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Two new species and new records of Galerucinae (Coleoptera: Chrysomelidae) from Vietnam

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Abstract. A new subgenus *Paratrachobalya* **subgen. n.** of the genus *Trachobalya* Weise, 1924 and two new species, *Charaea bezdeki* **sp. n.** and *Trachobalya (Paratrachobalya) ventrituberculata* **sp. n.**, are described from Vietnam. The figures of general view and aedeagus are given for them and related species. *Atrachya tricolor* Gressitt et Kimoto, 1963, *Brachyphora nigrovittata* Jacoby, 1890, *Theopea bicoloroides* Lee et Bezděk, 2020 and *Theopea sekerkai* Lee et Bezděk, 2018 are recorded for the first time from Vietnam. A new identification key for males of *Charaea coomani* species-group from Vietnam, Laos, Thailand, Myanmar and Peninsular Malaysia is provided.

Key words: Coleoptera, Chrysomelidae, Galerucinae, *Charaea*, *Trachobalya*, *Paratrachobalya*, Vietnam, South-East Asia.

Два новых вида и новые находки жуков-листоедов подсемейства Galerucinae (Coleoptera: Chrysomelidae) из Вьетнама

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Резюме. Описаны новый подрод *Paratrachobalya* **subgen. n.** рода *Trachobalya* Weise, 1924 и два новых вида, *Charaea bezdeki* **sp. n.** и *Trachobalya (Paratrachobalya) ventrituberculata* **sp. n.**, из Вьетнама. Даны изображения внешнего вида и аedeagus для них и близких к ним видов. Впервые для фауны Вьетнама указаны *Atrachya tricolor* Gressitt et Kimoto, 1963, *Brachyphora nigrovittata* Jacoby, 1890, *Theopea bicoloroides* Lee et Bezděk, 2020 и *Theopea sekerkai* Lee et Bezděk, 2018. Предложена новая определительная таблица для самцов группы видов *Charaea coomani* из Вьетнама, Лаоса, Таиланда, Мьянмы и полуостровной части Малайзии.

Ключевые слова: Coleoptera, Chrysomelidae, Galerucinae, *Charaea*, *Trachobalya*, *Paratrachobalya*, Вьетнам, Юго-Восточная Азия.

The Galerucinae (including the tribe Alticini) is the largest subfamily of the family Chrysomelidae, containing more 15800 species distributed worldwide. In the present paper based on study of materials collected by D. Fedorenko, R. Filimonov, A. Prosvirov, A. Prokofiev and P. Romantsov in Vietnam a new subgenus and two new species of this subfamily are described as well as several species are recorded as new for Vietnam.

All measurements were made using an ocular grid mounted on MBS-20 stereomicroscope. Photographs of the habitus were made by a Canon EOS 80D digital camera with a combined Canon EF 70–200 mm f/4.0L IS USM and inverted Minolta MC Rokkor-PF 50 mm f/1.7 lenses. Photographs of aedeagi were made by a Canon EOS 80D digital camera with a combined Canon EF 70–200 mm f/4.0L IS USM and inverted EFS 18–55 mm f/3.5–5.6 lenses. A photograph of spermatheca was made by a Canon EOS 80D digital camera with Canon Extender EF 1.4 X II and with a combined Canon EF 70–200 mm f/4.0L IS USM and inverted EFS 18–55 mm f/3.5–5.6 lenses. Images at different focal planes were combined using Zerene Stacker Professional 1.04 software.

Following abbreviations are used for depository places of types:

PR – collection of P. Romantsov (St Petersburg, Russia);

ZIN – collection of the Zoological Institute of the Russian Academy of Sciences (St Petersburg, Russia).

