Studies and Reports
Taxonomical Series 21 (2): 379-387, 2025

New genera of Alleculinae (Coleoptera: Tenebrionidae: Alleculinae: Alleculini) from the Oriental Region XXIV - *Flavodema* gen. nov.

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Taxonomy, new genus, new species, description, Coleoptera, Tenebrionidae, Alleculinae, Alleculini, *Flavodema*, Indonesia (Sumatra Island), Malaysia (Sabah, Island Borneo), Oriental Region

Abstract. A new genus of Alleculini Laporte, 1840 - *Flavodema* gen. nov. with the type species *Flavodema sabahica* sp. nov. from Malaysia (Sabah, Borneo Island) and *Flavodema harauica* sp. nov. from Indonesia (Sumatra Island) are described and illustrated. New genus *Flavodema* gen. nov. is compared with the similar genera *Cistelodema* Borchmann, 1932, *Paracistela* Borchmann, 1941 and *Cistelomorpha* L. Redtenbacher, 1868.

INTRODUCTION

A new Alleculine genus *Flavodema* gen. nov. with the type species *Flavodema sabahica* sp. nov. from Malaysia (Borneo Island, Sabah) and *Flavodema harauica* sp. nov. from Indonesia (Sumatra Island) are described and illustrated.

Species of the new genus *Flavodema* (subtribe Gonoderina Seiditz, 1896) differ from species of the similar genera *Cistelomorpha* L. Redtenbacher, 1868 (tribe Cteniopodini Solier, 1835), *Cistelodema* Borchmann, 1932 and *Paracistela* Borchmann, 1941 (both in subtribe Gonoderina Seidlitz, 1896) mainly by these characters: medium-sized body, head approximately as wide as long with transverse clypeus, eyes transverselly excised, insertion of antennae in eye excision not visible dorsally, antenna shorter than half body length, antennomeres 5-10 wide but not transverse, males with more teeth on protarsal claws than females.

MATERIAL AND METHODS

Two important morphometric characteristics used for the descriptions of species of the subfamily Alleculinae, the 'ocular index' dorsally (Campbell & Marshall 1964) and 'pronotal index' (Campbell 1965), are used in this paper as well. The ocular index equals (100 × minimum dorsal distance between eyes) / (maximum width of head across eyes). The pronotal index is calculated as (100 × length of pronotum along midline) / (width across basal angles of pronotum).

'Type material' information is taken from locality labels.

In the list of type material, a slash (/) separates data in separate rows, a double slash separates data (//) on different labels.

The following collection codes are used:
BNHM British Museum Natural History, London, England;
VNPC Vladimír Novák, private collection, Praha, Czech Republic.

Measurements of body parts and corresponding abbreviations used in text are as follows: AL - total antennae length, BL - maximum body length, EL - maximum elytral length, EW - maximum elytral width, HL - maximum length of head (visible part), HW - maximum width of head, OI - ocular index dorsally, PI - pronotal index dorsally, PL - maximum pronotal length, PW - pronotal width at base, RLA - ratios of relative lengths of antennomeres 1-11 from base to apex (3=1.00), RL/WA - ratios of length / maximum width of antennomeres 1-11 from base to apex, RLT - ratios of relative lengths of tarsomeres 1-5 respectively 1-4 from base to apex (1=1.00).

Other abbreviations are used: wl - white label; ys - yellow strip.

Measurements were made with an Olympus SZ 40 stereoscopic microscope with continuous magnification and with the Soft Imaging System AnalySIS. Snapshots were taken by using camera Canon EOS 550 D and Canon Macro Photo Lens MP-E and software Helicon Focus 7.7.5.

TAXONOMY

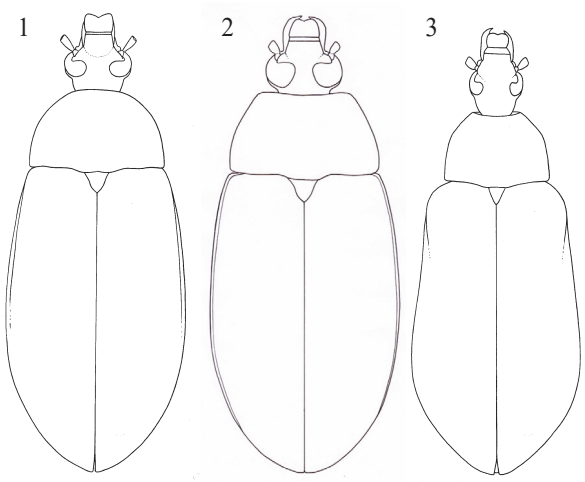
genus *Flavodema* gen. nov.
(Figs. 4-15)

Type species: *Flavodema sabahica* sp. nov.

