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First report of the genus *Oxyserphus* Masner (Hymenoptera: Proctotrupidae) from India with description of a new species

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ABSTRACT

In this study, *Oxyserphus narendrani* Debnath and Rajmohana sp. nov. (Hymenoptera: Proctotrupidae) is described from India. This represents the first record of the genus *Oxyserphus* Masner from India and the first formally described species of the genus from the Oriental Region. A comprehensive morphological description, diagnosis, and illustrations are provided. An updated checklist of the Indian species of Proctotrupidae is also presented.

Keywords: dark taxa, Oriental fauna, Proctotrupeidea, Proctotrupinae.

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1. INTRODUCTION

The genus *Oxyserphus* Masner, 1961 (Hymenoptera: Proctotrupidae) was established with *Proctotrupes maculipennis* Cameron, 1888 as the type species. Townes and Townes (1981) revised the genus *Oxyserphus*, and later, Kolyada and Mostovski (2017) synonymized *Homoserphus* Townes, 1981 with *Oxyserphus*. Currently, there are 21 living species and three fossil species recognized within *Oxyserphus*, with the highest diversity observed in the Australian region (Townes and Townes, 1981; Johnson, 1992; Kolyada and Mostovski, 2017; Abe, 2022). Some of the species have been recorded from the Nearctic and Palaearctic regions (Townes and Townes, 1981; Abe, 2022). Although the genus has been reported from the Oriental Region, no species has previously been formally identified or described from this biogeographic realm (Townes and Townes, 1981; Kolyada, 2007).

Oxysurphus is similar to *Brachyserphus* Hellén, 1941 and *Trachyserphus* Kolyada, 2017. It can, however, be distinguished from both genera by the distinctly produced apical clypeal margin, which is bordered by longitudinal carinae (Kolyada and Mostovski, 2017). Species of *Oxyserphus* are characterized by a strongly sclerotized clypeal margin bordered by one or more longitudinal carinae, the distance between the lower margin of the clypeus and the centre of the tentorial pit usually half the distance to the lower margin of the antennal socket, pronotal scrobe smooth or variously sculptured with fine horizontal to oblique wrinkles, occasionally with coarse rugosity, mesopleuron bearing a distinct horizontal groove (transepistomal

line), radial vein (r-rs) short, radial cell short and ovipositor sheath elongate with a rounded apex (Townes and Townes, 1981; Kolyada and Mostovski, 2017; Abe, 2022). The biology of the genus remains poorly understood, with larvae of Curculionidae and Anthribidae (Coleoptera) being the only recorded hosts to date (Townes and Townes, 1981).

In India, a total of eight species of Proctotrupidae are reported so far (Table 1). During our ongoing investigation of the proctotrupid fauna of India, a specimen belonging to the genus *Oxyserphus* was encountered. Detailed morphological examination demonstrated that it represents an undescribed species, constituting the first confirmed record of the genus from India and the first formally described species of *Oxyserphus* from the Oriental Region. This study provides a formal description and diagnosis of this new species based on detailed morphological characters and presents an updated checklist of the Proctotrupidae recorded from India.

Table 1. Checklist of Proctotrupidae from India (including the new species).

Sl.	Species	Type locality	Distribution in India	Reference
1	<i>Exallonyx (Exallonyx) nathani</i> Townes, 1981	India: Kodaikanal: Pulney Hills	Tamil Nadu	Townes and Townes, 1981; Johnson, 1992
2	<i>Exallonyx (Exallonyx) orientalis</i> Dodd, 1920	India: Assam	Assam	Dodd, 1920; Townes and Townes, 1981
3	<i>Nothoserphus mirabilis</i> Brues, 1940	Taiwan: Taihorin	Karnataka	Narasimham et al., 1997
4	<i>Oxysurphus narendrani</i> Debnath and Rajmohana sp. nov.	India: Assam	Assam	This study
5	<i>Phaenoserphus keralensis</i> Rajmohana and Narendran, 1996	India: Kerala: Eravikulam	Kerala	Rajmohana and Narendran, 1996
6	<i>Phaenoserphus partipes</i> Dodd, 1920	India: Kashmir	Jammu and Kashmir, Uttarakhand	Dodd, 1920; Townes and Townes, 1981
7	<i>Phaenoserphus transversus</i> Rajmohana and Narendran, 1996	India: Kerala: Munnar	Kerala	Rajmohana and Narendran, 1996
8	<i>Phaenoserphus sureshi</i> Rajmohana and Narendran, 1996	India: Kerala: Munnar	Kerala	Rajmohana and Narendran, 1996
9	<i>Phaenoserphus longigena</i> Rajmohana and Narendran, 1996	India: Kerala: Munnar	Kerala	Rajmohana and Narendran, 1996

2. MATERIALS AND METHODS

The material examined in this study was accessed from the National Zoological Collections, Zoological Survey of India, Kolkata (ZSIK). It was found in yellow pan trap (YPT) collections and preserved in absolute ethanol before being card-mounted for morphological examination. Townes and Townes (1981) and Kolyada and Mostovski (2017) were followed for generic identification and species comparison. Morphological terminology and descriptions follow Townes and Townes (1981), Yoder et al. (2010), Kolyada and Mostovski (2017), and Abe and Mita (2026). Photomicrographs were taken using a Leica M205A stereozoom microscope equipped with a Leica DFC500 digital camera and a 1.0× objective lens. Image acquisition and focus stacking were performed using Leica Application Suite (LAS) software.

