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A new unusual discolomatid beetle from the Northern Sumatra (Coccinelloidea, Discolomatidae)

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Abstract

Discolomatidae is a small beetle family that has been neglected in recent taxonomic studies. Only a few recent papers deal with local faunas, leaving many regions of the world virtually unexplored with respect to this group of beetles. Recent examination of material from the Naturhistorisches Museum in Wien revealed an outstanding new taxon, which is described here as *Sundaloma seideli* gen. et sp. nov. Despite its unusual morphology, such as the anteriorly extended pronotum entirely covering the head from above and the broadly expanded femora and tarsi, other features allow this new genus to be placed in the tribe Aphanocephalini.

Key Words

taxonomy, South Asia, Bukit Lawang, Sumatera Utara, new genus, new species

Introduction

Discolomatidae is a small family of beetles within the superfamily Coccinelloidea. They are mycophagous and have a primarily tropical and subtropical distribution (Cline and Ślipiński 2010; Szawaryn 2025; Yoshitomi 2025). The most recent world checklist includes nearly 500 valid species names, grouped into 16 genera, seven tribes, and five subfamilies (Yoshitomi 2025). The current classification of Discolomatidae was proposed by John (1954); however, it appears to be highly artificial and has never been rigorously tested. Since John's intensive studies in the 1930s–1960s, the family has attracted little interest among entomologists. Nevertheless, several recent alpha-taxonomic studies have been published, focusing on three genera: *Aphanocephalus* Wollaston (Yoshitomi and Pham 2021a; Szawaryn 2025), *Cephalophanus* John (Yoshitomi and Pham 2021b; Yoshitomi 2023; Yoshitomi and Hájek 2025), and *Fallia* Sharp (Cline and Shockley 2012). Recently, the first fossil discolomatid species from Miocene Dominican amber was also described (Szawaryn and Kupryjanowicz 2019).

This situation means that many regions of the world remain virtually unexplored with respect to the diversity of Discolomatidae. Recent investigation of the Discolomatidae material from the Naturhistorisches Museum in Wien revealed an outstanding new genus, which is described and diagnosed here. Unfortunately, only a single female was available for examination at the time; however, its description may accelerate the discovery of similar taxa in other collections as well.

Material and methods

The specimen examined in this study is deposited in the Naturhistorisches Museum Wien (**NHMW**).

The measurements were made using a micrometer attached to a dissecting microscope as follows: (TL) total length, from apical margin of pronotum to apex of elytra; (PL) pronotal length, from the middle of anterior margin to margin of basal foramen; (PW) pronotal width at widest part; (EL) elytral length along suture, including scutellar shield; (TW) total width across both elytra at

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widest part. Genitalia and other structures were dissected, cleared in 10% KOH solution, and rinsed with distilled water, then transferred to glycerol and examined on slides. The photographs of the genitalia and other disarticulated morphological structures were taken using an Olympus DP23 digital camera attached to an Olympus BX43F compound microscope. Habitus color images were taken using a stereo microscope Leica MZ 16 with a digital camera IC 3D. Final images were produced using Helicon Focus 5.0 × 64 and Adobe Photoshop CS6 software. After examination, the genitalia were mounted on mounting card and pinned with the respective specimen. The SEM illustrations were taken in the Laboratory of Scanning Microscopy (MIZ Warsaw), using a scanning electron microscope HITACHI S-3400N under low vacuum conditions. Morphological terminology follows Cline and Ślipiński (2010) and Lawrence et al. (2011).

Distribution map was produced based on label data using QGIS v. 3.44, with vector layers downloaded from the Natural Earth web page (www.naturalearthdata.com).

Results

Order: Coleoptera Linnaeus, 1758
Suborder: Polyphaga Emery, 1886
Superfamily: Coccinelloidea Latreille, 1807
Family: Discolomatidae Horn, 1878
Subfamily Aphanocephalinae Jakobson, 1904
Tribe Aphanocephalini Jakobson, 1904

Genus *Sundaloma* gen. nov.

https://zoobank.org/6B029C1E-BC0F-4AC7-AC0C-880E211C0432
Figs 1–4

Type species. *Sundaloma seideli* sp. nov.