Atrachya tricolor Gressitt et Kimoto, 1963

Material. 1♂ (PR), “N Vietnam, Lao Cai Prov., near Sa pa, Cat Cat Vill., 1274–1355 m. N 22°19'18.5", E 103°49'35.3" N 22°19'8.4", E 103°49'27.4" 15.V.2018 P. Romantsov leg.”; 1♀ (PR), “N Vietnam, Lao Cai Prov., near Sa pa, Cat Cat Vill. 1348–1264 m., N 22°19'31.8", E 103°49'41.9" N 22°19'19.2", E 103°49'28.6" 18.V.2018 R. Filimonov leg.”

Note. This species was described from south-east China (Fujian Province) by Gressitt and Kimoto [1963] and later recorded from Hunan Province (Xiangnan) by Yang [1992]. The record from Vietnam is the first for the Oriental Region.

Distribution. China [Beenen, 2010] and Northern Vietnam (new record).

Brachyphora nigrovittata Jacoby, 1890

Material. 1♂ (PR), “N Vietnam, Hòa Bình Prov., Mai Chau Vill., Chiếu Cave, 250–400 m N 20°39'20", E 105°4'59" N 20°39'12", E 105°5'3" 24.IV.2019 P. Romantsov leg.”

Note. This species was known only from the Palaearctic Region. The record from Vietnam is the first for the Oriental Region.

Distribution. China [Beenen, 2010] and Northern Vietnam (new record).

Charaea bezdeki **sp. n.** (Figs 1, 4, 5, 14, 15)

Material. Holotype, ♂ (PR): “N Vietnam, Hòa Bình Prov., Mai Chau Vill., Chiếu Cave, 250–400 m., N 20°39'20", E 105°4'59" N 20°39'12",

E 105°5'3" 24.IV.2019 P. Romantsov leg., Paratypes: 12♂, 13♀ (PR, ZIN), same data as in holotype; 5♂, 2♀ (PR), same data, but "20.IV.2019"; 5♂, 4♀ (PR), same data, but "21.IV.2019"; 1♂ (PR), "N Vietnam, Hòa Bình Prov., Mai Chau Vill., Eco Homestay N 20°38'56.6", E 105°3'59.2", at light 170 m., 17-25.IV.2019, Prosvirov leg."

Description. Male, holotype. Upperside of body metallic green-blue; antennae black, segments I–III with metallic green tint, underside of segments II and III brown; legs black with green metallic tint. Underside of body metallic green-blue with yellow abdomen. Body length 4.5 mm, width 2.2 mm. General view as in Fig. 1.

Body oblong, convex, slightly widened posteriorly, 1.95 times as long as wide. Head smooth, impunctate. Labrum transverse with rounded lateral margins and almost straight anterior margin. Anterior margin of clypeus straight with several long setae; nasal keel wide, convex, impunctate. Frontal tubercles large, convex, impunctate, obliquely transverse, separated from vertex by distinct deep furrow. Eyes large, strongly convex, oval; interocular space 1.8 times as wide as transverse diameter of eye. Vertex convex, shining and impunctate. Antennae robust, reaching middle of elytra, proportions in length of segments I–XI are as 12 : 5 : 6 : 10 : 10 : 9 : 10 : 10 : 9 : 12 (1 = 0.025 mm), their proportions in width are as 4.5 : 3 : 3 : 4 : 4 : 4 : 4 : 4 : 4 : 4 : 4, three basal segments shining with sparse semi-erect thin setae, following segments shagreen with denser recumbent thin setae. Pronotum strongly convex without any discal impressions, 1.35 times as wide as long, broadest at middle, about 1.35 times narrower than elytra at base. Anterior margin almost straight, posterior margin slightly convex, lateral margins rounded. Anterior margin unborded, lateral and posterior margins bordered; lateral borders rather wide, posterior border thin. Anterior angles almost rectangular, slightly swollen, lateral margins with several short setae. Disc of pronotum covered with two types of punctures: with rather deep, moderate size punctures along basal and lateral margins and with microscopic punctures sparsely scattered all over surface.

