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NOTE

**FIRST REPORT OF *MANTIBARIA MANTIS* (DODD)
(HYMENOPTERA: SCELIONIDAE: SCELIONINAE) FROM INDIA
AND ADDITIONAL DESCRIPTORS FOR THE SPECIES**

Kamalanathan Veenakumari & Prashanth Mohanraj

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FIRST REPORT OF *MANTIBARIA MANTIS* (DODD) (HYMENOPTERA: SCELIONIDAE: SCELIONINAE) FROM INDIA AND ADDITIONAL DESCRIPTORS FOR THE SPECIES

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The genus *Mantibaria*, egg parasitoids of praying mantids, was erected by Kirby in 1900. Masner (1976) mentions it as a most unusual genus in Scelionidae due to its ectoparasitic habit of feeding on the haemolymph of adult mantids during its phoretic phase. This genus is represented all over the world and very recently from the new world too (Masner 1976; Oliveira & Schoeninnger 2017). There are four species of *Mantibaria*, viz.: *mantis* (Dodd) from Australia, *seefelderiana* (De Stefani) from the Palaearctic region, *solygiae* Risbec from the Afrotropical region, and *kerouaci* Veenakumari & Rajmohana from India (Dodd 1913; Kieffer 1926; Masner 1976; Veenakumari et al. 2012; Johnson 1992, 2016). Mineo & Szabó (1978) redescribed *M. seefelderiana* and designated a neotype for the species 'owing to the loss of the original type material'. Two males of *M. solygiae* were reared from the ootheca of the mantid, *Soligia sulcatifrons* Serville, 1893 while *M. mantis* was reared from the ootheca of *Mantis religiosa* (Linnaeus 1758). Chopard (1922) and Rabaud (1922) have given a detailed account of the biology of *Mantibaria*. These

phoretic wasps are known to stay under the wings of the mantids. When the host insect lays its eggs, they descend onto the host egg mass and parasitize the eggs before the ootheca hardens. So far only one species, *M. kerouaci* was known from India (Veenakumari et al. 2012). *M. mantis* has so far been reported only from Australia.

We now report *M. mantis* from India and provide additional descriptors along with images, since the earlier description of the species is inadequate for the identification of the species.

Morphological terminology follows Masner (1976, 1980), Mikó et al. (2007, 2010) and Burks et al. (2013). Both the specimens of the present study were collected by sweep netting (SN). Specimens were mounted on point-card tips. The descriptions and imaging were carried out with a Leica M205A stereomicroscope, with 1× objective equipped with a Leica DFC-500 digital camera. Specimens examined in this study are deposited in the ICAR-National Bureau of Agricultural Insect Resources, Bangalore, India. Both specimens were collected by K. Veenakumari.

The following abbreviations are used in the description of the taxa. All the measurements are taken as per Mikó et al. (2010). HL-Head length; HW-Head width; HH-Head height; FCI-Frontal cephalic index (HW/HH); LCI-Lateral cephalic index (HH/HL); A1 - A10-Antennomeres 1–10 (A1=Scape, A2=Pedicel); L-Length; W-Width; H-Height; OOL-Ocellar-ocular length; POL-Posterior ocellar length; LOL-Lateral ocellar length; IOS-Interorbital space; Tm1–Tm5- Tarsomeres 1 to 5; T1–



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T6-Metasomal tergites 1 to 7. Width of all metasomal tergites taken anteriorly.

Though over 80 oothecae of mantids were collected, none yielded the egg parasitoid *Mantibaria*. They only yielded three species of *Podagrion* Spinola (Torymidae) and an unidentified species of Eupelmidae.

***Mantibaria mantis* (Dodd)
(Images 1–10)**

Rieliomorpha mantis Dodd, 1913: 156

Rielia mantis Kieffer, 1926, 279, 280

Mantibaria mantis Masner, 1976, 54:

