

AN ATYPICAL, BRACHYPTEROUS SPECIES OF *IDRIS* FÖRSTER (PLATYGASTROIDEA: SCELIONIDAE) FROM INDIA*

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A new species of *Idris* – *Idris semiflaviventris* sp. n. – belonging to the tribe Baeini is described from Kodaikanal in the Western Ghats, South India. This species is unusual in that it has a short interocellar space, subequal posterior margins of T1 and T2, and T2 the longest and widest tergite.

Keywords: Baeini, brachyptery, mesoscutellum, T2, T3, spider, taxonomy, Hymenoptera.

INTRODUCTION

The tribe Baeini (Scelionidae) are specialist endoparasitoids of spider eggs (IQBAL & AUSTIN 1997). *Idris elba* Talamas, recently found parasitizing the eggs of *Bagrada hilaris* (Burmeister) (Hemiptera: Pentatomidae) (LOMELI-FLORES *et al.* 2019), is the only species that does not conform to the utilization of Araneidae as ovipositional hosts. Of the 12 genera in Baeini (*sensu* AUSTIN 1986, AUSTIN & FIELD 1997), the three most speciose are *Idris* Förster (including *Ceratobaeus* Ashmead as junior synonym with 325 species), *Baeus* Haliday (91 species) and *Odontacolus* Kieffer (55 species) (AUSTIN & FIELD 1997, JOHNSON *et al.* 2018, VEENAKUMARI *et al.* 2020). While *Odontacolus* are apparently confined to the tropical and subtropical regions, the other two genera are ubiquitous in their distribution (JOHNSON *et al.* 2018).

Recent molecular studies by CAREY *et al.* (2006) reveal that *Baeini* (*sensu* AUSTIN 1986, AUSTIN & FIELD 1997) is polyphyletic and not monophyletic as previously thought, the included species switching twice to spider hosts within the Scelionidae.

Idris was erected by FÖRSTER (1856) based on male specimens, with *I. flavicornis* as the type species. Simultaneously he erected another genus *Acolus* with female specimens, oblivious of the fact that they were sexual dimorphs of the congeneric *Idris* (MASNER 1961, HUGGERT 1979). It was only in 1961 that Masner, taking cognizance of this, synonymized these two genera. HUGGERT (1979) detailed the convoluted synonymic history of these genera in his revision of *Idris* and *Ceratobaeus* of the West Palaearctic region.

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Species of the tribe Baeni, in general, has a wide range of wing size morphology. It can be found individuals with macropterous (large, fully functional wings) through brachypterous (small, non-functional wings, reduced to less than a third of their normal size) to micropterous (reduced, non-functional, flap-like remnants of wings). It is only the former two states that are found in species of *Idris* with the majority of them being macropterous, while some are brachypterous (CAREY *et al.* 2006, HUGGERT 1979). Abbreviated wings and a wide body in some Baeni are surmised to be two adaptations enhancing their ability to burrow through leaf litter to locate the silken egg sacs to parasitize the eggs of spiders (AUSTIN *et al.* 2005). Eight of the twenty species reported by HUGGERT (1979) from the Western Palaearctic exhibit sex-specific brachyptery with only the females being brachypterous and males (of known species) macropterous. Of these eight species, three, *viz.*, *I. flavicornis* Förster, *I. piceiventris* (Kieffer) and *I. semicastaneus* (Kieffer) have brachypterous wings of variable lengths from short to extending just beyond T2 to macropterous. The Western Palaearctic females, however, do not have wide or expanded bodies. AUSTIN *et al.* (2005) believe that except for a couple of non-Australian *Idris* and *Ceratobaeus* wing reduction appears to be species-specific.

Thirty of the 325 species of *Idris* reported from the world occur in India (JOHNSON 1992, RAJMOHANA 2006, 2014, VEENAKUMARI *et al.* 2015, JOHNSON *et al.* 2018, HOL 2019) all of which are macropterous. Only two species groups, the *melleus*-species group (MASNER & DENNIS 1996) and the *adikeshavous*-species group (VEENAKUMARI *et al.* 2015) have so far been defined in the effort to bring order to this vast genus. Creation of region-wise species groups will further help in this direction when cataloguing the species diversity of this disparate mega-genus.

Unlike the species detailed above, a new atypical species of *Idris* characterized by wing reduction in both sexes coupled with a wide body is described in this paper.

MATERIAL AND METHODS

Colour images were obtained using 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 specimens used for SEM studies were mounted on SEM stubs, and images were captured using Hitachi Table top microscope TM3030 (ESEM: Environmental Scanning Electron Microscope). The specimen was attached using two-sided conductive adhesive copper tape to the aluminium stub. No metal or carbon coating was applied. No dehydration treatments were used in the variable pressure vacuum system (VPSEM/environmental SEM). The same specimen could be carefully reoriented on the stub to obtain images of different parts enabling retrieval of the specimens. Measurements were taken during the imaging process.