Scutellum subtriangular with widely rounded apex; surface impunctate, shining and convex. Elytra 1.4 times as long as wide, widened near apex; surface rather densely covered with moderately large confused punctures. Humeral calli well developed. Epipleura broadened at base, rather suddenly narrowing in anterior third, then gradually narrowing to posterior quarter where disappearing not reaching apex. Wide part of epipleural surface slightly concave; the rest slightly convex, covered with microsculpture. Legs robust with very slightly swollen femora. All tibiae with short apical spurs. Tarsi with segment I elongate (2.5 times as long as wide), 1.5 times narrower than segment II and 1.5 times narrower than segment III. Segment I of hind tarsi 1.5 times shorter than all following segments combined. Claws appendiculate. Underside impunctate, sparsely covered with thin setae. Anterior coxal cavities open posteriorly. Prosternal process very narrow, almost invisible between procoxae. Abdomen with five distinctly visible ventrites; posterior margins of ventrites I–IV straight; last ventrite trilobed, middle lobe slightly impressed with straight cutting anterior margin. Pygidium convex with almost straight cutted apex. Aedeagus rather wide (Figs 14, 15), 3.14 times as long as wide, anterior margin of aedeagus slightly convex with small emargination in middle; ventral side with long narrow median impression; length of aedeagus 1.1 mm, its width 0.35 mm.

Paratypes. Males are similar to holotype, body length 3.9–4.7 mm. Females are similar to males but have last abdominal ventrite with posterior margin entire and widely rounded. Posterior margin of female pygidium with rather large triangular central tooth and two small indistinct lateral teeth (Fig. 4); body length 3.7–4.9 mm. Spermatheca as in Fig. 5, its length about 0.35 mm.

Differential diagnosis. The oriental species of *Charaea* Baly, 1878 were reviewed by Bezděk [2017]. In addition, revisions of this genus from Taiwan [Bezděk, Lee, 2014] and South India [Bezděk, Viswajyothi, 2019] were published. Two more *Charaea* species from Vietnam and

Sumatra were recently described by Romantsov [2018]. *Charaea bezdeki* sp. n. belongs to the *Ch. coomani* species-group and is close to the species having aedeagus with wide apical orifice (*Ch. zaki* Bezděk, 2017 and *Ch. khamhoanica* Romantsov, 2018). Within them *Ch. bezdeki* sp. n. is most similar to *Ch. zaki*, males of which have aedeagus with very wide apical orifice and anterior margin transversely bisinuate. Females of *Ch. zaki* have posterior margin of pygidium with three small subtriangular teeth and two round concavities between the teeth. In contrast, males of *Ch. bezdeki* sp. n. have anterior margin of aedeagus slightly convex with small emargination in the middle, females of this new species have posterior margin of pygidium with rather large triangular central tooth and two small indistinct lateral teeth (Fig. 4). *Charaea coomani* (Gressitt et Kimoto, 1963), living sympatrically with this new species, differs from both in structure of aedeagus and from the new species in colouring of body: deep blue in *Ch. coomani*, green-blue in *Ch. bezdeki* sp. n. (see also the key).