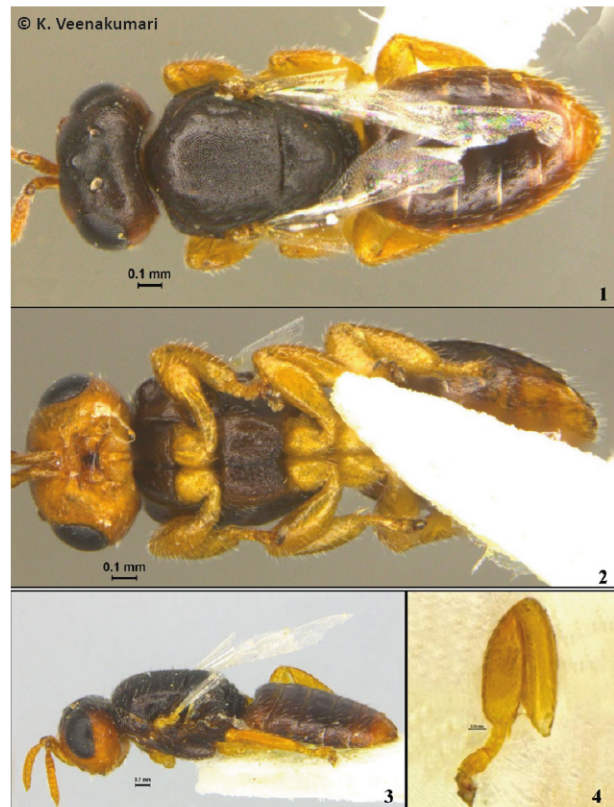
Material examined: (ICAR/NBAIR/P928), India: Karnataka, Chintamani, College of Sericulture, 13.59027778 N & 78.13888889 E, 858m, SN, 28.ix.2011, 1 female; (ICAR/NBAIR/P929) Karnataka: Tumkur, Stud farm, 13.03361111 N & 77.06333333 E, 784m, SN, 11.ix.2011, 1 female, coll. K. Veenakumari. Both the specimens are deposited at the National Bureau of Agricultural Insect Resources, Bengaluru. These specimens were identified as *M. mantis* by comparison with the images of the holotype provided in Platygastroidea Planetary Biodiversity Inventory (http://osuc.biosci.ohio-state.edu/hymDB/eol_scelionidae.home)

Female. Body length=2.781 mm (m=2.247 (1.713-2.781) mm; SD=0.755, n=2)

Color: Dorsally, head and mesosoma dark brown, metasoma a shade paler except for orange posterior tergites; ventrally mesosoma dark brown, metasoma medially and laterally yellow; eyes black; frons, gena orange; antennae orange except dark brown A2; tegula and all legs bright yellow; wings hyaline (Images 1–3).

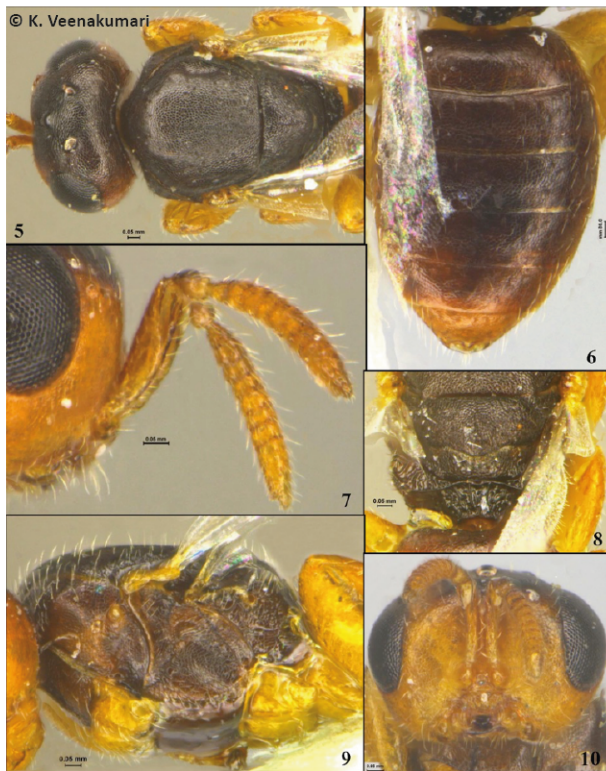
Head (Figs 1, 2, 3, 5, 7, 10): FCI=1.90; LCI=0.89; IOS 0.6× width of head, shortest posterior to anterior ocellus; eyes large (L: W=62.5:54.7) with sparse short setae; POL>OOL and OOL and LOL equal; ratio of POL:OOL:LOL in ratio of 17.5:8.6:8.6; frons, vertex and gena with fine granulate microsculpture; hyperoccipital carina absent; a faint ridge present between lateral ocelli and inner orbit; faint elongate striae present from base of occipital carina towards vertex; clypeus (L: W=7.5:15.3) reticulate; mandible (L: W=6.3:13.0) with three black teeth; antenna with ten antennomeres; length and width of antennomeres A1–A10 in ratio of 26.1:6.9, 7.6:5.5, 5.4:4.7, 3.8:6.4, 3.7:6.0, 3.2:5.7, 3.4:5.9, 3.0:6.4, 3.5:6.0, 13.8:6.1, respectively; A10 much elongate, 0.53× as long as A1, posteriorly truncated, becoming narrow apically.

