

Notes on *Trigonotoma* and *Pareuryaptus* (Coleoptera: Carabidae: Pterostichini) from Vietnam

Заметки о *Trigonotoma* и *Pareuryaptus* (Coleoptera: Carabidae: Pterostichini) Вьетнама

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КЛЮЧЕВЫЕ СЛОВА: Coleoptera, Carabidae, Pterostichini, *Pareuryaptus*, *Trigonotoma*, новая синонимия, Вьетнам.

ABSTRACT. Seven species of the genus *Trigonotoma* Dejean, 1828 and eight species of the genus *Pareuryaptus* Dubault *et al.*, 2008 are reviewed. *Trigonotoma aurifera* Tschitschérine, 1900, **stat.rest.**, and *T. chrysites* Bates, 1892, **stat. rest.**, are resurrected from synonymy of *T. nitidicollis* Chaudoir, 1868 or *T. lewisii* Bates, 1873, respectively. *Pareuryaptus luangphabangensis* Kirschenhofer, 2011, **stat.n.**, downgraded to a subspecies of *P. cambodgiensis* Dubault *et al.*, 2008. New synonymy is established: *P. morosus* (Tschitschérine, 1900) = *P. adoxus* Tschitschérine, 1900, **syn.n.** = *P. loeffleri* Kirschenhofer, 2007, **syn.n.** = *P. namptap* Kirschenhofer, 2011, **syn.n.** Keys to species from Vietnam are provided.

РЕЗЮМЕ. Дан обзор 7 видов рода *Trigonotoma* Dejean, 1828 и 8 видов рода *Pareuryaptus* Dubault *et al.*, 2008. *Trigonotoma aurifera* Tschitschérine, 1900, **stat.rest.**, и *T. chrysites* Bates, 1892, **stat. rest.**, восстановлены из синонимов *T. nitidicollis* Chaudoir, 1868 и *T. lewisii* Bates, 1873, соответственно. *Pareuryaptus luangphabangensis* Kirschenhofer, 2011, **stat.n.**, понижен в ранге до подвида *P. cambodgiensis* Dubault *et al.*, 2008. Установлена новая синонимия: *P. morosus* (Tschitschérine, 1900) = *P. adoxus* Tschitschérine, 1900, **syn.n.** = *P. loeffleri* Kirschenhofer, 2007, **syn.n.** = *P. namptap* Kirschenhofer, 2011, **syn.n.** Составлены определительные таблицы видов из Вьетнама.

Introduction

The genera *Trigonotoma* Dejean, 1828 and *Pareuryaptus* Dubault *et al.*, 2008 belong to the informal group ‘Trigonotomi’ (Coleoptera: Carabidae: Pterostichini) which includes also *Lesticus* Dejean, 1828;

Leiolesticus Roux *et al.*, 2016; *Euryaptus* Bates, 1892; *Nesites* Andrewes, 1939 (= *Aloma* Andrewes, 1931); and *Trigonaptus* Fedorenko, 2020. Most representatives of these genera are medium- to large-sized pterostichines easily recognizable by bright metallic colouration of the body, abdominal sterna transversely sulcate, the antennae rather short and often conspicuously geniculate, with the scape very long relative to the flagellum and scape-to-pedicel articulation angulate, the head more or less incrassate, with gula very wide, etc. *Leiolesticus* is confined to New Guinea and the other six range within the Oriental region, with some member species penetrating southeastern Palearctic region.

The recent authors contributed much to the taxonomy of *Trigonotoma* and *Pareuryaptus*, including many new species described from various regions [Kirschenhofer, 2007, 2011; Dubault *et al.*, 2007, 2008a, b, 2010a, b, 2011]. Roux *et al.* [2016] revised and illustrated all the taxa of the ‘Trigonotomi’ group, including altogether 53 species of *Trigonotoma* and 18 species of *Pareuryaptus*. Just recently, Zhu *et al.* [2020] contributed new two species to *Trigonotoma*, commented on some other congeners and keyed altogether six species recorded in China. Li *et al.* [2022] briefly reviewed four species of *Pareuryaptus*, among them three reported for the first time, from the country.

In this paper, we review *Trigonotoma* and *Pareuryaptus* from Vietnam, based chiefly on material collected by the author during 2004–2022 expeditions of the Russia-Vietnam Tropical Centre, Moscow – Hanoi, to various regions of the country. Special attention is paid on two fairly small species groups of *Trigonotoma*, the *lewisii*-group and the *nitidicollis*-group. These include species that are very similar in appearance, as well as in characters of male and female genitalia. Species not recorded

in Vietnam are given in square brackets. So examination of the internal sac of aedeagus is advisable for the purpose of species identification.

