

***Thorictus bengalensis* sp. nov., a new species of myrmecophilous beetle from India, West Bengal (Coleoptera: Dermestidae: Thorictinae: Thorictini)**

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Taxonomy, new species, new status, host ant, Coleoptera, Dermestidae, Thorictinae, *Thorictus*, West Bengal, India

Abstract. *Thorictus bengalensis* Háva & Chakrovorty sp. nov. from West Bengal, India is described, illustrated and compared with similar Indian species. *Trichomyrmex destructor* (Jerdon, 1851) (Hymenoptera, Formicidae, Myrmicinae, Crematogastrini) is the host ant species. The interaction has been studied from an urban rooftop-garden. The species *Thorictus wroughtoni* Wasmann, 1912 stat. nov. is elevated from subspecies to a separate species. The check list of *Thorictus* species recorded from India is added. Additionally, a Goblin spider species, *Gamasomorpha* sp. Karsch, 1881 (Arachnida: Araneae: Araneomorphae: Oonopidae) was observed to be inhabiting the same nest.

INTRODUCTION

The subfamily Thorictinae Agassiz, 1846, with 189 described species worldwide, is a myrmecophilous subfamily of beetles under the family Dermestidae (Coleoptera) (Háva 2023, Motyka et al. 2022). Its members can be recognized by their small size, strongly convex and strongly hardened bodies, reduced or absent eyes, absent wings, and their rounded hind coxae that do not reach the outer edge of the metasternum. Thorictinae are currently divided into two tribes, Thaumaphrastini and Thorictini, and includes four genera.

The subfamily Thorictinae from India has not been studied recently and only six species are known from India (John 1963, Háva 2009, 2023). In the article a new species is described from Kolkata, West Bengal in the nest of *Trichomyrmex destructor* (Jerdon, 1851) ant from an artificial rooftop garden in an urbanized landscape. Along with this interaction, a Goblin spider, *Gamasomorpha* sp. Karsch, 1881 (Arachnida: Araneae: Araneomorphae: Oonopidae) has been collected from the same nest. Spiders of this family are either myrmecophages or kleptoparasites (Ott et al. 2015). Utilizing chemical mimicry through the acquisition of host cuticular hydrocarbons, *Gamasomorpha* spp. live in close association of host species and generally utilizes their food resources, thereby negatively effecting host fitness (Witte

et al. 2009). This unique nest association demands further research in order to understand the dynamics of the ecological community and the probable interactional complexity between the nest associates, i.e., the spider and the myrmecophilous beetle with its host ant species and amongst themselves. Previous study from the same artificial habitat led to the rediscovery of a wasp species, highlighting the importance of these artificial habitat patches in entomofaunal research concerning urban metropolitan areas, and demands further investigation to fully understand the ecosystem dynamics (Chakrovorty et al. 2023). While urbanization cannot be halted, holistic studies concerning the influence of anthropogenic stochasticity on entomofaunal diversity might help us to predict the future of urban insect population and help to formulate and promote sustainable solutions.

MATERIAL AND METHODS

The specimens were collected by aspiration, after which the specimens were dry mounted on a cardboard point. The specimen was examined using Radical Stereo Zoom Trinocular Microscope -RSM-9F (180x magnification) with circular Led illuminator- Mfg. No. B201116 (Radical Scientific Equipments Pvt. Ltd., Ambala Cantonment, Haryana, India) and images were captured using Hayear 41 megapixels HDMI microscope camera with 0.5x trinocular adapter (Shenzhen Hayear Electronics Co. Ltd., China) and SONY alpha-58 (SLT-A58) camera with Cyruss 1.25" T adapter and T2/T ring adapter for SONY DSLR (SS enterprises, India). Images were analysed using original software provided by the manufacturer (HAYEAR USB microscope camera measure software, version x64, 4.10.17214.20200601). Images were captured at different layers having the sharpest focus and were then stacked to a single image using Helicon Focus 8 software. Measurements were calibrated using Erma Stage Micrometer (1mm -100 divisions) Model- Galaxy SMM101 (Erma Inc., Yushima, Bunkyo-ku, Tokyo, Japan). Standard morphometric techniques and terms have been used. The size of the beetles or of their body parts can be useful in species recognition and thus, the following measurements were made:

Total Length (TL) - linear distance from anterior margin of pronotum to apex of elytra.