Mesosoma (Images 5, 8, 9): Mesoscutum (L: W=54.7:62.5) with same sculpture as that on head;



Images 1–4. Brightfield images of *Mantibaria mantis* (female)
1 - Habitus (dorsal view); 2 - Habitus (ventral view);
3 - Habitus (lateral view); 4 - Foreleg

notauli absent; a short parapsidal furrow present latero-medially; pronotum visible from above; lateral pronotal area, mesopleuron and metapleuron with same sculpture as on head with reticulations of various sizes; epomial carina weak; netrion absent; mesopleuron with a short sternaulus; mesopleural depression distinct; mesopleural carina extending up to hind tegula; spiracles very distinct; mesoscutellum (L: W=24.9:41.4) with granular microsculpture and a short incomplete median keel; posterior margin of mesoscutellum not straight, extending medially; scutoscuteellar sulcus not foveate; metascutellum broad with same sculpture as that on mesoscutellum; propodeum broad with coarse sculpture, with three longitudinal carinae medially; anterior margin of propodeum carinated which is flexed laterally with a striated triangular area above it. Wings present but broken medially. All legs highly modified; femur (L: W=41.4:16.2) and tibia (L: W=33.7:12.0) very broad; length and width of tarsal segments Tm1- Tm5 in ratio of 4.4:4.6, 2.0:4.6, 2.1:4.7, 2.0:4.5, 9.0:6.7, respectively; Tm5 almost 1.5× as long as Tm2–Tm4 together; two claws (L: W= 5.7:3.5) and an enlarged



Images 5–10. Brightfield images of *Mantibaria mantis* (female)
 5 - Head and mesosoma; 6 - Metasoma; 7 - Antennae;
 8 - Mesoscutellum, metascutellum and propodeum; 9 - Pleuron;
 10 - Frons and antennae

empodium (L: W=8.0:5.3) present (Image 4).

Metasoma (Fig. 6): (L: W= 98.9:69.7); all tergites with uniform granular microsculpture; brown setae present on metasoma, setae denser laterally; length and width of tergites T1–T7 in ratio of 19.6:40.5, 18.5:64.0, 17.7:69.0, 16.4:66.8, 14.2:57.5, 10.1:39.0, 6.5:19.8, respectively; T7 with two sensory plates.

Discussion

Only four species of *Mantibaria* have been described worldwide. Though tropical countries like India are rich both in platygastroids and mantids, specimens of *Mantibaria* are rarely collected unless they are obtained from rearings of parasitized oothecae. During recent studies, Platygastroidea were collected from several regions in India in yellow pan traps, Malaise traps, pitfall traps, flight intercept traps and sweep nets, however, it was sweep nets alone that yielded five specimens of *Mantibaria* over a span of eight years. This pattern was identical to that of other phoretic species of Platygastroidea such as *Protelenomus* Kieffer and *Scelicerdo* Muesebeck (Veenakumari et al. 2012; Veenakumari & Mohanraj 2015). *Mantibaria* females

exhibit an obligate phoretic relationship as they shed their wings after hitching onto their hosts thus facilitating easy entry into the frothy mantid egg mass before it solidifies (Bin 1985; Couturier 1941). Rarity in collections may thus be attributed to the phoretic nature of these parasitoids in which the adults spend most of their lives on the host insect.

M. mantis has so far been reported only from Australia. Two species of *Mantibaria*, *M. mantis* (Australia) and *M. seefelderiana* (Africa, European and Indo-Malaysian regions) appear to be conspecific as no significant differences are noticeable between them in the images of the types hosted on the Platygastroidea website (http://osuc.biosci.ohio-state.edu/hymDB/eol_scelionidae.home). Masner (1976) and Galloway & Austin (1984) too were of the same opinion; however, as Galloway & Austin (1984) mention, this can only be ascertained when the types are studied.

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