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Redescription of *Protelenomus flavicornis* KIEFFER (Platygastroidea: Platygastridae) from India

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Abstract

The phoretic genus *Protelenomus* (Platygastridae: Telenominae) is represented by only two species – *P. flavicornis* and *P. anoplocnemidis* worldwide. *P. flavicornis* is being reported for the first time from India. Phoretic on *Anoplocnemis phasiana* (Heteroptera: Coreidae) it is redescribed as the original description is meagre.

Key words: *Protelenomus*, Telenominae, phoresy.

Introduction

The subfamily Telenominae (Hymenoptera: Platygastroidea: Platygastridae), comprising species with the potential for use in biological control, is represented by six genera in India. These are *Eumicrosoma* GAHAN, *Trissolcus* ASHMEAD, *Telenomus* HALIDAY, *Mudigere* JOHNSON, *Paratelenomus* DODD et al. *Protelenomus*, another genus in this subfamily was erected by KIEFFER (1906). This phoretic genus is represented by just two species, *Protelenomus flavicornis* KIEFFER and *P. anoplocnemidis* (GHESQUIÈRE) worldwide (MASNER 1976, JOHNSON 1992; 2012). *Protelenomus anoplocnemidis* was first described as an endoparasitoid of *Anoplocnemis curvipes* F. (Heteroptera: Coreidae) by

Ghesquière (1948), and later redescribed by Risbec (1950). *Protelenomus* is reported as an egg parasitoid of *Anoplocnemis* spp. (Ghesquière (1948), Risbec 1950, Kohno 2002). The phoretic females parasitized the eggs of *Anoplocnemis* spp. when reared together in the laboratory (Kohno 2002).

Anoplocnemis phasiana is a pest of grapes, brinjal (egg plant), dolichos bean, redgram, groundnut, glyricidia, pongamia and ridge gourd (Puttarudraiah and Maheswaraiyah, 1956). The phoretic association between an undescribed species of *Protelenomus* and *A. phasiana* was studied by Kohno (2002) from Japan. The mean number of parasitoids on an adult coreid bug varied from 0.6 - 24. The genus *Protelenomus* is being reported for the first time from India and *P. flavicornis* is redescribed and illustrated as it was inadequately described by Kieffer (1906, 1926).

Material and Methods

When collecting platygastriids from the field, two coreid bugs (*Anoplocnemis phasiana* (Fabricius)) were collected by hand from a meter high *Solanum melongena* L. (Solanaceae) plant. One of them had six platygastriids on it.

Morphological studies including digital images and measurements were made using AutoMontage version 3.6 Leica DFC 425 camera, Leica M205A stereomicroscope and 1x objective lens. The material studied is deposited at the National Bureau of Agriculturally Important Insects, Bangalore, India;

Abbreviations and morphological terminology used in the text follow Masner (1979, 1980) and Mikó et al. (2007, 2010).

Abbreviations: Head width (HW), head height (HH), head length (HL), frontal cephalic index (FCI=HW/HH), lateral cephalic index (LCI=HH/HL), interorbital space (IOS), antennal segments (A1-A11), length of transscutal line (TSL), length (L), width (W), ocular ocellar length (OOL), post ocellar length (POL), lateral ocellar length (LOL), metasomal tergites 1 to 6 (T1-T6), metasomal sternites 1-6 (S1-S6).

Results

Protelenomus flavicornis Kieffer (Plate 1, 2)

Female: Body length = 2.18 mm

Body black, shining; antenna, legs brownish, basitarsi dark brown, claws blackish brown; coxae brownish black, mandible black, clypeus, ocelli dark brown.

