

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

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Abstract. Two new species of the genus *Zizu* Novák, 2019 (Alleculini Laporte, 1840) from India are described as follows: *Zizu pagat* sp. nov. and *Zizu uhu* sp. nov.

INTRODUCTION

The genus *Zizu* Novák, 2019 with the type species *Zizu kejvali* Novák, 2019 was established by Novák (2019). Presently we know 12 species of this genus, four of them are living in the Palearctic Region (Novák 2019, 2020 2024), and the other species live in the Oriental Region (Novák 2019 and 2023).

New species *Zizu pagat* sp. nov. and *Zizu uhu* sp. nov., both from India are described, illustrated including male genitalia and compared with other Indian species (*Zizu flavis* Novák, 2024, *Zizu keralaensis* Novák, 2019 and *Zizu kejvali* Novák, 2019).

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, a double slash (//) on different labels.

The following collection code is used:

BMNH collection of British Museum Natural History, London, England;

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 8.3.11.

TAXONOMY

Genus *Zizu* Novák, 2019

Type species: *Zizu kejvali* Novák, 2019.

Zizu pagat sp. nov. (Figs. 1-4)

Type locality. India, Tamil Nadu, Jawalagiri.

Type material. Holotype (♂): Jawalagiri, / North Salem. / F.R.I. Sandal / Insect Survey / Vert.: 29.VII.30 // Plot 12 // 1536, (BMNH). (1 ♂): same data as holotype, (BMNH, VNPC); (1 ♂): same data as holotype, but 26.IX.30 // 1434, (BMNH); (1 ♂): 25.VII.30 Jawalagiri, / North Salem. / F.R.I. Sandal / Insect Survey / Vert.: 29.VII.30 // Plot 12 // 1534, (BMNH). The types are provided with a printed red label: 'Zizu / pagat sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2026'.

Description of holotype. Habitus as in Fig. 1, elongate, slightly oval, semi-matte, from ochre yellow to pale reddish brown, dorsal surface with pale setae, punctures and fine microgranulation, BL 7.50 mm. Widest near middle elytra length; BL/EW 2.81.

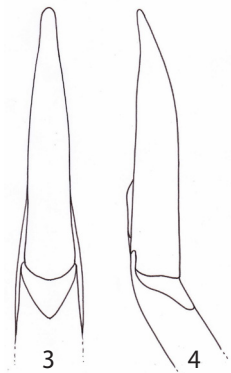
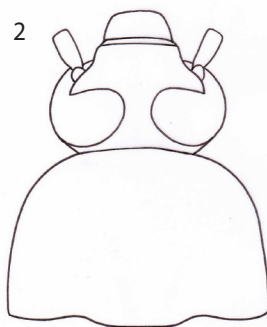
Head (Fig. 2) pale reddish brown, longer than wide through the eyes, narrower than base of pronotum. Dorsal surface semi-matte with shallow punctures, pale setae and microgranulation. Clypeus pale reddish brown, transverse, surface with pale setae and microgranulation, slightly excised in middle of apex. HW 1.41 mm; HW/PW 0.71; HL (visible part) 1.00 mm. Eyes large, transverse, excised, space between eyes very narrow, distinctly narrower than diameter of one eye, slightly narrower than length of antennomere 2; OI equal to 15.65.

Antenna short (AL(1-11) 3.16 mm, not reaching half body length, AL(1-11)/BL 0.42), antennomeres matte, narrow, antennomeres 4-10 slightly widened apically. Dorsal surface with recumbent, pale setae and microgranulation. Antennomeres 4-10 longer than antennomere 3. Antennomere 2 shortest.

RLA(1-11): 0.60 : 0.44 : 1.00 : 1.28 : 1.12 : 1.16 : 1.12 : 1.16 : 1.12 : 1.04 : 1.00.

RL/WA(1-11): 1.50 : 1.57 : 2.78 : 3.20 : 2.80 : 2.64 : 2.55 : 2.64 : 2.55 : 2.36 : 2.27.

Maxillary palpus ochre yellow, shiny, with pale setae and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.



Figs. 1-4. *Zizu pagat* sp. nov.: 1- habitus; 2- head and pronotum; 3- apical piece of aedeagus, dorsal view; 4- apical piece of aedeagus, lateral view.

Pronotum (Fig. 2) pale reddish brown, slightly longer than semi-circular, matte, convex, widest in base, approximately as wide as elytra at humeri. Dorsal surface with long, pale setae, small punctures and fine microgranulation. PL 1.30 mm; PW 1.98 mm; PI equal to 65.66. Border lines narrow, margins conspicuous from dorsal view. Base bisinuate, anterior and lateral margins arcuate, anterior angles indistinct, posterior angles slightly obtuse.

Elytra. Pale reddish brown, elongate-oval, slightly convex, semi-matte, widest near middle elytral length. Dorsal surface with long, pale setae. EL 5.20 mm; EW 2.87 mm; EL/EW 1.81. Elytral striae with rows of coarse punctures, elytral intervals slightly convex with microgranulation.