Elytral Width (EW) - maximum linear transverse distance.

Pronotum Length (PL) - measured from the top of the anterior margin to scutellum.

Pronotum Width (PW) - measured between the two posterior angles of pronotum.

Distance Between Antenna (DBA) - linear distance between inner margin of antennal socket.

Distance Between Eyes (DBE) - linear distance between the inner margin of eyes close to antennal socket.

Preparation of the male genitalia. After rehydrating the holotype specimen, the abdomen was detached from the 1st sternite using fine needle and was placed in 10% KOH solution for 12 hours at room temperature. After which the genitalia was dissected using appropriate tools and examined under microscope.

Acronyms of type depositories:

JHAC Jiří Háva, Private Entomological Laboratory & Collection, Únětice u Prahy, Prague-West, Czech Republic;

IFNC iForNature Nature Club Laboratory and educational collection, Kolkata, West Bengal, India.

Specimens of the species described here is provided with a red, printed label with text as follows: „HOLOTYPE (or PARATYPE) *Thorictus bengalensis* sp. nov. J. Háva & A. Chakrovorty det. 2023”.

TAXONOMY

Subfamily Thorictinae Tribe Thorictini Genus *Thorictus* Germar, 1834

„*T. orientalis* species group“

Thorictus bengalensis Háva & Chakrovorty sp. nov.

(Figs. 1-5)

<https://zoobank.org/urn:lsid:zoobank.org:pub:77FB3BE7-3642-43B7-81E5-6D25B6169CBE>

Type material. Holotype (♂): India, West Bengal, Kolkata, iForNature rooftop garden, 22°38'34.1''N 88°25'47.6''E, 8 July 2018, A. Chakrovorty lgt., (IFNC). Paratypes (4 spec.): same data as holotype, (3 IFNC, 1 JHAC).

Description. Body small (Fig. 1), castaneous brown, covered by short, yellow setae on dorsal surface and short setae on ventral surface. Measurements (mm): TL 1.80 EW 0.95 PL 0.65 PW 0.78 DBA 0.21 DBE 0.40. Head finely punctate with very short, yellow, recumbent setae. Labial palpi entirely brown. Antennae brown, with 11 antennomeres, antennal club compact, with 3 antennomeres, terminal antennomere with short yellow setae. Lateral eyes on head with very small granules. Pronotum as finely punctate as head, covered by short, yellow, recumbent setation. Lateral margin of pronotum very finely dentate. Posterior angles without long yellow setae. Ventral posterior pronotal angles without yellow setation. Scutellum small, triangular, without setation. Elytra very finely punctate, covered by short, recumbent, yellow setae; lateral yellow setation erect; with two depressions in anterior half near scutellum. Epipleuron finely punctate, anterior angles with large bump; bump coarsely punctured with yellow setation. Prosternum finely punctate. Mesosternum with small, foveolate punctures. Metasternum finely punctate. Visible abdominal sternites very finely punctate, covered by very short, recumbent, yellow setae. Striation on first visible abdominal sternite long. Legs brown, covered by long, yellow setae. Male genitalia (Fig. 5): aedeagus is pointed, dorsoventrally thickened, with maximum thickness at the base which gradually decreases towards the tip, the tip is pointed (claw-shaped). Aedeagus slightly compressed laterally and bends towards the ventral side. The parameral apices are slightly blunted, narrowing from base to apex, and a slight thickening at the subapical area, concave throughout the length, with the concavity facing towards the aedeagus. The apices slightly bend away from the central midline. The thickened apical area of parameres is covered with fine short setae, that are equidistantly placed, single row, covering the lateral margin, with a tuft of hair on the apex. The ventral margin of the parameres is ridged.

Differential diagnosis. The new species belongs to the „*Thorictus orientalis* species group“ according to characters stated by John (1963); new species according to short dorsal setation similar to *Thorictus nilgiriensis* John, 1963, all other known Indian species are covered by long dorsal setation; from *Thorictus nilgiriensis* John, 1963 differs by the figured characters especially by the setation on margin of thorax.

Etymology. Named according to the state West Bengal.

Bionomy. Type specimens collected in a nest of the ant *Trichomyrmex destructor* (Jerdon, 1851), (Fig. 6) (Hymenoptera, Formicidae, Myrmicinae, Crematogastrini) from the base of an earthen flowering pot, along with a *Gamasomorpha* sp. Karsch, 1881 (Arachnida: Araneae: Araneomorphae: Oonopidae).



