, mandibles bidentate with prominent long white setae; antenna nine segmented with three segmented clava; A1 longest of all antennal segments, ventral lamella on one side is linear and narrow and present throughout the length of A1 while on other side it is broader and present only on anterior half; club clothed with short dense setae, setae on A2-A6 longer and sparse; A1 including lamella reticulate; relative proportions of length and width of antennal segments are 13.5:3.9; 5.8:2.6; 2:1.9; 1.8:1.9; 1.5:1.9; 1.6:2; 4.2:4.4; 3.3:4.4; 4.1:3.4.

**M e s o s o m a** : L:B (25:24) Pronotum subangular clearly visible from above; adorned with sparse white setae; epomial carina present; cervical pronotal area smooth; short white setae present on anterior rim of pronotum; upper lateral pronotal area striate, lower pronotal area smooth with a depression at base; mesonotum scaly reticulate; notauli broad, cone shaped, reaching half of mesonotum, with five longitudinal striae in each notaulus; mesopleura basally smooth, with a strong sternaulus and with two long and three short transverse ridge in the upper half; metapleura in anterior half glabrous and posterior half with recumbent long white setae and foamy structures; mesoscutellum smooth shining with very few setae; half as long as wide (L:B=65:137); mesoscutellum base with short white setae; metanotum with a short triangular foamy structure with a broad depression in middle (base: height =74:75); scutoscutellar sulcus not foveate; propodeum anteriorly smooth with long white setae; basally and laterally covered with foamy structures; foamy structure found in between hind coxae.

Wings transparent with almost uniform distribution of microtrichia; fore wing (L:B 82:29) 1.14 times wider than mesoscutum (TSL/WW=0.293); hind wing (L:B = 70:13); fore wing with marginal vein short (1/5<sup>th</sup> length of fore wing) with a knob; fore wing with frenal gutter and hind wing with two hamuli; hind wing cilia around 0.4 times the width of hind wing.

**M e t a s o m a** : (L:B= 37:25) T1 trapezoidal with two long white lateral setae on either side; T1 with medial blunt protuberance with a carina on either side running the entire length of T1; few white setae present anteriorly; T2 longest, glabrous almost as wide as mesoscutum; L:B =29:25; anterior T2 with two basal pits; a narrow ridge present just above basal pit; a shallow lateral depression on each side up to 1/3<sup>rd</sup> of anterior abdomen; other tergites retracted and not clearly visible T6 triangular; S1 with foamy basal band with three linear bands along length of S1 along with white setae; lateral tergite 1 with recumbent yellowish white setae; laterotergites finely punctate; S3, S4, S5, S6 very small;

Male: Length : 0.869mm

Similar to female except for antenna and body size; proportions of length and width of antennal segments are 14.4:5.1; 5.1:2.8; 2.8:1.8; 2:1.8; 1.6:2; 2.5:3; 3.5:3.5; 2.9:4.4; 6.8:3.7; club covered with dense long setae (0.014mm) while rest of antenna with sparse setae.

**C o m m e n t s** . Very similar to *Fidiobia semistriata* BUHL, O'CONNOR & ASHE 2009 from Sulawesi, but it differs from this species in having head wider relative to

mesosoma, scaly reticulate mesonotum, female metasoma wider than mesosoma, mesopleura with a strong sternaulus and with two long and three short transverse ridges. Also Afrotropical *F. zebra* BUHL 2010 has longitudinally striated wide notauli, but in that species the entire hind part of mesoscutum, not only notauli as in *F. nagarajae*, is longitudinally striated.

**E t y m o l o g y :** Named after Dr. H. Nagaraja, a well known *Trichogramma* taxonomist.

***Plutomerus veereshi* nov.sp. VEENAKUMARI, BUHL & RAJMOHANA**

**M a t e r i a l e x a m i n e d :** Holotype: ♀, (Reg.No.ICAR/NBAIL/P37) INDIA: Karnataka: Bengaluru: Attur, 30.VIII.2011, pitfall trap, N13°04'36.49", E77°33'54.71"; Paratypes: (Reg.No.ICAR/NBAIL/P38), INDIA: Karnataka: Bengaluru: Attur, 10.VIII.2011, 1♀, Malaise trap, N 13°04'36.49", E 77°33'54.71"; (Reg.No.ICAR/NBAIL/P39), Karnataka: Bengaluru: Gandhi Krishi Vigyana Kendra, 30.IX.201, 1♂ sweepnet, N13°2'3", E77°35'18".

