

New species of *Zizu* Novák, 2019 (Coleoptera: Tenebrionidae: Alleculinae: Alleculini) from Southeastern Asia

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Abstract. Four new species of the genus *Zizu* Novák, 2019 from Southeastern Asia are described as follows: *Zizu phuruaensis* sp. nov. from Thailand (Loei Province), *Zizu skalei* sp. nov. from Thailand, *Zizu tratensis* sp. nov. from Thailand (Trat Province) and *Zizu tiomanensis* sp. nov. from Malaysia (Johor Province, Island Tioman). All new species are illustrated including male genitalia and keyed together with all known species from southeastern Asia. The new distributional data from Cambodia on the species *Zizu viator* Novák, 2019, known from Laos are added.

INTRODUCTION

Genus *Zizu* Novák, 2019 was described by Novák (2019) for *Zizu kejvali* Novák, 2019 as a type species. Species of this genus are inhabiting Asia from India, Nepal and Pakistan in western parts to Thailand and Laos in southeastern Asia (Novák 2019, 2020, 2021 and 2024 in press). In present we recognize four species in the Palearctic Region (Novák 2019, 2020 and 2024 in press.) and further four species living in the Oriental Region (Novák 2019).

New species from southeastern Asia are described as follows: *Zizu phuruaensis* sp. nov. from Thailand (Loei Province), *Zizu skalei* sp. nov. from Thailand, *Zizu tratensis* sp. nov. from Thailand (Trat Province) and *Zizu tiomanensis* sp. nov. from Malaysia (Johor Province, Island Tioman). All new species are illustrated including male genitalia and keyed together with all known species from southeastern Asia. New distributional data from Cambodia on the species *Zizu viator* Novák, 2019, known from Laos are added as well as list of so far known *Zizu* species.

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 $(100 \times \text{minimum dorsal distance between eyes}) / (\text{maximum width of head across eyes})$. The pronotal index is calculated as $(100 \times \text{length of pronotum along midline}) / (\text{width across basal angles of pronotum})$.

'Type material' information is taken from recent locality labels.

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

The following collection codes are used:

ASGG private collection of Andre Skale, Gera, Germany;

DHBC private collection of David Hauck, Brno, Czech Republic;

VNPC private collection of Vladimír Novák, 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 ($1=1.00$).

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 *Zizu* Novák, 2019

Type species: *Zizu kejvali* Novák, 2019.

Zizu phuruaensis sp. nov.

(Figs. 1-5)

Type locality. Northeastern Thailand, Loei Province, Phu Rua National Preserve, 17°30'N 101°21'E, 1100 m.

Type material. Holotype (♂): THAI, NE, Loei prov., Phu / Rua N.P., 1100 m, / 17°30'N 101°21'E, 6- / 9.iv.1999. D. Hauck leg., (VNPC). Paratypes: (4 ♂♂, 7 ♀♀): same data as holotype, (DHBC, VNPC). The types are provided with a printed red label: '*Zizu / phuruaensis* sp. nov. / HOLOTYPE [or PARATYPE] / V. Novák det. 2023'.

Description of holotype. Habitus as in Fig. 1, body larger, wide, oval, semi-matte, from pale reddish brown to brown, dorsal surface with pale setation, punctures and fine microgranulation, BL 7.92 mm. Widest near middle elytra length; BL/EW 2.61.

Head (Fig. 2) reddish brown or pale reddish brown, a little wider than long, through the eyes approximately as wide as anterior margin or distinctly narrower than base of pronotum. Anterior part slightly paler than posterior half. Dorsal surface shiny with sparse, pale setae, fine microgranulation and dense, small punctures. Clypeus wide, transverse, with rounded lateral margins, pale reddish brown. Dorsal surface with small punctures, long, pale setae, and microgranulation. Mandibles pale reddish brown, glabrous, shiny with darker sides and apex. HW 1.29 mm; HW/PW 0.57; HL (visible part) 1.19 mm. Eyes large, transverse, excised, space between eyes narrow, distinctly narrower than diameter of one eye; distinctly wider than length of antennomere 2; OI equal to 18.96.

Antenna (Fig. 3). Long, narrow, ochre yellow (AL 5.11 mm, slightly exceeding half body length - AL/BL 0.53). Antennomeres rather matte, surface with fine microgranulation, recumbent pale setae and very small punctures. Antennomere 2 shortest, antennomeres 3-11 widened apically and longer than antennomere 3. Ultimate antennomere widest before apex.