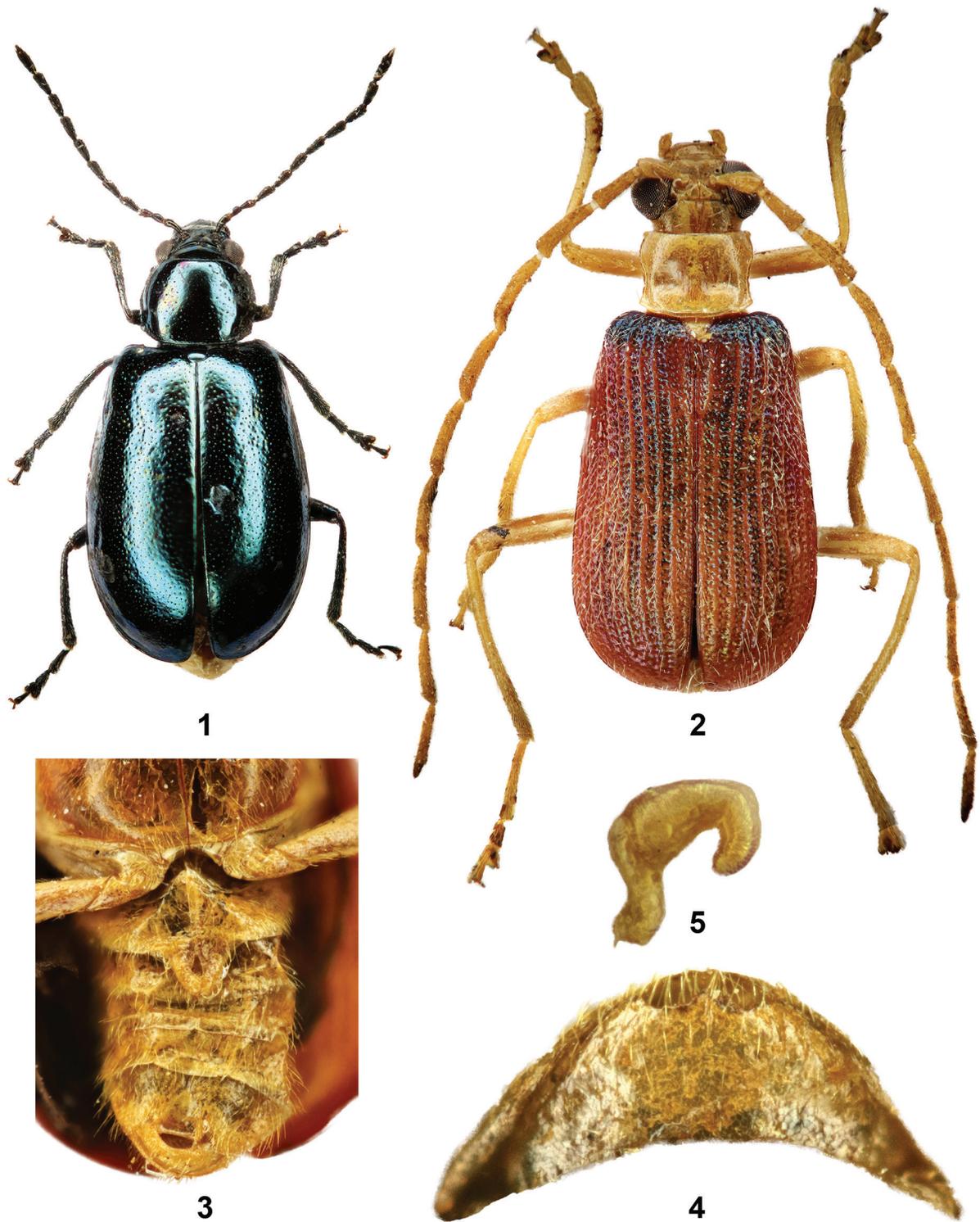
Below I suggest a new identification key on males of *Charaea coomani* species-group from Vietnam, Laos, Thailand, Myanmar and Peninsular Malaysia (on the base of the key given by Bezděk [2017] with addition of *Ch. khamhoanica* and *Ch. bezdeki* sp. n.).

Bionomics. Almost all type specimens of this new species were collected on one big tree where they lived together with numerous specimens of *Ch. coomani*.

Distribution. Northern Vietnam.

Etymology. The name of this new species is dedicated to Jan Bezděk, a well known specialist in Chrysomelidae.