**D i a g n o s i s :** LOL slightly longer than OOL (51:45); female A5 1.5 times as long as A4; mesopleura with seven transverse ridges.

**D e s c r i p t i o n :** Female (Holotype) Length=1.386 mm.

Body fully black; antenna orangish brown with club blackish brown; foamy structures off-white; coxae blackish brown, femora brown, tibia and tarsi yellowish brown; mandibles blackish brown; tegula blackish brown.

**H e a d :** FCI= 1.386; LCI=1.426; HW/IOS=1.721. Head transverse, a little wider than mesonotum (HW/TSL=1.12); occiput strongly concave and scooped/caved in forming a sharp hyperoccipital carina which continues around the eye orbits forming a ledge next to orbits; eyes large (L:W= 21:19) with very sparse white setae; temples absent; ocelli very prominent, POL>LOL>OOL (94:51:45); clypeus small; mandibles bidentate with long white setae; entire head including vertex, occiput with umblicate reticulations and sparse white setae; antennae nine segmented with three segmented clava; A1 with very much enlarged ventral lamella; entire scape including lamella with linear reticulations interspersed with transverse ridges; lamella translucent; A2-A9 clothed with setae, A4-A6 with long white setae; club densely covered with short white setae; proportions of length and width of antennal segments are 25:17; 7:3; 5:2; 2:2.5; 3:4.5; 1.5:2; 5:7; 5:8; 6:7.

**M e s o s o m a :** L:B= 38:34; mesonotum sloping forward; pronotum reticulate, clearly visible dorsally, angulate anterolaterally; epomial carina not distinct; lateral pronotal area umblicate reticulate, lower pronotal area smooth with a depression at base; mesonotum with deep, broad notauli (0.025mm broad) which narrows down at posterior end; notauli diverging anteriorly ; DPN=0.122; inter notaular area with irregular uneven crevices, lateral notular area granulate; mesopleura smooth with seven transverse ridges of which 3<sup>rd</sup> and 5<sup>th</sup> are short and restricted to anterior half, three transverse ridges in lower half above sternaulus; metapleura anteriorly smooth followed by sparse white setae and rich foamy structures; mesoscutellum smooth, L:B = 7:25; mesoscutellum adorned with thin white setae anteriorly and thick white setae posteriorly; lateral keels on either side of mesoscutellum raised and projecting downwards as a blunt tooth; scutoscutellar sulcus deep, nonfoveate; metanotum with a triangular foamy structure with a deep depression in

centre (base: height=20:11); propodeum covered with foamy structures which extends between hind coxae; wings transparent with microtrichia almost uniformly distributed; proportions of length and width of fore wing and hind wing are 96:41 and 77:21; marginal vein on fore wing 0.15 length of fore wing; frenal gutter on fore wing and two hamuli on hind wing present.

**M e t a s o m a** : L:B= 60: 37; T1 trapezoidal with base faintly sinuate in centre, with 2 white lateral setae; T1 with small medial protuberance with fovea on either side; T2 longest and broadest of all tergites; T2 with two basal pits with extended depression on lateral margins; T2 with upper 2/3<sup>rd</sup> uniformly smooth; lower 1/3<sup>rd</sup> of T2, T3, T4 finely punctate; T6 triangular; first laterotergite with dense yellowish white recumbent setae; second laterotergite finely punctate; S1 with foamy structures extending as three broad bands from the basal band, white setae present between these bands; S2 with rugged sculpture anteriorly, smooth in middle and finely punctate in basal 1/3<sup>rd</sup>, proportions of length and width of T1 –T4 are 12.8:13.2 (anteriorly); 12.8:33.5 (posteriorly); 39.8:37.2; 3.8:25.9:3.2:16.8.

**Male**: Length=1.366mm; similar to female except for antennal segments; clava orangish; relative proportions of length and breadth of antennal segments 25:14; 7:3; 6:2; 2:3; 2:3; 2:3; 4:5; 4:5; 7:5.