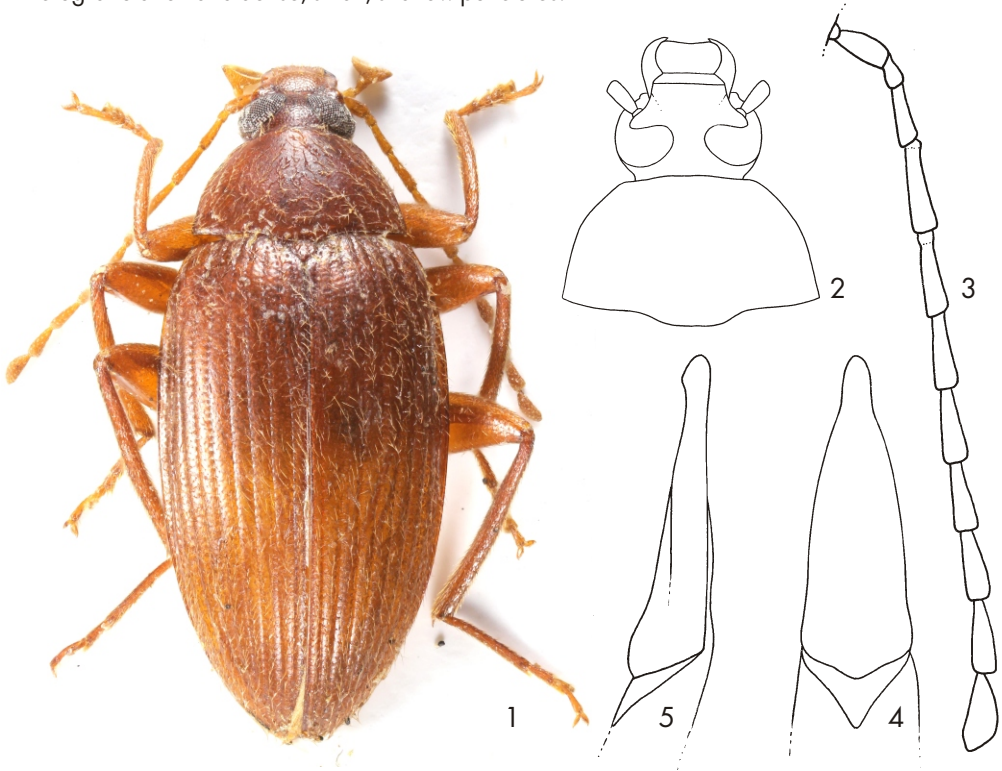
RLA(1-11): 0.82 : 0.32 : 1.00 : 1.29 : 1.24 : 1.15 : 1.24 : 1.16 : 1.10 : 1.18 : 1.10.

RL/WA(1-11): 2.00 : 1.16 : 3.78 : 3.83 : 4.20 : 3.71 : 4.20 : 2.82 : 3.00 : 3.08 : 2.68.

Maxillary palpus ochre yellow, rather matte. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular, slightly shoe-shaped.

Pronotum (Fig. 2) reddish brown, wide, transverse, wider than semicircular, matte, slightly convex, widest in base, approximately as wide as elytra at humeri. Dorsal surface with fine microgranulation, dense, very small punctures and long, pale setae. PL 1.31 mm; PW 2.26 mm; PI equal to 57.97. Border lines very narrow, margins conspicuous from dorsal view. Lateral margins narrowing in basal part, arcuate in apical half. Base finely bisinuate, anterior margin very slightly arcuate, anterior angles obtuse, posterior angles almost rectangular.

Elytra. Reddish brown, wide, elongate oval, slightly convex, slightly shiny, widest near middle. Dorsal surface with pale setation. EL 5.42 mm; EW 3.03 mm; EL/EW 1.79. Elytral striae with rows of small, coarse punctures, larger than those in pronotum, intervals between punctures in rows narrower than diameter of punctures. Elytral intervals very finely convex, with microgranulation and dense, small, shallow punctures.



Figs. 1-5. *Zizu phurvaensis* sp. nov. (male holotype): 1- habitus; 2- head and pronotum; 3- antenna; 4- apical piece of aedeagus, dorsal view; 5- apical piece of aedeagus, lateral view.

Scutellum. Dark brown as elytron itself, triangular with microgranulation and a few long, pale setae, slightly shiny.

Elytral epipleura well-developed, reddish brown, with punctures and pale setae distinctly narrowing to ventrite 1, then parallel in apical part.

Legs. Long and narrow, pale reddish brown, with pale setation. Dorsal surface with fine microgranulation and very small, shallow punctures. Tibiae normally shaped, slightly widened apically. Pro- and mesotarsomeres 3 and 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.48 : 0.49 : 0.69 : 1.12 (protarsus), 1.00 : 0.32 : 0.24 : 0.42 (metatarsus).

Both protarsal claws with 8 visible teeth.

Ventral side of body reddish brown with punctures. Abdomen pale reddish brown, shiny, with sparse, pale setae, very fine microgranulation and very small, shallow punctures.

Aedeagus (Figs. 4, 5) smaller, ochre yellow, shiny. Basal piece rounded laterally and slightly narrowing in dorsal view. Apical piece elongate triangular from dorsal view, beak-shaped

dorsally and laterally. Ratio of length of apical piece to length of basal piece from dorsal view 1 : 3.45.

Female has space between eyes wider (OI approximately 28), protarsal claws with only 7 visible teeth.

Measurements of female body. BL 9.38 mm; HL 1.43 mm; HW 1.55 mm; OI 28.03; PL 1.42 mm; PW 3.05 mm; PI 46.56; EL 6.53 mm; EW 4.03 mm; AL(1-11) 4.11 mm; AL/BL(1-11) 0.44; HW/PW 0.51; BL/EW 2.33; EL/EW 1.62.

RLA(1-11): 0.83 : 0.35 : 1.00 : 1.24 : 1.04 : 1.19 : 1.06 : 1.03 : 1.06 : 1.00 : 0.99.

RL/WA(1-11): 2.36 : 1.56 : 4.21 : 4.95 : 3.77 : 4.52 : 3.86 : 3.15 : 3.46 : 2.67 : 2.93.

RLT: 1.00 : 0.48 : 0.72 : 0.66 : 1.30 (protarsus), 1.00 : 0.32 : 0.27 : 0.50 (metatarsus).

