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Taxonomic notes on the genus *Pseudoligota* Cameron (Coleoptera: Staphylinidae: Aleocharinae) from Japan

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Abstract

The genus *Pseudoligota* Cameron, 1920 is discovered in Japan for the first time, resulting in two taxonomic changes: a new combination *P. antennata* (Bernhauer, 1907), **comb. nov.**, and a new species *P. nozakii* Hashizume, Yamamoto & Maruyama, **sp. nov.** from Okinawa Prefecture, southwestern Japan. The former species has long been placed in the genus *Oligota* Mannerheim, 1830. This is the fourth genus in the subtribe Gyrophaenina known from Japan. The species *P. affinis* Cameron, 1939 from India and Peninsular Malaysia is placed as a junior synonym of *P. antennata*.

Key words: East Asia, Homalotini, Hypocyphtini, Gyrophaenina, rove beetle, taxonomy

Introduction

The subtribe Gyrophaenina of the tribe Homalotini contains 1126 species in 23 genera worldwide (Newton 2021). From Japan, 24 species in three genera have been recorded from this subtribe (Shibata *et al.* 2013; Schülke & Smetana 2015).

Pseudoligota Cameron, 1920 is a small genus of Gyrophaenina, with 17 known species worldwide (Cameron 1920, 1939, 1950; Pace 1991, 2003, 2011, 2012). Most of the *Pseudoligota* species are distributed in Asia, except for *P. cooki* Pace, 1991 from New Caledonia (Pace, 1991) and *P. karnyi* (Cameron, 1925) from Australia (Cameron 1939). *Pseudoligota* includes very small beetles, around 1 mm in length, which are collected mainly from fungi (Cameron 1920, 1939; Ashe 1984).

The type material of Bernhauer (1907) at the Field Museum of Natural History in Chicago was examined in August and September 2011 by SY and MM. Based on the results, we concluded that *Holobus antennatus*, originally described as *Oligota antennata* Bernhauer, 1907, is in fact a member of the genus *Pseudoligota*. Moreover, *P. affinis* Cameron, 1939 should be considered a junior synonym of *H. antennatus* judging from the detailed illustrations by Ashe (1984). We also noted the presence of an undescribed species of *Pseudoligota* collected from Okinawa Prefecture, southwestern Japan.

In this paper, the genus *Pseudoligota* Cameron, 1920 is recorded for the first time from Japan and *P. nozakii* **sp. nov.** is described herein.

Materials and methods

The type specimen of *O. antennata* is deposited in the Field Museum of Natural History (FMNH), Chicago, USA. Other specimens studied in this paper are deposited in the Kyushu University Museum (KUM), Fukuoka, Japan,

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and private collection of Paweł Jałoszyński (pcPJ), Wrocław, Poland. The label data of the holotypes are quoted verbatim, with the text in double quotation marks (“”); a slash (/) was used to separate lines on the same label, and a double slash (//) was used to separate different labels on the same pin.

Dissected body parts were soaked in a 10% KOH solution and then heated in a hot water bath until the muscles and other soft tissues were dissolved and the specimens became suitable for observations. Later, they were embedded in Euparal as permanent specimens on glass plates, following the procedure of Maruyama (2004). Morphological observations were conducted using Olympus SZ40, Olympus SZX10, and Nikon ECLIPSE Ci-L microscopes. Habitus photos were taken using a Sony α 7R IV digital camera with a Canon MP-E65 mm 1–5× macro lens. The photos were combined in Zerene Stacker software (Zerene System LLC, USA). In the field, photos were taken by a Ricoh WG-5 and a Ricoh WG-50 cameras. Line drawings were made using a Nikon ECLIPSE Ci-L microscope fitted with a Nikon Y-IDT drawing tube and the Inkscape 1.1 software. Figures were edited using GIMP 2. 8. 22 software.

The following abbreviations were applied: BL—length of body from anterior margin of clypeus to posterior margin of tergite VII; FBL—length of forebody from anterior margin of clypeus to end of elytral suture; HL—length of head from anterior margin of clypeus to posterior margin of vertex; HW—maximum width of head, including eyes; HTL—length of hind tibia; PL—maximum length of pronotum; PW—maximum width of pronotum; EL—length of elytral suture from apex of scutellar shield to posterior elytral margin; EW—maximum width of elytra. All measurements are in millimeters and are reported in the format “minimum–maximum”.

Taxonomy

Key to genera of the subtribe Gyrophaenina in Japan

1 Body flattened, elongate oval to parallel-sided in dorsal view; ligula entire, parallel-sided 2
- Body rather convex, broadly oval to elongate oval in dorsal view; ligula bifid, or, if entire, broadly rounded 3
2 Eyes extremely large, occupying most of lateral margins of head . . . . . *Phanerota* Casey, 1906
- Eyes moderate in size . . . . . *Gyrophaena* Mannerheim, 1830
3 Body densely covered with relatively long setae; meso- and metaventral process not fused; ligula entire, broadly rounded . . . . . *Brachida* Mulsant & Rey, 1871
- Body sparsely covered with relatively short setae; meso- and metaventral process fused; ligula bifid, parallel-sided. . . . . *Pseudoligota* Cameron, 1920

Remarks. We have several specimens belonging to genera not recorded in Japan. Here is a key for only the four genera that have already been recorded from Japan.