**E t y m o l o g y** : Named after Dr. G. K. Veeresh, a well known soil biologist.

**C o m m e n t s** : This species can be separated from the two other species of the genus by the key below.

#### **Key to the hitherto described World species of *Plutomerus* (♀ ♀)**

- 1 OOL 1.5 times as long as LOL; mesoscutum evenly covered by minute coin-like structures ..... *P. japonicus* YAMAGISHI 1997
- OOL shorter than LOL; mesoscutum granulate laterally, midlobe with uneven crevices ..... 2
- 2 A5 1.5 times as long as A4; A6 one and a third times as wide as long; mesopleura with seven transverse ridges; T2 less than 1.1 times as long as wide... *P. veereshi* nov.sp.
- A5 only about half as long as A4; A6 more than twice as wide as long; mesopleura with five transverse ridges; T2 more than 1.1 times as long as wide ..... *P. indicus* (MUKERJEE 1981)

#### **Acknowledgements**

The authors are grateful to Dr. N. K. Krishna Kumar, Director, NBAIL, Bangalore for providing facilities for conducting this work. The first author is also grateful to Ms. B.L. Lakshmi for all the help rendered. We also thank 'The Platygastridae Planetary Biodiversity Inventory Project' for literature support.

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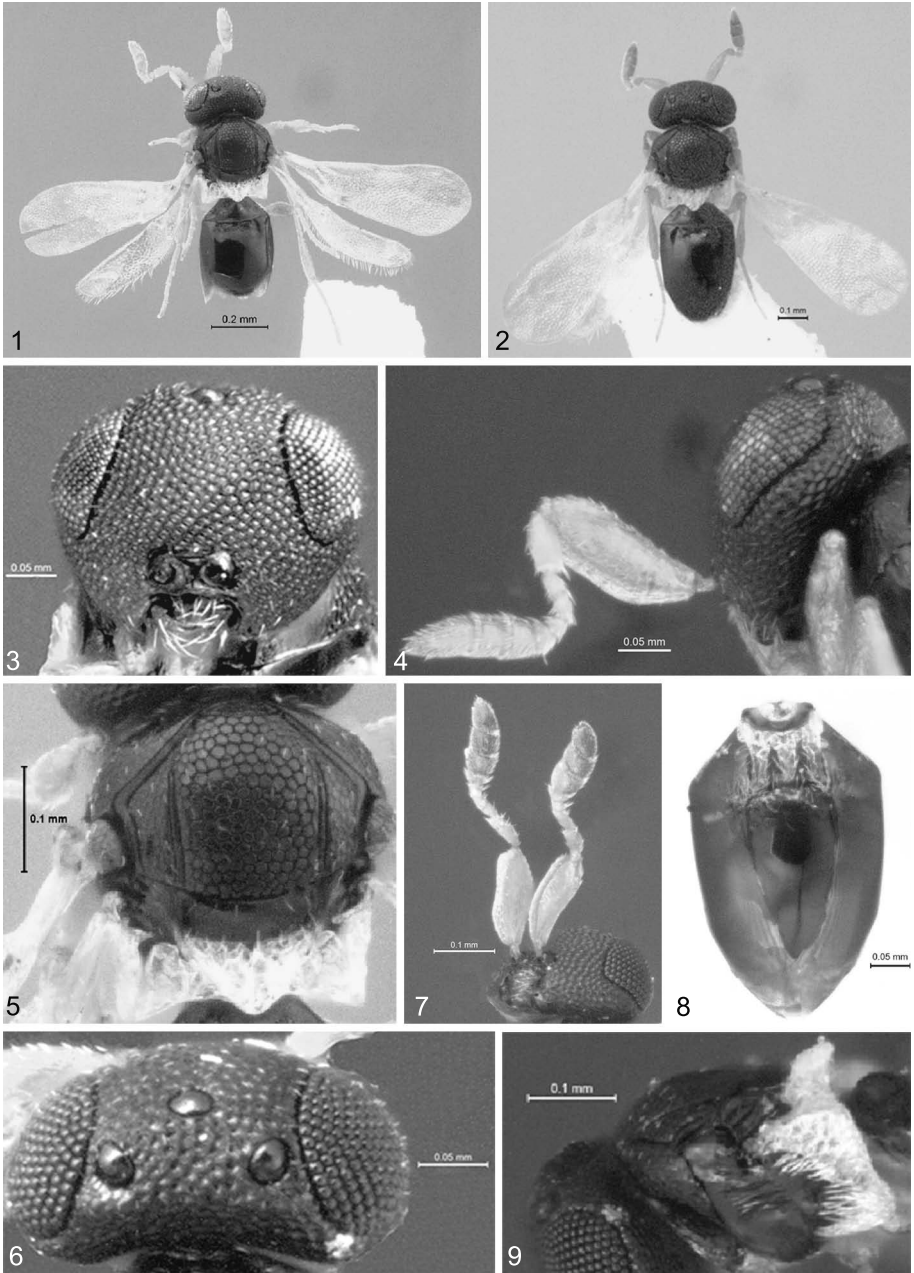
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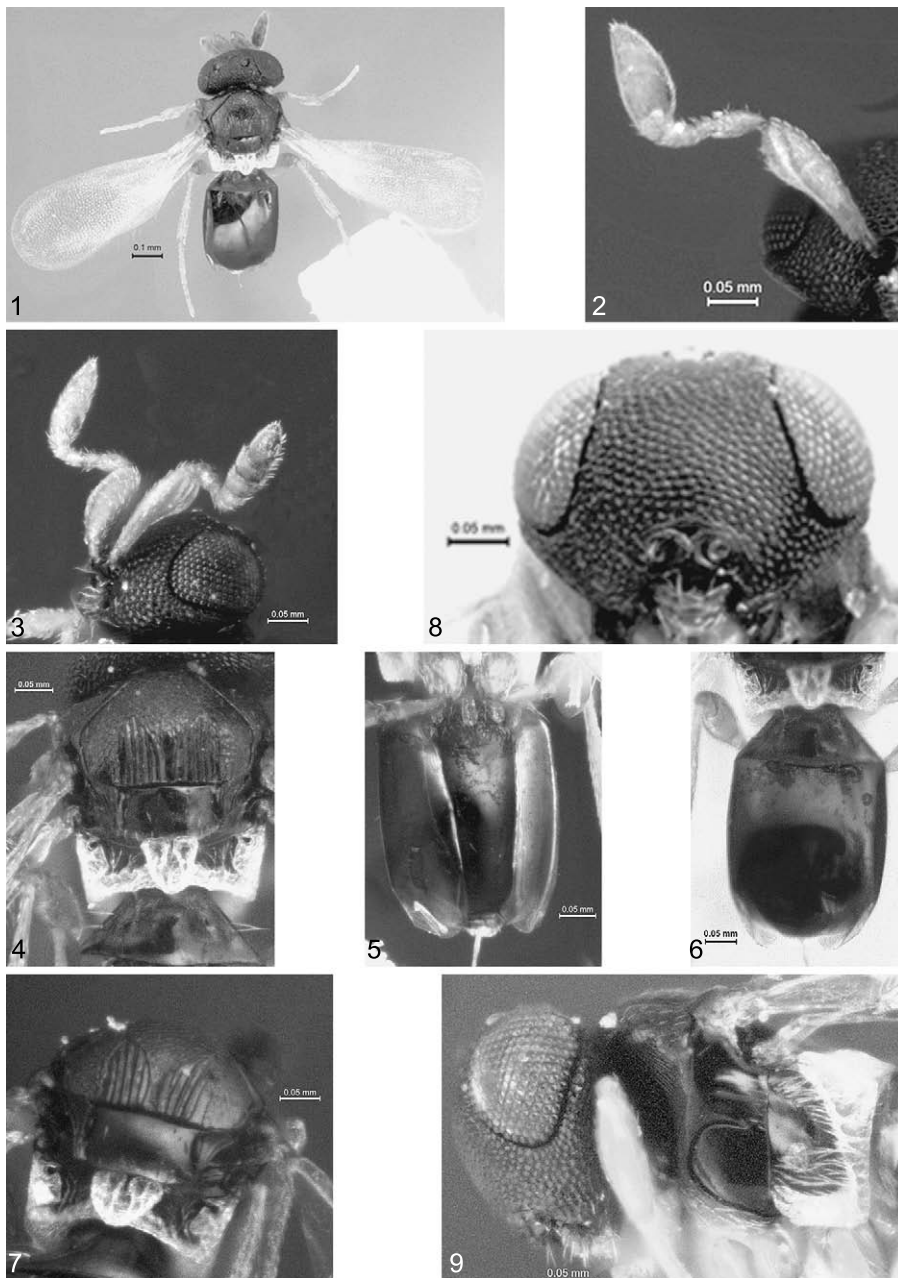