Diagnosis. *Sundaloma* gen. nov. is a very distinctive genus among Discolomatidae, as the only taxon of that family has a completely arcuate anterior margin of prosternum, entirely covering head, which is invisible from above. In similar looking genera, *Cassidoloma* Kolbe and *Discoloma* Erichson, anterior prosternal margin is always deeply emarginate and at least anterior portion of a head is always visible. *Sundaloma* gen. nov. also possesses broadened and flattened legs (which is also a unique feature among discolomatids), and broad upturned lateral elytral margins.

Description. Body elongate, broadly oval with sides subparallel (Figs 1A, 2A), dorsally distinctly spherical, convex (Fig. 1B, C). Dorsal body surface appearing glabrous (Figs 1A, 2A), only lateral margins of pronotum and elytra with very short, sparce hairs (Fig. 2D).

Head deeply retracted into prothorax and concealed from above by pronotum (Figs 1B, 2A–C). Eyes small, elliptical, coarsely faceted (Fig. 2C), without interfacetal setae. Ventral antennal grooves very deep, extending

Figure 1. *Sundaloma seideli* gen. et sp. nov. (holotype). **A.** Habitus, dorsal; **B.** Habitus, frontal; **C.** Habitus, lateral.

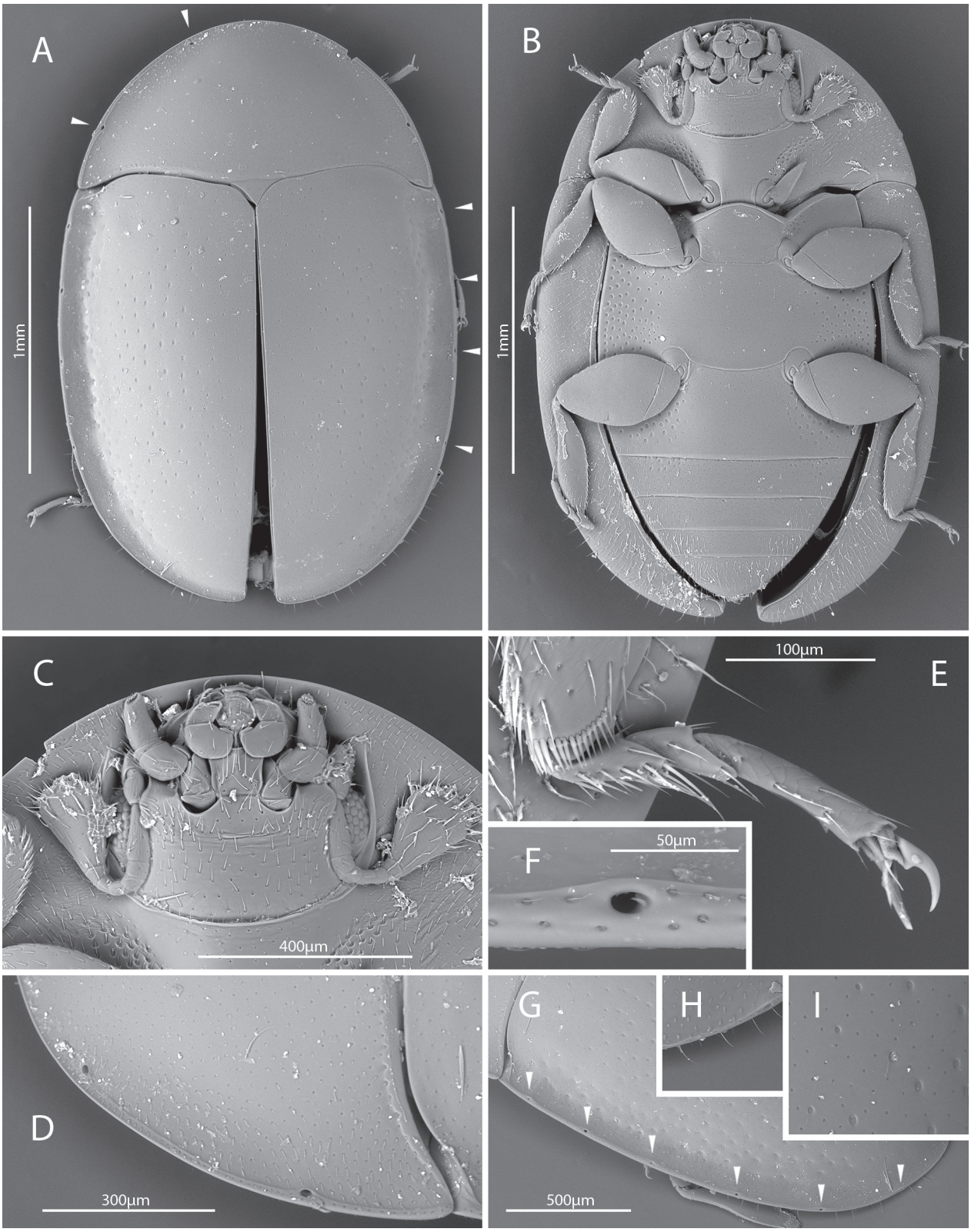

Figure 2. *Sundaloma seideli* gen. et sp. nov. SEM illustrations: **A.** Habitus, dorsal; **B.** Habitus, ventral; **C.** Head and mouthparts; **D.** Lateral view of pronotum; **E.** Tarsus; **F.** Gland opening on elytron; **G.** Lateral view of elytron; **H.** Marginal bristles on hind elytral margin; **I.** Punctation on elytra. Arrows indicate outlets of glandular pores.

well beyond posterior margin of eyes (Fig. 2C). Antennae 9-segmented with a 1-segmented club (Fig. 2C). Mandibles bidentate apically. Maxilla (Fig. 2C) with semicircular cardo, stipes with well visible sutures between palpifer, basistipes and mediostipes. Maxillary palp with four palpomeres (Fig. 2C); first very small, reduced; second large, inflated; third reduced, ring-like; apical one somewhat conical. Submentum transverse (Fig. 2C);