Head: FCI(HW/HH) = 1.73; LCI (HH/HL) = 1.15; HW/IOS = 1.36; head transverse almost 1.70 times as wide as high; head 1.15 times as wide as mesosoma (HW/TSL= 1.15); frons transversely reticulate, with a very shallow antennal scrobe and covered with sparse white setae; interantennal process prominent with depression beside antennal insertion; orbital carina and malar sulcus very well developed; central keel absent; clypeus large, bluntly bidentate, mandible unidentate with few short stout white setae at

base; most of gena longitudinally reticulate, basally smooth, with few short, stout white setae; eyes bulging (L : W = 1.84 : 0.24), bare; POL: LOL: OOL = 26:11:2; vertex reticulate, bulging on sides, depressed in centre; post orbital carina very sharp, temples two times longer than OOL; occipital carina well developed, foveolate; temples areolate; malar region reticulate and scrobiculate along orbital carina; antenna eleven segmented, non clavate, densely clothed with short white setae; scape with a narrow anteroventral lamella; measurements of length and breadth of antennal segments (A1-A11) are 29.8:4.6; 7.2:4.2; 7.0:4.5; 4.5:4.9; 4.6:4.6; 4.2:4.9; 4.4:4.8; 4.1:4.5; 4.1:4.8; 3.8:4.9 8.3:4.0.

Mesosoma (L:W= 60:45): Pronotum not visible from above; pronotal cervical sulcus foveolate; epomial carina present; cervical pronotal area setose rugose; upper lateral pronotal area striate, lower lateral pronotal area with deep foveae; netrion smooth; mesonotum sloping anteriorly, variously sculptured; anteriorly punctate, laterally reticulate, medially coriaceous, posterolaterally striate; entire mesonotum covered with thick short white setae; skaphion and notauli absent, a parapsidal line marked by carina present towards extreme lateral side of mesonotum .

Mesoscutal suprahumeral sulcus foveolate; scutoscutellar sulcus non foveolate; mesoscutellum semicircular (L:W= 24:16); mesoscutellum coriaceous with 3-4 striae on either side converging medially; a triangular patch of dense setae present medially with few sparse setae laterally; posterior mesoscutellar sulcus foveolate; mesepimeral sulcus foveolate, fovea elongate in upper region; postmesepimeral area smooth; mesopleural pit and femoral depression prominent; metapleuron with highly prominent metapleural pit; metapleural sulcus foveolate; dorsal metapleural area punctate-rugose, ventral metapleural area striate; metanotal trough foveolate, metascutellum striate with eight strong prominent carinae; propodeum well developed with several strong striae and longitudinal fovea.

Metasoma (L:W= 9.2:6.1): Metasoma elongate with six visible abdominal segments; T1 short, medially withdrawn, strongly costate, costae arising from basal depressions reaching posterior margin of T1; lateral setae on T1 present; T2 costate, costae arising from basal depressions, extending $9/10^{\text{th}}$ of length of T2, costae becoming narrower towards posterior margin; T2 apically smooth; second laterotergite smooth with few white setae extending more than half the length; T3, T4, T5, T6 finely, densely punctate, apically smooth; long thin white setae present on T3, T4, T5, T6 lateromedially; lateral striae on S2 length extending up to $3/4^{\text{th}}$ of S2, medial striae extending up to $1/3^{\text{rd}}$ of S2 length; S2 apically smooth, with few setigerous punctae; S2 with lateral setal fields; remaining sternites setigerous punctate; length and breadth of tergites T1-T6 are 12.3:41.4; 54.2:61; 5.2:57.5; 4.5:53; 5.7:45; 10.0:30.3.

Fore wing (L:W= 13:5) and hind wing (L:W= 11:3.5) with short brown setae; submarginal vein less than half of forewing length, marginal vein small, length less than $1/3^{\text{rd}}$ of stigmal vein length, postmarginal vein absent; both wings with marginal cilia; hind wing about six times broader than length of hind wing cilia (HWW/HWS= 6.36).

Legs: Femora, tibiae of mid and hind legs well developed relative to fore legs; coxae, femora reticulate, tibiae, basitarsi carinate; basitarsi of mid and hind legs with a row of dense white setae apically, hind tibia with dense setae laterally at apical $1/3^{\text{rd}}$; claws well developed, curved; length of five segments of leg are in ratio of 13: 13.3: 35.1: 42.6:

33.8; length of five tarsal segments including claw are 19.6: 2.1: 1.3: 1.5: 9.3; arolium well developed.