Genus *Pseudoligota* Cameron, 1920

Pseudoligota Cameron, 1920: 213 (original description). Type species: *Pseudoligota varians* Cameron, 1920, fixed by subsequent designation by Blackwelder, 1952: 327.

Diagnosis. The genus *Pseudoligota* can be distinguished from other Japanese gyrophaenin genera by the combination of the following character states: body minute (adults BL: 0.8–1.2 mm) and slightly limuloid; hypomeron not visible in lateral view; mesoventrite without medial longitudinal carina; meso- and metaventral processes between mesocoxae fused; inner face of lacinia with single row of setae; apex of galea with four rows of setae; labium with ligula bifid, divided at distal 2/3–3/4 of its length; prelabium with single medial seta (modified after Ashe 1984).

Pseudoligota antennata (Bernhauer, 1907), comb. nov.

(Figs 1A, 2A–C, 4A–B, 5A)

Oligota antennata Bernhauer, 1907: 388 (original description; type locality: Onsen [Unzen in Nagasaki-ken, Kyushu]).
Oligota (*Holobus*) *antennata*: Bernhauer & Scheerpeltz, 1926: 512 (catalogue).
Holobus antennatus: Smetana, 2004: 453 (catalogue); Schülke & Smetana, 2015: 657 (catalogue).
Pseudoligota affinis Cameron, 1939: 147 (original description; type locality: Siwaliks: Nakraunda [Northern India: Uttarakhand,

Nakraunda in 'Siwaliks' [= presumably city of Shivalik Nagar], Nakraunda Village.]); Smetana, 2004: 447 (catalogue); Pace, 2011: 29 (Eastern India: Orissa (currently Odisha)); Pace, 2012: 325 (Malaysia: Pahang); Schülke & Smetana, 2015: 646 (catalogue). **Syn. nov.**

Material examined. Type material. Holotype: male, "Onsen. Japan / lg. Sauter. [handwritten] // antennata / Brh. Typ [handwritten] // Oligota antennata / Brh. Typus [handwritten] // Chicago NHMus / M. Bernhauer / Collection." (abdominal segments VIII–X and aedeagus were dissected and mounted in Euparal by MM) (FMNH). See details on Fig. 4.

Additional specimens studied. **JAPAN**: **Hokkaido**: [**Hokkaido**]: 4 exs., Kannonzawa-rindô, Toyama, Minami-ku, Sapporo-shi, 8 VIII 2021, T. Nozaki leg. (KUM); **Shikoku**: [**Ehime-ken**]: 1 ex., Matsuyama Castle, Kuromon Trail, 17 V 2018, P. Jałoszyński leg. (pcPJ); **Kyushu**: [**Ôita-ken**]: 17 exs., Shônaichô-Asono, Yufu-shi, 20 V 2021, T. Hashizume leg. (KUM); [**Nagasaki-ken**]: 3 exs., Mitsushimamachi-Sumo, Tsushima-shi, 11 IX 2021, T. Hashizume leg. (KUM); [**Kagoshima-ken**]: 1 ex., Koseda, Yaku-shima Is., 22 VII 2021, T. Hashizume leg. (KUM); 6 exs., Kurio, Yaku-shima Is., 21 VII 2021, T. Hashizume leg. (KUM).

Diagnosis. This species can be distinguished from its congeners by a combination of the following characters: body black, antennae and legs yellow, elytra and male tergite VII unmodified, male tergite VIII with broad blunt median tooth at posterior margin, and the shape of the median lobe of aedeagus. *Pseudoligota picea* Pace, 2003 and *P. picetoides* Pace, 2003 have somewhat similar median lobes of the aedeagus, but males of these species have carinae or granules at sutural elytral margins and an elongate tubercle in the center of tergite VII.