Figs. 1-3. *Thorictus bengalensis* Háva & Chakrovorty sp. nov.: 1- habitus, dorsal; 2- habitus ventral; 3- habitus lateral (photo by Arnob Chakrovorty).

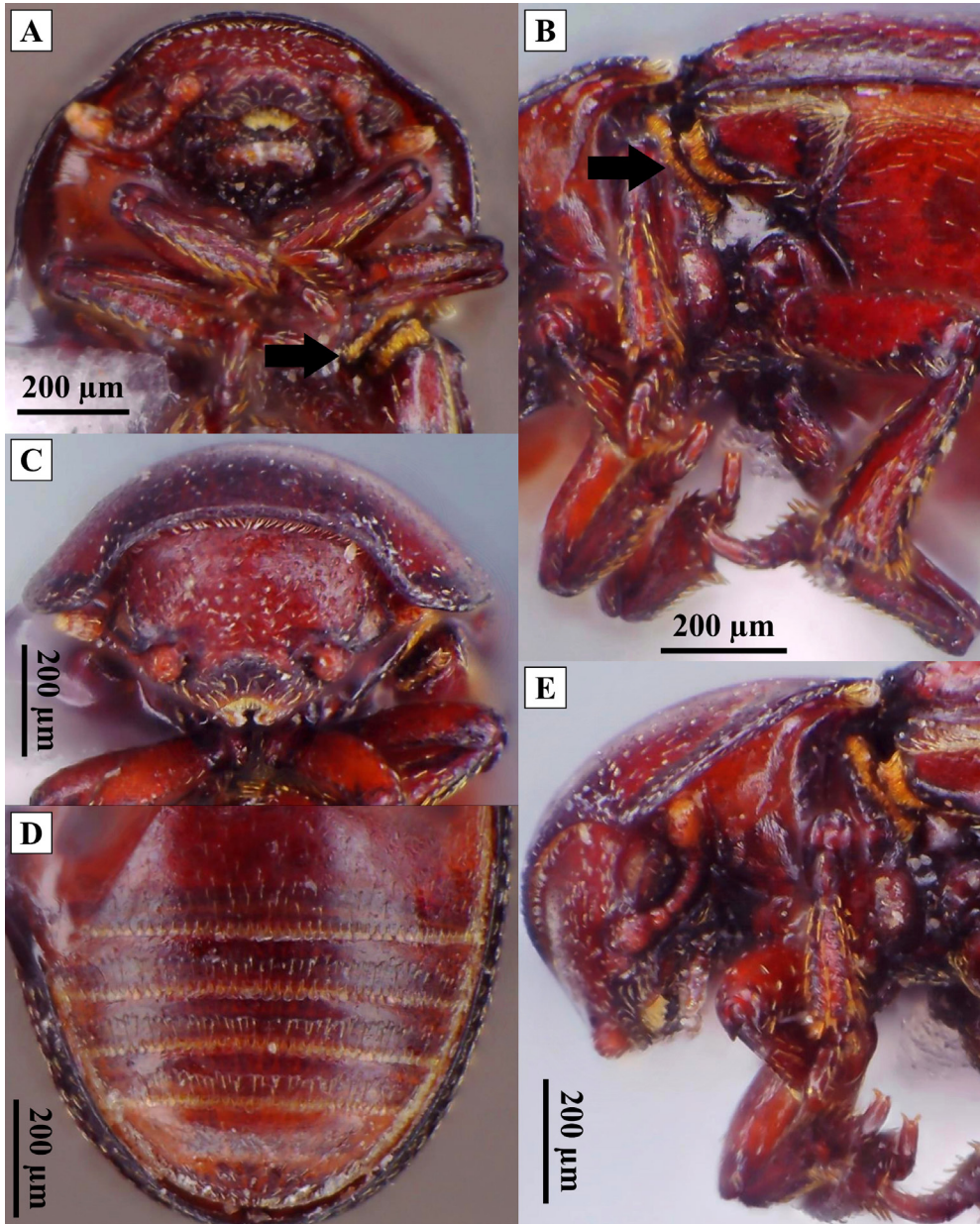


Fig. 4. *Thoricus bengalensis* Háva & Chakrovorty sp. nov.: A, C- head; D- abdomen; B, E- setation on margin of thorax (photo by Arnob Chakrovorty).

