

**Review on the genus *Dioxycula* Fairmaire, 1896
(Coleoptera: Tenebrionidae: Alleculinae: Alleculini)
with descriptions of five new species**

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Abstract. New species of Alleculini (subtribe Alleculina Laporte, 1840), genus *Dioxycula* Fairmaire, 1896 are described as follows: *Dioxycula drescheri* sp. nov. from Indonesia (Island Java), *Dioxycula kelantanica* sp. nov. from Malaysia (Kelantan Province), *Dioxycula laosica* sp. nov. from Laos (Louang Phrabang and Phongsaly Provinces), *Dioxycula subvirida* sp. nov. from Thailand (Chiang Mai Province) and *Dioxycula tenua* sp. nov. from Thailand (Chiang Rai Province). The species *Dioxycula malaccana* (Pic, 1915) comb. nov. is transferred from the genus *Allecula* Fabricius, 1801, and redescribed, new distributional data (Indonesia - Sumatra Island) are added and male genitalia are illustrated for the first time. New species are described, illustrated and compared together. A key to species of *Dioxycula* is added.

INTRODUCTION

Fairmaire (1896) described the genus *Dioxycula* with the type species *Dioxycula aranea* Fairmaire, 1896 from Indonesia (Island Java), so far the only described species of the genus.

New species of Alleculini genus *Dioxycula* Fairmaire, 1896 are described as follows: *Dioxycula drescheri* sp. nov. from Indonesia (Island Java), *Dioxycula kelantanica* sp. nov. from Malaysia (Kelantan Province), *Dioxycula laosica* sp. nov. from Laos (Louang Phrabang and Phongsaly Provinces), *Dioxycula subvirida* sp. nov. from Thailand (Chiang Mai Province) and *Dioxycula tenua* sp. nov. from Thailand (Chiang Rai Province). New species are described, illustrated and compared together.

Species *Dioxycula malaccana* (Pic, 1915) comb. nov. is transferred from the genus *Allecula* Fabricius, 1801, is redescribed here, new distributional data (Indonesia - Sumatra Island) are added and male genitalia is illustrated at the first time. Key to the species of *Dioxycula* is added.

Species in this genus have distinguishing characters: body narrow, elongate, BL/EW 3.3-4.0, head through the eyes distinctly wider than anterior margin of pronotum, eyes very large, space between eyes narrow, antenna long, exceeding three quarters body length, antennomeres filiform, ultimate maxillary palpomere widely triangular, pronotum narrow, bell-shaped, slightly excised laterally before posterior angles, widest at base, elytra narrow, elongate, regularly narrowing apically, legs very long and narrow.

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 $(100 \times \text{length of pronotum along midline}) / (\text{width across basal angles of pronotum})$.

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

The following collection code is used:

- KMTJ Kimio Masumoto, private collection, Tokyo, Japan;
- MNHN Muséum National d'Histoire naturelle, Paris, France;
- NMBS Naturhistorisches Museum, Basel, Switzerland;
- NMPC National Museum, Praha, Czech Republic;
- NMTJ National Museum, Tokyo, Japan;
- UNAN Universiteit van Amsterdam, Amsterdam, The Netherlands;
- VNPC private collection of Vladimír Novák, Praha, Czech Republic;
- ZSMG Zoologische Staatssammlung München, Germany.

Measurements of body parts and corresponding abbreviations used in the 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 used in the text: bf= black frame; hb= handwritten black; pb= printed black; rl= red label; wl= white label; yl= yellow label.

Measurements were made with Olympus SZ 40 stereoscopic microscope with continuous magnification and with 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 5.2.

TAXONOMY

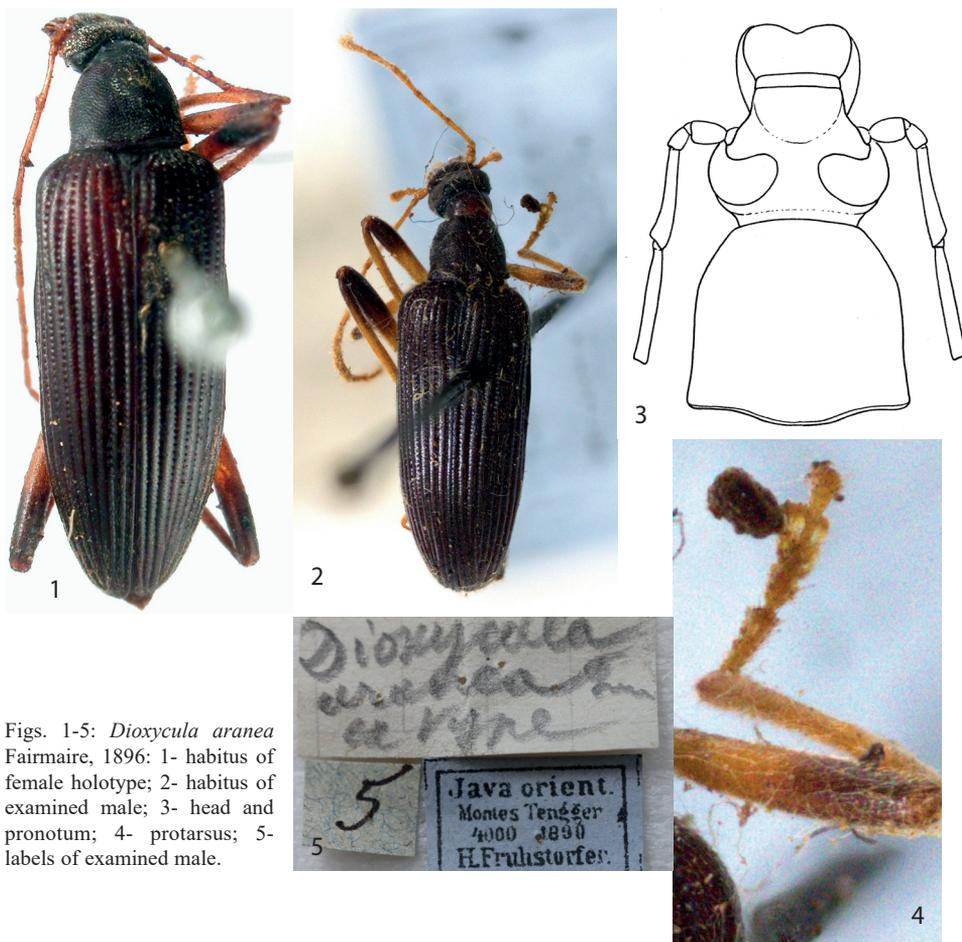
Genus *Dioxycula* Fairmaire, 1896

Type species: *Dioxycula aranea* Fairmaire, 1896.

Diagnosis of the genus (males). Habitus as in Figs. 2, 6, 10, 14, 19, 20, 24, 28, body narrow, elongate, dorsal surface with pale setation, punctuation and microgranulation. Widest near elytral humeri; BL/EW 3.3-4.0. Head (as in Figs. 3, 7, 11, 15, 22, 25, 29) through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than base of pronotum. Clypeus wide and transverse, half heart shaped, lateral margins rounded, apex excised in middle. Eyes very large, transverse, deeply excised, space between eyes narrow, distinctly

narrower than diameter of one eye; OI 13.4-27.3. Antenna long, exceeding three quarters body length, antennomeres filiform. Ultimate maxillary palpomere widely triangular. Pronotum (Figs. 3, 7, 11, 15, 21, 25, 29) narrow, bell-shaped, slightly convex, narrower than elytra at humeri, slightly excised laterally before posterior angles, widest in base; PI 76-95. Elytra narrow, elongate, regularly narrowing apically. Elytral striae with rows of coarse punctures. Scutellum semi elliptical. Elytral epipleura well-developed. Legs very long and narrow. Pro- and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. Protarsal claws with more than 18 visible teeth. Aedeagus (Figs. 8, 9, 12, 13, 16, 17, 22, 23, 26, 27, 30, 31).

Remark. Antennomere 3 as long as antennomere 4, protarsomere 1 as long as protarsomeres 2-5 (according to Fairmaire 1896: 115). Antennomere 4 of *Dioxycula aranea* is 1.1 times longer than antennomere 3 in female holotype and 1.2 times longer in examined male. Protarsomere 1 is distinctly shorter than antennomeres 2-5 together in examined male.