- 1(2). Aedeagus with bifurcate apex (Fig. 6). Peninsular Malaysia *Ch. bifurcatum* Bezděk, 2017
- 2(1). Apex of aedeagus not bifurcate.
- 3(8). Aedeagus with wide apical orifice, anterior margin not subtriangular and not forming apical process (Figs 7, 8, 14).
- 4(5). Anterior margin of aedeagus with very deep triangular emargination (Fig. 8). Vietnam
..... *Ch. khamhoanica* Romantsov, 2018
- 5(4). Anterior margin of aedeagus bisinuate or slightly convex with small emargination in middle.
- 6(7). Anterior margin of aedeagus bisinuate (Fig. 7). Myanmar *Ch. zaki* Bezděk, 2017
- 7(6). Anterior margin of aedeagus slightly convex with small emargination in middle (Fig. 14). Vietnam
..... *Ch. bezdeki* sp. n.
- 8(3). Apex of aedeagus with narrower apical orifice, anterior margin subtriangular or forming apical process (Figs 9–13).
- 9(12). Apex of aedeagus forming apical process (Figs 9, 10).
- 10(11). Apical process of aedeagus narrow, convergent, with rounded tip (Fig. 10). China, Taiwan, Vietnam
..... *Ch. kelloggi* (Gressitt et Kimoto, 1963)
- 11(10). Apical process of aedeagus wider, parallel, tip transversely truncated (Fig. 9). Laos, Thailand
..... *Ch. latha* Bezděk, 2017
- 12(9). Apex of aedeagus subtriangular (Figs 11–13).
- 13(14). Aedeagus wider, ca. 2.7 times as long as wide (Fig. 13). Myanmar *Ch. langeri* Bezděk, 2017
- 14(13). Aedeagus narrower, ca. 3.6–3.7 times as long as wide (Figs 11, 12).