B i o l o g y : Six females of *Protelenomus* were found on an adult *A. phasiana* (Fig. 1a) collected from an isolated *S. melongena* plant growing in a cultivated plot of land in July, 2012 from Bangalore, S. India. Unlike other phoretic scelionids like *Mantibaria* and *Sceliocerdo*, these parasitoids were not anchored on to their host with their mandibles, but were clinging on to them with their legs. While four individuals were lodged on the mesonotum, the other two were found on the hind leg.

When the adult *A. phasiana* harbouring the parasitoids died after 8 days in confinement a fresh female of the bug was introduced into the container. The parasitoids continued to remain on the dead host and did not move on to the newly introduced individual. One parasitoid died on the date of collection. All the others died from 5-11 days after the death of the host. The total longevity of the parasitoids from the date of collection varied from 13 to 19 days.

The parasitoids held on tenaciously to their coreid host as they did not drop off or fly away even when the bugs were hand-picked from their host plant. Unlike the female of *Sceliocerdo viatrix* (BRUES) which cling on to their grasshopper host (*Neoarthacris acuticeps* BOLIVAR) even after the death of both the host and parasitoid, the females of *P. flaviconris* dropped off their host after their death. They also did not move over to another bug after the death of their host only when they died did they drop off their host.

M a t e r i a l e x a m i n e d : Female, (Reg.No.ICAR/NBAIL/P47, P48, P49, P50, P51, P52), INDIA: Karnataka: Bangalore: Kengeri, 17.vii.2012, collected on *Anoplocnemis phasiana*, 12° 54' N latitude, 77° 29' E longitude.

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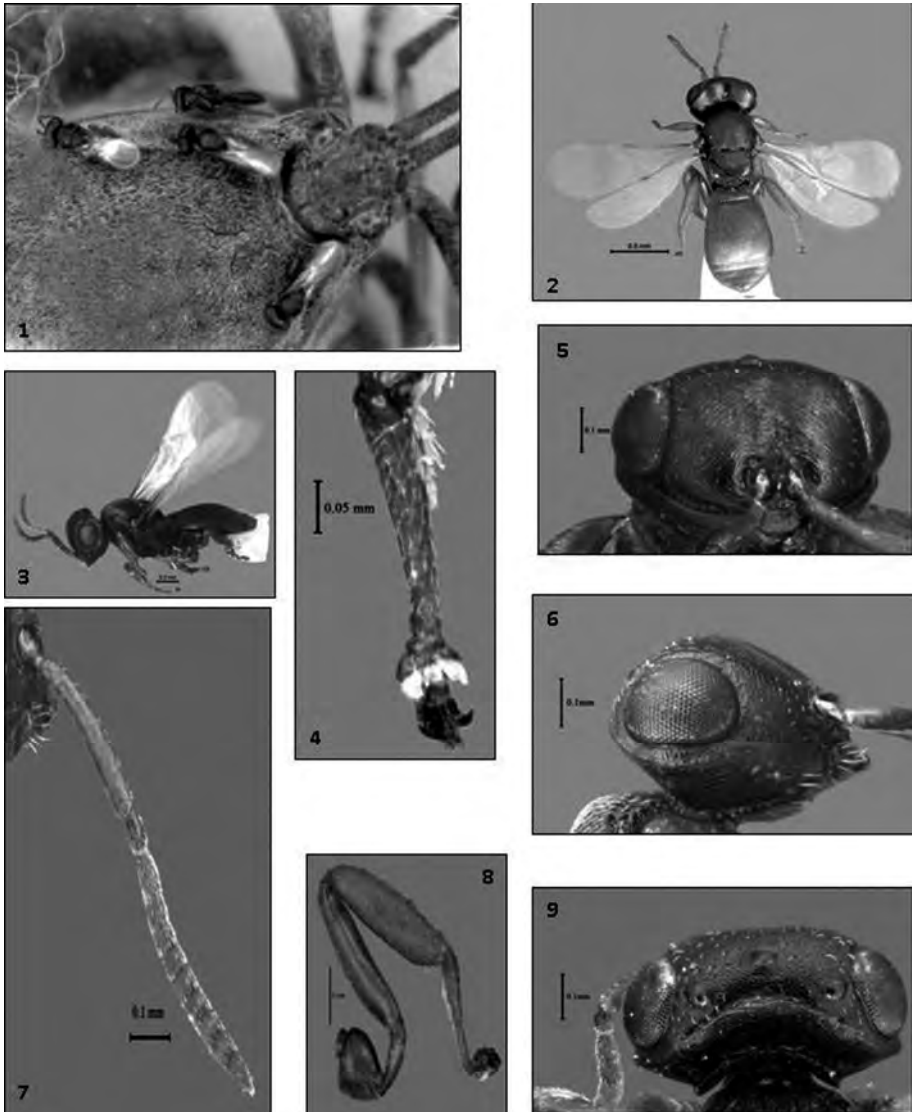