Figs. 1-5: *Dioxycula aranea* Fairmaire, 1896: 1- habitus of female holotype; 2- habitus of examined male; 3- head and pronotum; 4- protarsus; 5- labels of examined male.

***Dioxycula aranea* Fairmaire, 1896**

(Figs. 1-5)

Type locality. Indonesia (Island Java).

Type material. Holotype: (♀): wl: *Dioxycula / aranea / Fairm T / Java* [hb], (MNHN).

Material examined. (♂): gl: *Dioxycula / aranea Frm / ex type* [hb] // 5 [hb] // bl with bf: Java orient. / Montes Tengğger / 4000 1890 / H.Fruhstorfer [pb], (MNHN).

Measurements of examined male: OI 22.09; PI 94.29. BL/EW 3.42.

Distribution. Indonesia (Island Java).

***Dioxycula drescheri* sp. nov.**

(Figs. 6-9)

Type locality. Indonesia, Island Java, Batoerraden, G. Slammat.

Type material. Holotype: (♂): wl with bf: Batoerraden / G. Slammat. Java / F. C. Drescher. [pb] / II.1926 [hb], (UNAN). Paratypes: (1 ♂): same data as holotype, (VNPC); (1 ♂): same data as holotype, but V.1926, (UNAN); (1 ♂): same data as holotype, but 7.-9.VIII.1926, (UNAN); (1 ♂, 1 ♀): same data as holotype, but I.1927, (UNAN); (1 ♀): same data as holotype, but I.1926, (VNPC); (1 ♀): same data as holotype, but 10.IV.1927, (UNAN); (1 ♀): same data as holotype, but 21.X.1929, (UNAN). The types are provided with a printed red label: '*Dioxycula / drescheri* sp. nov. / HOLOTYPUS [or PARATYPUS] / V. Novák det. 2021.

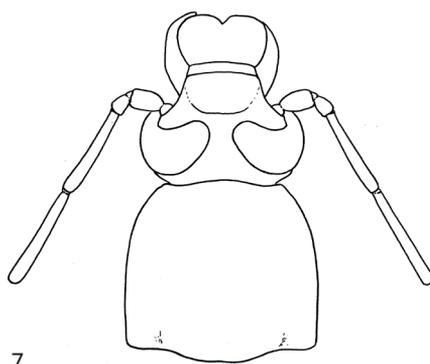
Description of holotype. Habitus as in Fig. 6, body narrow, elongate, parallel, from pale brown to brown, dorsal surface shiny with pale setation, punctuation and microgranulation, BL 8.43 mm. Widest near elytral humeri; BL/EW 3.85.

Head (Fig. 7) approximately as wide as long, through the eyes distinctly wider than anterior margin of pronotum, very slightly narrower than base of pronotum. Dorsal surface more matte than surface of pronotum, with sparse, pale setae, punctures and microgranulation. Posterior part brown with dark setae behind eyes and coarser punctures than those in pale reddish brown anterior half. Clypeus pale reddish brown, wide and transverse, half heart shaped, with very shallow punctures, microgranulation and denser pale setation than those in anterior part, lateral margins rounded, apex excised in middle. Mandibles pale reddish brown, glabrous, shiny, with darker sides and apex. HW 1.22 mm; HW/PW 0.87; HL (visible part) 1.21 mm. Eyes very large, transverse, excised, space between eyes very narrow, distinctly narrower than diameter of one eye; slightly wider than length of antennomere 2; OI equal to 13.40.

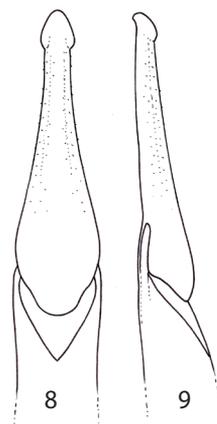
Antenna. Long, narrow, pale brown (AL 6.47 mm, exceeding three quarters body length - AL/BL 0.77). Antennomeres filiform, rather matte with short pale setation, microgranulation and punctures. Antennomere 2 shortest, antennomere 4 longest. Antennomeres 5-11 shorter or as long as antennomere 3 and more than 5 times longer than wide.

RLA(1-11): 0.49 : 0.19 : 1.00 : 1.08 : 0.92 : 0.93 : 0.87 : 0.91 : 0.99 : 0.89 : 1.01.

RL/WA(1-11): 2.47 : 1.35 : 7.36 : 8.33 : 7.10 : 6.25 : 6.41 : 5.65 : 7.27 : 6.26 : 8.20.



Figs. 6-9: *Dioxycula drescheri* sp. nov.: 6- habitus of male holotype; 7- head and pronotum of male holotype; 8- apical piece of aedeagus, dorsal view; 9- apical piece of aedeagus, lateral view.



Maxillary palpus pale brown, rather matte, with longer, pale setation, microgranulation and small and shallow punctures. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.

Pronotum (Fig. 7) brown, shiny, slightly convex, bell-shaped, distinctly narrower than elytra at humeri, widest at base. Dorsal surface with long, pale setation, fine microgranulation and dense, coarse punctuation, punctures large, intervals between punctures narrower than diameter of punctures. PL 1.25 mm; PW 1.41 mm; PI equal to 88.65. Border lines very narrow, margins conspicuous from dorsal view. Lateral margins straight and parallel in basal part, slightly arcuate in apical half, base finely bisinuate, anterior margin slightly rounded. Posterior and anterior angles obtuse.

Elytra. Reddish brown, narrow, elongate, parallel, shiny, finely narrowing apically. Dorsal surface with long, pale setation. EL 5.97 mm; EW 2.19 mm; EL/EW 2.73. Elytral striae with rows of large and coarse punctures (approximately as large as those in pronotum), intervals between punctures in rows narrower than diameter of punctures. Elytral intervals rather flat than convex, with sparse, small, shallow punctures and microgranulation.

Scutellum. Brown, semi elliptical, slightly shiny, with setae, punctures and microgranulation.

Elytral epipleura well-developed, reddish brown, covered with a few pale setae and large punctures in basal part, widest at base, distinctly narrowing to ventrite 1, then narrow and parallel with denser and longer setation in apical part.

Legs. Very long and narrow, pale reddish brown, dorsal surface with fine microgranulation,

long, pale setation and shallow punctures. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.71 : 0.74 : 0.97 : 1.47 (protarsus), 1.00 : 0.35 : 0.36 : 0.53 : 0.83 (mesotarsus), 1.00 : 0.42 : 0.41 : 0.82 (metatarsus).

Protarsal claws with more than 30 visible teeth.

Ventral side of body brown, with sparse setae and large punctures. Abdomen brown, slightly shiny, with pale setation, fine microgranulation and sparse, small and shallow punctures. Ultimate and penultimate ventrites slightly paler, ultimate ventrite with very shallow impression in apex.

Aedeagus (Figs. 8, 9) pale brown, slightly shiny. Basal piece slightly narrowing in dorsal view and slightly rounded laterally. Apical piece elongate triangular with rounded apex dorsally, beak-shaped from dorsal and lateral view. Ratio of length of apical piece to length of basal piece from dorsal view 1: 2.96.

Female has body slightly wider and space between eyes distinctly wider (OI approximately 26) than in male. Protarsal claws have only 12 teeth.

Measurements of female body. HW/PW 0.83; BL/EW 3.49; EL/EW 2.52.

RLA(1-8): 0.46 : 0.20 : 1.00 : 1.15 : 0.92 : 0.87 : 0.85 : 0.83.

RL/WA(1-8): 1.95 : 1.24 : 5.86 : 7.15 : 6.23 : 5.58 : 5.46 : 5.27.

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 8.49 mm (7.94-9.05 mm); HL 1.23 mm (1.16-1.32 mm); HW 1.26 mm (1.18-1.35 mm); OI 16.41 (13.40-19.64); PL 1.25 mm (1.20-1.27 mm); PW 1.45 mm (1.37-1.56 mm); PI 86.19 (81.41-90.51); EL 6.01 mm (5.54-6.53 mm); EW 2.31 mm (2.16-2.56 mm). Females (n= 4). BL 9.29 mm (8.29-9.98 mm); HL 1.31 mm (1.25-1.40 mm); HW 1.34 mm (1.27-1.43 mm); OI 26.06 (22.22-28.62); PL 1.37 mm (1.36-1.38 mm); PW 1.59 mm (1.50-1.72 mm); PI 86.68 (80.23-91.33); EL 6.60 mm (5.68-7.20 mm); EW 2.64 mm (2.37-2.86 mm).

