



NEW RECORD OF THE SUBGENUS *COPRIS* (*PARACOPRIS*) BALTHASAR (COLEOPTERA: SCARABAEIDAE: SCARABAEINAE) FROM NORTHERN WESTERN GHATS WITH AN UPDATED CHECKLIST OF SUBGENUS *PARACOPRIS*

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ABSTRACT

Copris is a genus of dung beetles that belongs to the subfamily Scarabaeinae. It comprises more than 250 tunnelling species with worldwide distribution. The subgenus *Paracopris* has 24 species, 13 of which are reported from India. The present report is the first record of the species *Copris* (*Paracopris*) *davisoni* Waterhouse, 1891 from the Northern Western Ghats, Maharashtra, India. For the first time, male genitalia photos of the species are included in the morphological redescription. Additionally, a current checklist for the Indian *Copris* genus (*Paracopris*) is provided.

Key words: Coleoptera, dung beetle, distribution, Maharashtra, male genitalia, new record, Northern Western Ghats, redescription, scarabs, species diversity, taxonomy

The genus *Copris* Geoffroy, 1762 is found all over the world, with over 235 species described (Davis et al., 2008). According to morphological characteristics of the elytra and the pronotum, the genus *Copris* generally divides into four subgenera: *Copris*, *Paracopris* (Balthasar, 1939); *Microcopris* (Balthasar, 1958); and *Sinocopris* (Ochi, Kon and Bai, 2009). Currently, the subgenus *Paracopris* consists of 24 species, of which 13 are reported from India (details in Checklist). Despite being a different subgenus, *Paracopris* presents particular difficulties because there are only slight intraspecific changes in the morphology of the elytral and pygidial punctures among the species. These poorly defined morphological limits exacerbate the delineation and identification of *Copris* (*Paracopris*) species. The dung beetle fauna of India is well documented (Arrow 1931; Balthasar 1963, 1974), even though these documentations are outdated and need to be revised. Several scattered articles from the last few years are available (Chandra and Gupta 2011; 2012; Kalawate, 2018; Kharel et al., 2020; Jagdale et al., 2023a, b, c). During a recent survey, a species of *Copris* (*Paracopris*) was discovered to be a new record for the Northern Western Ghats, Maharashtra, India. This work intends to provide a new distributional record for *Copris* (*Paracopris*) *davisoni* Waterhouse, 1891 to the Northern Western Ghats along with a morphological redescription of the species. In this publication, photographs of the

Copris (*Paracopris*) *davisoni* genitalia have been published for the first time from India.

MATERIALS AND METHODS

In 2022-23, one male specimen was collected by the first author from Rajewadi, Tryambakeshwar, Nashik, Maharashtra (20°01'36"70N, 73°58'99"43E) from the field using light trap. The collected specimen was euthanized with ethyl acetate vapours and brought to the laboratory for further studies. The specimen was relaxed, pinned, and dry-preserved in the laboratory in the fumigated box. The identification was done with the help of available literature (Arrow 1931; Balthasar 1963). The specimen was studied under an Olympus (Sz61-TR) trinocular stereo zoom microscope (Led) with a photography facility. To study the male genitalia, the genitalia were removed carefully from the abdomen, boiled in 10% KOH for 5-10 minutes, and rinsed with distilled water. The genitalia was stored in a separate vial containing 70% ethanol with the same catalogue number given to the specimen. Further, the identification was confirmed by comparing with the verified specimen images accessible at the following link- ([https://indiabiodiversity.org/files-api/api/get/raw/img//Copris davisoni/Copy of DSC 0274.JPG](https://indiabiodiversity.org/files-api/api/get/raw/img//Copris%20davisoni/Copy%20of%20DSC%200274.JPG)). The identified specimen was duly registered and deposited in the Zoological Collection at the Department of Zoology, MVPs ACS College, Trimbakeshwar, Nashik.