Description (male). Habitus as in Figs. 4, 10, medium-sized, elongate-oval, matte, dorsal surface with setae, punctures and microgranulation. Widest near two thirds of elytral length. Head (Figs. 5, 11) as wide as long, through the eyes approximately as wide as anterior margin, narrower than base of pronotum. Clypeus transverse. Mandibles glabrous, shiny. Eyes large, transverse, excised, space between eyes aproximately as wide as diameter of one eye, slightly wider than length of antennomere 1. Antenna (Figs. 6, 12) short, not reaching half body length. Antennomere 2 shortest, antennomeres 5-10 short and wide, shorter than antennomere 3. Ultimate maxillary palpomere longer than penultimate, knife-shaped. Pronotum (Figs. 5, 11) convex, border lines narrow, margins conspicuous from dorsal view. Base bisinuate, anterior angles indistinct, posterior angles distinct. Elytra elongate oval, convex, matte, widest near two thirds elytral length, surface with dense and short, recumbent setae. Elytral striae with rows of corse, very small punctures. Elytral epipleura well-developed. Legs long and narrow. Penultimate tarsomeres not widened and lobed. Protarsal claws with teeth. Aedeagus as in Figs. 8, 9 and 14, 15.

Female without distinct differences, protarsal claws have fewer teeth than male.

Differential diagnosis. The most similar genera from this area are *Paracistela* Borchman, 1941 (body outline as in Fig. 1) and *Cistelodema* Borchmann, 1932 (body outline as in Fig.



Figs. 1-3. body outlines: 1- *Paracistela* Borchman, 1941; 2- *Cistelodema* Borchmann, 1932; 3- *Cistelomorpha* L. Redtenbacher, 1868.

2) - both from subtribe Gonoderina Seidlitz, 1896 and *Cistelomorpha* L. Redtenbacher, 1868 (body outline as in Fig. 3) - from the tribe Cteniopodini Solier, 1835).

Species of the new genus *Flavodema* clearly differ from similar species of the genus *Cistelomorpha* mainly by medium-sized body, by head approximately as wide as long with transverse clypeus, by eyes transversaly excised, by insertion of antennae in eye excision not visible dorsally; while species of *Cistelomorpha* have mostly large body, head is distinctly longer than wide, clypeus is not transverse, eyes are not distinctly excised, insertion of antennae is clearly visible dorsally (Novák 2018).

Species of the new genus *Flavodema* are distinctly different from the similar species of the genus *Cistelodema* mainly by medium-sized body, yellow from dorsal view, by antennomeres 5-10 wide but not transverse and by males with more teeth on protarsal claws than in females; while species of *Cistelodema* have a small body with dorsal surface mostly darker, antennomeres 5-10 are transverse (Novák 2020) and males and females have the same number of teeth on the protarsal claws.

Species of the new genus *Flavodema* clearly differ from similar species of the genus *Paracistela* mainly by short antennae (not reaching half body length), by antennomeres 5-10 wide and short, 1.3-2.2 times longer than wide; while species of *Paracistela* have the antenna longer than half body length and antennomeres 5-10 are longer and narrower (Novák 2011, 2022: RL/WA 1.9-4.6).

Etymology. Compound name from Latin *Flavus* (yellow) describing the colour of the dorsal surface and *-dema* resembling similarity to the genus *Cistelodema* Borchmann, 1932. Gender: feminine.

Distribution. Indonesia, Malaysia.

Flavodema harauica sp. nov.

(Figs. 4-9)

Type locality. Indonesia, West Sumatra, Harau valley, 20 km north of Payakumbuh, 600 m.

Type material. Holotype (♂): Indonesia, West Sumatra / HARAU VALLEY env. / 20 km N of Payakumbuh / 600 m; 5. 2007; St Jakl lgt, (VNPC). Paratypes (1 ♂, 2 ♀♀): same data as holotype, (VNPC). The types are provided with a printed red label: 'Flavodema / harauica sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2024'.