Differential diagnosis. (See the key below for more information). The most similar species from Island Java are *Dioxycula aranea* Fairmaire, 1896 and *Dioxycula malaccana* (Pic, 1922) from Indonesia and Malaysia.

Dioxycula drescheri sp. nov. clearly differs from the species *D. aranea* mainly by body narrower and longer (BL/EW 3.85 in males), by space between eyes narrow (OI 13-20 in males), by femora and tibiae unicolored; while *D. aranea* has body slightly wider and shorter (BL/EW 3.4), space between eyes is wider (OI 22 in male) and femora and tibiae are bicolor. *D. drescheri* is distinctly different from a similar species *D. malaccana* mainly by smaller body (BL 8-10 mm) and larger punctures on dorsal surface of pronotum and in elytral striae than those in *D. malaccana* with larger body (BL more than 12 mm).

Etymology. Named after the collector of type series.

Distribution. Indonesia (Island Java).

Dioxycula kelantanica sp. nov.

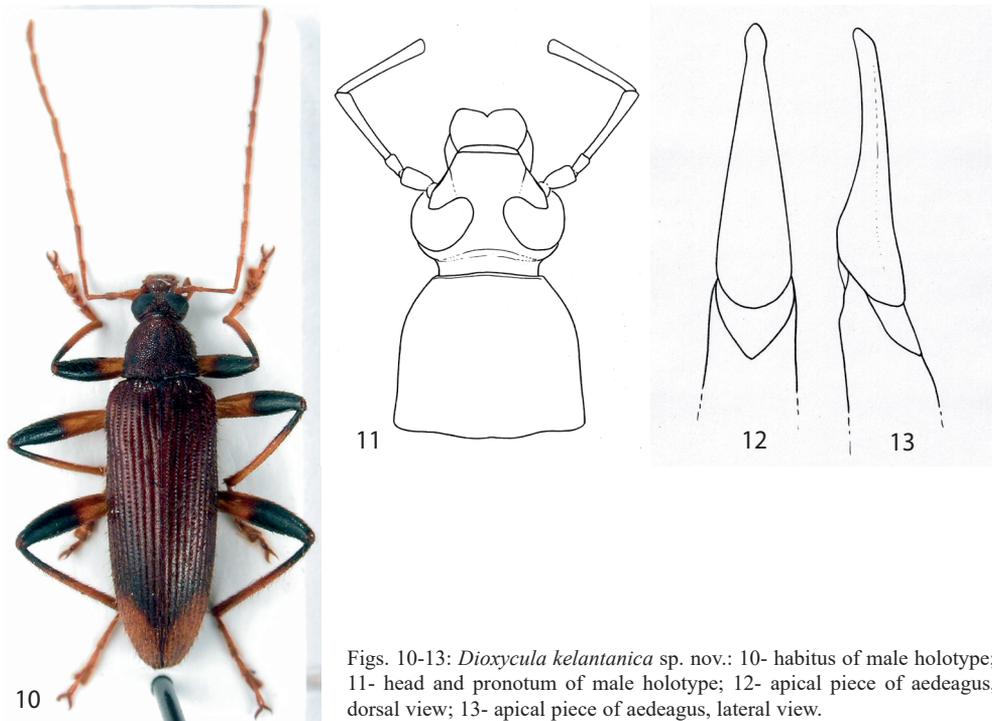
(Figs. 10-13)

Type locality. Western Malaysia, Kelantan Province.

Type material. Holotype: (♂): MALAYSIA W Kelantan, / 60 km N of Tanah Rata / TANAH KERAJAAN, / 12.-30.iv.2007, 1000 m / Petr Čechovský lgt., (VNPC); (1 ♀): MALAYSIA West, PAHANG / Cameron Highlands, / TANAH RATA, 3.-19.ii.2005 / P. Čechovský lgt. 1200-1500 m; (VNPC); (1 ♂): MALAYSIA West, KELANTAN / 90 km N of Gua Musang / Gunung Basor, 1700 m / Kampong Kubur Datu / 10.iv.-5.v.2016 / Petr Cehovsky lgt., (VNPC); (1 ♂, 2 ♀♀): MALAYSIA., KELANTAN / road between Kampong Raja / and Gua Musang, 1400-1700m, / (Ladang Pandrak), 1.-28. / iv.2006; 4°63-88'N; 101°45-95'E, / Čechovský Petr lgt., (VNPC); (1 ♂): MALAYSIA-W, Pahang, / 30km SE of IPOH, 1500m, / Banjaran Titi Wangsa, / TANAH RATA, 14-15.iii. / 2002, P.Čechovský leg., (VNPC); (1 ♂): MALAYSIA – Perak / Cameron Highlands / Tanah Rata / 13. – 16.3.1997 / Oliver Dulík leg., (ZSMG). The types are provided with a printed red label: 'Dioxycula / kelantanica sp. nov. / HOLOTYPUS [or PARATYPUS] / V. Novák det. 2021'.

Description of holotype. Habitus as in Fig. 10, body narrow, elongate, parallel, from ochre yellow to dark brown, dorsal surface slightly shiny with pale setation, punctuation and fine microgranulation, BL 9.80 mm. Widest near elytral humeri; BL/EW 3.84.

Head (Fig. 11) slightly longer than wide, through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than pronotum at base. Dorsal surface with long and sparse, pale setae, relatively sparse punctuation and microgranulation. Posterior part brown, strangled behind eyes, with coarser punctures than those in pale reddish brown and



Figs. 10-13: *Dioxycula kelantanica* sp. nov.: 10- habitus of male holotype; 11- head and pronotum of male holotype; 12- apical piece of aedeagus, dorsal view; 13- apical piece of aedeagus, lateral view.

rather shiny anterior part. Clypeus wide and transverse, half heart shaped, with distinct microgranulation, punctuation indistinct, lateral margins rounded, apex excised in middle. Mandibles pale reddish brown, glabrous, with sparse microgranulation, shiny, with dark lateral margins. HW 1.31 mm; HW/PW 0.80; HL (visible part) 1.37 mm. Eyes very large, transverse, deeply excised, space between eyes narrow, distinctly narrower than diameter of one eye; slightly wider than length of antennomere 2, distinctly narrower than length of antennomere 1; OI equal to 19.57.

Antenna. Long and narrow, pale brown (AL 8.33 mm, exceeding three quarters body length - AL/BL 0.85). Antennomeres almost filiform, antennomers 3-10 very slightly widened apically, dorsal surface with pale setation and distinct microgranulation. Antennomeres 1-4 slightly shiny, antennomeres 5-11 rather matte. Antennomeres with pale setation, fine microgranulation and small punctures. Antennomere 2 shortest, antennomeres 4-11 longer than antennomere 3 and more than 5 times longer than wide.

RLA(1-11): 0.48 : 0.27 : 1.00 : 1.17 : 1.16 : 1.25 : 1.25 : 1.17 : 1.15 : 1.14 : 1.15.

RL/WA(1-11): 1.70 : 1.14 : 5.90 : 6.27 : 5.96 : 6.73 : 6.68 : 6.27 : 6.48 : 6.09 : 6.75.

Maxillary palpus pale reddish brown, slightly shiny, with pale setation and microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.

Pronotum (Fig. 11) bell-shaped, dark brown, narrow, finely convex, slightly shiny, distinctly narrower than elytra at humeri, very finely excised before posterior angles, widest in base. Dorsal surface with long and dense, pale setation, microgranulation and dense punctuation, punctures relatively large and coarse. PL 1.44 mm; PW 1.64 mm; PI equal to 86.75. Border lines very narrow, all margins not clearly conspicuous from dorsal view. Lateral margins almost straight in posterior part, slightly arcuate in apical half, base very finely bisinuate, anterior margin almost straight. Posterior angles roundly obtuse, anterior angles obtuse.

Elytra. Brown, apex with two ochre yellow spots (as in Fig. 10), narrow, elongate, parallel, shiny, with longer, semierect, pale setation. EL 6.99 mm; EW 3.55 mm; EL/EW 2.74. Elytral striae with rows of coarse punctures (approximately as large as those in surface of pronotum), intervals between punctures in rows narrower than diameter of punctures. Elytral intervals slightly convex, with small and shallow punctures and microgranulation.