Terminology for morphology follows MASNER (1976, 1980), MIKÓ *et al.* (2007, 2010) and that for macro and microsculpture HARRIS (1979). The following abbreviations are

used in the description of the taxa. L – length; W – width; A1–A12 – antennomeres 1–12; IOS – interorbital space; T1–T3 – metasomal tergites 1–3. Width of all metasomal tergites taken anteriorly. All the measurements are taken following the method of Míkó *et al.* (2010).

All the specimens were collected using yellow pan traps (YPT).

The type specimens of the new species are deposited in the ICAR-National Bureau of Agricultural Insect Resources (ICAR-NBAIR), Bengaluru, India.

TAXONOMY

Idris semiflaviventris* Veenakumari sp. n. (Figs 1–6)

Material examined: Holotype, female (ICAR/NBAIR/P2693), INDIA: Tamil Nadu: Kodaikanal, Shenbaganur, 10°14'01''N 77°30'47''E, 1865m, YPT, 02.IV.2014. Paratypes: 1 female, (ICAR/NBAIR/P2694), same data as holotype; 2 males, (ICAR/NBAIR/P2695, P2696), same data as holotype.

Description: Female body length = 0.98 mm ($m = 0.93(0.88–0.98)$ mm, $n = 2$). Male body length = 0.83 mm ($m = 0.85(0.83–0.86)$ mm, $n = 2$).

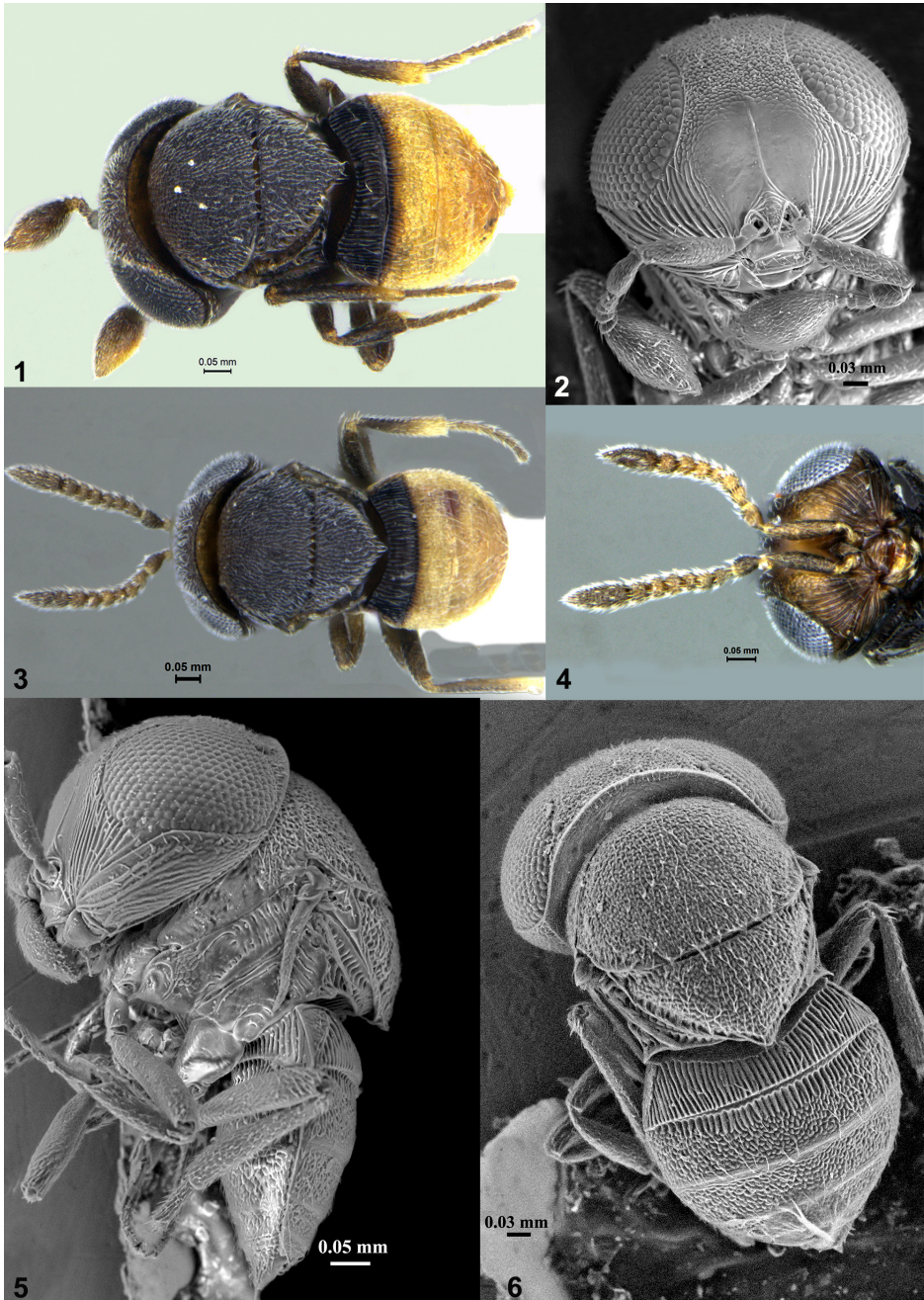
Colour (Figs 1 & 3): Head, mesosoma and T1 dark brownish black; remainder of metasoma yellowish brown; antenna brownish black; coxa, femur and anterior 3/4th of tibia blackish brown and remainder of leg brownish black.