Description of holotype. Habitus as in Fig. 4, medium-sized, elongate-oval, convex, matte, from yellow to black, dorsal surface with pale setae, punctures and microgranulation, BL 9.51 mm. Widest near two thirds elytral length; BL/EW 2.63.

Head (Fig. 5) approximately as wide as long, through the eyes approximately as wide as anterior margin, narrower than base of pronotum. Dorsal surface semi-matte with dense, coarse punctures and pale setae. Interspaces between punctures shiny. Clypeus pale reddish brown, transverse, surface with long, pale setae, very small punctures and fine microgranulation. Mandibles large, ochre yellow, glabrous, shiny with sparse, pale setae in sides, apex darker. HW 1.40 mm; HW/PW 0.50; HL (visible part) 1.36 mm. Eyes large, transverse, excised, space between eyes approximately as wide as diameter of one eye, a little wider than length of antennomere 1; OI equal to 35.26.

Antenna (Fig. 6) short, ochre yellow (AL 4.06 mm, not reaching half body length - AL/BL 0.43). Antenal insertion is directly in excision of eye. Dorsal surface with dense and short, pale setae, dense, coarse punctures and microgranulation. Antennomeres 1-4 semi-matte, antennomeres 5-11 matte, antenomere 1 pale reddish brown, rest of antennomeres black. Antennomere 2 shortest, antennomeres 4-10 shorter than antennomere 3. Antennomeres 5-10 short, only 1.66-2.15 longer than wide.

RLA(1-11): 0.75 : 0.37 : 1.00 : 0.91 : 0.87 : 0.75 : 0.78 : 0.81 : 0.75 : 0.81 : 1.11.

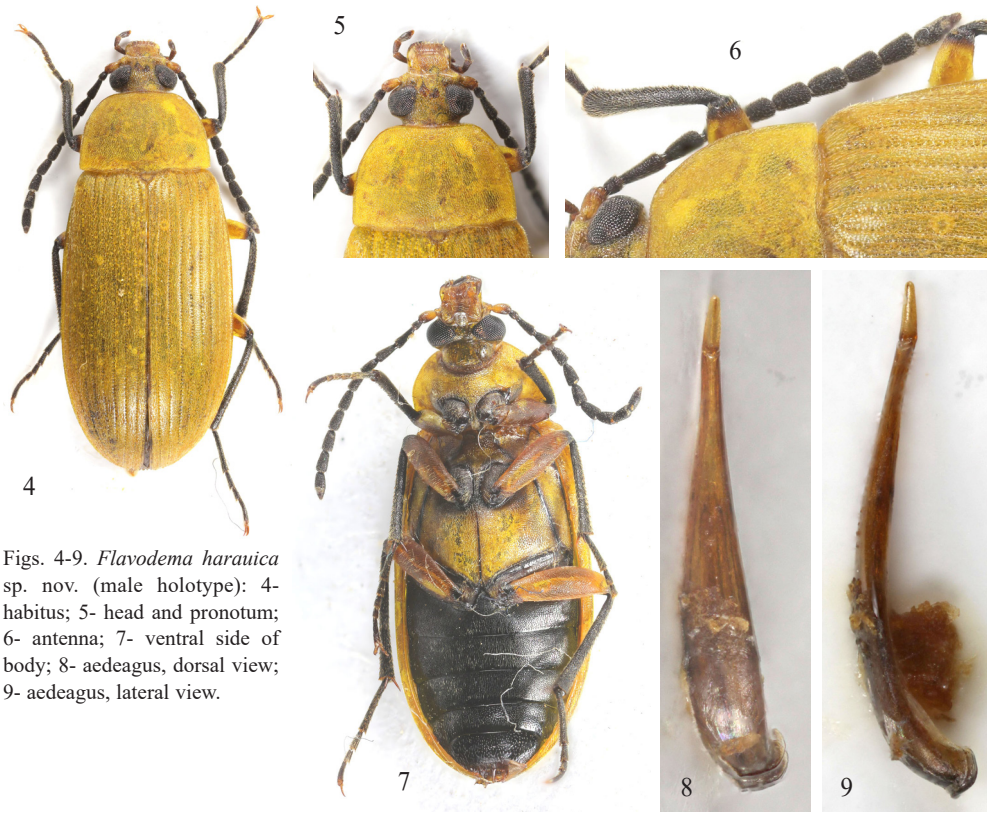
RL/WA(1-11): 1.83 : 1.20 : 3.03 : 2.67 : 2.15 : 1.78 : 1.77 : 1.84 : 1.66 : 1.80 : 3.00.