Plate 1: *Protelenomus flavicornis* (1) Phoretic adults on *Anoplocnemis phasiana* (2) Habitus (dorsal view) (3) Habitus (profile) (4) Basitarsus showing well developed claws (5) Frons (6) Lateral view of head (7) Female antenna (8) Hind leg (9) Vertex.

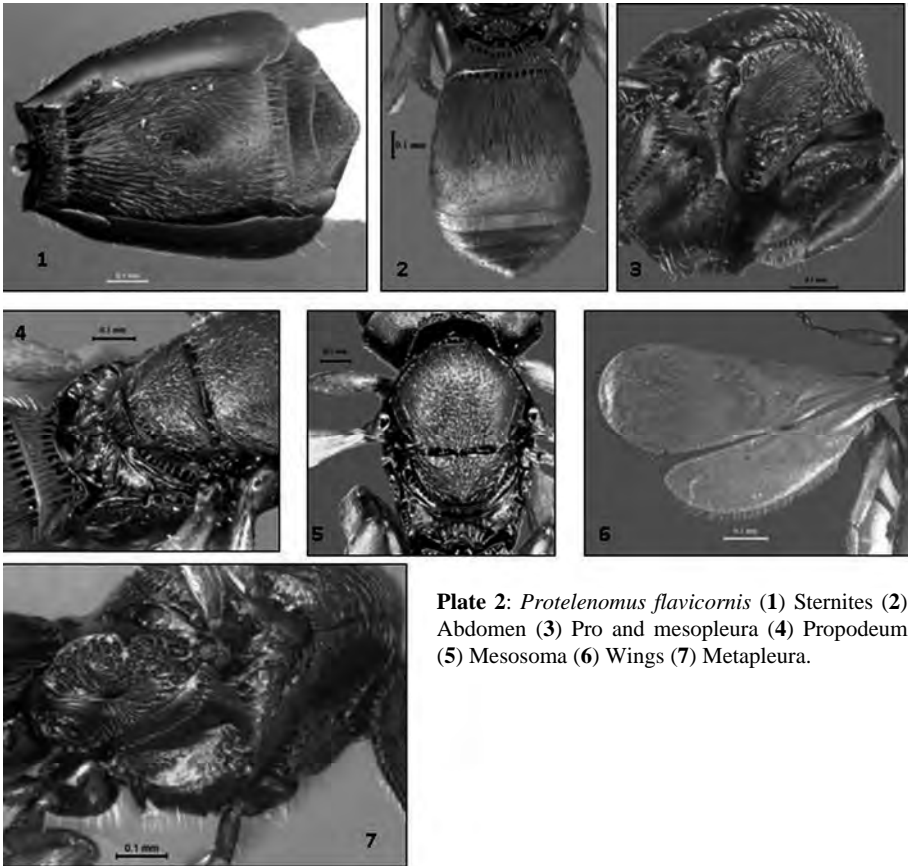


Plate 2: *Protelenomus flavicornis* (1) Sternites (2) Abdomen (3) Pro and mesopleura (4) Propodeum (5) Mesosoma (6) Wings (7) Metapleura.