Acronyms used are as follows: ISEA — Institute of Systematics and Ecology of Animals, Russian Academy of Sciences, Novosibirsk; MPSU — Moscow Pedagogical State University; SIEE — the author's reference collection at A.N. Severtsov Institute of Ecology & Evolution, Russian Academy of Sciences, Moscow; ZIN — Zoological Institute, Russian Academy of Sciences, St. Petersburg; ZMMU — Zoological Museum of the Moscow State University.

The following parameters and ratios were analyzed (Tab. 1–4): lengths of antennal scape (a1L) and antennomeres 2–*n* combined (a2–*n*; *n* = 3 or 4, or 5); maximum body length measured between apices of closed mandibles and apex of elytron (BL); length of metepisternum at outer margin (est3L); width of metepisternum at base (est3W); length of terminal labial palpomere at inner margin (lp3L); width of terminal labial palpomere at apex (lp3W); length of penultimate maxillary palpomere except basal condyle (mp3L); length of terminal maxillary palpomere (mp4L); maximum width of terminal maxillary palpomere (mp4W), measured either at the broadest point or along apical margin; length of elytron, measured from the highest point of basal margin to apex (EL); maximum width of elytra (EW); width of head across eyes (HW); width of pronotum between apical (PA) or basal (PB) angles; length of pronotum along median line (PL); distance between pronotal apex and level of maximum width of pronotum, measured along mid-line; maximum width of pronotum (PW).

Measurements were taken using an eyepiece micrometer within the accuracy of two decimal places. The means are given in round brackets for the ratios, with the number of measured specimens (*n*) indicated for the first ratio in the description. All labels are printed. Data on labels of type specimens are in quotes, new line being marked with slash.

Results

Trigonotoma Dejean, 1828

Dejean, 1828: 182; Chaudoir, 1852: 71; Chaudoir, 1868: 158; Tschischérine, 1900: 180; Andrewes, 1930: 352; Dubault *et al.*, 2008a: 240; Roux *et al.*, 2016: 22, 92; Zhu *et al.*, 2020: 49.

Type species: *Trigonotoma viridicollis* (non *Omasus viridicollis* Macleay, 1825): Dejean, 1828 = *T. indica* Brullé, 1834 (subsequent designation by Hope, 1838: 111).

DIAGNOSIS. A member of the 'Trigonotomi' group. Head more or less incrassate, with gula very wide, increasingly so toward base. Antennae geniculate, with scape long, from barely shorter to longer than antennomeres 2 to 4 combined; pedicel with seta; clypeus and labrum deeply sinuate at apical margins, usually leaving labral membrane widely exposed; labral setae evenly spaced; mentum short, with median tooth on a level with lateral lobes. Elytra without setigerous pores (except two species), stria 7 with three preapical setae. Mesoventricle mostly with a precoxal tooth on each side. Meso- and metatarsomere 1 with at least anterior (outer) lateral setae. Terminal labial palpomere very widely triangular to (mostly) securiform in male. Median lobe of aedeagus with apex mostly lamellate, curved to the right, quadrate or trapezoidal.

Other characters as for the group: abdominal sternites transversely sulcate; mentum with deep labial pits; elytral umbilical seta series (USS) continuous. Leg setation: metacoxa bisetose (inner seta missing), metatrochanter asetose, metafe-

mur with one seta (basal), metatibia externally and tarsomere 5 ventrally setose; metatarsomeres 1 and 2 with dorso-apical setae.

Aedeagus with median lobe slightly dorsoventrally flattened; right paramere short; internal sac dorsal or almost so; right paramere short. Female gonocoxite IX falcate, narrow, with indistinct nematiform seta and no ensiform setae.

REDESCRIPTION. Body mostly macropterous, BL 13–32 mm dependent on species, shiny black to bright metallic. Eyes (Figs 1–6) medium-sized, convex, gena rather distinct, neck constriction shallow yet distinct. Mandibles moderate in length, with apex very pointed and strongly incurved. Frontal sulci mostly long.

Pronotum cordiform through subquadrate to nearly circular. Lateral bead rather thick, broadened and flattened toward base. Basal foveae moderately deep, rather flat at bottom, smooth to densely punctate or rugose; inner basal sulcus mostly deep, outer one more shallow, curved slightly outside and more or less distinctly extended into lateral groove inside lateral bead. Base without bead; apex laterally beaded.

Elytra oblong, with sides slightly rounded, humeri rather widely rounded yet distinct, and apices rounded combined. Basal ridge almost complete, inwardly reaching stria 1 or 2, or 3. Striae mostly deep and distinctly punctate or crenulate; parascutellar striae long; stria 1 adjoining parascutellar seta. Intervals mostly convex and more so toward apex. USS: 20–23 (for species from Vietnam).