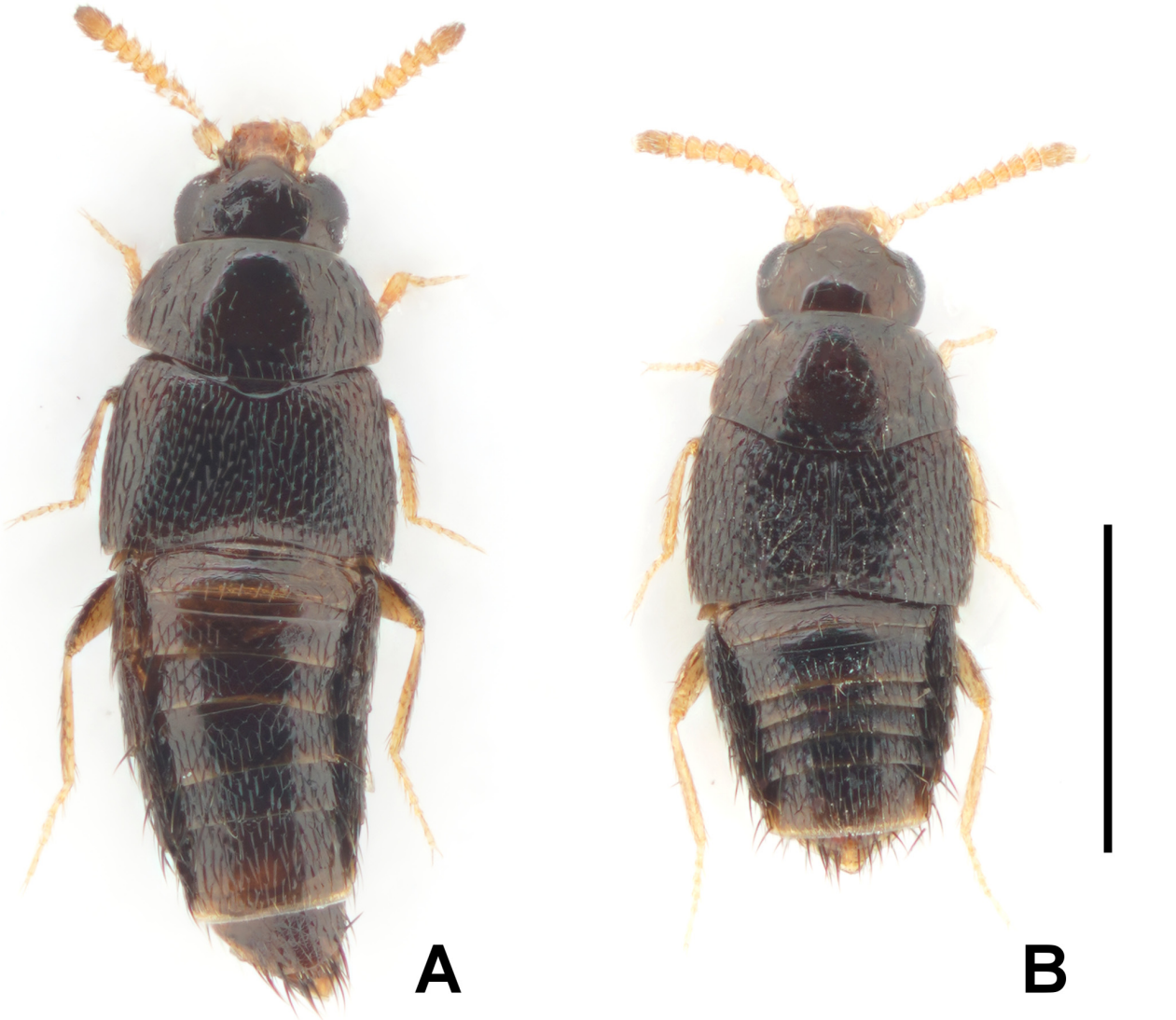

FIGURE 1. Habitus of two species of *Pseudoligota* from Japan. (A) *Pseudoligota antennata* **comb. nov.** (B) *Pseudoligota nozakii* **sp. nov.** Scale bar: 0.5 mm.

Redescription. Measurements. (n = 5): BL 0.90–1.27; FBL: 0.52–0.66; HL: 0.17–0.20; HW: 0.26–0.29; PL: 0.19–0.25; PW: 0.38–0.46; EL: 0.19–0.26; EW: 0.43–0.56. (Holotype: BL ≈ 1.1; PL: 0.24; PW: 0.43; HTL: 0.24).

Body (Fig. 1A) black; legs and antennae excluding terminal segment yellow; antennal terminal segment darker than proximal segments.

Head. Transverse, about 1.50 times as wide as long. Sparsely punctured with indistinct shallow punctures. Antenna 11-segmented, segments I–III longer than wide, segments IV–V about as wide as long, VI–X transverse, segment XI 1.5 times as long as wide.

Thorax. Pronotum transverse, about 1.83 times as wide as long, widest at posterior angles, base rounded; punctures somewhat denser, more distinct than those of head; microsculpture indistinct. Elytra transverse, slightly wider than pronotum; punctures larger than those of pronotum; microsculpture slightly stronger than that on pronotum, composed of transverse reticulation; carinae or granules on sutural margins absent. Hind wings developed.

Abdomen narrowed posteriad, with punctures finer than those on elytra, with diamond-shaped reticulation. Tergite VII unmodified.

Male. Tergite VIII (Fig. 2A) with broad blunt median tooth at posterior margin. Median lobe of aedeagus (Fig. 2B) of complicated shape; parameral process bilobed, parameral lobe of parameral process long, apex pointed, bending paramerally in the apical 2/5; abparameral lobe short, apex rounded, exceeding the flexure of parameral lobe; long thin lobe on left side in abparameral view; flagellum very long, emerging to outside from behind the parameral process, basal part of flagellum relatively small and slightly oval.