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 5). BL 8.62 mm (7.92-9.23 mm); HL 1.28 mm (1.19-1.39 mm); HW 1.38 mm (1.29-1.48 mm); OI 19.43 (16.77-21.14); PL 1.48 mm (1.31-1.59 mm); PW 2.56 mm (2.26-2.87 mm); PI 57.71 (55.40-59.11); EL 5.83 mm (5.42-6.25 mm); EW 3.35 mm (3.03-3.65 mm). Females (n= 7). BL 8.97 mm (8.47-9.82 mm); HL 1.37 mm (1.29-1.49 mm); HW 1.47 mm (1.34-1.56 mm); OI 28.43 (27.67-29.42); PL 1.38 mm (1.28-1.53 mm); PW 2.86 mm (2.62-3.18 mm); PI 48.11 (46.56-50.00); EL 6.23 mm (5.87-6.80 mm); EW 3.74 mm (3.43-4.05 mm).

Differential diagnosis. Habitually similar species are *Zizu novis* Novák, 2019 from northern Thailand, *Zizu viator* Novák, 2019 from Laos, *Zizu skalei* sp. nov. from southern Thailand and *Zizu tratensis* sp. nov. from Trat Province in Thailand.

Species of *Zizu phuruaensis* sp. nov. clearly differs from the similar species *Z. skalei* and *Z. tratensis* mainly by the space between the eyes narrower (OI approximately in males 19, in females 28); while *Z. skalei* and *Z. tratensis* have the space between the eyes wider (OI in males 31-33, in females 35-43).

Species of *Zizu phuruaensis* sp. nov. is distinctly different from the similar species *Z. viator* mainly by the punctuation of the pronotum sparse with very small, almost indistinct, shallow punctures; while *Z. viator* has the punctuation of the pronotum dense with distinct and coarse punctures.

Species of *Zizu phuruaensis* sp. nov. clearly differs from the similar species *Z. novis* mainly by the space between the eyes wider (OI approximately 19), distinctly wider than the length of antennomere 2; while *Z. novis* has the space between the eyes narrow (OI 13.5), narrower than the length of antennomere 2.

Etymology. Toponymic, named after the type locality Phu Rua National Preserve (Thailand, Loei Province).

Distribution. Thailand (Loei Province).

***Zizu skalei* sp. nov.**
(Figs. 6-10)

Type locality. Southern Thailand, East of Koh Chang, 12°03'N 102°18'E, 0-200 m.

Type material. Holotype (♂): S-THAILAND, E - Koh / Chang, 14.6.-28.6.2018 / 12°03'N 102°18'E / leg. A. Skale, 0-200m, (VNPC). Paratypes: (1 ♂, 3 ♀): same data as holotype, (ASGG, VNPC). The types are provided with a printed red label: 'Zizu / skalei sp. nov. / HOLOTYPUS [or PARATYPUS] / V. Novák det. 2023'.

Description of holotype. Habitus as in Fig. 6, body larger, wide, oval, matte, from pale reddish brown to dark reddish brown, dorsal surface with pale setation, punctures and fine microgranulation, BL 7.46 mm. Widest near middle elytra length; BL/EW 2.60.

Head (Fig. 7) reddish brown or pale reddish brown, a little wider than long, through the eyes slightly wider than anterior margin and distinctly narrower than base of pronotum. Dorsal surface semi-matte with dense and long, pale setae, fine microgranulation and dense, small punctures. Anterior part distinctly paler than posterior half. Clypeus pale reddish brown, wide, transverse, lateral margins rounded. Dorsal surface with shallow punctures, long, pale setae and microgranulation. Mandibles pale reddish brown with darker sides and apex, glabrous, shiny. HW 1.25 mm; HW/PW 0.54; HL (visible part) 1.07 mm. Eyes large, transverse, excised, space between eyes narrow, slightly narrower than diameter of one eye; wider than length of antennomere 1; OI equal to 30.96.

Antenna (Fig. 8). Long, narrow, pale reddish brown (AL 4.36 mm, distinctly exceeding half body length - AL/BL 0.59). Antennomeres semi-matte, surface with long, pale setae and small, coarser punctures. Antennomere 2 shortest, antennomeres 3-11 slightly widened apically and longer than antennomere 3. Ultimate antennomere longest, widest before apex, half drop-shaped.

RLA(1-11): 0.80 : 0.35 : 1.00 : 1.26 : 1.10 : 1.14 : 1.17 : 1.18 : 1.27 : 1.16 : 1.32.

RL/WA(1-11): 2.19 : 1.47 : 3.09 : 4.07 : 3.39 : 3.24 : 2.96 : 3.36 : 3.60 : 3.42 : 3.76.

Maxillary palpus pale reddish brown, semi-matte, surface with long, pale setae. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular, slightly shoe-shaped.

Pronotum (Fig. 7) brown, wide, transverse, widest than semicircular, matte, convex, widest in basal half, approximately as wide as elytra at humeri. Dorsal surface with fine microgranulation, relatively dense, very small and shallow punctures and long, pale setation. PL 1.46 mm; PW 2.32 mm; PI equal to 62.93. Border lines very narrow, margins conspicuous from dorsal view. Lateral margins almost straight in basal part, arcuate in apical half. Base finely bisinuate, anterior margin almost straight, anterior angles rounded, indistinct, posterior angles almost rectangular.