Head (Figs 1, 2, 5 & 6): Vertex and dorsal mesonotum covered with dense short white setae; head 1.23× as wide as high and 1.3× as high as long; IOS very short, 0.3× width of head, 0.57× eye length; dorsal frons rugose, antennal scrobe distinct on either side of central keel; vertex rugose; gena densely striate; anterior and posterior margins of gena parallel and converging dorsally; POL > LOL in ratio of 20.2:15.4; posterior ocelli contiguous with orbits; distance between hyperoccipital carina and posterior margin of lateral ocellus <0.4× MOD; posterior margin of eye touching hyperoccipital carina, densely setose, subequal in length and width; interantennal process rugose, protruding; facial striae and malar striae distinct; A1 and clava subequal in length; A2 3.1× as long as A3; A3 subequal in length and width; clava 2× as long as wide.

Mesosoma (Figs 1, 5 & 6): Mesoscutum and mesoscutellum 0.65× and 0.57× as long as wide respectively; both mesoscutum and mesoscutellum with same sculpture as that on vertex; notauli absent; lateral pronotal area dorsally rugose, remainder predominantly smooth with sparse weak transverse carinae posteriorly; subacroleural sulcus and mesepimeral sulcus foveate, speculum with deep furrows; mesopleural pit and mesopleural carina distinct; ventral mesopleuron smooth with a rugose patch medially; ventral margin of mesopleuron extending as a narrow structure; metapleuron dorsally with transverse carinae, remainder smooth except for foveate metapleurale sulcus posteriorly; paracoxal sulcus indicated as a furrow; posterior margin of mesoscutellum 'V' shaped, extending over anterior margin of T1 hiding metascutellum and medial propodeum; posterior mesoscutellar sulcus foveate; propodeum triangular with vertical carinae, visible dorsolaterally, with postero-lateral corners extending as a spine; fore wing sclerite narrow extending up to T1.

Metasoma (Figs 1, 5 & 6): Metasoma 0.82× as long as wide; T1 distinctly visible dorsally and strongly costate, with a triangular granular patch laterally; T2 with anterior one-third costate; the remainder of T2 and other tergites with granular sculpture; T2 longest

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Figs 1–6. *Idris semiflaviventris* sp. n.: 1 = habitus, dorsal view (female), 2 = head (female), 3 = habitus, dorsal view (male), 4 = head (male), 5 = habitus lateral view (female), 6 = habitus dorsal view (female)

and widest of all tergites; posterior margins of T1 and T2 subequal; T2 1.4× as long as T3; T2 0.25× as long as the width of its anterior margin; submarginal ridge well impressed.

Male (Figs 3 & 4): Similar to female. Antenna moniliform with nine visible antennomeres unlike that generally found in males of *Idris* which have 12 antennomeres where the last two antennomeres are either fused or have a distinct constriction between them.

Etymology: The species epithet 'semiflaviventris' refers to the yellow color of T2 and remaining tergites in both sexes. The name is treated as an adjective.

Diagnosis: *Idris semiflaviventris* sp. n. is unique among all the species of *Idris* so far described because of the following combination of character states: both male and female are brachypterous; T2 longer than T3 (except *I. adikeshavus* species group); posterior margins of T1 and T2 subequal; IOS narrow, at most 0.3× head width; male antenna with nine visible antennomeres. This combination of character states is not present in any other described species of *Idris*.

However, this species resembles two Indian species, *I. triangularis* Mukerjee and *I. coorgensis* (Mani et Mukerjee) in having a posteriorly extended mesoscutellum. The salient differences between *I. semiflaviventris* and the other two species are T2 longest and widest of all tergites, posterior margin of T1 and T2 subequal; IOS short, at most 0.3× head width in *I. semiflaviventris* sp. n. while in the other two species T3 longer and wider than T2, posterior margin of T1 narrower than posterior margin of T2, IOS at least 0.6× head width.

Idris triangularis is macropterous; central keel on frons extending up to anterior ocellus; mesoscutum and mesoscutellum finely reticulate and shiny; T2 entirely costate; whereas *I. semiflaviventris* sp. n. is brachypterous, central keel on frons extending half the length of frons; mesoscutum and mesoscutellum rugose; T2 anteriorly costate and posteriorly rugose.

Idris coorgensis was described based on a male specimen. This species is also macropterous; notaulus present; male antennomeres A11 and A12 with distinct constriction; mesoscutum and mesoscutellum finely reticulate; T2 entirely costate; whereas *I. semiflaviventris* sp. n. is brachypterous; notaulus absent; male antennae with 9 visible antennomeres; mesoscutum and mesoscutellum rugose; T2 anteriorly costate and posteriorly rugose.

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