Scutellum. Brown, semi elliptical, shiny, with punctures and microgranulation.

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

Legs. Very long and narrow, ochre yellow with apical half of very thin femora and apex of tibiae blackish brown. Dorsal surface with fine microgranulation, long, pale setation and punctuation, punctures very small. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.61 : 0.60 : 0.76 : 1.33 (protarsus), 1.00 : 0.49 : 0.43 : 0.73 (metatarsus).

Tarsal claws long and narrow, protarsal claws with almost 40 visible teeth.

Ventral side of body brown with relatively large punctures. Abdomen brown, very slightly shiny, with pale setation, fine microgranulation and shallow punctures. Ultimate ventrite with very shallow triangular impression in the middle of apex.

Aedeagus (Figs. 12, 13) ochre yellow, shiny. Basal piece slightly narrowing in dorsal view, and slightly rounded laterally. Apical piece triangular with rounded top dorsally, beak-shaped from dorsal and lateral view. Ratio of length of apical piece to length of basal piece from dorsal view 1: 2.90.

Female has body slightly wider and space between eyes distinctly wider than in male. Protarsal claws have 14 and 15 visible teeth.

Measurements of female body. AL 7.85 mm; AL/BL 0.83; HW/PW 0.79; BL/EW 3.44; EL/EW 2.47.

RLA(1-11): 0.46 : 0.21 : 1.00 : 1.10 : 1.05 : 1.13 : 1.13 : 1.06 : 1.06 : 1.04 : 1.09.

RL/WA(1-11): 2.25 : 1.50 : 6.53 : 7.20 : 6.87 : 5.64 : 5.84 : 6.12 : 5.47 : 6.80 : 7.13.

RLT: 1.00 : 0.54 : 0.54 : 0.65 : 1.38 (protarsus), 1.00 : 0.37 : 0.38 : 0.68 (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 9.31 mm (8.80-9.80 mm); HL 1.34 mm (1.28-1.37 mm); HW 1.31 mm (1.25-1.34 mm); OI 18.74 (16.77-21.10); PL 1.40 mm (1.36-1.44 mm); PW 1.63 mm (1.57-1.66 mm); PI 87.18 (86.75-87.90); EL 6.56 mm (6.14-6.99 mm); EW 2.49 mm (2.34-2.56 mm). Females (n= 3). BL 9.54 mm (9.49-9.60 mm); HL 1.36 mm (1.31-1.42 mm); HW 1.34 mm (1.28-1.41 mm); OI 24.34 (23.45-26.09); PL 1.33 mm (1.32-1.34 mm); PW 1.72 mm (1.70-1.74 mm); PI 77.52 (77.01-77.91); EL 6.84 mm (6.84-6.84 mm); EW 2.82 mm (2.77-2.92 mm).

Differential diagnosis. (See the key below for more information). *Dioxycula kelantanica* sp. nov. clearly differs from all other known species of *Dioxycula* by elytra with ochre yellow spots; while other known species of *Dioxycula* have elytra unicolored (without spots).

Etymology. Toponymic, named after the type locality Kelantan Province (Malaysia).

Distribution. Malaysia (Kelantan Province).

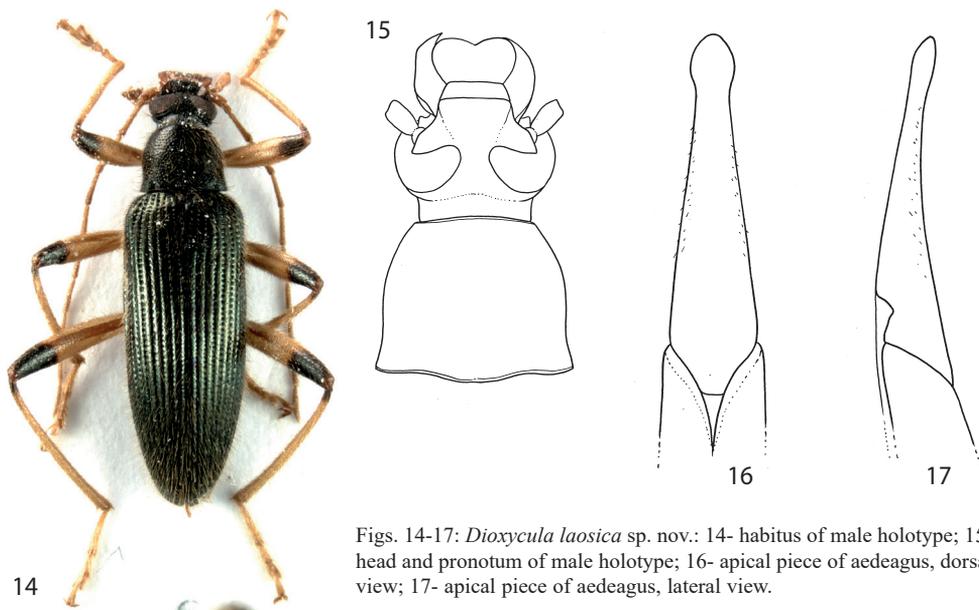
***Dioxycula laosica* sp. nov.**

(Figs. 14-17)

Type locality. Laos, Luang Prabang Province, 19°34'N, 102°13'E, environ of Ban Kiukacham, 1400-1450 m.

Type material. Holotype: (♂): LAOS, Luang Prabang Prov., / 19°34'N/102°13'E, / Ban Kiukacham env., / 1400 - 1450 m, 19.vi.2009, / M. Geiser & D. Hauck leg., // NHMB Basel, NMPC Prague / Laos 2009 Expedition: / M. Brancucci, M. Geiser, / Z. Kraus, D. Hauck, V. Kubáň, (NMPC); Paratypes: (1 ♂): same data as holotype, (VNPC); (2 ♂♂, 1 ♀): LAO, Phongsaly prov., / 21°41-2'N 102°06-8'E, / 28.v.-20.vi.2003. PHONGSALY env., / ~1500m, Brancucci leg., (NMBS, VNPC). The types are provided with a printed red label: '*Dioxycula / laosica* sp. nov. / HOLOTYPUS [or PARATYPUS] / V. Novák det. 2021'.

Description of holotype. Habitus as in Fig. 14, body narrow, elongate, parallel, black with green metallic lustre, dorsal surface shiny with pale setation, punctuation and very fine microgranulation, BL 9.31 mm. Widest near elytral humeri; BL/EW 3.80.



Figs. 14-17: *Dioxycula laosica* sp. nov.: 14- habitus of male holotype; 15- head and pronotum of male holotype; 16- apical piece of aedeagus, dorsal view; 17- apical piece of aedeagus, lateral view.

Head (Fig. 15) slightly longer than wide, through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than base of pronotum. Dorsal surface shiny with pale setae, fine microgranulation and dense punctuation, punctures medium sized. Posterior part black with long, dark setae behind eyes, coarser punctures than those in brown anterior half. Clypeus pale reddish brown, wide and transverse, half heart shaped, with shallow punctures, pale setation and distinct microgranulation, lateral margins rounded, apex excised in middle. Mandibles pale brown, glabrous, shiny, sides and apex darker, with pale setae in sides. HW 1.35 mm; HW/PW 0.82; HL (visible part) 1.40 mm. Eyes very large, transverse, excised, space between eyes narrow, distinctly narrower than diameter of one eye; slightly narrower than length of antennomere 1; OI equal to 17.33.

Antenna. Long and narrow, pale brown (AL 7.29 mm, exceeding three quarters body length - AL/BL 0.78). Antennomeres filiform, rather matte, dorsal surface with pale setation, fine microgranulation and shallow punctures. Antennomere 2 shortest, antennomere 4 longest. Antennomeres 4-9 longer than antennomere 3, antennomeres 4-11 more than 6 times longer than wide.

RLA(1-11): 0.48 : 0.28 : 1.00 : 1.19 : 1.02 : 1.05 : 1.09 : 1.06 : 1.07 : 0.89 : 1.01.

RL/WA(1-11): 2.06 : 1.63 : 5.42 : 7.00 : 6.55 : 6.73 : 6.96 : 7.14 : 7.55 : 6.63 : 8.88.

Maxillary palpus pale brown, rather matte, with pale setation and fine microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.