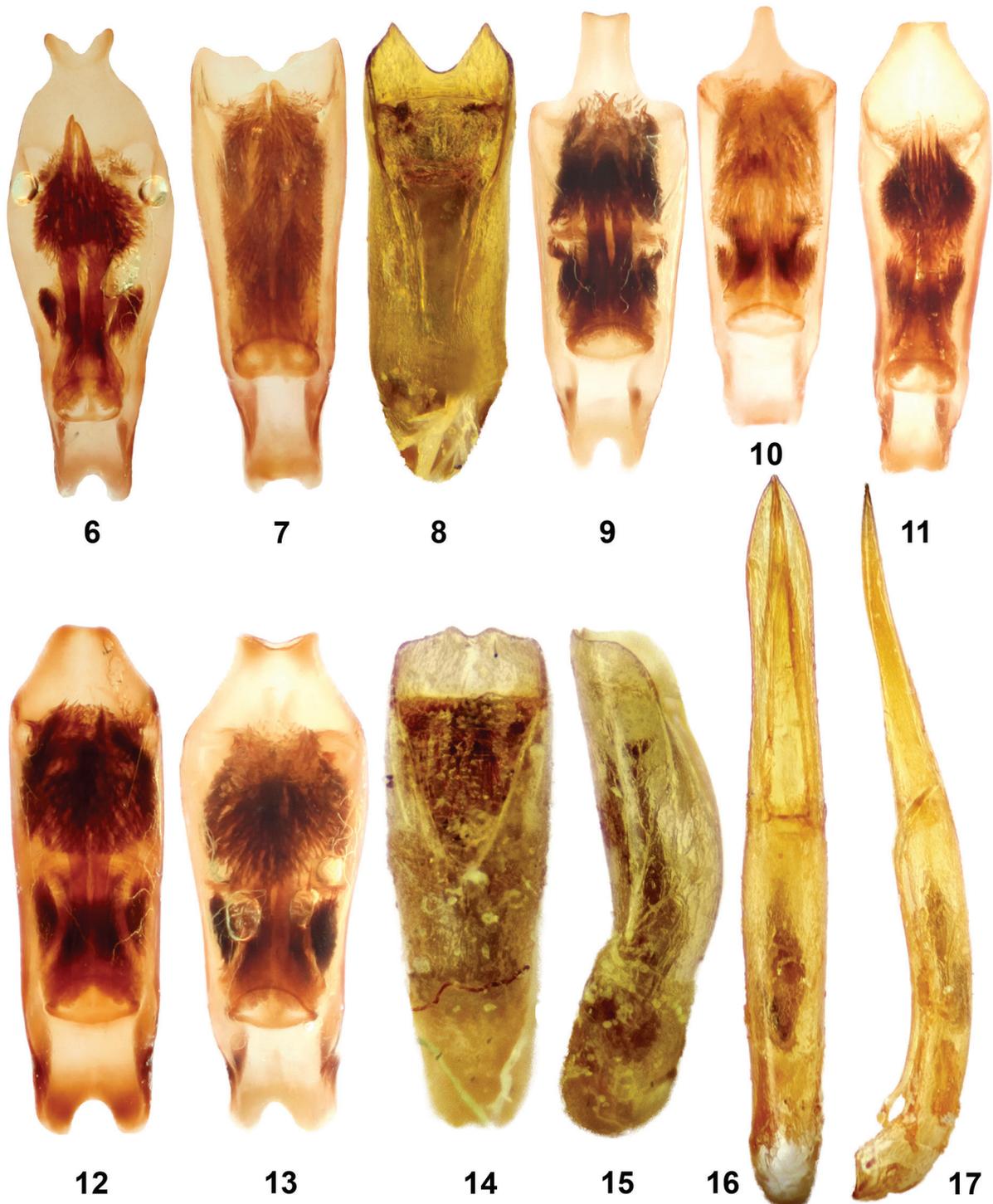


Figs 1–5. Galerucinae, general view and details of structure.

1, 4–5 – *Charaea bezdeki* sp. n.: 1 – male, holotype, general view, 4 – female, paratype, pygidium, 5 – female, paratype, spermatheca; 2–3 – *Trichobalya* (*Paratrichobalya*) *ventrituberculata* sp. n., male, holotype: 2 – general view, 3 – abdomen.

Рис. 1–5. Galerucinae, общий вид и детали строения.

1, 4–5 – *Charaea bezdeki* sp. n.: 1 – самец, голотип, вид сверху, 4 – самка, паратип, пигидий, 5 – самка, паратип, сперматека; 2–3 – *Trichobalya* (*Paratrichobalya*) *ventrituberculata* sp. n., самец, голотип: 2 – вид сверху, 3 – брюшко.



Figs 6–17. Galerucinae, aedeagi.
 6 – *Charaea bifurcatum* Bezděk, 2017; 7 – *Ch. zaki* Bezděk, 2017; 8 – *Ch. khanghoanica* Romantsov, 2018; 9 – *Ch. latha* Bezděk, 2017; 10 – *Ch. kelloggi* (Gressitt et Kimoto, 1963); 11 – *Ch. jaromiri* Bezděk, 2017; 12 – *Ch. coomani* (Gressitt et Kimoto, 1963); 13 – *Ch. langeri* Bezděk, 2017; 14–15 – *Ch. bezdeki* sp. n., holotype; 16–17 – *Trichobalya (Paratrichobalya) ventrituberculata* sp. n., holotype. 6–14, 16 – dorsal view; 15, 17 – lateral view. 6, 7, 9–13 – after Bezděk [2017].

Рис. 6–17. Galerucinae, эдеагусы.

6 – *Charaea bifurcatum* Bezděk, 2017; 7 – *Ch. zaki* Bezděk, 2017; 8 – *Ch. khanghoanica* Romantsov, 2018; 9 – *Ch. latha* Bezděk, 2017; 10 – *Ch. kelloggi* (Gressitt et Kimoto, 1963); 11 – *Ch. jaromiri* Bezděk, 2017; 12 – *Ch. coomani* (Gressitt et Kimoto, 1963); 13 – *Ch. langeri* Bezděk, 2017; 14–15 – *Ch. bezdeki* sp. n., голотип; 16, 17 – *Trichobalya (Paratrichobalya) ventrituberculata* sp. n., голотип. 6–14, 16 – вид сверху; 15, 17 – вид сбоку. 6, 7, 9–13 – по [Bezděk, 2017].