Elytra. Dark reddish brown, wide, elongate oval, slightly convex, matte, widest near middle. Dorsal surface with pale setation. EL 4.93 mm; EW 2.87 mm; EL/EW 1.72. Elytral striae with rows of small, coarse punctures approximately as large as those in pronotum, intervals between punctures in rows narrower than diameter of punctures. Elytral intervals very finely convex, with fine microgranulation and very small, almost indistinct, shallow punctures.

Scutellum. Reddish brown with sides darker, wide, semi-elliptical, with microgranulation and a few long, pale setae, rather matte.

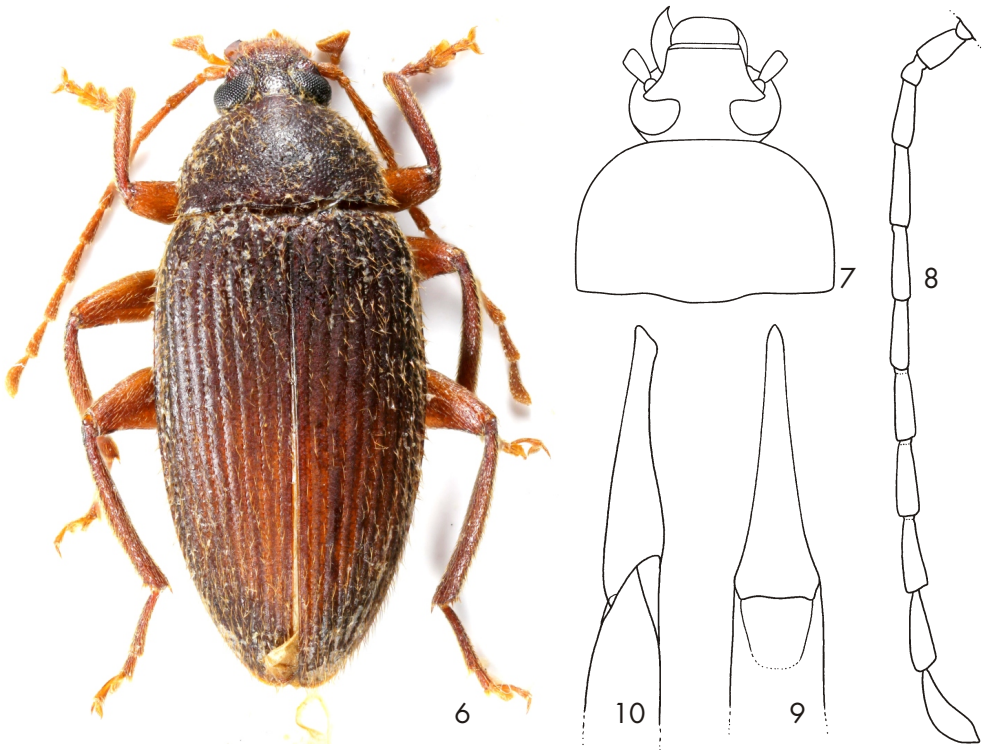
Elytral epipleura well-developed, reddish brown, with punctures and pale setae distinctly narrowing to ventrite 1, then relatively narrow and parallel in apical part.

Legs. Long and narrow, pale reddish brown, with pale setation. Dorsal surface with fine microgranulation and shallow punctures. Tibiae normally shaped, slightly widened apically. Pro- and mesotarsomeres 3 and 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.49 : 0.60 : 0.89 : 1.47 (protarsus), 1.00 : 0.39 : 0.29 : 0.52 (metatarsus).

Both protarsal claws with 12 visible teeth.

Ventral side of body brown, shiny with dense, small punctures. Abdomen brown, shiny, with pale setae, fine microgranulation and dense, small punctures. Ultimate ventrite with large, shallow triangular impression in middle.

Aedeagus (Figs. 9, 10) larger, ochre yellow, shiny. Basal piece slightly rounded laterally and slightly narrowing in dorsal view. Apical piece elongate triangular from dorsal view, beak-shaped dorsally and laterally. Ratio of length of apical piece to length of basal piece from dorsal view 1 : 4.34.



Figs. 6-10. *Zizu skalei* sp. nov. (male holotype): 6- habitus; 7- head and pronotum; 8- antenna; 9- apical piece of aedeagus, dorsal view; 10- apical piece of aedeagus, lateral view.

Female without distinct differences, protarsal claws with only 8 visible teeth.

Measurements of female body. BL 7.33 mm; HL 1.03 mm; HW 1.19 mm; OI 34.53; PL 1.33 mm; PW 2.22 mm; PI 59.91; EL 4.97 mm; EW 2.92 mm; AL(1-11) 4.18 mm; AL/BL(1-11) 0.57; HW/PW 0.54; BL/EW 2.51; EL/EW 1.70.

RLA(1-11): 0.74 : 0.35 : 1.00 : 1.17 : 1.09 : 1.17 : 1.10 : 1.16 : 1.17 : 1.10 : 1.30.

RL/WA(1-11): 1.96 : 1.26 : 3.45 : 3.68 : 3.95 : 4.05 : 4.47 : 4.44 : 4.26 : 3.17 : 3.46.

RLT: 1.00 : 0.60 : 0.71 : 0.91 : 1.89 (protarsus), 1.00 : 0.34 : 0.36 : 0.54 (metatarsus).