mentum sub-quadrate, with median portion weakly elevated forming a sub-triangular shape; prementum with anterior margin broadly rounded; ligula setose, with apical margin broadly rounded; labial insertions placed basally, separated by a narrow carina. Labial palp with three palpomeres (Fig. 2C); first very small, reduced, ring-like; second large, inflated; apical one somewhat rectangular.

***Prothorax*.** Pronotum transverse, widest at the base (Figs 1A, 2A); forming a broadly rounded, hemi-circular shield, covering head from above. Lateral margins flattened and broadly explanate, with a broad lateral bead posterior margin weakly sinuate. Lateral pronotal carinae present, complete along lateral margins, starting from the level of anterior gland openings (Fig. 2A). Posterior margin with border present in lateral parts only. Anterior margin not bordered. Posterior angles distinctly acute (Fig. 2D); pronotal disc simple. Lateral pronotal margins with two pairs of glandular pores (Fig. 2B, D) at ¼ and ¾ of the pronotal length, both well visible from above. Notosternal sutures absent; notosternal ridge indistinct (Fig. 2B). Margins of the occipital foramen with distinct lateral ridges. Prosternum distinctly longer than procoxal cavity, flat (Fig. 2B); anterior prosternal margin broadly arcuate posteriorly; surface smooth except lateral portions covered with coarse punctae. Prosternal process broad, broader than visible procoxal diameter, apex broadly laterally expanded (Fig. 2B), posteriorly closing procoxal cavity; surface flat with apex truncate, without lateral carinae. Procoxal cavities circular, widely separated, externally closed. Procoxae with long concealed lateral extensions; trochantins concealed. Hypomeron smooth.