Scutellum. Pale reddish brown, roundly triangular, semi-matte with a few pale setae, microgranulation and a few punctures.

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

Legs long, ochre yellow. Dorsal surface with setae and microgranulation. Femora strong, pro- and mesotarsomeres 3 and 4 and penultimate metatarsomeres widened and lobed. RLT: 1.00 : 0.67 : 0.80 : 0.80 : 1.67 (protarsus); 1.00 : 0.40 : 0.38 : 0.48 : 0.75 (mesotarsus); 1.00 : 0.35 : 0.24 : 0.33.

Protarsal claws relatively small, pale reddish brown, with 11 visible teeth.

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

Aedeagus (Figs. 3, 4) ochre yellow, shiny. Basal piece rounded laterally and narrowing in dorsal view. Apical piece elongate triangular dorsally, beak-shaped in both views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 2.15.

Female unknown.

Variability. One specimen is distinctly darker dorsally than the others. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Specimens (n=4). BL 6.99 mm (6.62-7.50 mm); HL 0.85 mm (0.76-1.00 mm); HW 1.21 mm (1.09-1.45 mm); OI 15.80 (12.84-17.91); PL 1.21 mm (1.11-1.30 mm); PW 1.81 mm (1.68-1.98 mm); PI 66.92 (65.66-68.0); EL 4.76 mm (4.37-5.20 mm); EW 2.50 mm (2.25-2.67 mm).

Differential diagnosis. The most similar species from India are *Zizu uhu* sp. nov., *Zizu flavis* Novák, 2024, *Zizu kejvali* Novák, 2019 and *Zizu keralaensis* Novák, 2019.

The new species *Zizu pagat* sp. nov. clearly differs from the similar species *Z. uhu* mainly by the smaller body (BL approximately 7 mm), by the space between the eyes narrow (OI approximately 15.80) and by the shape of aedeagus as in Figs. 3 and 4; while *Z. uhu* has a larger body (BL approximately 8.8 mm), the space between the eyes is wider than the diameter of one eye (OI approximately 37.7) and by the shape of aedeagus as in Figs. 7 and 8.

The new species *Zizu pagat* sp. nov. is distinctly different from the similar species *Z. keralaensis* and *Z. kejvali* mainly by the shorter body (BL approximately 7 mm), by the short antenna not reaching half the body length (AL/BL 0.42) and by the shape of the aedeagus as in Figs. 3 and 4; *Z. flavis*, *Z. keralaensis* and *Z. kejvali* have a larger body (BL approximately 9.9 mm for *Z. flavis*; BL approximately 9 mm for male of *Z. keralaensis*; BL 8.8 mm for male of *Z. kejvali*), the antenna is longer than half the body length and the shape of aedeagus is as in Novák 2024 (464: figs. 21 and 22 for *Z. flavis*) and Novák (2019: 189: figs. 4 and 5 for *Z. keralaensis*; 191: figs. 9 and 10 for *Z. kejvali*).

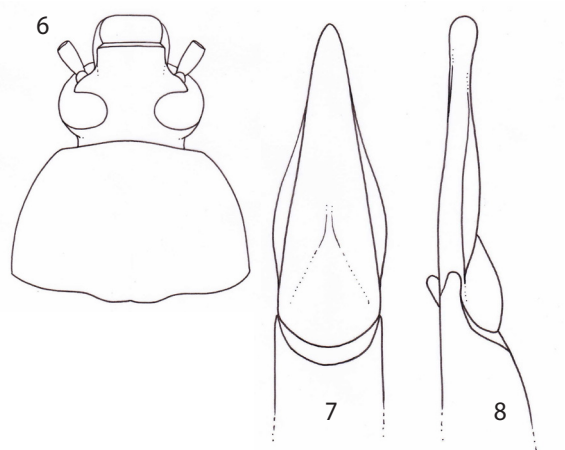
Etymology. Named after a card in the tarot game (Czech expressive name *-pagat*).

Distribution. India, Tamil Nadu.

***Zizu uhu* sp. nov.**
(Figs. 5-8)

Type locality. India, Tamil Nadu, Jawlagiri.

Type material. Holotype (♂): Jawlagiri, / North Salem. / F.R.I. Sandal / Insect Survey / Vert.: 15.VII.30 // 1535, (BMNH). Paratypes: (1 spec.): same data, but 11.VII.30, (BMNH); (2 spec.): same data, but 16.X.30, (BMNH, VNPC); (1 spec.): same data, but 15.X.30, (BMNH); (1 spec.): 16.VII.30; (1 spec.): 31.VIII.30 (VNPC); (2 spec.): 10.X.30 (BMNH); (2 spec.): 19.X.30, (BMNH); (2 spec.): 3.X.30 (VNPC); (1 spec.): Ayur, / North Salem. / F.R.I. Sandal / Insect Survey / 29.X.30, (VNPC); (2 spec.): same data as penultimate, but 30.IX.30, (BMNH). The types are provided with a printed red label: 'Zizu / uhu sp. nov. / HOLOTYPUS or PARATYPUS / V. Novák det. 2026'.