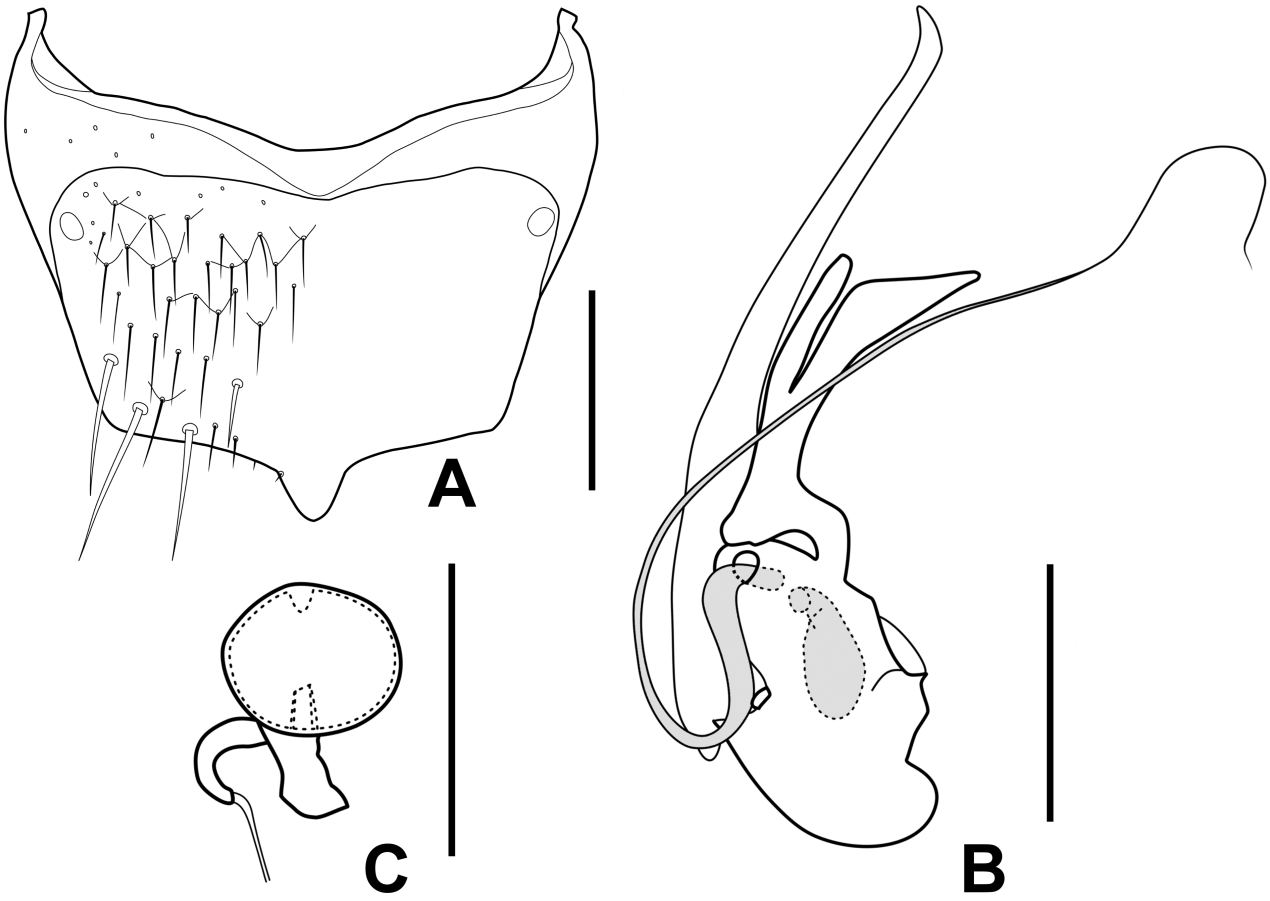

FIGURE 2. *Pseudoligota antennata* **comb. nov.** (A) male tergite VIII in dorsal view. (B) median lobe of aedeagus in lateral view. (C) spermatheca. Scale bars: 0.1 mm.

Female. Similar to male in general appearance. Tergite VIII without broad blunt tooth at posterior margin. Spermatheca (Fig. 2C) simple; distal bulb rounded with tongue-shaped lobe, wall of the distal end protrudes inward; duct curved.

Distribution. Japan: (Kyushu; Hokkaido, Tsushima Is., Yaku-shima Is.—new record); India, Peninsular Malaysia.

Remarks. *Pseudoligota antennata* was originally described as *Oligota antennata* by Bernhauer (1907). Then, *Holobus* was given a full generic rank by Coiffait & Saiz (1967) and recently this species was catalogued as *Holobus antennatus* (Smetana 2004; Schülke & Smetana 2015). However, after studying the holotype of *Oligota antennata*, it was determined that this species should belong to the genus *Pseudoligota*. *Pseudoligota affinis* was described from northernmost India by Cameron (1939). The original description of *P. affinis* (see Cameron (1939)) and illustrations of the aedeagus of *P. affinis* in Ashe (1984) are consistent with the characteristics of *P. antennata*, and the two species are indistinguishable. Therefore, *P. affinis* should be regarded as a junior synonym of *P. antennata*.