***Pterothorax*.** Scutellar shield large, triangular and apically acute (Fig. 2A). Elytra with disc irregularly punctate with puncta od double size (Fig. 2A, I), lateral edge with six glandular pores (Fig. 2A, F, G), four anterior glandular openings more or less visible from above, two distal placed on the margin of elytra, not visible from above. Lateral margins of elytra broadly explanate, well visible throughout from above (Figs 1A, 2A), with broad lateral bead, upturned in frontal view (Fig. 1C); humeral corner with oblique indentation to receive posterior corners of pronotum (Fig. 2D). Epipleura very broad (Fig. 2B), complete, inner margin with complete carina fading before base of elytra. Mesoventrite transverse, anterior portion of mesoventrite on much lower level than mesoventral junction. Externally visible anterior mesoventral margin anteriorly broadly rounded, forming a transverse fold to accommodate posterior margin of prosternal process (Fig. 2B), anterior margin bordered; mesoventral process apically truncate. Mesocoxal cavities circular, laterally closed. Meso-metaventral suture visible, junction forming slightly posteriorly rounded line (Fig. 2B). Metaventrite flat, without discrimen, with mesocoxal marginal lines separate medially, almost complete laterally (Fig. 2B), posterior margin between mesocoxae slightly rounded. Metacoxae widely separated, strongly transverse but mostly concealed by metaventrite and appearing globular. Hind wings well-developed.

Legs with trochanters large, elongate, narrowly subtriangular (Fig. 2B); femora distinctly flattened, together with trochanter forming a broad sub-oval outline; tibiae broad, flattened, with patches of stiff and long bristles in apical parts, tibial spurs absent; tarsal formula 3-3-3 (Fig. 2E); tarsomeres 1 and 2 with small rounded ventral lobe; pretarsal claws appendiculate; empodium bisetose (Fig. 2E).

Abdomen with five free ventrites (Figs 2B, 3A); ventrite 1 shorter than ventrites 2–4 combined; intercoxal process slightly emargined anteriorly. Ventrite 1 with metacoxal marginal lines present, medially separated, laterally incomplete (Fig. 2A, I). Posterior margin of ventrite 5 rounded. Sternite VIII divided into two lateral sclerotized lamellae (Fig. 3B). Tergite VIII (pygidium) heavily sclerotized (Figs 3B), with median groove forming an interlocking mechanism with elytra (Fig. 2A), slightly bent downwards and visible ventrally, appearing as narrow, false ventrite 6 (Fig. 2B).

***Female terminalia and genitalia*.** Paraprocts reduced, membranous; proctiger narrow, in form of lightly sclerotized arc (Fig. 3D); coxites elongate, relatively broad, with sides sub-parallel, styli absent (Fig. 3D). Bursa copulatrix membranous (Fig. 3E), sperm duct long, narrow, distinctly coiled, originating apically (Fig. 3C); spermatheca slightly coiled, sclerotized (Fig. 3C).

Male not studied.

Etymology. The generic name is a composition derived from Sunda Islands, to which Sumatra belongs (type locality of the new species), and suffix -loma, frequently used in Discolomatidae in generic names (e.g. *Casidoloma*, *Discoloma*). Gender is neuter.

Sundaloma seideli sp. nov.

https://zoobank.org/54CB7E25-F95A-45F5-A353-1EDC1053800C

Figs 1–4

Diagnosis. As for the genus.

Description. Length 2.33 mm, width 1.54 mm; TL/EW = 1.54; PL/PW = 0.47; EL/EW = 1.11. Body elongate, broadly oval with sides subparallel (Figs 1A, 2A), laterally distinctly spherical (Fig. 1C). Body black, only with anterolateral margins of pronotum light brown. Dorsal vestiture white.