Pronotum (Fig. 15) blackish brown, bell-shaped, slightly convex, shiny, slightly narrower than elytra at humeri, widest in base. Dorsal surface with long and dense, pale setation and dense punctuation, punctures medium sized and coarse, microgranulation very fine,

almost indistinct. PL 1.44 mm; PW 1.64 mm; PI equal to 87.81. Border lines very narrow, lateral margins not clearly conspicuous from dorsal view. Lateral margins excised before rectangular posterior angles, slightly arcuate in anterior part, base finely bisinuate, anterior margin almost straight. Anterior angles obtuse.

Elytra. Black with green metallic lustre, narrow, elongate, parallel, shiny, with long and dense, pale setation. EL 6.47 mm; EW 2.45 mm; EL/EW 2.64. Elytral striae with rows of large and coarse punctures (distinctly larger than those in pronotum), intervals between punctures in rows narrower than diameter of punctures. Elytral intervals slightly convex, with sparse, small and shallow punctures and very fine, almost indistinct microgranulation.

Scutellum. Black, semi elliptical, more matte, with small, shallow punctures and microgranulation.

Elytral epipleura well-developed, covered with pale setae, blackish brown, widest in base, basal part with punctures, distinctly narrowing to ventrite 1, then narrow and parallel in apical part.

Legs. Very long and narrow, ochre yellow, apex of femora and base of tibiae blackish brown with long dark setae. Dorsal surface with pale setation, very fine microgranulation and punctuation, punctures shallow. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.66 : 0.57 : 0.66 : 1.33 (protarsus), 1.00 : 0.46 : 0.41 : 0.45 : 0.88 (mesotarsus), 1.00 : 0.46 : 0.45 : 0.67 (metatarsus).

Protarsal claws with more than 20 visible teeth.

Ventral side of body blackish brown, with punctuation, pale setation of metaventrite distinctly denser than in prothorax and mesoventrite. Abdomen blackish brown, slightly shiny, with longer, recumbent, pale setation, fine microgranulation and small punctures.

Aedeagus (Figs. 16, 17) pale brown, shiny. Basal piece almost parallel in basal part from dorsal view, then narrowing, arcuate in lateral view. Apical piece short, narrow, elongate triangular with rounded apex in dorsal view, beak-shaped dorsally and laterally. Ratio of length of apical piece to length of basal piece from dorsal view 1: 2.32.

Female has body slightly wider and space between eyes distinctly wider than in male. Protarsal claws have 12 teeth.

Measurements of female body. BL 9.08 mm; HL 1.43 mm; HW 1.30 mm; OI 24.93; PL 1.39 mm; PW 1.79 mm; PI 85.46; EL 6.26 mm; EW 2.71 mm; AL 6.21 mm; AL/BL 0.68; HW/PW 0.73; BL/EW 3.35; EL/EW 2.31.

RLA(1-11): 0.53 : 0.31 : 1.00 : 1.05 : 0.93 : 0.93 : 0.90 : 0.92 : 0.94 : 0.91 : 0.96.

RL/WA(1-11): 1.88 : 1.35 : 4.09 : 4.18 : 5.62 : 5.62 : 6.08 : 6.23 : 5.53 : 5.33 : 5.25.

RLT: 1.00 : 0.55 : 0.63 : 0.96 : 1.90 (protarsus), 1.00 : 0.43 : 0.37 : 0.72 (metatarsus).

Variability. The type specimens somewhat vary in size; each character is given as its mean value, with full range in parentheses. Males (n=4). BL 9.37 mm (9.01-9.61 mm); HL 1.46 mm (1.40-1.52 mm); HW 1.37 mm (1.34-1.41 mm); OI 18.67 (17.33-20.67); PL 1.41 mm (1.36-1.49 mm); PW 1.65 mm (1.64-1.68 mm); PI 82.42 (82.42-88.69); EL 6.51 mm (6.10-6.73 mm); EW 2.55 mm (2.45-2.71 mm).

Differential diagnosis. (See the key below for more information). The most similar species are *Dioxycula subvirida* sp. nov. and *Dioxycula tenua* sp. nov. (dorsal surface with metallic lustre) from Thailand.

Dioxycula laosica sp. nov. clearly differs from the species *D. subvirida* mainly by punctuation between eyes denser (interspaces between punctures are distinctly wider than diameter of punctures), by punctuation on disc of pronotum sparser (interspaces between punctures almost wider than diameter of punctures); while *D. subvirida* has punctuation between eyes sparser (interspaces between punctures are distinctly narrower than diameter of punctures) and punctuation on disc of pronotum is denser (interspaces between punctures are almost narrower than diameter of punctures).

D. laosica is distinctly different from a similar species *D. tenua* mainly by dorsal surface with green metallic lustre; while *D. tenua* has dorsal surface without green metallic lustre.

Etymology. Toponymic, named after the country of its origin - Laos.

Distribution. Laos (Louang Prabang and Phongsaly Provinces).

***Dioxycula malaccana* (Pic, 1915) comb. nov.**

(Figs. 18-23)

Allecula malaccana Pic, 1915: 16.

Type locality. Malaysia, Perak.

Type material. Holotype (destroyed - without head - Fig. 18): wl: Perak [hb] // yl: type [hb] // rl: TYPE [pb] // wl: *Allecula* / *malaccana* / Pic [hb], (MNHN).

Material examined: (1 ♂): MALAYSIA West, PERAK / 40 km SE of IPOH, 900 m / Banjaran Titi Wangsu / RINGLET, 29.iii.-15.iv.2004 / P. Čechovský lgt., (VNPC - male for redescription); (1 ♂, 1 ♀): MALAYSIA, KELANTAN / road between Kampong Raja / and Gua Musang, 1400-1700 m, / (Ladang Pandrak), 1.-28. / iv.2006; 4°63'-88'N; 101°45'-95'E, / Čechovský Petr lgt., (VNPC); (1 ♀): MALAYSIA-W., Perak, / 40km SE of IPOH, 900 m, / Banjaran Titi Wangsa / RINGLET, 25.iii.-3.iv.2002 / P.Čechovský leg., (VNPC); (1 ♂, 1 ♀): MALAYSIA W KELANTAN / 30 km NW of Gua Musang / Ulu Lalat Mt. 800-1000m / KAMPONG SUNGAI OM; 21. / vi.-14.vii.2010P.Čechovský lgt., (VNPC); (2 ♂♂, 2 ♀♀): same data as penultimate, but 22.v. - 14.vi. 2012 / Petr Cechovsky lgt., (VNPC); (2 ♀♀): same data, but 27.v. / 19.vi.2011; (VNPC); (1 ♀): MALAYSIA W., PAHANG / 50 km NE of Kuala / Rompin, Endau Rompin / Nat. P., 400 m, G. Keriung / (Kg. Tebu Hitam); 9.-30.iv. / 2008; P. Čechovský lgt., (VNPC); (2 ♂♂, 1 ♀): SUMATRA (N.), BRASTAGI / G. Sibayak, 1450-1900m / 19.-23.II.1991 / Bocák & Bocáková lgt., (NMBS, VNPC); (1 ♀): SUMATRA (Jambi), GUNUNG / KERINCI, 1800-2100 m / 6.-7. III.1991 / Bocák & Bocáková lgt., (NMBS); (1 ♂): SUMATRA Gn Talamau / 17km E Simpangempat / 21.-25. May2001 750 m / Bolm lgt., (Ophir mts.), (VNPC); (1 ♂): Prapat / 1400m [pb] 21.VIII. [hb] // Sumatra [pb] 1981 [hb] / J. Wiesner, (NMBS).

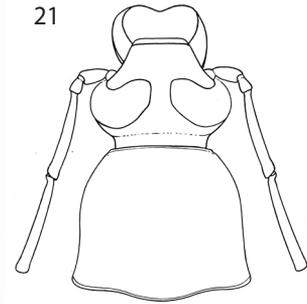
Redescription (male). Habitus of male as in Fig. 19, body narrow, elongate, from pale brown to black or blackish brown, dorsal surface slightly shiny with pale setation, punctuation and microgranulation, BL 12.07 mm. Widest near elytral humeri; BL/EW 4.04. Head (Fig. 21) blackish brown, slightly longer than wide, through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than base of pronotum. Dorsal surface



18



19

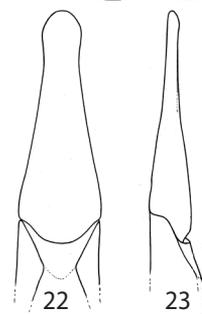


21

Figs. 18-23: *Dioxycula malaccana* (Pic, 1915) comb. nov.: 18- habitus of holotype; 19- habitus of male from Malaysia; 20- habitus of male from Indonesia (Sumatra Island); 21- head and pronotum; 22- apical piece of aedeagus, dorsal view; 23- apical piece of aedeagus, lateral view.