Bionomics. Most specimens were obtained from fungi on dead wood in deciduous and evergreen forests (Fig. 5A–B).

***Pseudoligota nozakii* Hashizume, Yamamoto & Maruyama, sp. nov.**
(Figs 1B, 3A–C, 5C)

Type material. Holotype: male (KUM), "JAPAN: Okinawa-ken, / Ishigaki-shi, Sakieda, / Maese-dake, / 26 III 2022, / T. Nozaki leg. // HOLOTYPE / *Pseudoligota / nozakii* / des. T. Hashizume, / S. Yamamoto & / M. Maruyama, 2022". **Paratypes**. **JAPAN**: [**Okinawa-ken**]: 4 males, 2 females, 4 unsexed, same data as holotype. (KUM).

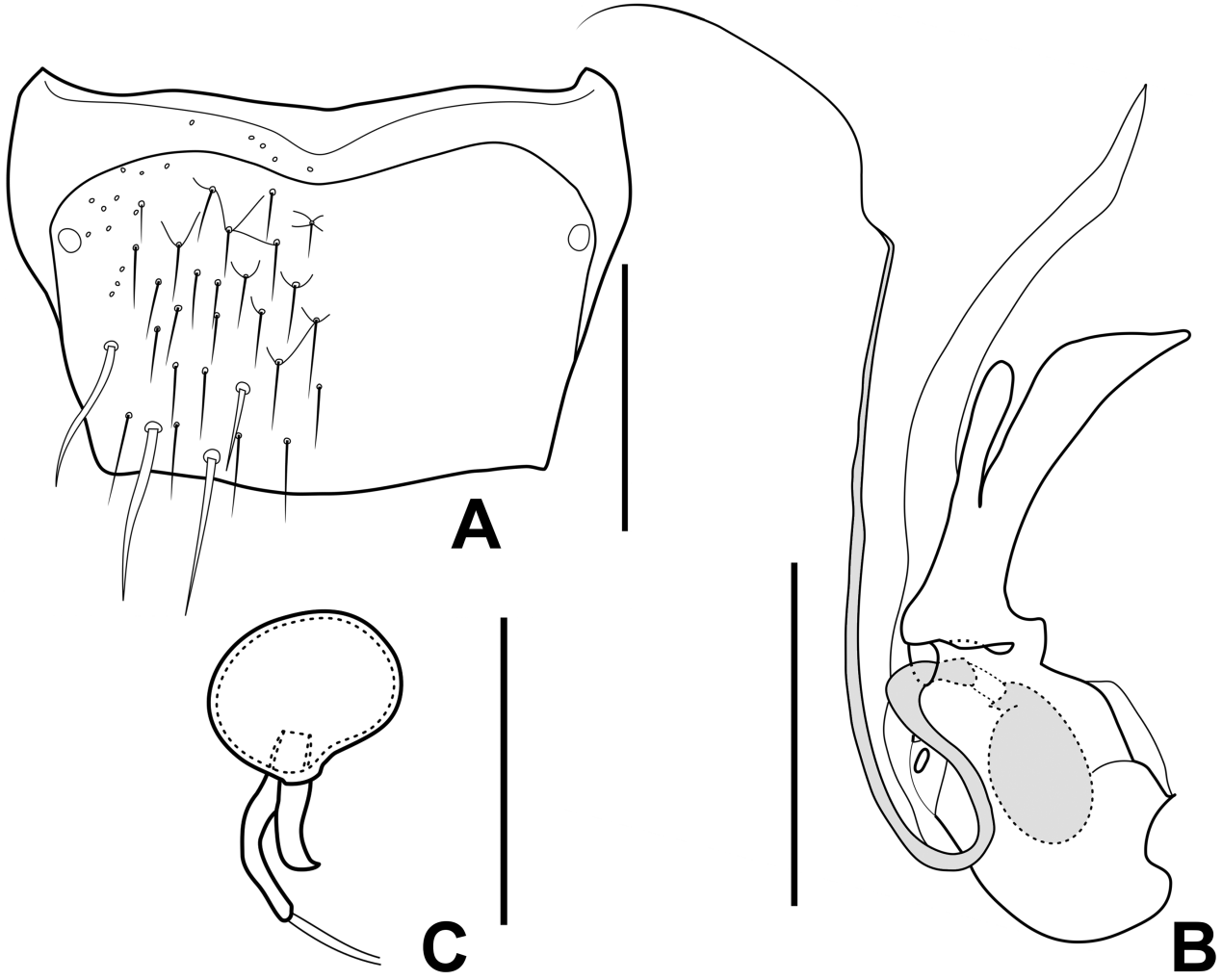

FIGURE 3. *Pseudoligota nozakii* **sp. nov.** (A) male tergite VIII in dorsal view. (B) median lobe of aedeagus in lateral view. (C) spermatheca. Scale bars: 0.1 mm.