Pronotum covered with small sparse punctae, elytra with punctation similar in size intermixed with large punctae in median and lateral areas. Ventral side with short sparse hairs on head, hypomere, lateral areas of prosternum, metaventrite, and ventrites 1–4, ventrite 5 and epipleura entirely covered with moderately long hair, only a single sparse row of longer setae is present on outer margin of epipleura from the level of posterior portion of ventrite 1 to tip of epipleura (Fig. 2G, H).

Female genitalia. Coxites relatively broad, elongate, styli absent (Fig. 3D). Sperm duct diverging apically from bursa copulatrix, of uniform diameter, distinctly coiled (Fig. 3C, E); spermatheca vermiform, coiled sclerotized tube of varying diameter (Fig. 3C, E).

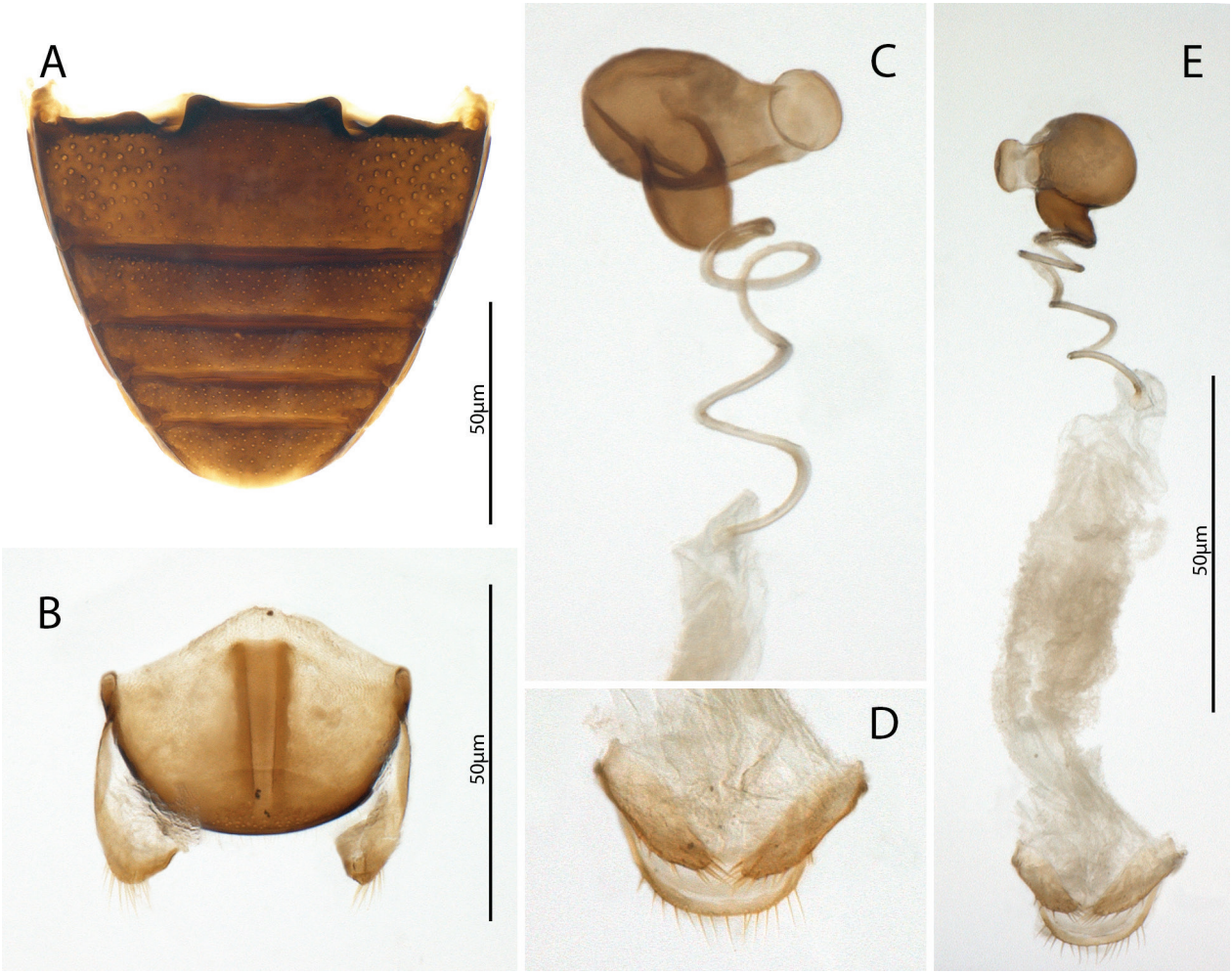

Figure 3. *Sundaloma seideli* gen. et sp. nov. female abdomen and terminalia: **A.** Abdomen; **B.** Tergit VIII and sternite VIII; **C.** Spermatheca; **D.** Coxites and proctiger; **E.** Female genitalia.

Figure 4. Type locality of *Sundaloma seideli* gen. et sp. nov. on Sumatra (Indonesia).

Male not studied.

Material examined. Holotype, female, "N-SUMATRA, 1990 (20) Bukit Lawang leg. Jäch, 26.–27.2" (NHMW).

Etymology. The specific name is dedicated to my colleague Matthias Seidel, an expert in Scarabaeidae: Rutelinae and curator of Coleoptera at the Naturhistorisches Museum Wien, who kindly provided me with the opportunity to study Discolomatidae from the Wien collection.

Distribution. Indonesia: Sumatra: Bukit Lawang (Fig. 4).

Discussion

As I had the opportunity to study only a single specimen, I was unable to examine all morphological details, such as the morphology of the head and mouthparts. Thus, some key features remain unknown and require further study. However, based on the characteristics that are already clearly visible, some assumptions about the closest relatives of *Sundaloma* can be made. The following set of characters shows similarities with *Aphanocephalus* (see Szawaryn 2025): a) anterior corners of the prono-