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 2). BL 7.41 mm (7.36-7.46 mm); HL 1.06 mm (1.05-1.07 mm); HW 1.24 mm (1.22-1.25 mm); OI 29.37 (27.78-30.96); PL 1.42 mm (1.38-1.46 mm); PW 2.26 mm (2.20-2.32 mm); PI 62.83 (62.73-62.93); EL 4.93 mm; EW 2.85 mm (2.82-2.87 mm). Females (n= 3). BL 7.63 mm (7.33-7.90 mm); HL 1.07 mm (1.03-1.10 mm); HW 1.24 mm (1.19-1.27 mm); OI 36.98 (34.53-40.82); PL 1.41 mm (1.33-1.47 mm); PW 2.34 mm (2.22-2.44 mm); PI 60.03 (59.91-60.25); EL 5.16 mm (4.97-5.35 mm); EW 3.00 mm (2.92-3.07 mm).

Differential diagnosis. Habitually similar species are *Zizu novis* Novák, 2019 from northern Thailand, *Zizu viator* Novák, 2019 from Laos, *Zizu phuruvaensis* sp. nov. from Loei Province

in Thailand and *Zizu tratensis* sp. nov. from Trat Province in Thailand.

Species of *Zizu skalei* sp. nov. clearly differs from the similar species *Zizu novis* Novák, 2019, *Zizu phuruaensis* sp. nov. and *Zizu viator* Novák, 2019 mainly by the wider space between the eyes (OI approximately 30 in males and 42 in females); while *Z. novis*, *Z. phuruaensis* and *Z. viator* have the space between the eyes narrower (OI 14-22).

Species of *Zizu skalei* sp. nov. is distinctly different from the similar species *Z. tratensis* mainly by the punctuation of the pronotum shallower, punctures approximately as large as punctures in elytral striae and the shape of apical piece of aedeagus as in Figs. 9 and 10; while *Z. tratensis* has the punctuation of the pronotum coarser, punctures in the pronotum are distinctly smaller than those in elytral striae and the shape of apical piece of aedeagus is as in Figs. 19 and 20.

Etymology. Patronymic, named after the collector of type series Andre Skale (ASGG - well known specialist in beetle family Cerambycidae).

Distribution. Thailand.

***Zizu tiomanensis* sp. nov.**

(Figs. 11-15)

Type locality. Malaysia, Johor Province, Tioman Island, Kampong Tekek.

Type material. Holotype (♂): MALASIA, prov. Johor / Tioman Isl. - Kampong Tekek / jungle track 10-600 m a.s.l. / V. Hula lgt., 16.-29.3.2009, (VNPC). Paratype: (1 ♂): MALAYSIA;Tioman; 0-400m; / rd. Kampong Tekek-K. Juara / 4.-16.iii.1998; 2.48N 104,11E / D. Hauck leg., (VNPC). The types are provided with a printed red label: 'Zizu / tiomanensis sp. nov. / HOLOTYPE [or PARATYPE] / V. Novák det. 2023'.

Description of holotype. Habitus as in Fig. 11, body larger, wide, oval, semi-matte, from pale reddish brown to dark brown, dorsal surface with pale setation, punctures and fine microgranulation, BL 8.19 mm. Widest near middle elytra length; BL/EW 2.69.

Head (Fig. 12) a little wider than long, through the eyes distinctly narrower than anterior margin or base of pronotum. Dorsal surface with sparse, pale setae and fine microgranulation. Posterior part dark brown with larger and coarser punctures than those in reddish brown anterior part with shallow, small punctures. Clypeus wide, transverse, reddish brown with rounded lateral margins. Dorsal surface matte with long, pale setae, and microgranulation. Mandibles semi-matte, reddish brown with fine microgranulation, darker sides and apex. HW 1.32 mm; HW/PW 0.56; HL (visible part) 1.28 mm. Eyes large, transverse, excised, space between eyes narrow, distinctly narrower than diameter of one eye; narrower than length of antennomere 1; OI equal to 19.84.

Antenna (Fig. 13). Long, narrow, pale reddish brown (AL 5.22 mm, almost reaching two thirds body length - AL/BL 0.64). Antennomeres rather matte, surface with long, pale setae, fine microgranulation and very small, shallow punctures. Antennomere 2 shortest, antennomeres 3-11 slightly widened apically and longer than antennomere 3. Ultimate antennomere widest before apex.

RLA(1-11): 0.85 : 0.33 : 1.00 : 1.36 : 1.22 : 1.21 : 1.30 : 1.27 : 1.18 : 1.19 : 1.06.

RL/WA(1-11): 2.36 : 1.37 : 3.12 : 4.42 : 3.65 : 3.76 : 3.89 : 3.41 : 3.68 : 3.44 : 2.77.