20



22



23

rather matte with sparse, pale setae, black setae behind eyes, microgranulation and shallow punctures. Clypeus wide and transverse, half heart shaped, lateral margins rounded, dorsal surface with longer pale setation, apex ochre yellow, excised in middle. Mandibles pale brown, glabrous, shiny, with sides slightly darker and pale setae in sides. HW 1.59 mm; HW/PW 0.78; HL (visible part) 1.56 mm. Eyes very large, transverse, deeply excised, space

between eyes narrow, distinctly narrower than diameter of one eye; distinctly narrower than length of antennomere 1, approximately as wide as length of antennomere 2; OI equal to 16.10. Antenna long, pale brown, narrow (AL 10.29 mm, exceeding two thirds body length - AL/BL 0.85). Antennomeres almost filiform, antennomeres 3-10 very slightly widened apically, dorsal surface with pale setation, very small punctures and fine microgranulation. Antennomere 2 shortest, antennomere 4 longest. Antennomeres 3-11 more than 7 times longer than wide. RLA(1-11): 0.39 : 0.41 : 1.00 : 1.20 : 1.03 : 1.08 : 1.04 : 1.00 : 0.96 : 0.91 : 1.00. RL/WA(1-11): 1.78 : 1.04 : 7.13 : 8.04 : 7.04 : 7.38 : 7.13 : 7.81 : 8.72 : 7.45 : 10.93. Maxillary palpus pale brown, rather matte, with pale setation, fine microgranulation and very small punctures. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular. Pronotum (Fig. 21) dark reddish brown, narrow, bell-shaped, slightly convex, rather matte, distinctly narrower than elytra at humeri, slightly excised laterally before posterior angles, widest in base. Dorsal surface with microgranulation, pale setation and dense punctuation, punctures coarse and medium sized. PL 1.74 mm; PW 1.95 mm; PI equal to 89.23. Border lines very narrow, margins not clearly conspicuous from dorsal view. Lateral margins arcuate in apical part, base finely bisinuate, anterior margin almost straight. Posterior angles roundly obtuse, anterior angles almost indistinct. Elytra blackish brown, narrow, elongate, regularly narrowing apically, slightly shiny, with dense and relatively long, pale setation. EL 8.77 mm; EW 2.99 mm; EL/EW 2.93. Elytral striae with rows of coarse punctures (slightly larger than those in surface of pronotum), intervals between punctures in rows narrower than diameter of punctures (sometimes very close together). Elytral intervals more flat than convex, with fine microgranulation, small and shallow punctures mainly in basal part, larger shallow punctures in apical part. Scutellum blackish brown, semi elliptical, shiny, with small, shallow punctures and microgranulation. Elytral epipleura well-developed, covered with pale setae, basal part widest in base, with one row of punctures, distinctly narrowing to the level of metacoxae, then narrow and parallel in apical part. Legs very long and narrow, reddish brown, apical part of tibiae and tarsi pale brown. Dorsal surface with fine microgranulation, pale setation and very small and shallow punctures. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.66 : 0.74 : 0.85 : 1.36 (protarsus), 1.00 : 0.41 : 0.39 : 0.50 : 0.76 (mesotarsus), 1.00 : 0.52 : 0.46 : 0.71 (metatarsus). Tarsal claws long and narrow, protarsal claws with more than 40 visible teeth. Ventral side of body dark brown, with dense punctuation, short setation in metaventricle denser than in prothorax and mesoventricle. Abdomen dark brown, shiny, with sparse, recumbent, pale setation and fine microgranulation. Ultimate ventricle rather matte with large shallow, triangular impression in the middle of apex. Aedeagus (Figs. 22, 23) pale brown, shiny. Basal piece slightly narrowing in dorsal view, rounded laterally. Apical piece very narrow in lateral view, triangular with rounded apex in dorsal view, beak-shaped dorsally and laterally. Ratio of length of apical piece to length of basal piece in dorsal view 1: 2.56.

Female has body slightly wider than male, protarsal claws have 12 and 13 teeth.

Distribution. Malaysia, new for Indonesia (Sumatra Island).

***Dioxycula subvirida* sp. nov.**

(Figs. 24-27)

Type locality. Northern Thailand, Chiang Mai Province, Doi Suthep.

Type material. Holotype (♂): N. THAILAND; / Chiang Mai Prov. / Doi Suthep / 13-16. V. 2012 / K. MASUMOTO leg., (NMTJ). Paratypes: (7 ♂♂): same data as holotype, (KMTJ, VNPC); (1 ♂): Thailand, Chiang Mai / Doi Suthep, 10.V.2012 / K. Masumoto leg., (VNPC); (1 ♂): N. THAILAND; / Chiang Mai Prov. / Doi Pui, 1500m / 17. V. 2009 / K. Masumoto leg., (KMTJ). The types are provided with a printed red label: '*Dioxycula / subvirida* sp. nov. / HOLOTYPE [or PARATYPE] / V. Novák det. 2021'.

Description of holotype. Habitus as in Fig. 24, body narrow, elongate, parallel, black with green metallic lustre, dorsal surface rather shiny with pale setation, punctuation and fine microgranulation, BL 9.17 mm. Widest near elytral humeri; BL/EW 3.41.

Head (Fig. 25) approximately as wide as long, through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than pronotum in base. Dorsal surface slightly shiny with long, pale setae, microgranulation and punctuation. Posterior part blackish brown with large and coarse punctures and dark setae behind eyes, anterior part dark brown with ochre yellow apex and shallow punctures smaller than those in posterior half. Clypeus ochre yellow, wide and transverse, half heart shaped, with long, pale setae, shallow punctures and distinct microgranulation, lateral margins rounded, apex slightly excised in middle. Mandibles ochre yellow, with lateral sides and apex darker, glabrous, shiny with pale setae in sides. HW 1.36 mm; HW/PW 0.87; HL (visible part) 1.43 mm. Eyes very large, transverse, deeply excised, space between eyes very narrow, distinctly narrower than diameter of one eye; distinctly narrower than length of antennomere 1, slightly wider than length of antennomere 2; OI equal to 18.18.

Antenna. Ochre yellow, long and narrow (AL 7.77 mm, exceeding three quarters body length - AL/BL 0.85). Antennomeres filiform, dorsal surface with pale setation, fine microgranulation and shallow punctures. Antennomere 2 shortest, antennomere 4 longest. Antennomeres 5-11 slightly shorter than antennomere 3 and more than 6 times longer than wide.

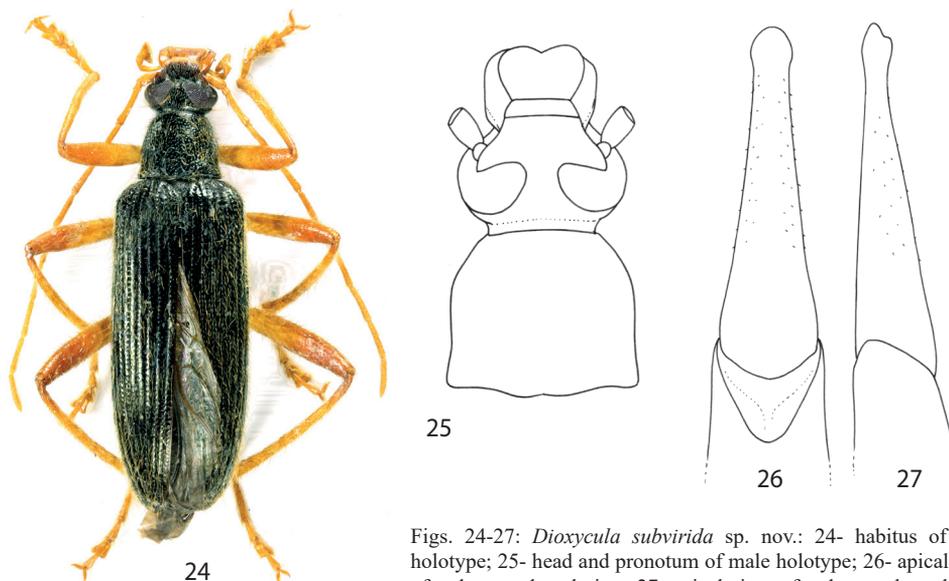
RLA(1-11): 0.45 : 0.20 : 1.00 : 1.08 : 0.98 : 0.96 : 0.96 : 0.94 : 0.94 : 0.92 : 0.90.