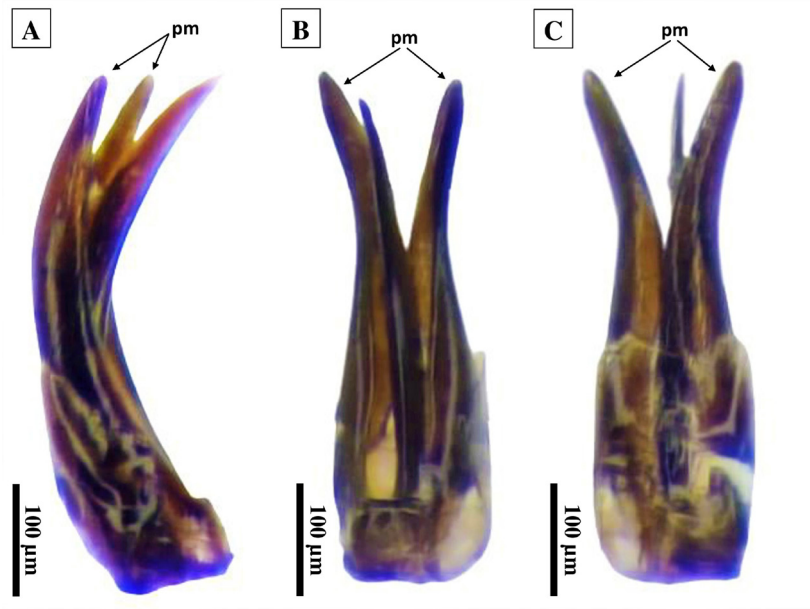


Fig. 5. *Thoricus bengalensis* Háva & Chakrovorty sp. nov., holotype, male genitalia: A- aedeagus left lateral aspect; B- aedeagus ventral view; C- aedeagus dorsal view; (pm = parameres) (photo by Arnob Chakrovorty).

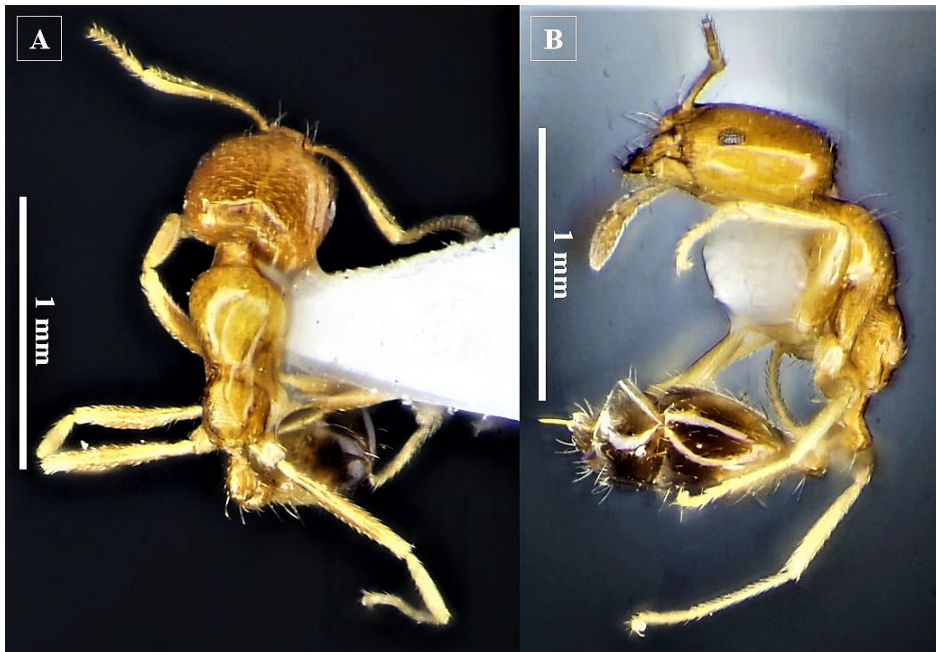


Fig. 6. Habitus of *Trichomyrmex destructor* (Jerdon, 1851) (photo by Arnob Chakrovorty).



Fig. 7. iForNature- Nature Club rooftop garden, type locality of the new species (photo by Arnob Chakrovorty).