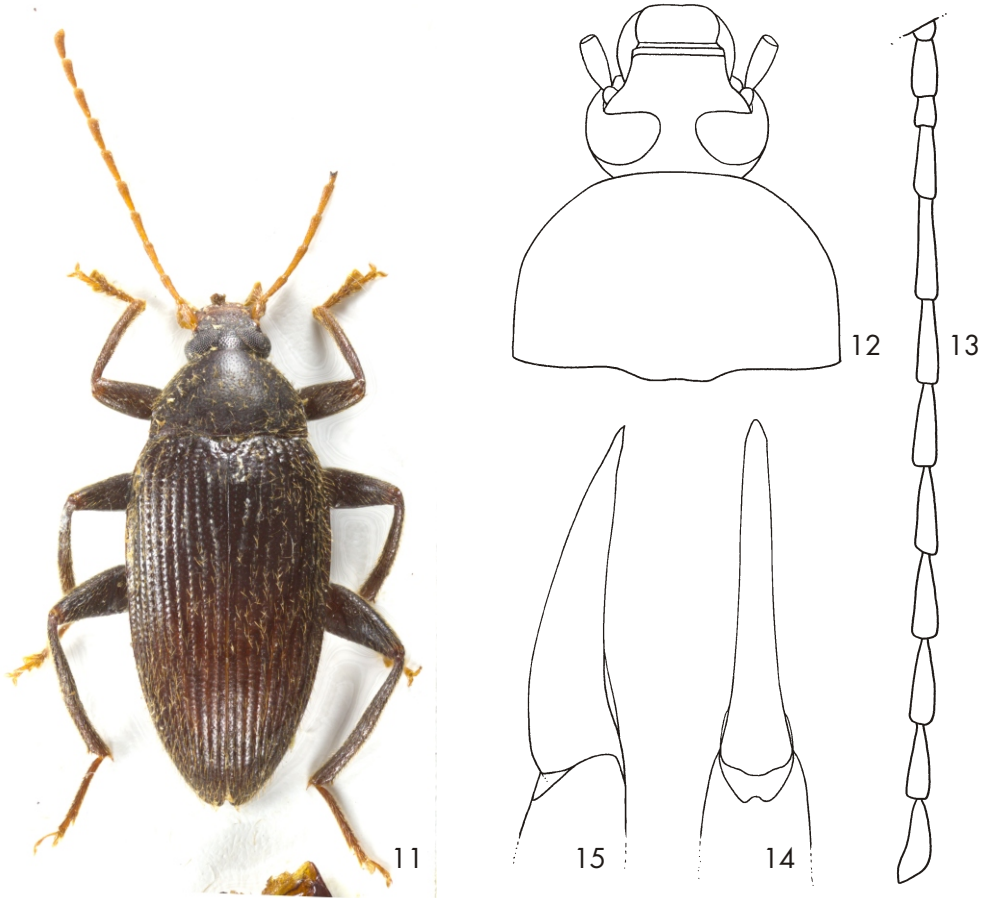
Maxillary palpus pale brown, rather matte. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular, slightly shoe-shaped.

Pronotum (Fig. 12) dark brown, wide, transverse, widest than semicircular, matte, slightly convex, widest in base, approximately as wide as elytra at humeri. Dorsal surface with fine

microgranulation, very small and shallow punctures and long, pale setae. PL 1.49 mm; PW 2.36 mm; PI equal to 63.14. Border lines very narrow, margins conspicuous from dorsal view. Lateral margins slightly arcuate in basal part, distinctly arcuate in apical half. Base slightly bisinuate, anterior margin arcuate, anterior angles indistinct, posterior angles roundly obtuse.

Elytra. Dark brown, wide, elongate oval, convex, shiny, widest near middle. Dorsal surface with long, pale setation. EL 5.42 mm; EW 3.05 mm; EL/EW 1.48. Elytral striae with rows of medium sized, coarse punctures, intervals between punctures in rows narrower than diameter of punctures. Elytral intervals finely convex, with fine microgranulation and small, sparse punctures.

Scutellum. Black as elytron itself, pentagonal with microgranulation and a few long, pale setae, slightly shiny.



Figs. 11-15. *Zizu tiomanensis* sp. nov. (male holotype): 11-habitus; 12-head and pronotum; 13-antenna; 14-apical piece of aedeagus, dorsal view; 15-apical piece of aedeagus, lateral view.

Elytral epipleura well-developed, dark brown, distinctly narrowing to ventrite 1, then parallel in apical part.

Legs. Long and narrow, dark brown, with pale setation, tarsi distinctly paler, protibiae with short, strong setae in inner side, metatibiae slightly curved. Dorsal surface with fine

microgranulation and small, shallow punctures. Pro- and mesotarsomeres 3 and 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.51 : 0.60 : 0.61 : 1.08 (protarsus), 1.00 : 0.28 : 0.20 : 0.43 (metatarsus).

Both protarsal claws with 11 visible teeth.

Ventral side of body dark brown, mesoventrite with punctures. Abdomen blackish brown, shiny, with sparse, pale setae, fine microgranulation and sparse, small and shallow punctures. Ultimate and penultimate ventrites matte, ultimate ventrite with shallow triangular impression in middle of apex.

Aedeagus (Figs. 14, 15) relatively large, ochre yellow, slightly shiny. Basal piece strong, rounded laterally and slightly narrowing in dorsal view. Apical piece elongate triangular from dorsal view, beak-shaped dorsally and laterally. Ratio of length of apical piece to length of basal piece from dorsal view 1 : 2.89.

Female. Unknown.

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 2). BL 8.46 mm (8.19-8.72 mm); HL 1.29 mm (1.28-1.29 mm); HW 1.33 mm (1.32-1.33 mm); OI 18.54 (17.24-19.84); PL 1.56 mm (1.49-1.62 mm); PW 2.46 mm (2.36-2.56 mm); PI 63.21 (63.14-63.28); EL 5.62 mm (5.42-5.81 mm); EW 3.15 mm (3.05-3.25 mm).

Differential diagnosis. No species of *Zizu* Novák, 2019 is known from Malaysia yet. The new species *Zizu tiomanensis* sp. nov. is a unique species by the black dorsal surface.

Etymology. Toponymic, named after the type locality Island Tioman (Malaysia, Johor Province).