Figs. 5-8. *Zizu uhu* sp. nov.: 5- habitus; 6- head and pronotum; 7- apical piece of aedeagus, dorsal view; 8- apical piece of aedeagus, lateral view.

Description of holotype. Habitus as in Fig. 5, elongate-oval, semi-matte, from ochre yellow to brown, dorsal surface with pale setae, punctures and fine microgranulation, BL 8.57 mm. Widest near elytra length; BL/EW 2.80.

Head (Fig. 6) through the eyes slightly wider than long, approximately as wide as anterior margin and narrower than base of pronotum. Dorsal surface semi-matte with dense, small punctures and long pale setae. Brown posterior part distinctly darker than pale reddish brown anterior half and clypeus. Clypeus transverse, surface with long pale setae and fine microgranulation. HW 1.35 mm; HW/PW 0.60; HL (visible part) 1.21 mm. Eyes large, transverse, excised, space between eyes narrow, slightly wider than diameter of one eye, wider than length of antennomere 2; OI equal to 37.26.

Antenna pale reddish brown, antennomeres narrow, semi-matte. Dorsal surface with recumbent, pale setae and microgranulation. Antennomere 2 shorter than antennomere 1 or 3. RLA(1-4) : 0.52 : 0.33 : 1.00 : 1.03. RL/WA(1-4): 1.55 : 1.57 : 4.71 : 5.23.

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

Pronotum (Fig. 6) reddish brown, matte, convex, almost semi-circular, widest in base, as wide as elytra at humeri. Dorsal surface with long, pale setae, matte, with very sparse and very small punctures and fine microgranulation. PL 1.37 mm; PW 2.27 mm; PI equal to 60.35. Base bisinuate, anterior and lateral margins slightly arcuate, anterior and posterior angles obtuse.

Elytra. Reddish brown, elongate-oval, slightly convex, semi-matte, widest near middle of elytra length. Dorsal surface with long, pale setae. EL 5.99 mm; EW 3.06 mm; EL/EW 1.96. Elytral striae with rows of coarse punctures, elytral intervals slightly convex, with microgranulation.

Scutellum. Pale reddish brown with sides darker, matte, triangular.

Elytral epipleura well-developed, pale reddish brown with pale setae, basal part with punctures, narrowing to metaventrite, then relatively wide becoming parallel on apical part.

Legs long, ochre yellow. Dorsal surface with pale setae and microgranulation. Pro- and mesotarsomeres 3 and 4 and penultimate metatarsomeres widened and lobed. RLT: 1.00 : 0.52 : 0.81 : 1.00 : 1.67 (protarsus); 1.00 : 0.29 : 0.36 : 0.57 (metatarsus).

Protarsal claws relatively small, pale reddish brown, both with 11 visible teeth.

Ventral side of body pale reddish brown with punctures and pale setae. Abdomen brown or reddish brown, shiny with recumbent, pale setae, dense, small punctures and microgranulation. Ultimate ventrite ochre yellow with large, shallow impression in middle of apex.

Aedeagus (Figs. 7, 8) ochre yellow, shiny. Apical piece triangular dorsally, beak-shaped in both views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 3.11.

Female without distinct differences, only protarsal claws with 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=15). BL 8.80 mm (8.57-8.90 mm); HL 1.22 mm (1.18-1.28 mm); HW 1.38 mm (1.31-1.45 mm); OI 37.71 (35.81-40.41); PL 1.48 mm (1.37-1.57 mm); PW 2.46 mm (2.27-2.58 mm); PI 60.20 (58.91-61.11); EL 6.09 mm (5.99-6.22 mm); EW 3.29 mm (3.06-3.58 mm).

Differential diagnosis. The most similar species from India are *Zizu pagat* sp. nov., *Zizu flavis* Novák, 2024, *Zizu kejvali* Novák, 2019 and *Zizu keralaensis* Novák, 2019.

The new species *Zizu uhu* sp. nov. clearly differs from the similar species *Z. flavis*, *Z. kejvali*, *Z. keralaensis* and *Z. pagat* mainly by the space between the eyes wide, slightly wider than the diameter of one eye (OI approximately 37.7) and by the shape of the aedeagus as in Figs. 7 and 8; while *Z. flavis*, *Z. kejvali*, *Z. keralaensis* and *Z. pagat* have the space between eyes distinctly narrower than the diameter of one eye (OI approximately 14.7 for males *Z. flavis*, OI 15.5 for males of *Z. kejvali*, OI 13.6 for male of *Z. keralaensis*, OI approximately 15.8 for male of *Z. pagat*) and the shape of the aedeagus is as in Figs. 3 and 4 (*Z. pagat*), in Novák (2019: 189: figs. 4, 5 for *Z. keralaensis*, 191: 9, 10 for *Z. kejvali*) and in Novák (2024: 464: figs. 21 and 22: for *Z. flavis*).

Etymology. Named after a card in the tarot game (Czech expressive name *-uhu*).

Distribution. India, Tamil Nadu.

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