The following abbreviations are used in the descriptions: A1–A13= antennomeres 1–13 (A1 = scape, A2 = pedicel); LOL= lateral ocellar line, OOL= ocular ocellar line; POL= posterior ocellar line; r-rs = vertical part of radius; R1 = costal cell of radius cell; 2RS = radius.

3. RESULTS & DISCUSSION

Systematics

Class: Insecta Linnaeus, 1758
Order: Hymenoptera Linnaeus, 1758
Family: Proctotrupidae Haliday, 1833
Genus: *Oxyserphus* Masner, 1961

***Oxyserphus narendrani* Debnath and Rajmohana sp. nov.**

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(Figure 1A–H)

Description

Holotype: Female

Measurements:

Body length (including ovipositor) = 3.30 mm; fore wing length 2.23 mm; ovipositor length = 0.65 mm.

Color (Figure 1A):

Head black; mesosoma and metasoma brownish black except for apical abdominal segments being yellow and ovipositor sheath reddish brown; legs including coxae yellow; antenna brown except scape and pedicel yellowish brown.

Head (Figure 1B–E):

0.7× longer than wide in frontal view; length of face 1.3× inner distance between eyes; frons, vertex, occiput, gena smooth, densely setose; area between antennal sockets flat; head without vertical frontal carina between toruli; occipital carina incomplete, limited dorsally; distance between antennal sockets 0.7× to their diameter; clypeus wide, with broadly truncate apex, apical edge of clypeus strong and bordered by one shallow longitudinal keel; distance from lower edge of clypeus to centre of tentorial pit 0.5× distance to lower edge of antennal socket; mandibles shortened and thickened basally, with a single point; labrum gently rounded apically; gena 0.4× eye height; malar sulcus absent; eyes very sparsely pubescent with minute setae; LOL < OOL < POL in ratio of 8:11:15. Antenna long, filiform; scape 1.5× longer than wide; pedicel 1.2× wider than long, 0.4× scape in length; A3 2.2× longer than wide; A4 0.8× longer than A3 and subequal to A5 in length; A12 1.4× longer than wide; A13 2.2× longer than wide, 1.5× longer than scape, 1.1× as long as A3.

Mesosoma (Figure 1D–E, G):

Mesoscutum and mesoscutellum smooth, densely setose; notauli narrow, incomplete, short, same as length of tegula; scutoscuteellar sulcus foveate; humeral tubercle (= pronotal lobe) well developed, broadly rounded, with neither keels nor wrinkles; propleura with a deep, complete, median horizontal groove and with a shallow, incomplete groove above it; lower corner of propleura without any setae, with two small pits; pronotal scrobe smooth; epomia distinct, complete; horizontal mesopleural groove (= transepisternal line) deep and wide, almost straight; vertical mesopleural suture (= mesepimeral sulcus) foveate dorsally up to mesopleural groove, ventrally smooth; speculum smooth; mesopleuron below horizontal groove with hairs, upper front 0.7× of it smooth; front margin of mesopleuron with a hairless area between hair patch on subtegular area and its horizontal groove; metapleuron laterally with shiny bare area occupying about two thirds of its surface, ventrally rugose reticulate and densely setose; propodeum divided into two portions, anterior part with a median and lateral carinae, area between smooth, separated from posterior portion by a transverse carina, posterior portion somewhat declivous, rugose, densely setose; longer spur of hind tibia reaching 0.6× basitarsus length.

Wings (Figure 1F):

Vein r-rs short, 1.0× longer than wide; stigma 0.6× longer than wide; R1 reaching beyond 2RS.