Maxillary palpus brown, semi-matte, with long pale setae, small punctures and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere longer and darker than penultimate, knife-shaped with ochre yellow apex.

Pronotum (Fig. 5) yellow, matte, convex, widest at base, as wide as elytra at humeri. Dorsal surface with short, recumbent, pale setae, dense, small punctures and microgranulation. Interspaces between punctures very narrow. PL 1.75 mm; PW 2.78 mm; PI equal to 62.95. Border lines narrow, margins clearly distinct dorsally. Base slightly bisinuate, anterior margin slightly excised in middle, anterior angles indistinct, posterior angles roundly rectangular.

Elytra. Yellow, elongate oval, convex, matte, widest near two thirds elytral length. Dorsal surface with dense and short, recumbent pale setae. EL 6.40 mm; EW 3.61 mm; EL/EW 1.77. Elytral striae with rows of small, coarse punctures, elytral intervals with fine microgranulation and very small, shallow punctures.

Scutellum. Yellow, semi-elliptical, with sides darker, matte, with a few pale setae, fine microgranulation and a few small, shallow punctures.



Figs. 4-9. *Flavodema harauica* sp. nov. (male holotype): 4- habitus; 5- head and pronotum; 6- antenna; 7- ventral side of body; 8- aedeagus, dorsal view; 9- aedeagus, lateral view.

Elytral epipleura well-developed, yellow or ochre yellow, with dense, pale setae, narrowing to ventrite 1, then relatively wide leads parallel on apical part.

Legs. Long and narrow, black, femora except apex yellow. Dorsal surface with pale setae and microgranulation, tibiae with dense and coarse punctures. Penultimate tarsomeres not widened and lobed. RLT: 1.00 : 0.47 : 0.54 : 0.40 : 1.66 (protarsus); 1.00 : 0.44 : 0.34 : 0.25 : 0.83 (mesotarsus); 1.00 : 0.38 : 0.31 : 0.65 (metatarsus).

Protarsal claws pale reddish brown, with 16 and 19 teeth.

Ventral side of body yellow with dark parts as in Fig. 7, with short, pale setae. Abdomen black.

Aedeagus (Figs. 8, 9) ochre yellow or pale brown, shiny. Basal piece slightly rounded laterally and narrowing in dorsal view. Apical piece very short, elongate triangular dorsally, beak-shaped from dorsal and lateral views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 7.64.

Female without distinct differences, both protarsal claws have only 8 teeth.

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Specimens (n=4). BL 9.27 mm (8.42-9.70 mm); HL

1.34 mm (1.29-1.36 mm); HW 1.36 mm (1.30-1.40 mm); OI 36.09 (34.13-38.07); PL 1.68 mm (1.52-1.75 mm); PW 2.67 mm (2.41-2.78 mm); PI 63.04 (62.95-63.14); EL 6.26 mm (5.61-6.63 mm); EW 3.63 mm (3.37-3.81 mm).

Differential diagnosis. This species is similar to *Flavodema sabahica* sp. nov. from Malaysia (Sabah, Borneo Island).
The new species *Flavodema harauica* sp. nov. clearly differs from the similar species *Flavodema sabahica* mainly by the pronotum being widest at the base (Fig. 5), antennomere 1 pale reddish brown (Fig. 6), by the scutellum being semi-elliptical, and by the colouring of the ventral surface (as in Figs. 4, 7); while *F. sabahica* has the pronotum widest near the middle of the lateral margins (Fig. 11), by antennomere 1 is black (Fig. 12), the scutellum is triangular and the colouring of the ventral surface is as in Figs. 10, 13.

Etymology. Toponymic, named after the name of Harau valley in West Sumatra (Indonesia).

Distribution. Indonesia (Sumatra Island).

*Flavodema sabahica s*p. nov.
(Figs. 10-15)

Type locality. Malaysia, Borneo, Sabah, Mount Trus Madi, 600 m.