- 15(16). Aedeagus as in Fig. 11. Internal sclerites in aedeagus clavate, covered with small spines. Thailand
 *Ch. jaromiri* Bezděk, 2017
 16(15). Aedeagus as in Fig. 12. Internal sclerites in aedeagus parallel, without spines. Vietnam
 *Ch. coomani* (Gressitt et Kimoto, 1963)

Theopea bicoloroides Lee et Bezděk, 2020

Material. 1♂ (PR), "N Vietnam, Hòa Bình Prov., Mai Chau Vill., Chiềù Cave, 250–400 m., N 20°39'20", E 105°4'59" N 20°39'12", E 105°5'3" 20.IV.2019 P. Romantsov leg."; 1♀ (PR), same data, but "21.IV.2019 A. Prosvirov leg."

Distribution. China: Yunnan; Laos [Lee, Bezděk, 2020] and Northern Vietnam (new record).

Theopea sekerkai Lee et Bezděk, 2018

Material. 1♂ (PR), "N Vietnam, Hòa Bình Prov., Mai Chau Vill., Eco Homestay N 20°38'56.6", E 105°3'59.2", at light 170 m., 25.IV.2019 P. Romantsov leg."; 1♂ (PR), same data, but "22.IV.2019 A. Prosvirov leg."

Distribution. Laos [Lee, Bezděk, 2018] and Northern Vietnam (new record).

Paratrichobalya subgen. n.

Type species: *Trichobalya ventrituberculata* sp. n.

Description. Body elongate ovate (Fig. 2). Eyes large and convex, genae very short, maxillary palpi with penultimate segment swollen. Antennae long with part of segments expanded and curved. Pronotum with lateral margins rounded anteriorly and constricted posteriorly. Elytra punctate-striate with longitudinal ridges between two longitudinal rows and with unpaired, short and indistinct scutellar row; elytral surface rather densely covered with semi-erect setae. All tibiae with apical spurs, claws appendiculate. Anterior coxal cavities closed posteriorly. Prosternal process very narrow, invisible between procoxae. Abdomen with ventrite I bearing large triangular protuberance directed backward and with last ventrite trilobed (Fig. 3). Aedeagus flattened apically with superficial split tip (Fig. 16).

Differential diagnosis. This new subgenus has shape of pronotum with lateral margins rounded anteriorly and constricted posteriorly and structure of punctate-striate elytra with longitudinal ridges between two longitudinal rows of punctures typical for *Trichobalya* Weise, 1924 s. str., but differs in antennae with part of segments expanded and in specific structure of abdomen with ventrite I bearing large triangular protuberance directed backward; in contrast, antennae filiform and simple structure of abdomen in the nominotypical subgenus.

Note. *Paratrichobalya* subgen. n. has the structure of antennae and aedeagus more typical for the genus *Taumacera* Thunberg, 1814, but the structure of pronotum and elytra typical for *Trichobalya* as well as lacking of metathoracic process, allows me to place it in this genus.

Distribution. Vietnam.

Trichobalya (*Paratrichobalya*) *ventrituberculata* sp. n.
 (Figs 2, 3, 16, 17)

Material. Holotype, ♂ (ZIN): "North Vietnam, Prov. Lao Cai Hoang Lien Son Mt. Range, env. Fanxipan, 1950–2100 m VII 2007, D. Fedorenko". Paratype: 1♂ (PR), "Vietnam, Lam Dong Prov on border with Khanh Hoa 22–24. IV. 2010 A. Prokofiev leg."

Description. Male, holotype. Body oblong, slightly flattened and broadened posteriorly, about 2.3 times as long as wide. Head, pronotum, antennae, legs and underside yellowish-brown; narrow basal part of elytra black with strong dark blue metallic tint, the rest of elytra red-brown with slight blue metallic tint except apical slope pure red-brown without metallic tint. Body length 6.8 mm, width 3 mm. General view as in Fig. 2.