tum acute, fitting into oblique depressions on the elytra, b) a broad prosternal process, and c) a broad mesoventral process with a rounded anterior margin,. As a result, I tentatively propose placing the new genus *Sundaloma* gen. nov. in the tribe Aphanocephalini. However, the current classification proposed by John (1954) appears to be artificial; the definitions of subfamilies and tribes are not based on morphological characteristics that define higher taxa in modern taxonomy.

Sundaloma gen. nov. is the first discolomatid taxon from Asia with such an extraordinary external appearance, characterized by broadly expanded and upturned lateral margins. Externally, the new genus resembles *Cassidoloma* (Africa) (John 1940, 1959) and *Discoloma* (Americas) (John 1944, 1959) – both placed in the tribe Discolomatinae sensu John 1954. These genera share similarly expanded lateral margins of the pronotum and elytra. However, the anterior margin of the pronotum in both genera always has a deep emargination, and at least the anterior portion of the head remains visible. The prosternal process in *Cassidoloma* is rather narrow, whereas in *Discoloma* it is broad. Similarly, the legs, especially the tibiae, are slender in *Cassidoloma*, while in *Discoloma* they are slightly broadened, though not to the extent observed in *Sundaloma*.

This brief synopsis of a few characters calls into question the placement of *Cassidoloma* and *Discoloma* within a single tribe. At present, however, it is also difficult to make definitive statements about the relationships between these superficially similar genera and the newly described genus *Sundaloma* from Sumatra, which shows that a modern revision of the entire family is necessary.

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Additional information

Conflict of interest

The author has declared that no competing interests exist.

Ethical statement

No ethical statement was reported.

Artificial Intelligence (AI) use

The author accepts full responsibility for the content of the manuscript, including the disclosure of any use of AI.
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Author contributions

The author solely contributed to this work

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Data availability

All of the data that support the findings of this study are available in the main text.