RL/WA(1-11): 1.78 : 1.21 : 6.55 : 5.72 : 6.78 : 6.44 : 6.44 : 7.06 : 6.88 : 6.88 : 7.38.

Maxillary palpus ochre yellow, rather matte, with pale setation and fine microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.

Pronotum (Fig. 25) black, shiny, slightly convex, distinctly narrower than elytra at humeri, widest in base. Dorsal surface with long, pale setation, very fine microgranulation and punctuation, punctures medium sized and coarse. PL 1.29 mm; PW 1.57 mm; PI equal to 82.17. Border lines very narrow, margins conspicuous in dorsal view, only in the middle of anterior part not clearly distinct. Lateral margins slightly excised before posterior angles and slightly angled in apical half. Base finely bisinuate, anterior margin almost straight. Posterior angles roundly obtuse, anterior angles indistinct.

Elytra. Black, with green metallic lustre, narrow, elongate, parallel, shiny, with dense, recumbent, pale setation. EL 6.45 mm; EW 2.69 mm; EL/EW 2.40. Elytral striae with



Figs. 24-27: *Dioxycula subvirida* sp. nov.: 24- habitus of male holotype; 25- head and pronotum of male holotype; 26- apical piece of aedeagus, dorsal view; 27- apical piece of aedeagus, lateral view.

rows of large and coarse punctures, distinctly larger than those in pronotum, intervals between punctures in rows narrower than diameter of punctures. Elytral intervals flat, with microgranulation and dense punctures, some approximately as large as, some distinctly smaller than those in striae.

Scutellum. Black, triangular, rather matte, with setae and microgranulation.

Elytral epipleura well-developed, black, shiny, covered with a dense and long, pale setae, basal part widest in base, with punctures, distinctly narrowing to ventrite 1, then relatively wide and parallel in apical part.

Legs. Very long and narrow, ochre yellow, apical part of femora, base of tibiae and tarsi pale brown. Dorsal surface with fine microgranulation, almost erect, pale setation and small and shallow punctures. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.58 : 0.60 : 0.74 : 1.08 (protarsus), 1.00 : 0.39 : 0.37 : 0.44 : 0.88 (mesotarsus), 1.00 : 0.50 : 0.41 : 0.67 (metatarsus).

Protarsal claws with 18-20 visible teeth.

Ventral side of body black, with pale setae and punctures, setation of metaventrite denser than setation of prothorax and mesoventrite. Abdomen blackish brown, shiny, with long, recumbent, pale setation, fine microgranulation and dense, small punctures. Ultimate ventrite with shallow impression in the middle of apex.

Aedeagus (Figs. 26, 27) pale brown, shiny. Basal piece slightly narrowing in dorsal view, finely rounded laterally. Apical piece elongate triangular with rounded top dorsally, beak-shaped in dorsal and lateral views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 3.15.

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= 10). BL 9.08 mm (8.76-9.33 mm); HL 1.41 mm (1.38-1.44 mm); HW 1.35 mm (1.32-1.37 mm); OI 18.15 (16.78-19.74); PL 1.30 mm (1.26-1.33 mm); PW 1.58 mm (1.52-1.65 mm); PI 82.64 (80.61-85.16); EL 6.38 mm (6.12-6.60 mm); EW 2.42 mm (2.33-2.69 mm).

Differential diagnosis. (See the key below for more information). Most similar species (dorsal surface with metallic lustre) are *Dioxycula laosica* sp. nov. from Laos and *Dioxycula tenua* sp. nov. from Thailand.

Dioxycula subvirida sp. nov. clearly differs from the species *D. tenua* mainly by dorsal surface of body with green metallic lustre; while metallic lustre of dorsal surface in *D. tenua* is not green.

D. subvirida is distinctly different from similar species *D. laosica* mainly by punctuation between eyes sparser, (interspaces between punctures are distinctly wider than diameter of punctures), by punctuation on disc of pronotum denser (interspaces between punctures almost narrower than diameter of punctures); while *D. laosica* has punctuation between eyes denser, (interspaces between punctures are distinctly narrower than diameter of punctures) and punctuation on disc of pronotum is sparser (interspaces between punctures are almost wider than diameter of punctures).

Etymology. Named after the colouring of dorsal surface from Latin - *subvirida* (greenish).

Distribution. Thailand (Chiang Mai Province).

***Dioxycula tenua* sp. nov.**
(Figs. 28-31)

Type locality. Northern Thailand, Chiang Rai Province, environ of Wiang Pa Pao.

Type material. Holotype: (♂): N THAILAND - Chiang / Rai prov.; Wiang Pa / Pao env. 21.5.-10.6. / 2011; P. Viktora lgt., (VNPC); (1 ♂, 2 ♀♀): same data as holotype, (VNPC). The types are provided with a printed red label: 'Dioxycula / tenua sp. nov. / HOLOTYPE [or PARATYPE] / V. Novák det. 2021'.

Description of holotype. Habitus as in Fig. 28, body narrow, elongate, parallel, black, dorsal surface shiny with pale setation, punctuation and fine microgranulation, BL 8.26 mm. Widest near elytral humeri; BL/EW 3.79.

Head (Fig. 29) slightly longer than wide, through the eyes distinctly wider than anterior margin of pronotum, slightly narrower than base of pronotum. Dorsal surface shiny with sparse, pale setation, punctuation and microgranulation. Posterior part black with dark setae behind eyes and coarser punctures than those in blackish brown anterior part. Clypeus pale brown, wide and transverse, half heart shaped, with small, shallow punctures, long, pale setae and distinct microgranulation, lateral margins rounded, apex excised in middle. Mandibles ochre yellow, shiny, glabrous, lateral sides and apex slightly darker, with pale setae in sides. HW 1.28 mm; HW/PW 0.88; HL (visible part) 1.33 mm. Eyes very large, transverse, distinctly excised, space between eyes narrow, distinctly narrower than diameter of one eye; distinctly wider than length of antennomere 2, approximately as wide as length of antennomere 1; OI equal to 19.19.

Antenna. Very long, narrow, ochre yellow (AL(1-10) 5.92 mm, reaching almost three quarters body length - AL(1-10)/BL 0.72). Antennomeres almost filiform, dorsal surface with pale setation, shallow punctures and microgranulation. Antennomere 2 shortest, antennomeres 3-10 more than 5 times longer than wide.

RLA(1-10): 0.41 : 0.23 : 1.00 : 1.10 : 0.94 : 0.96 : 1.09 : 1.07 : 1.03 : 1.03.

RL/WA(1-10): 2.15 : 1.33 : 5.83 : 6.42 : 5.50 : 5.83 : 6.08 : 5.77 : 6.00 : 6.26.

Maxillary palpus pale brown, more matte, with pale setation and fine microgranulation. Palpomeres 2 and 3 distinctly narrowest at base and widest at apex, ultimate palpomere widely triangular.

Pronotum (Fig. 29) black, shiny, slightly convex, distinctly narrower than elytra at humeri, widest in base. Dorsal surface with long, pale setation, very fine microgranulation and dense punctuation, punctures medium sized, coarse. PL 1.28 mm; PW 1.46 mm; PI equal to 87.67. Border lines very narrow, margins not always clearly conspicuous from dorsal view. Lateral margins distinctly excised before posterior angles, finely arcuate in apical half, base finely bisinuate, anterior margin slightly rounded. Posterior angles rectangular, anterior angles obtuse.

Elytra. Black, narrow, elongate, parallel, shiny, with metallic lustre, surface with pale setation. EL 5.65 mm; EW 2.18 mm; EL/EW 2.59. Elytral striae with rows of large and coarse punctures (distinctly larger than those in pronotum), intervals between punctures in rows narrower than diameter of punctures. Elytral intervals slightly convex, with sparse, small punctures, microgranulation almost indistinct.

Scutellum. Black, semi elliptic, slightly shiny, with dark setae, small punctures and microgranulation.

Elytral epipleura well-developed, blackish brown, with a few pale setae and row of punctures in basal part, widest at base, distinctly narrowing to ventrite 1, then narrow and parallel with denser pale setation in apical part.