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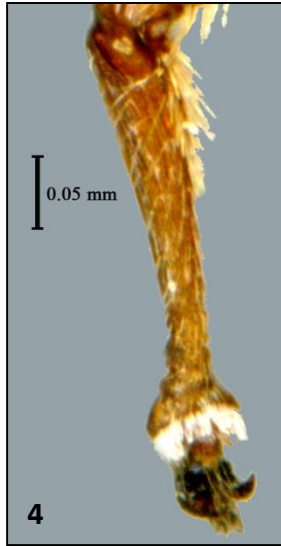
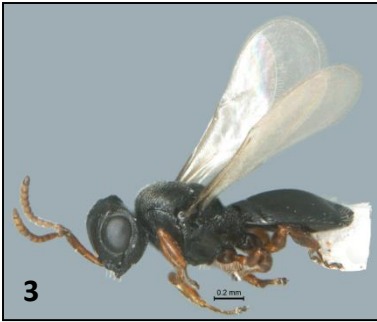


Plate 1

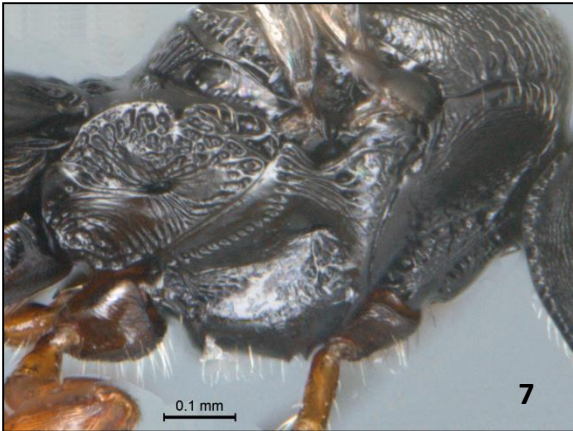
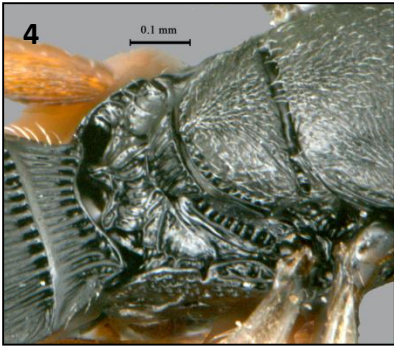
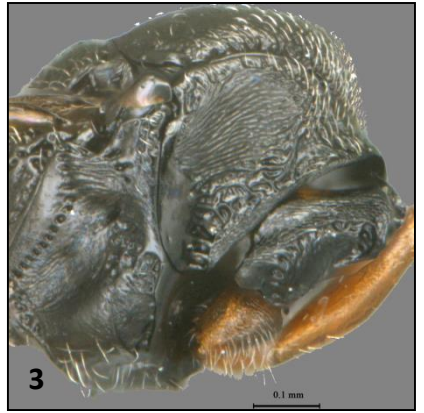
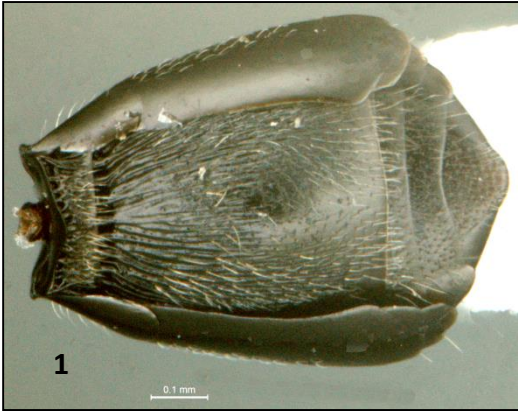


Plate 2