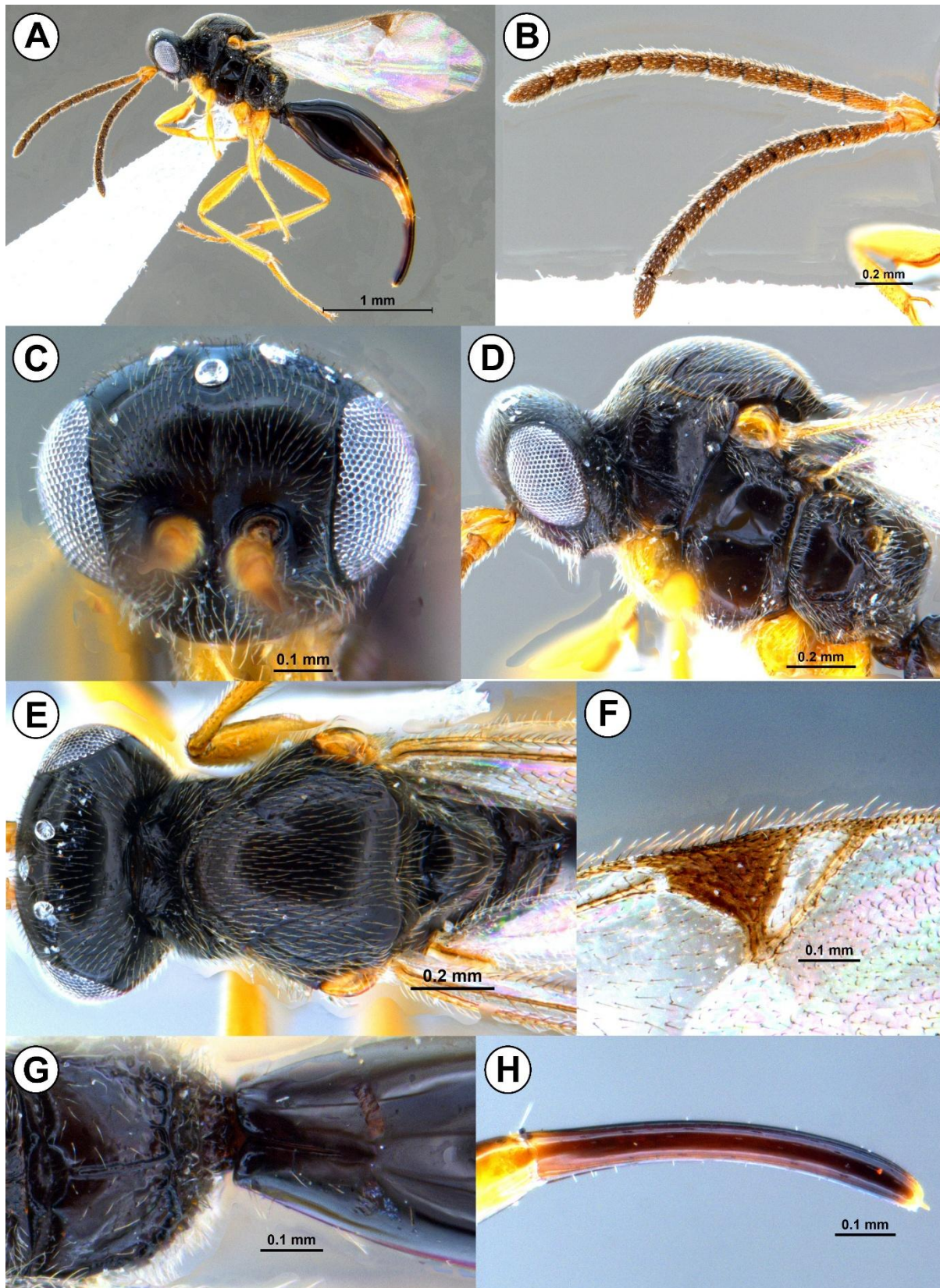


Figure 1. *Oxyserphus narendrani* Debnath and Rajmohana **sp. nov.**, ♀, Holotype. **A.** Lateral habitus, **B.** Antennae, **C.** Frontal view of head, **D.** Lateral view of head and mesosoma, **E.** Dorsal view of head and mesosoma, **F.** Fore wing venations, **G.** Dorsal view of propodeum and basal portion of syntergite, **H.** Ovipositor.

Metasoma (Figure 1G–H):

Abdomen without stalk; syntergite base with one medial longitudinal groove reaching up to 0.7× of first thyridial interspace; lateral grooves on antero-dorsal part of syntergite present, but very short (almost foveae). Ovipositor sheath 10.0× longer than wide, 0.8× as long as hind tibia, distinctly curved apically (in lateral view), apex round; sheath surface smooth with very sparse irregular minute setae.

Male: Unknown.

Biology: Unknown.

Distribution: India (Assam).

Etymology:

This species is named in honor of the late Dr. T. C. Narendran in recognition of his outstanding contributions to the taxonomy of parasitoid Hymenoptera in India. The specific epithet is treated as a noun in apposition.

Material examined:

Holotype: Female (ZSIK/37809/H3): INDIA: Assam: Dibru-Saikhowa National Park; 27.5742 °N, 95.3236 °E; ~140 m. a.s.l.; 19.xi.2024; YPT; Coll: Rahul Mondal.