Legs. Very long and narrow, ochre yellow, apical third and base of tibiae blackish brown with long, dark setae. Dorsal surface with very fine microgranulation, long, pale setation and shallow punctures. Protarsomeres and mesotarsomeres 3, 4 and metatarsomere 3 widened and lobed. RLT: 1.00 : 0.65 : 0.57 : 0.89 : 1.40 (protarsus), 1.00 : 0.42 : 0.37 : 0.43 : 0.85 (mesotarsus), 1.00 : 0.38 : 0.38 : 0.74 (metatarsus).

Protarsal claws with 20 visible teeth.

Ventral side of body black, with long, pale setae and dense punctures. Abdomen blackish brown, slightly shiny, with short, recumbent, pale setation, fine microgranulation and very small punctures.

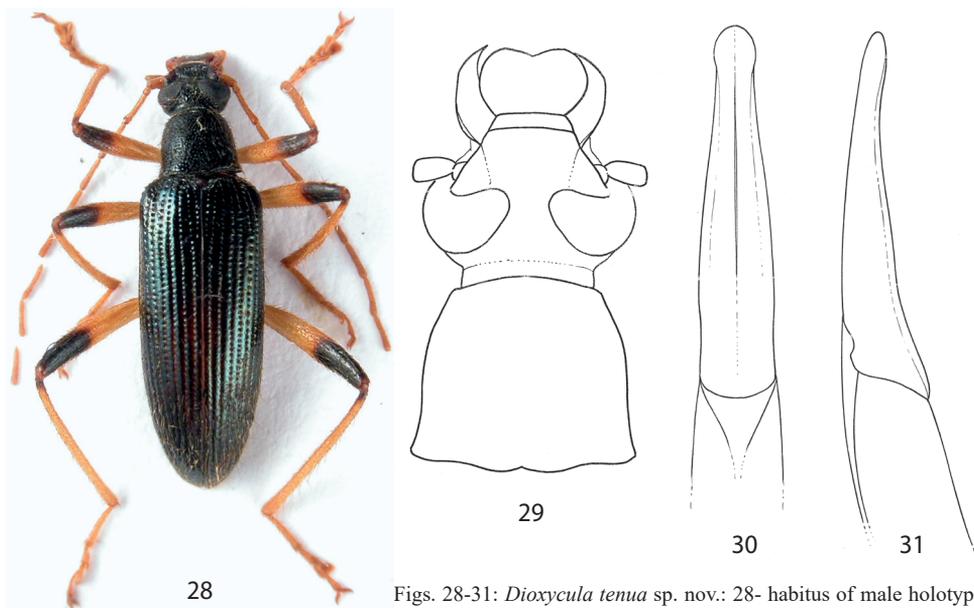
Aedeagus (Figs. 30, 31) pale brown, slightly shiny. Basal piece rounded in dorsal view, narrowing laterally. Apical piece relatively long and narrow, beak-shaped in dorsal and lateral views. Ratio of length of apical piece to length of basal piece in dorsal view 1: 2.13.

Female has body slightly wider than male, protarsal claws have 12 teeth.

Measurements of female body. AL 7.26 mm; AL/BL 0.76; HW/PW 0.76; BL/EW 3.45; EL/EW 2.43.

RLA(1-10): 0.60 : 0.23 : 1.00 : 1.05 : 1.08 : 1.08 : 1.10 : 1.10 : 1.08 : 1.05 : 1.23.

RL/WA(1-10): 2.34 : 1.13 : 4.81 : 4.77 : 6.19 : 6.19 : 7.39 : 7.08 : 6.92 : 6.75 : 8.64.



Figs. 28-31: *Dioxycula tenua* sp. nov.: 28- habitus of male holotype; 29- head and pronotum of male holotype; 30- apical piece of aedeagus, dorsal view; 31- apical piece of aedeagus, lateral view.

RLT: 1.00 : 0.50 : 0.56 : 0.83 : 1.52 (protarsus), 1.00 : 0.47 : 0.47 : 0.70 (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 8.32 mm (8.26-8.38 mm); HL 1.32 mm (1.30-1.33 mm); HW 1.26 mm (1.24-1.28 mm); OI 19.59 (19.19-20.00); PL 1.29 mm (1.28-1.29 mm); PW 1.52 mm (1.46-1.58 mm); PI 84.66 (81.65-87.67); EL 5.72 mm (5.65-5.79 mm); EW 2.24 mm (2.18-2.29 mm). Females (n= 2). BL 9.54 mm (9.52-9.55 mm); HL 1.45 mm (1.40-1.50 mm); HW 1.40 mm (1.35-1.45 mm); OI 22.93 (20.86-25.00); PL 1.41 mm (1.40-1.41 mm); PW 1.84 mm (1.77-1.90 mm); PI 76.67 (73.68-79.66); EL 6.68 mm (6.65-6.70 mm); EW 2.83 mm (2.76-2.90 mm).

Differential diagnosis. (See the key below for more information). Most similar species (dorsal surface with metallic lustre) are *Dioxycula laosica* sp. nov. from Laos and *Dioxycula subvirida* sp. nov. from Thailand.

Dioxycula tenua sp. nov. clearly differs from the species *D. subvirida* and *D. laosica* mainly by metallic lustre of body in dorsal view not green; while *D. subvirida* and *D. laosica* have body in dorsal view with green metallic lustre.

Etymology. Named after its main character thin body, from Latin - *tenua* (thin).

Distribution. Thailand (Chiang Rai Province).

KEY TO THE SPECIES OF THE GENUS *DIOXYCULA* FAIRMAIRE

- 1(2) Dorsal surface of elytra with ochre yellow spots. Habitus of male holotype as in Fig. 10, head and pronotum (Fig. 11) and shape of apical piece of aedeagus (Figs. 12 and 13). Malaysia. *Dioxycula kelantanica* sp. nov.
- 2(1) Dorsal surface of elytra unicolored (without spots). 3
- 3(4) Elytra with metallic lustre. 5
- 4(3) Elytra without metallic lustre. 9
- 5(6) Metallic lustre of elytra not green. Habitus of male holotype as in Fig. 28, head and pronotum (Fig. 29) and shape of apical piece of aedeagus (Figs. 30 and 31). Thailand (Chiang Rai). *Dioxycula tenua* sp. nov.
- 6(5) Elytra with green metallic lustre 7
- 7(8) Punctuation between eyes denser, interspaces between punctures distinctly narrower than diameter of punctures, punctuation on disc of pronotum sparser, interspaces between punctures almost wider than diameter of punctures. Habitus of male holotype as in Fig. 14, head and pronotum (Fig. 15) and shape of apical piece of aedeagus (Figs. 16 and 17). Laos. *Dioxycula laosica* sp. nov.
- 8(7) Punctuation between eyes sparser, interspaces between punctures distinctly wider than diameter of punctures, punctuation on disc of pronotum denser, interspaces between punctures almost narrower than diameter of punctures. Habitus of male holotype as in Fig. 24, head and pronotum (Fig. 25) and shape of apical piece of aedeagus (Figs. 26 and 27). Thailand (Chiang Mai). *Dioxycula subvirida* sp. nov.
- 9(10) Tibiae and femora bicolor, body shorter and wider (BL/EW 3.4). Habitus of female holotype as in Fig. 1, habitus of examined male (Fig. 2), head and pronotum (Fig. 3), protarsus (Fig. 4). Indonesia (Island Java). *Dioxycula aranea* Fairmaire, 1896
- 10(9) Tibiae and femora unicolored, body longer and narrower (BL/EW 3.8-4). 11
- 11(12) Body larger (BL more than 12 mm), elytral striae and dorsal surface of pronotum with medium sized punctures. Habitus of male as in Figs. 19 and 20, head and pronotum (Fig. 21) and shape of apical piece of aedeagus (Figs. 22 and 23). Indonesia (Island Sumatra), Malaysia. *Dioxycula malaccana* (Pic, 1922) comb. nov.
- 12(11) Body smaller (BL 8-10 mm), elytral striae and dorsal surface of pronotum with large sized punctures. Habitus of male holotype as in Fig. 6, head and pronotum (Fig. 7) and shape of apical piece of aedeagus (Figs. 8 and 9). Indonesia (Island Java). *Dioxycula drescheri* sp. nov.

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