Diagnosis. This species is similar to *P. antennata*, it can be distinguished by its smaller body, the male tergite VIII without a broad blunt tooth at the posterior margin, and the abparameral lobe of the parameral process of

median lobe of aedeagus not reaching the flexure of the parameral lobe of parameral process. This species can also be distinguished from other *Pseudoligota* spp. by a combination of the black body coloration, the unmodified elytra, male tergite VII, and male tergite VIII, the relatively complicated general shape of the median lobe of the aedeagus, and the absence of inward protrusion on the wall of distal end of the spermatheca.

Description. Measurements. (n = 5): BL 0.84–0.96; FBL: 0.51–0.58; HL: 0.16–0.18; HW: 0.25–0.26; PL: 0.20–0.22; PW: 0.38; EL: 0.19–0.21; EW: 0.41–0.46.

Body (Fig. 1B) black; legs and antennae excluding terminal segment yellow; antennal terminal segment darker than proximal segments.

Head. Transverse, about 1.53 times as wide as long. Sparsely punctured with indistinct shallow punctures. Antenna 11-segmented, segments I–III longer than wide, segments IV–X transverse, segment XI about 1.5 times as long as wide.

Thorax. Pronotum transverse, about 1.85 times as wide as long, widest at posterior angles, base rounded; punctures somewhat denser, more distinct than those of head; microsculpture indistinct. Elytra transverse, slightly wider than pronotum; punctures larger than those of pronotum; microsculpture slightly stronger than that on pronotum, composed of transverse reticulation; carinae or granules on sutural margins absent. Hind wings developed.

FIGURE 4. Holotype of *Oligota antennata* Bernhauer, 1907 (= *Pseudoligota antennata* **comb. nov.**). (A) habitus in dorsal view. (B) labels.

Abdomen narrowed posteriad, with punctures finer than those on elytra, with diamond-shaped sculpture. Tergite VII unmodified.

Male. Tergite VIII (Fig. 3A) without broad blunt tooth at posterior margin. Median lobe of aedeagus (Fig. 3B) of complicated shape; parameral process bilobed, parameral lobe of parameral process long, apex pointed, bending

paramerally in the apical 2/5; abparameral lobe short, apex rounded, not reaching the flexure of parameral lobe; long thin lobe on left side in abparameral view; flagellum very long, emerging to outside from behind the parameral process, basal part of flagellum large and slightly oval.

Female. Similar to male in general appearance. Spermatheca (Fig. 3C) simple; distal bulb rounded with tongue-shaped lobe, wall of the distal end without inward protrusion; duct curved.

Distribution. Japan: Ryukyus: Ishigaki-jima Is.

Etymology. This specific name of the new species is dedicated to Tsubasa Nozaki who is the collector of the type series.

Bionomics. All specimens were obtained from fungi on dead wood in evergreen forest (Fig. 5C–D).