CHECK LIST OF *THORICTUS* SPECIES RECORDED FROM INDIA

***Thorictus braminus* Wasmann, 1912**

Host ant: *Pheidole* sp., *Prenolepsis* sp.

Distribution: India: Ahmednagar, Maharashtra

***Thorictus bengalensis* Háva & Chakrovorty sp. nov.**

Host ant: *Trichomyrmex destructor* (Jerdon, 1851)

Distribution: India: West Bengal

***Thorictus heimi* Wasmann, 1899**

Host ant: *Prenolepis* sp., *Pheidole* sp., *Tetramorium* (= *Triglyphothrix*) sp.

Distribution: India: Maharashtra: Ahmadnagar

***Thorictus indicus* John, 1963**

Distribution: England (introduced); India: Karnataka, Kerala; Myanmar

***Thorictus kejvali* Háva, 2009**

Distribution: India: Orissa

***Thorictus nilgiriensis* John, 1963**

Distribution: India: Tamil Nadu: Nilgiri Hills

***Thorictus wroughtoni* Wasmann, 1912 stat. nov.**

Thorictus heimi wroughtoni Wasmann, 1912: 109.

Host ant: *Pheidole* sp., *Tetramorium* sp.

Distribution: India: Madhya Pradesh, Maharashtra: Ahmadnagar

Material examined: „INDIA, Maharashtra, 25 km from Poona on the way to Aurangabad, Gy. Topál lgt.” / „, No. 612, singled material, 7.viii.1967“, 1 ex., (JHAC).

Remarks. According to original description, redescription and morphological characters figured by John (1965), the species *Thorictus wroughtoni* Wasmann, 1912 **stat. nov.** is elevated from subspecies to a separate species.

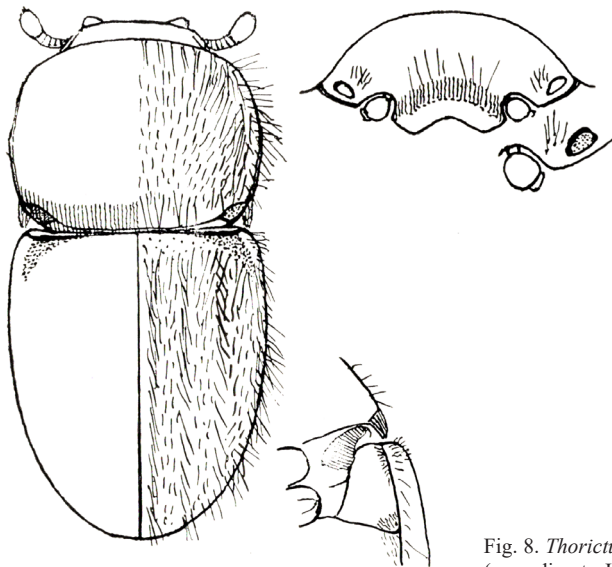
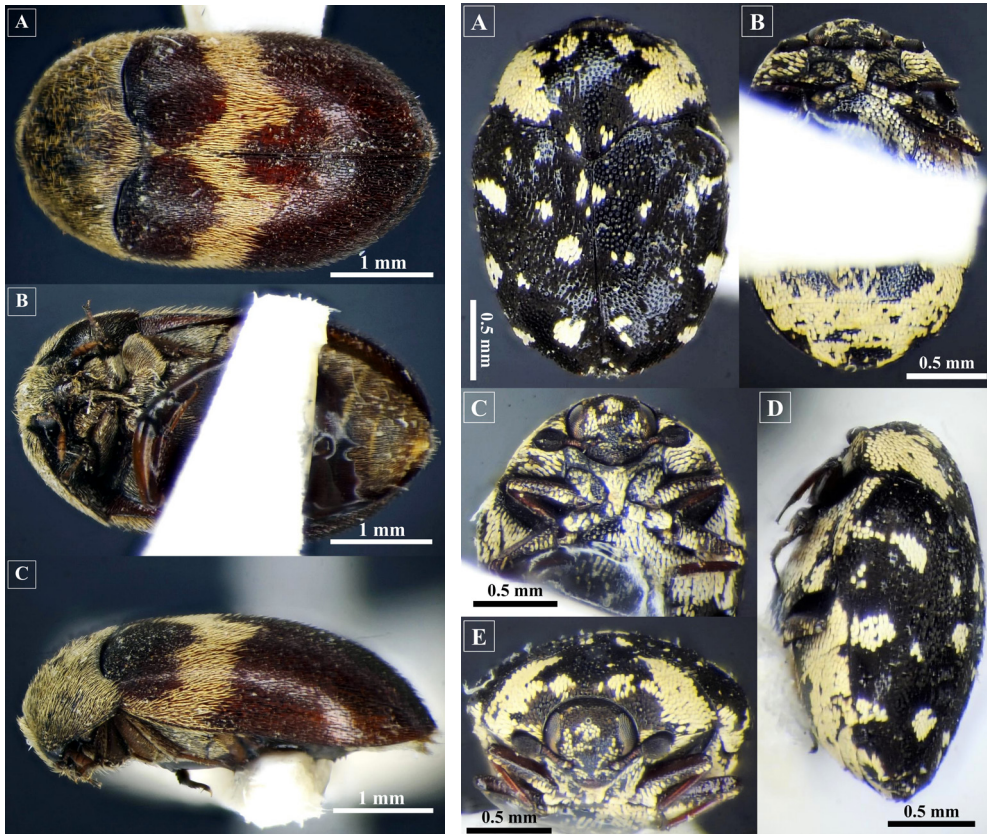