Distribution. Malaysia (Johor Province).

***Zizu tratensis* sp. nov.**

(Figs. 16-20)

Type locality. Central Thailand, Trat Province, Ko Kut Island.

Type material. Holotype (♂): C-THAILAND Trat Prov. / Ko Kut Isl., 24.5.-8.6.2022 / leg. A. Skale, (VNPC). Paratypes: (2 ♂♂, 1 ♀): same data as holotype, (ASGG, VNPC); (4 ♂♂, 1 ♀): C-THAILAND, Trat Prov. / Ko Kut Isl., 1.-11.11. / 2022, leg. A. Skale, (ASGG, VNPC). The types are provided with a printed red label: 'Zizu / tratensis sp. nov. / HOLOTYPUS [or PARATYPUS] / V. Novák det. 2023'.

Description of holotype. Habitus as in Fig. 16, body larger, wide, oval, matte, from pale reddish brown to reddish brown, dorsal surface with pale setation, punctuation and very fine microgranulation, BL 8.00 mm. Widest near middle elytra length; BL/EW 2.69.

Head (Fig. 17) reddish brown, shiny, approximately as wide as long, through the eyes slightly wider than anterior margin and distinctly narrower than base of pronotum. Dorsal surface with long, pale setae, fine microgranulation and dense, small punctures. Clypeus wide, transverse, half heart shaped, pale reddish brown with apex excised in middle. Dorsal surface with small, shallow punctures, long, pale setae and distinct microgranulation. Mandibles reddish brown, semi-matte, with microgranulation and darker apex, lateral margins with pale setae. HW 1.32 mm; HW/PW 0.56; HL (visible part) 1.31 mm. Eyes large, transverse, excised, space between

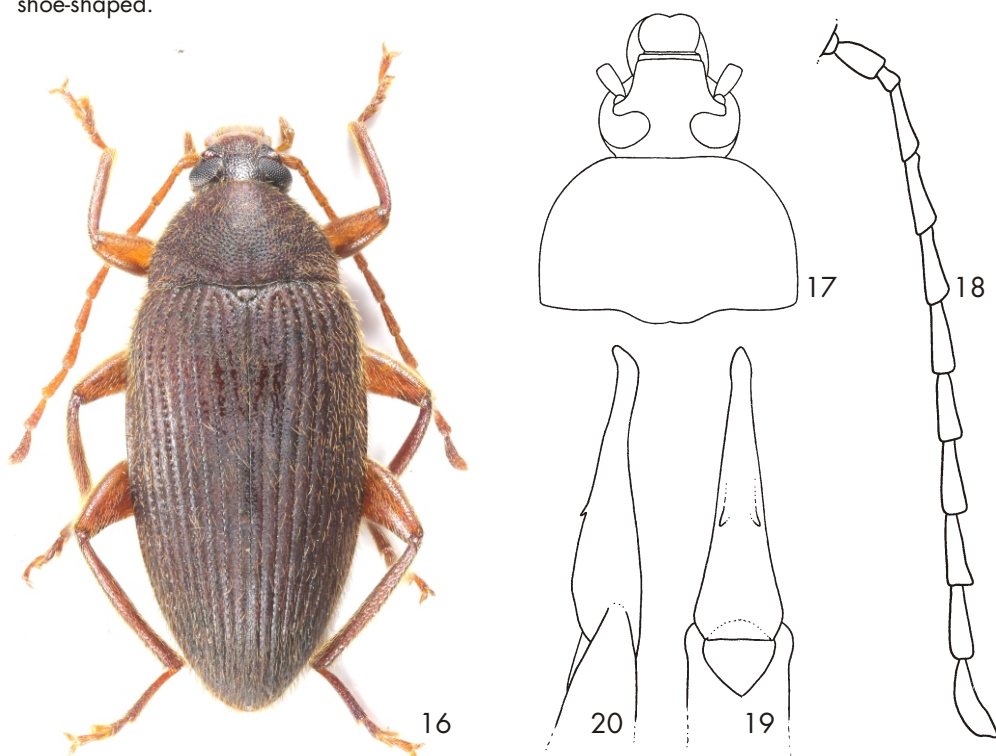
eyes narrow, approximately as wide as diameter of one eye or as wide as length of antennomere 1; OI equal to 32.93.

Antenna (Fig. 18). Long, narrow, pale reddish brown (AL 4.72 mm, distinctly exceeding half body length - AL/BL 0.59). Antennomeres matte, surface with long, pale setae and large, sparse, shallow punctures. Antennomere 2 shortest, antennomeres 4 and 11 longest, antennomeres 3-11 slightly widened apically and longer than antennomere 3. Ultimate antennomere widest before apex.

RLA(1-11): 0.65 : 0.33 : 1.00 : 1.22 : 1.06 : 1.10 : 1.05 : 1.04 : 1.05 : 1.11 : 1.22.

RL/WA(1-11): 1.89 : 1.93 : 4.50 : 4.95 : 4.11 : 4.94 : 4.00 : 3.29 : 3.72 : 3.00 : 3.31.

Maxillary palpus pale reddish brown, semi-matte, surface with pale setae. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular, slightly shoe-shaped.



Figs. 16-20. *Zizu tratensis* sp. nov. (Figs. 16-18: male holotype): 16-habitus; 17-head and pronotum; 18-antenna; 19-apical piece of aedeagus, dorsal view; 20-apical piece of aedeagus, lateral view.