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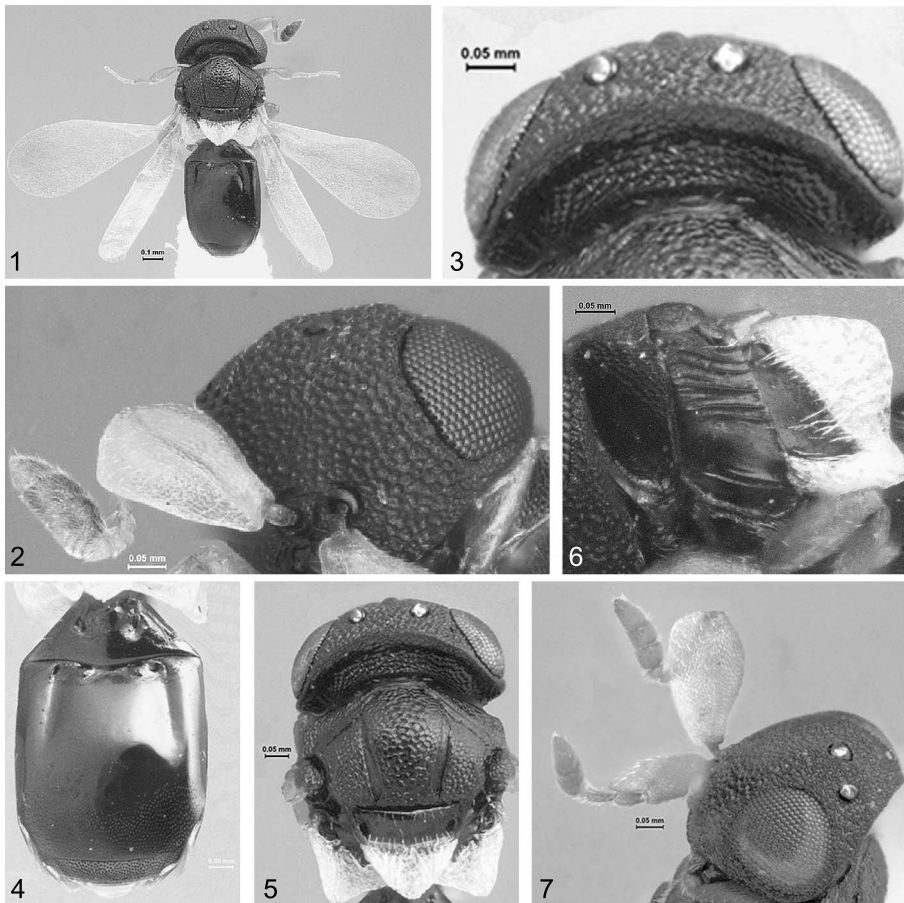
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**Plate 1:** *Fidiobia virakthamati* nov.sp.: (1) Female. (2) Male. (3) Head – front view. (4) Antenna (male). (5) Mesosoma – dorsal view. (6) Head dorsal view. (7) Antennae (Female). (8) Metasoma – ventral view. (9) Metasoma – lateral view.



**Plate 2:** *Fidiobia nagarajae* nov.sp.: (1) Female. (2) Female antenna. (3) Male antennae. (4) Mesosoma. (5) Metasoma ventral view. (6) Metasoma dorsal view. (7) Mesosoma showing notauli. (8) Face – frontal view. (9) Lateral view of mesosoma.



**Plate 3:** *Plutomerus veereshi* nov.sp.: (1) Female. (2) Head frontal view with antenna (Female). (3) Head showing vertex. (4) Metasoma – dorsal view. (5) Mesosoma – dorsal view. (6) Mesosoma-lateral view. (7) Head with antennae (male).

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Zeitschrift/Journal: [Entomofauna](#)

Jahr/Year: 2012

Band/Volume: [0033](#)

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