Fig. 8. *Thorictus wroughtoni* Wasmann, 1912 stat. nov. (according to John).

NOTE. Other dermestid species in the same garden are collected and observed: *Attagenus fasciatus* (Thunberg, 1795), *Anthrenus (Anthrenodes) maculifer* Reitter, 1881 and *Anthrenus (Anthrenus) oceanicus* Fauvel, 1903.



Figs. 9-10. Habitus of species: 9- *Attagenus fasciatus* (Thunberg, 1795); 10- *Anthrenus (Anthrenodes) maculifer* Reitter, 1881. (photo by Arnob Chakrovorty)

ACKNOWLEDGEMENTS. Arnob Chakrovorty, Banani Bhattacharjee and Asmita Samadder would like to acknowledge Pranab Chakraborty, member, iForNature - Nature Club for his tireless efforts in maintaining the rooftop experimental garden in a scientifically sound and ecologically friendly way. Arnob Chakrovorty and Banani Bhattacharjee would like to acknowledge iForNature - Nature Club for providing the necessary microscopy facilities. The authors acknowledge Ayan Mondal, WBES, Assistant Professor in Zoology, Government General Degree College, Mohanpur, Department of Higher Education, Govt. of West Bengal, for his help regarding identification of the spider specimen.

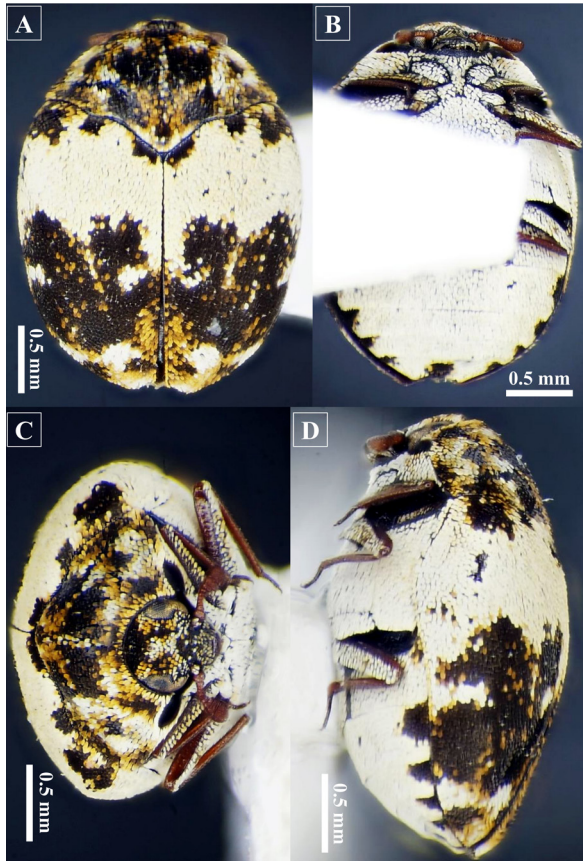


Fig. 11. Habitus of species: 11- *Anthrenus* (*Anthrenus*) *oceanicus* Fauvel, 1903 (photo by Arnob Chakrovorty).

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Received: 31.7.2023

Accepted: 10.9.2023

Printed: 31.3.2024