RESULTS AND DISCUSSION

A. Taxonomy

Genus *Copris* Geoffroy, 1762

Copris Geoffroy, Ins. des Env. de Paris, 1762, p. 87; Fourcroy, Ent. Paris, i, 1785, p. 13; Lacord., Gen. Col. iii, 1856, p. 96

Type species: *Scarabaeus lunaris* Linnaeus, 1758

Subgenus *Paracopris* Balthasar, 1939

Type species *Copris punctulatus* Wiedemann, 1823 (by original designation)

Diagnosis: Greyish-black, reddish brown in colour. Broad head with smooth clypeus. Clypeus and frons usually armed with a horn and/or carina. Broad, anteriorly untruncated, and clearly punctate pronotum. Tibia is slender in comparison to the other subgenera.

***Copris (Paracopris) davisoni* Waterhouse, 1891**

Ann. Mag. Nat. Hist. (6) vii, 1891, p. 520.

Copris davisoni: Arrow, 1931; Faun. Brit. India, III: 132

Copris (Paracopris) davisoni: Mon. der Scarabaeidae und Aphodiidae der Palaeark. Und Orientalis. Region (Coleoptera: Lamellicornia), Coprinae, I: 373

Type Locality: Malabar, Nilgiris, Leg.W.Davison

Type Repository: Type in the British Museum.

Specimen examined: MVPs-ACSC, ENT-1/3001, 28.vi.2023, 01 ex., Rajewadi, Trimbakeshwar, Nashik, Maharashtra (20°01'36"70N, 73°58'99"43E), coll. P.S. Jagdale.

Redescription: Male. Oval in shape (Fig. 1a). Total body length 13 mm, body width 5.5 mm. whole surface Black. Mouthparts, antennomeres and bristles on legs reddish-yellow. Head is smooth and shining. The middle of a clypeus produces an upward front edge that curves backward to form a pointed horn that is slightly hollowed in front (Fig. 1b). Behind this, and just in front of the eyes, is a second horn, short, robust, blunt at the tip, and also oriented obliquely backward. Pronotum densely punctured with a notched front margin in the middle. The elytra are clearly striate, with well-defined transverse punctures contiguous to the striae and punctured quite closely and evenly (Fig. 1c). The pygidium has been deeply and closely punctured. The metasternal shield is extremely smooth, with only a few punctures on the edges. There are four pointed teeth on the broad front tibiae, along with are loosely scattered punctured in the front femora (Fig. 1b). Male genitalia (Fig. 1d-f): Phallobase is larger than parameres, and moderately curved in lateral view. Parameres are broad at the base, recurved, strongly bent downward from its front portion, with flat tips. Maximum length (excluding the recurved tips), about 3.25 mm; Maximum width, about 0.8 mm.

Table 1. Checklist for the subgenus *Paracopris* from India

Species	Distribution
<i>Copris (Paracopris) andrewesi</i> Waterhouse, 1891.	Karnataka, Madhya Pradesh, Maharashtra, Orissa, West Bengal, Rajasthan.
<i>Copris (Paracopris) davisoni</i> Waterhouse, 1891.	Central and South India (Madhya Pradesh, Karnataka, Kerala, Tamil Nadu) New record to Maharashtra.
<i>Copris (Paracopris) imitans</i> Felche, 1910.	Chhattisgarh, Goa, Gujarat, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan.
<i>Copris (Paracopris) signatus</i> Walker, 1858.	Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Maharashtra, Puducherry, Rajasthan, Tamil Nadu.
<i>Copris (Paracopris) imitans</i> Felsche, 1910	Bihar, Goa, Karnataka, Madhya Pradesh, Maharashtra, Rajasthan, Uttar Pradesh, West Bengal.
<i>Copris (Paracopris) compressipennis</i> Gillet, 1910.	Assam, Manipur, Sikkim, West Bengal.
<i>Copris (Paracopris) cribratus</i> Gillet, 1927.	Arunachal Pradesh, Gujarat, Karnataka, Kerala, Meghalaya, Rajasthan, Tamil Nadu, Uttar Pradesh.
<i>Copris (Paracopris) excisus</i> Waterhouse, 1891.	Himachal Pradesh, Punjab, Uttarakhand.
<i>Copris (Paracopris) furciceps</i> Felsche, 1910.	Arunachal Pradesh, Gujarat, Meghalaya, Rajasthan, Sikkim, Uttar Pradesh, West Bengal.
<i>Copris (Paracopris) punctulatus</i> Wiedemann, 1823.	Arunachal Pradesh, Assam, Rajasthan.
<i>Copris (Paracopris) punjabensis</i> Gillet, 1921.	Haryana, Himachal Pradesh, Punjab, Uttarakhand.
<i>Copris (Paracopris) ramosiceps</i> Gillet, 1921.	India.
<i>Copris (Paracopris) surdus</i> Arrow, 1931.	Madhya Pradesh, Rajasthan, Uttarakhand.