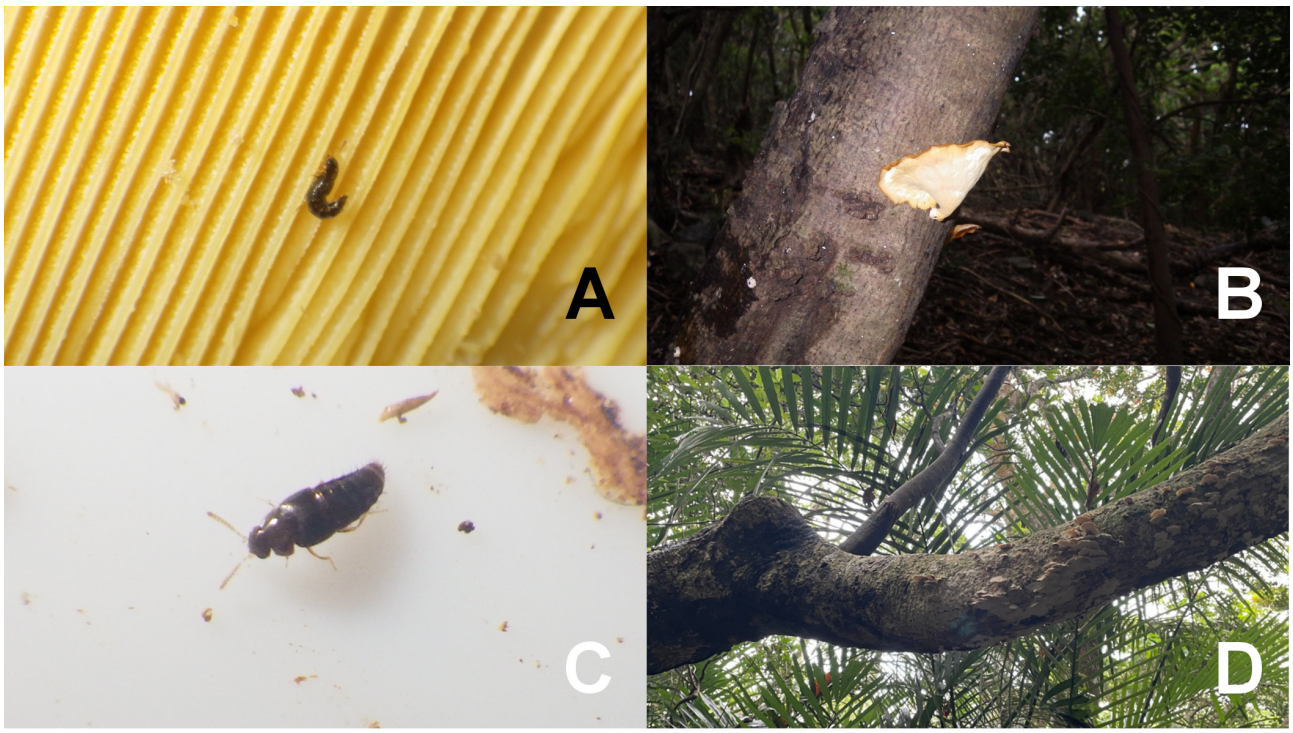

FIGURE 5. The living habitus and habitat of *Pseudoligota* spp. (A) *P. antennata* **comb. nov.** on fruiting body of fungi. (B) fruiting body of fungi from Fig. 5A on dead wood. (C) habitus of *P. nozakii* **sp. nov.** (D) fruiting body of fungi on dead wood from which *P. nozakii* **sp. nov.** was obtained. (C–D: photo by T. Nozaki, used with permission).

Key to Japanese species of *Pseudoligota*

1. Male tergite VIII with broad blunt median tooth at posterior margin; wall of distal end of spermatheca with inward protrusion . . . . . *P. antennata* (Bernhauer, 1907)
- Male tergite VIII unmodified; wall of distal end of spermatheca without inward protrusion . . . . . *P. nozakii* sp. nov.

Discussion

The Japanese aleocharine fauna has gradually been clarified in recent years, but our knowledge is far from comprehensive, particularly in relation to taxa inhabiting forest litter or found on fungi (e.g., Inoue & Maruyama 2022). This also holds for the aleocharine tribe Hypocyphtini, possibly due to their minute body sizes, although some agriculturally important species have recently been revised (Kanao *et al*. 2016). *Oligota antennata* has long been placed in Hypocyphtini despite the fact that it has 11-segmented antennae, while all other hypocyphtins have 10-segmented ones (Kanao *et al*. 2016).

In this study, we found that the generic and tribal assignments of *Oligota antennata* were erroneous, and proposed a new combination for the species as *Pseudoligota antennata*, consequently placing it in the aleocharine tribe Homalotini (subtribe Gyrophaenina). Our efforts also led to the discovery of a new species in the same genus,

described herein as *Pseudoligota nozakii*. These findings constitute the first record of the genus not only from Japan but also from East Asia, implying a potentially wider distribution of *Pseudoligota*. We believe that other specimens of *Pseudoligota* might have been misidentified or misplaced as members of Hypocyphtini, like our case.

Our finding is crucial for the taxonomic definition of Hypocyphtini due to the removal of *Oligota antennata* (= *P. antennata*) from this tribe. After this taxonomic treatment, all hypocyphtins now have antennae with 10 segments. The reduction in antennal segments in Aleocharinae is frequently associated with miniaturisation (e.g., Yamamoto & Maruyama 2016), and there are now no exceptions in Hypocyphtini for reduced antennal segmentation due to our transfer of *P. antennata* with 11-segmented antennae to Homalotini.

The ecological data on *Pseudoligota* are limited, and the only information is that beetles were collected from fungi, rotten fruit, or under bark (Cameron 1920, 1939; Ashe 1984). We found that Basidiomycetes on dead wood in deciduous or evergreen forests are host fungi (Fig. 5). Investigating similar microenvironments may help obtaining additional specimens of *Pseudoligota*.

Pseudoligota nozakii is currently known to occur only on Ishigaki-jima, a subtropical island in southwestern Japan. However, considering the very wide distribution of *P. antennata*, the new species might be found in other areas in future. We hope that our research sheds light on this small genus.

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References

Ashe, J.S. (1984) Generic revision of the subtribe Gyrophaenina (Coleoptera: Staphylinidae: Aleocharinae) with a review of the described subgenera and major features of evolution. *Quaestiones Entomologicae*, 20, 129–349.

Bernhauer, M. (1907) Zur Staphylinidenfauna von Japan. *Verhandlungen der kaiserlich-königlichen Zoologisch-Botanischen Gesellschaft in Wien*, 57, 371–414.

Bernhauer, M. & Scheerpeltz, O. (1926) Staphylinidae VI (Pars 82). *In*: Junk, W. & Schenkling, S. (Eds.) *Coleopterorum Catalogus. Vol. 5. Staphylinidae*. W. Junk, Berlin, pp. 499–988.