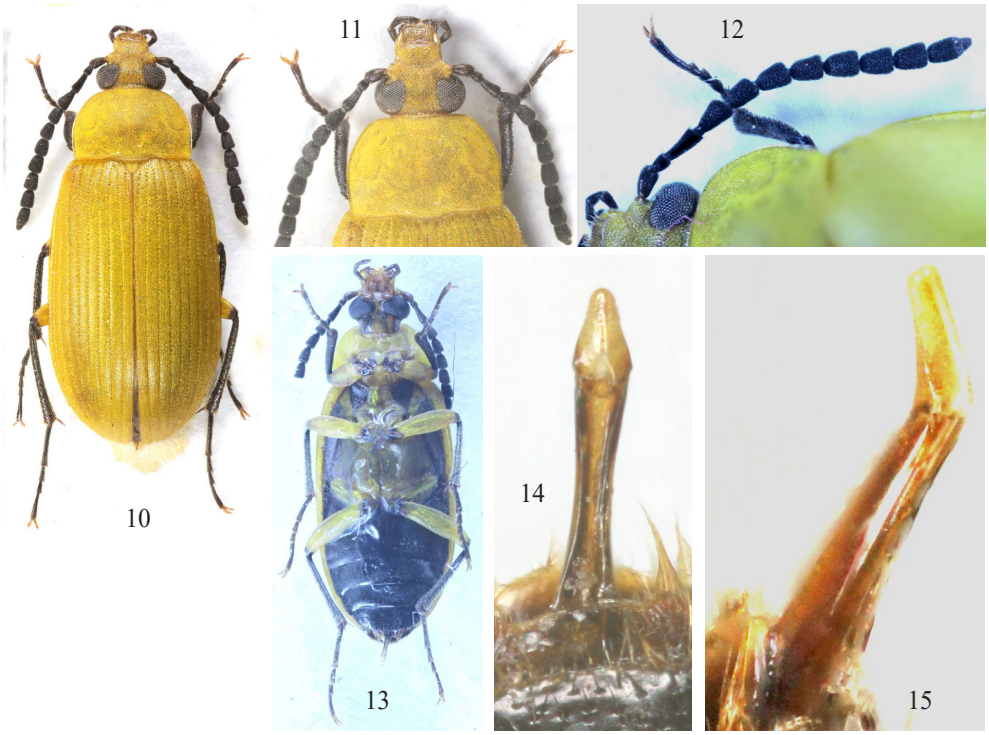
Type material. Holotype (♂): wl with ys: ´BORNEO, Sabah / Mount. Trus Madi, / 20.iii.2007. 600m / Steven Chew // BMNH (e) 2009-6, (BMNH). Paratypes: (3 ♂♂, 1 ♀): same data as holotype, (BMNH, VNPC). The types are provided with a printed red label: ’Flavodema / sabahica sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2024‘.

Description of holotype. Habitus as in Figs. 10, medium-sized, elongate-oval, matte, from yellow to black, dorsal surface with pale setae, punctures and sparse microgranulation, BL 7.77 mm. Widest near two thirds of elytral lengt; BL/EW 2.46.

Head (Fig. 11) as wide as long, through the eyes approximately as wide as anterior margin, narrower than base of pronotum. Dorsal surface shiny with dense, coarse punctures and long, pale setae. Clypeus pale brown, transverse, surface with long, pale setae, coarse punctures. Mandibles yellow, glabrous, shiny pale setae in sides. HW 1.30 mm; HW/PW 0.61; HL (visible part) 1.30 mm. Eyes large, transverse, excised, space between eyes aproximately as wide as diameter of one eye, slightly wider than length of antennomere 1; OI equal to 32.31.

Antenna (Fig. 12) short, black, (AL 3.50 mm, not reaching half body length - AL/BL 0.45). Dorsal surface with dark, dense, recumbent setae, microgranulation and small, coarse punctures. Antennomere 2 shortest, antennomeres 5-10 wide, shorter than antennomere 3 and 1.29-1.46 times longer than wide.
RLA(1-11): 0.84 : 0.46 : 1.00 : 1.06 : 0.80 : 0.86 : 0.86 : 0.93 : 0.94 : 0.85 : 1.20.
RL/WA(1-11): 1.82 : 1.22 : 2.30 : 1.70 : 1.42 : 1.43 : 1.35 : 1.41 : 1.46 : 1.29 : 2.22.