Diagnosis:

In the key to species of *Oxyserphus* provided by Townes and Townes (1981), *Oxyserphus narendrani* Debnath and Rajmohana runs to couplet 19 but does not conform to either lead. This new species can be distinguished from the Australian species, *O. sulcatus* (Riek, 1955) by the sculpture of the propleuron, which bears 6–7 fine, short, somewhat radiating sulci situated medially towards the anterior margin in *O. sulcatus*, whereas *O. narendrani* has a single median horizontal groove with a shallow, incomplete groove above it. It also differs in the relative length of the ovipositor sheath, which is 1.1× as long as the hind tibia in *O. sulcatus* but only 0.8× as long as the hind tibia in *O. narendrani*. *Oxyserphus narendrani* can further be separated from the Australian species *O. nigriscutum* (Dodd, 1915) by the shape of the stigma (0.6× longer than wide in *O. narendrani* vs. distinctly longer than wide in *O. nigriscutum*), and by the relative length of the ovipositor sheath (0.8× the length of the hind tibia in *O. narendrani* vs. 1.2× in *O. nigriscutum*).

Kolyada and Mostovski (2017) synonymized the genus *Hormoserphus* Townes (in Townes and Townes 1981) under *Oxyserphus*, transferring *H. clypeatus* (Ashmead, 1893) to the latter genus. *Oxyserphus narendrani* can be distinguished at once from *O. clypeatus* by the pronotal groove or horizontal line (absent in *O. clypeatus* vs. present in *O. narendrani*).

Discussion

The knowledge of the Indian fauna of Proctotrupidae has progressed only modestly since the revision of Townes and Townes (1981), which reported the species then known from the country (Table 1). Subsequently, in their review of the Indian Proctotrupeoidea, Mani and Sharma (1982) provided a key to the genera of Proctotrupidae. However, they neither reported nor described any Indian species under the genera included in the key. The key primarily served to identify the Oriental genera rather than being based exclusively on the Indian fauna, as most of those genera (*Paracodrus* Kieffer, *Disogmus* Förster) have not yet been confirmed from India. Mani and Sharma (1982) also noted the occurrence of two unidentified species of *Proctotrupes* Latreille from India, but no subsequent taxonomic studies have addressed these records.

Further progress was made by Rajmohana and Narendran (1996), who described four new species of *Phaenoserphus* Kieffer from India. Narasimham et al. (1997) reported three proctotrupid taxa from India: *Codrus* sp. (without a specified collection locality), *Cryptoserphus* sp. from Lachung, Sikkim, and *Nothoserphus mirabilis* Brues from Bangalore, Karnataka. Later, Rajmohana (2006) presented a revised key to the genera of Indian Proctotrupidae, modified from Mani and Sharma (1982). Nevertheless, the taxonomy of Indian Proctotrupidae remains inadequately studied.

One of the major impediments to proctotrupid taxonomy in the Oriental Region is the absence of modern revisionary studies and comprehensive identification resources. In addition, proctotrupids represent a relatively neglected taxonomic group or 'dark taxa', with limited taxonomic expertise and sparse collection material available for study. Consequently, the diversity and distribution of the family in the region are underestimated. Species of *Oxyserphus* appear to be particularly rare in collections and mainly found at high altitudes

(Townes and Townes, 1981). Despite the examination of extensive proctotrupid material, only a single specimen of the genus was encountered during the present study. Further surveys are therefore required to better understand its distribution in India.

4. CONCLUSION

The discovery of *Oxyserphus narendrani* not only represents the first record of the genus from India but also the first formally described species of *Oxyserphus* from the Oriental Region, highlighting the inadequately explored diversity of the group in this biogeographic region. Further faunistic surveys across different habitats and geographic regions of India, combined with integrative taxonomic studies using detailed morphological and voucher-based molecular data, are needed for future research.

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Author contributions

RD: Data curation, Formal analysis, Investigation, Methodology, Resources, Software, Visualization, Writing—original draft, Writing—review and editing. KR: Investigation, Methodology, Supervision, Validation, Writing—original draft, Writing—review and editing.

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Conflict of Interest

The authors declare that they have no conflicts of interest, competing financial interest or personal relationship that could have influenced the work reported in this paper.

Informed consent

Not applicable.

Ethical approval & declaration

In this article, the animal regulations are followed as per the ethical committee guidelines of Zoological Survey of India, Prani Vigyan Bhawan, New Alipore, Kolkata, West Bengal, India; the authors observed the genus *Oxyserphus* Masner (Hymenoptera: Proctotrupidae) from India with description of a new species. The Animal ethical guidelines are followed in the study for species observation, identification & experimentation.

Data and materials availability

Data that support the findings of this study are embedded within the manuscript.

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