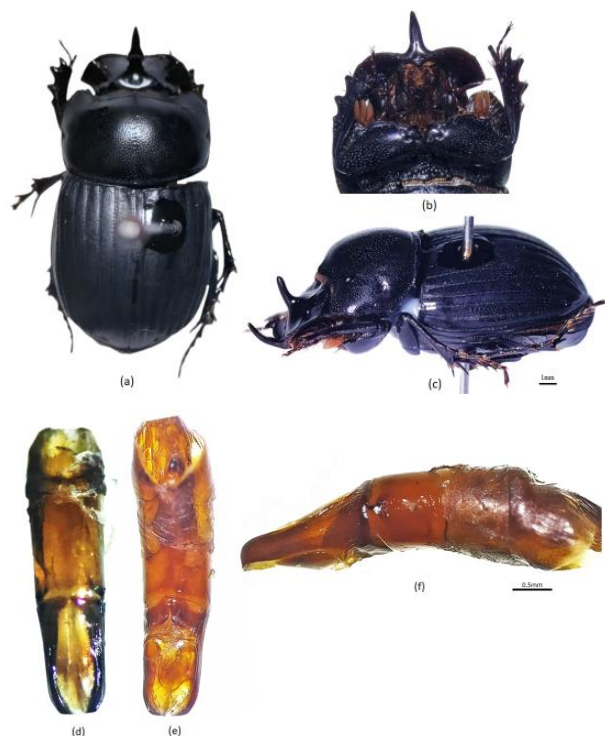


Fig. 1. *Copris* (*Paracopris*) *davisoni*: a. habitus; b. hollow horn pattern; c. lateral view; d-f, Male genitalia, d- dorsal view, e- ventral view, f- lateral view

The checklist of species of the subgenus *Paracopris* is provided in Table 1.

Distribution: Assam, Bihar, Chhattisgarh, Haryana, Himachal Pradesh, Karnataka, Kashmir, Kerala, Madhya Pradesh, Punjab, Uttarakhand, and Uttar Pradesh. New record for Indian state Maharashtra. The distribution of the species provided here is based on Arrow (1931); Kharel et al. (2020); Schoolmeesters, P (2023).

ACKNOWLEDGEMENTS

The authors thank Dr Dilip Pawar, Principal, MVP Samaj's ACS College, Trimbakeshwar, Nashik, and Dr Sharad Kambale, Vice-Principal, MVP Samaj's ACS College, Trimbakeshwar for providing necessary facilities and constant encouragement. The authors also acknowledge Dr Ravikiran Pagare for the Microscope facility from Sandip University, Nashik. The authors are grateful to the subject editor and anonymous reviewers for the constructive comments for the improvement of the manuscript.

FINANCIAL SUPPORT

No funding was received.

AUTHOR CONTRIBUTION STATEMENT

All authors equally contributed.

CONFLICT OF INTEREST

No conflict of interest.

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(Manuscript Received: December, 2023; Revised: May, 2024;

Accepted: May, 2024; Online Published: May, 2024)

Online First in www.entosocindia.org and indianentomology.org Ref. No. e24869