Blackwelder, R.E. (1952) The generic names of the beetle family Staphylinidae, with an essay on genotypy. *Bulletin of the United States National Museum*, 200, 1–483.

Cameron, M. (1920) New species of Staphylinidae from Singapore. Part III. *Transactions of the Entomological Society of London*, 1920, 212–284.
https://doi.org/10.1111/j.1365-2311.1920.tb00214.x

Cameron, M. (1939) *The fauna of British India, including Ceylon and Burma. Coleoptera: Staphylinidae. Vol. 4. Part I.* Taylor and Francis, London, xviii + 410 pp.

Cameron, M. (1950) New species of Staphylinidae (Col.) from Malay Peninsula. *The Annals and magazine of natural history*, Series (12) 3, 1–40 + 89–131.
https://doi.org/10.1080/00222935008654046

Coiffait, A. & Saiz, F. (1967) Aleocharidae du Chili. I. Tribus Oligotini, Myllaenini, Bolitocharini (Col. Staphylinoidae). *Extrait du Bulletin de la Société D'Histoire Naturelle de Toulouse*, 103, 51–98.

Inoue, S. & Maruyama, M. (2022) Revision of the genus *Plesiochara* Sawada (Coleoptera: Staphylinidae: Aleocharinae). *Zootaxa*, 5165 (4), 501–519.
https://doi.org/10.11646/zootaxa.5165.4.3

Kanao, T., Maruyama, M. & Ohno, S. (2016) Redescriptions and distributions of acarivorous rove beetles, *Holobus kashmiricus beneficus* and *H. yasumatsui* (Coleoptera: Staphylinidae: Aleocharinae), in Japan and Taiwan. *Applied Entomology and Zoology*, 51 (2), 275–287.
https://doi.org/10.1007/s13355-016-0399-2

Maruyama, M. (2004) A permanent slide pinned under a specimen. *Elytra, Tokyo*, 32 (2), 276.

Newton, A. (2021) Staphyliniformia world catalog database. *In*: Bánki O., Roskov, Y., Döring, M., Ower, G., Vandepitte, L.,

Hobern, D., Remsen, D., Schalk, P., DeWalt, R. E., Keping, M., Miller, J., Orrell, T., Aalbu, R., Adlard, R., Adriaenssens, E. M., Aedo, C., Aeschet, E., Akkari, N., Alfenas-Zerbini, P., *et al*., *Catalogue of Life Checklist*. October 2021. Available from: https://doi.org/10.48580/dfpk-3gk (accessed 8 August 2022)

Pace, R. (1991) La sottofamiglia Aleocharinae della Nuova Caledonia (Coleoptera, Staphylinidae). *Memorie della Società entomologica italiana*, 70 (1), 79–170.

Pace, R. (2003) Gyrophaenini dei generi *Sternotropa*, *Pseudoligota* e *Adelarthra* del Monte Kinabalu (Borneo, Sabah) (Coleoptera, Staphylinidae). *Revue Suisse de zoologie*, 110 (4), 761–781.
https://doi.org/10.5962/bhl.part.80211

Pace, R. (2011) Aleocharinae from India gathered by Guillaume de Rougemont (Coleoptera, Staphylinidae). *Lavori della Società vebeziana di scienze naturali*, 36, 23–40.

Pace, R. (2012) New data, new species, and two new genera of Aleocharinae from the Oriental Region (Insecta: Coleoptera: Staphylinidae). *Veröffentlichungen des Naturkundemuseums Erfurt*, 31, 319–360.

Schülke, M. & Smetana, A. (2015) Staphylinidae. *In*: Löbl, I. & Löbl, D. (Eds.), *Catalogue of Palaearctic Coleoptera*. *Vol. 2*. *Hydrophiloidea—Staphylinoidea. Revised and updated edition*. Brill, Leiden/Boston, pp. 304–1134.

Shibata, Y., Maruyama, M., Hoshina, H., Kishimoto, T., Naomi, S.-I., Nomura, S., Puthz, V., Shimada, T., Watanabe, Y. & Yamamoto, S. (2013) Catalogue of Japanese Staphylinidae (Insecta: Coleoptera). *Bulletin of the Kyushu University Museum*, 11, 69–218.

Smetana, A. (2004) Aleocharinae. *In*: Löbl, I. & Smetana, A. (Eds.), *Catalogue of Palearctic Coleoptera. Vol. 2*. *Hydrophiloidea, Histeroidea, Staphylinoidea.* Apollo Books, Stenstrup, pp. 353–494.

Yamamoto, S. & Maruyama, M. (2016) Revision of the subgenus *Tinotus* Sharp, stat. n., of the parasitoid rove-beetle genus *Aleochara* Gravenhorst (Coleoptera, Staphylinidae, Aleocharinae) from Japan, Taiwan, and the Russian Far East. *ZooKeys*, 559, 81–106.
https://doi.org/10.3897/zookeys.559.6755