Pronotum (Fig. 17) dark reddish brown, wide, transverse, wider than semicircular, matte, convex, widest in basal half, approximately as wide as elytra at humeri. Dorsal surface with fine microgranulation, dense, small punctures and long, pale setae. PL 1.49 mm; PW 2.36 mm; PI equal to 63.14. Border lines very narrow, margins conspicuous from dorsal view. Lateral margins arcuate in apical part. Base finely bisinuate, anterior margin almost straight, anterior angles indistinct, posterior angles obtuse.

Elytra. Dark reddish brown, wide, elongate oval, slightly convex, matte, widest near middle.

Dorsal surface with pale setation. EL 5.20 mm; EW 2.97 mm; EL/EW 1.75. Elytral striae with rows of medium-sized, coarse punctures, larger than those in pronotum, intervals between punctures in rows narrower than diameter of punctures. Elytral intervals slightly convex, with fine microgranulation and very small, shallow punctures.

Scutellum. Dark reddish brown as elytron itself, pentagonal with microgranulation, few small, shallow punctures and a few long, pale setae, semi-matte.

Elytral epipleura well-developed, reddish brown with pale setae, with punctures narrowing to ventrite 1 in basal part, then parallel in apical part.

Legs. Long and narrow, pale reddish brown, with dense, pale setation, protibiae with short, strong setae in inner side. Dorsal surface with fine microgranulation and small, shallow punctures. Tibiae normally shaped, slightly widened apically. Pro- and mesotarsomeres 3 and 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.28 : 0.28 : 0.58 : 1.22 (protarsus), 1.00 : 0.40 : 0.35 : 0.52 (metatarsus).

Both protarsal claws with 13 visible teeth.

Ventral side of body reddish brown with punctures. Abdomen brown, shiny, with long, pale setae, fine microgranulation and dense, small and shallow punctures. Ultimate ventrite with shallow triangular impression in middle of apex, slightly paler than penultimate.

Aedeagus (Figs. 19, 20) large, ochre yellow, shiny. Basal piece strong, slightly rounded laterally and slightly narrowing in dorsal view. Apical piece elongate triangular from dorsal view, hook-shaped laterally. Ratio of length of apical piece to length of basal piece from dorsal view 1 : 4.01.

Female has space between eyes distinctly wider than in male (OI approximately 42), protarsal claws with only 8 visible teeth.

Measurements of female body. BL 7.63 mm; HL 1.18 mm; HW 1.19 mm; OI 42.60; PL 1.32 mm; PW 2.20 mm; PI 60.00; EL 5.13 mm; EW 2.84 mm; AL(1-11) 4.09 mm; AL/BL(1-11) 0.54; HW/PW 0.54; BL/EW 2.69; EL/EW 1.81.

RLA(1-11): 0.68 : 0.32 : 1.00 : 1.25 : 1.00 : 1.15 : 1.16 : 1.17 : 1.13 : 1.12 : 1.12.

RL/WA(1-11): 1.44 : 0.89 : 3.28 : 4.09 : 4.06 : 4.06 : 4.12 : 6.08 : 4.67 : 4.86 : 4.55.

RLT: 1.00 : 0.58 : 0.58 : 0.71 : 1.29 (protarsus), 1.00 : 0.32 : 0.33 : 0.45 (metatarsus).

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n= 7). BL 7.51 mm (6.92-8.00 mm); HL 1.20 mm (1.12-1.31 mm); HW 1.21 mm (1.13-1.32 mm); OI 30.16 (26.53-32.93); PL 1.42 mm (1.29-1.54 mm); PW 2.23 mm (2.02-2.40 mm); PI 63.62 (62.83-64.17); EL 4.90 mm (4.48-5.20 mm); EW 2.84 mm (2.66-2.99 mm). Females (n= 2). BL 7.67 mm (7.63-7.70 mm); HL 1.19 mm (1.18-1.20 mm); HW 1.20 mm (1.19-1.21 mm); OI 41.87 (41.14-42.60); PL 1.34 mm (1.32-1.35 mm); PW 2.22 mm (2.20-2.24 mm); PI 60.14 (60.00-60.27); EL 5.14 mm (5.13-5.15 mm); EW 2.91 mm (2.84-2.98 mm).

Differential diagnosis. Habitually similar species are *Zizu novis* Novák, 2019 from northern Thailand, *Zizu phuruaensis* sp. nov. from Loei Province in Thailand, *Zizu skalei* sp. nov. from Thailand and *Zizu viator* Novák, 2019 from Laos.

Species of *Zizu tratensis* sp. nov. clearly differs from the similar species *Zizu novis* Novák, 2019, *Zizu phuruaensis* sp. nov. and *Zizu viator* Novák, 2019 mainly by the wider space between the eyes (OI approximately 30 in males and 42 in females); while *Z. novis*, *Z. phuruaensis* and *Z. viator* have the space between the eyes narrower (OI 14-22).

<i>keralensis</i> Novák, 2019	India
<i>nepalensis</i> Novák, 2019	Nepal
<i>novis</i> Novák, 2019	Thailand
<i>phuruvaensis</i> sp. nov.	Thailand
<i>skalei</i> sp. nov.	Thailand
<i>tenebris</i> Novák, 2019	Pakistan
<i>tiomanensis</i> sp. nov.	Malaysia
<i>tratensis</i> sp. nov.	Thailand
<i>viator</i> Novák, 2019	Cambodia, Laos

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