Head impunctate; labrum transverse, about 2 times as wide as long with almost straight anterior margin; surface slightly convex, covered with microsculpture, but smooth along anterior margin bearing two pale setae (with longer seta near anterior angle) laterally on each side. Maxillary palpi with penultimate segment swollen, apical segment small, triangular. Anterior margin of clypeus straight with several long setae; nasal keel narrow and convex; genae short, about 5 times shorter than transverse diameter of eye and about 6 times shorter than longitudinal diameter of eye. Frontal tubercles large, flattened, strictly transverse, contiguous but divided by thin median longitudinal impression, with anterior angle acute inserted between antennal insertions and separated from vertex by straight deep furrow; surface impunctate but covered with microsculpture. Eyes large, strongly convex, oval; interocular space as wide as transverse diameter of eye. Vertex slightly convex, surface shagreen with round deep depression behind frontal tubercles. Antennae about 1.35 times longer than length of body, densely covered with short sub-recumbent hairs. Antennal segment I long and expanded on apex; segment II very small, cylindrical; segment III conical, slightly expanded on apex; segment IV slightly curved, expanded on apex; segments V–VIII slightly curved; segments IX–XI filiform, straight and long, last segment with pointed apex. Proportions in length of segments I–XI are as 30 : 5 : 23 : 33 : 44 : 41 : 40 : 37 : 37 : 35 : 37, their proportions in width (in widest part) are as 9 : 6 : 10 : 9 : 7 : 8 : 7 : 7 : 7 : 6 : 5 (1 = 0.025 mm). Pronotum slightly flattened with pair of discal depressions, 1.34 times as wide as long with equal maximum width in anterior third and at level of posterior angles; about 1.65 times narrower than elytra at base. Anterior margin slightly concave, posterior margin slightly convex, lateral margins sinuate: rounded anteriorly and constricted posteriorly. Anterior margin unbordered, lateral and posterior margins bordered. Anterior angles almost rectangular, slightly protruding laterally, posterior angles triangular, distinctly protruding laterally; each angle with setigerous pore bearing very long pale seta, additional several short setae visible on lateral margin. Disc of pronotum with reticulate microsculpture. Scutellum triangular, about 1.5 times as wide as long with slightly rounded apex; surface covered with microsculpture. Elytra 1.55 times as long as wide, broadened at level of apical slope; surface rather densely covered with semi-erect hairs, punctate-striate with longitudinal ridges between two longitudinal rows of punctures and with indistinct, unpaired, short scutellar row. Humeral calli developed. Epipleura broadened at base, gradually narrowing to apex. Legs slender, all tibiae with apical spurs. Tarsi with segment I swollen and elongate (about 2 times as long as wide), 1.5 times wider than segment II and approximately equal in width to segment III. Segment I of middle tarsi slightly swollen and elongate (about 2.3 times as long as wide), 1.2 times wider than segment II and slightly narrower than segment III; proportions in length of segments I–IV are as 17 : 10 : 8 : 18. Segment I of hind tarsi elongate (about 6 times as long as wide), slightly longer than all following segments combined. Claws appendiculate. Underside impunctate, sparsely covered with thin hairs. Procoxae globular, prosternal process very narrow, invisible between procoxae. Anterior coxal cavities closed posteriorly. Abdomen with five distinctly visible ventrites; posterior margin of ventrite I with large triangular protuberance directed backward; last ventrite trilobed, middle lobe rectangular, deeply impressed throughout with straight cutting anterior margin. Pygidium convex, triangular with rounded apex. Aedeagus narrow and long (Figs 16, 17), about 8.3 times as long as wide, rounded before triangular apex; ventral side with longitudinal median impression; length of aedeagus 2.9 mm, its width 0.35 mm.

Paratype: male is similar to holotype, body length 7.1 mm.

Differential diagnosis. *Trichobalya ventrituberculata* sp. n. can be easily distinguished from all known *Trichobalya* species by unusual for representatives of this genus structure of antennae with segments III–VIII not filiform and abdomen with large triangular protuberance on posterior margin of ventrite I.

Distribution. Northern and Central Vietnam.

Etymology. The name of this new species refers to a protuberance on abdominal ventrite I.

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