Maxillary palpus blackish brown, shiny, with dark setae, punctures and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere longer than penultimate, knife-shaped with pale reddish brown apex.



Figs. 10-15. *Flavodema sabahica* sp. nov. (Figs. 10-12: male holotype; Figs. 13-15: male paratype): 10- habitus; 11- head and pronotum; 12- antenna; 13- ventral part of body; 14- apical piece of aedeagus, dorsal view; 15- apical piece of aedeagus, lateral view.

Pronotum (Fig. 11) yellow, semi-matte, convex, widest near middle, slightly narrower than elytra at humeri. Dorsal surface with short, pale setae, dense, small and shallow punctures and fine microgranulation inside punctures. Interspaces between punctures very narrow. PL 1.43 mm; PW 2.14 mm; PI equal to 66.82. Border lines narrow, margins conspicuous from dorsal view. Base bisinuate, anterior margin almost straight, anterior angles indistinct, posterior angles finely obtuse.

Elytra. Yellow, elongate oval, convex, matte, widest near two thirds elytral length, surface with dense and short, recumbent setae. EL 5.04 mm; EW 3.16 mm; EL/EW 1.60. Elytral striae with rows of coarse, very small punctures, elytral intervals with fine microgranulation and very small, shallow punctures.

Scutellum. Yellow, triangular, matte, with pale setae and shallow punctures.

Elytral epipleura well-developed, yellow, with sparse, short, pale setae narrowing to ventrite 1, then relatively narrow leading parallel to apex.

Legs. Long and narrow, black, femora yellow with black apex. Dorsal surface with pale setae, dense, coarse punctures and fine microgranulation. Penultimate tarsomeres not widened and lobed. RLT: 1.00 : 0.78 : 0.59 : 0.63 : 2.31 (protarsus); 1.00 : 0.45 : 0.39 : 0.28 : 0.92 (mesotarsus); 1.00 : 0.36 : 0.28 : 0.60 (metatarsus).

Both protarsal claws with 12 teeth.

Ventral side of body (Fig. 13): prosternum and hypomeron yellow, meso- and metaventrite dirty yellow, other parts black. Abdomen black, shiny, surface with pale setae, dense, small punctures and microgranulation.

Aedeagus (apical part as in Figs. 14, 15). Apical piece short, triangular from dorsal and lateral views.

Female without distinct differences, protarsal claws have only 7 and 8 teeth.

Variability. Some specimens have legs dark brown or apex of femora and base of tibiae are dark brown. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Specimens (n=5). BL 8.08 mm (7.70-8.54 mm); HL 1.29 mm (1.22-1.36 mm); HW 1.28 mm (1.21-1.36 mm); OI 33.19 (31.92-35.52); PL 1.48 mm (1.41-1.57 mm); PW 2.21 mm (2.10-2.34 mm); PI 67.05 (66.82-67.14); EL 5.30 mm (5.04-5.70 mm); EW 3.18 mm (3.08-3.37 mm).

Differential diagnosis. This species is similar to *Flavodema harauica* sp. nov. from Indonesia (Sumatra Island).

The new species *Flavodema sabahica* sp. nov. clearly differs from the similar species *F. harauica* mainly by the pronotum being widest near the middle of the lateral margins (Fig. 11), by antennomere 1 black (Fig. 12), by the scutellum triangular and by the colouring of the ventral surface (Fig. 13); while *F. harauica* has the pronotum widest at the base as in Fig. 5, antennomere 1 is pale reddish brown (Fig. 6), the scutellum is semi-elliptical and the colouring of the ventral surface is as in Fig. 7.

Etymology. Toponymic, named after the name of Malayian Province in Borneo - *Sabah* (Malaysia).

Distribution. Malaysia (Sabah, Borneo Island).

ACKNOWLEDGEMENTS. Sincere thanks are due to Maxvell V. L. Barclay and Dmitry Telnov (BMNH) for loaning me material under their care. I am very indebted to Larry G. Bezark (California, U.S.A.) for English revision to the manuscript.

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Received: 6.4.2025
Accepted: 10.5.2025
Printed: 5.10.2025