Leg setation: profemur posterior face bisetose (basal seta missing); metatarsomeres 1 and 2 with a few or no posterolateral setae; ventral setae strong, spiniform, arranged in two rows, tarsomeres 2 and 3 with dorso-apical setae. Meso- and metatarsomeres 1–3 with anterolateral (outer) carina long and sharp to missing, with ventrolateral sulcus only traceable in the latter case.

Venter rather coarsely and densely punctate along sides, including propleura, meso- and metathorax, and abdominal sternites II–IV. Prosternal process not beaded, its posterior inclination wide and flat to sharply carinate. Mesoventricle with a distinct precoxal tooth on each side. Metepisternum mostly long (following macropterous condition) to short.

Secondary sexual characters. Protarsomeres 1–3 dilated and biserially squamose on ventral side in male. Labial palpomere 3 securiform in male, subtriangular, very slightly dilated toward apex, in female. Elytra barely shorter in female than in male (Tab. 1), with apices rounded or subtruncate (*vs.* angulate) combined. Mesotibia rugulose in apical half of anterolateral face, with a small latero-apical tooth just above longer movable apical spur, in male, smooth and without tooth in female.

Internal sac of aedeagus very different in shape, mostly either simple, more or less tubiform (Figs 59–76), or with additional, separate, dorsobasal bulb (Figs 77–80); this latter type of the internal sac is also characteristic of *Pareuryaptus* and *Trigonaptus*.

In species examined, female pregenital segments, genitalia and reproductive tract are similar to those of *Lesticus* (Figs 7–26, 31, 36–38), except chiefly for tergite VIII convex (*vs.* truncate or concave) at apical margin and spermatheca more robust, being shorter, wider and thence more differentiated. Spermathecal duct rather short and directly extended into receptacle, spermatheca proper; spermathecal gland short to very long, spermathecal gland duct rather short. Bursa copulatrix short, *i.e.*, normal in length, to very elongated. No distinct sphincter at bases of spermathecal duct and common oviduct.

GEOGRAPHIC DISTRIBUTION. Throughout the Oriental region and the adjacent parts of southernmost Palearctic subregion within China to Japan.

Seven species have hitherto been reported or described from Vietnam: *T. dohrnii* Chaudoir, 1852; *T. perraudieri* Bates, 1889; *T. nitidicollis* Chaudoir, 1868; *T. chrysites* Bates, 1892 (as *T. bhamoensis*: Kuntzen, 1911); *T. aurifera* Tschitschérine, 1900; *T. ledouxi* Dubault *et al.*, 2010; and *T. stricta* Dubault *et al.*, 2011.

HABITATS AND HABITS. The adults of the species reviewed were collected in various habitats at lower altitudes, along forests trails and forest edges, as well as in fields. Many specimens were taken at light at night.

COMMENTS. The genus was revised recently [Roux *et al.*, 2016], with key to the species provided and additional keys for particular regions such as India or Indochina, or Indonesia. In course of the revision, many new species were contributed to the genus, including those of the *T. lewisii* species group and of the *T. nitidicollis* species group [Dubault *et al.*, 2010a, b]. Other results obtained included recognition of *T. aurifera* as a synonym of *T. nitidicollis*, and *T. lewisii* Bates, 1873, as a widespread polytypic species.

The groups discussed include altogether to ten species in Indochina. These all are very similar in appearance, except that the species of the *T. lewisii*-group by comparison have the body slightly smaller, the meso- and metatarsi with (vs. without) longitudinal anterolateral carina (and sulcus above), and the metatarsi with a few or no posterolateral setae, respectively.

KEY TO SPECIES OF *TRIGONOTOMA* FROM VIETNAM

- 1(2) Pronotum densely punctate along base (Fig. 6). Body dorsum more or less unicoloured, deep green to nearly black, elytra rather shiny in male, dull in female. BL 19–22.5 mm. Elytra long, about three fourths longer than wide. Pronotum with base wide and posterolateral seta inserted much inside almost indistinct basal angle. — Indochina and southern China. 6. *T. dohrnii* Chaudoir, 1852
- 2(1) Pronotum impunctate at least in middle of base (Figs 1–5).
- 3(4) Body dorsum uniform metallic green or bronzed. BL 21–28 mm. Tarsi neither laterally carinate nor sulcate. Mesoventerite without precoxal tooth. — Thailand to Vietnam. 7. *T. perraudieri* Bates, 1889
- 4(3) Dorsum contrastingly bicoloured, with forebody bright metallic green, golden green or cupreous green and elytra black to very deep violaceous. Mesoventerite in lateral view with a distinct precoxal tooth.
- 5(6) Pronotum impunctate, with basal foveae very shallow and sides subconvex in front of basal angles (Fig. 95). Metepisternum short, about as long at outer margin as wide at anterior margin. BL 21–24 mm. — Tam Dao, northern Vietnam. 5. *T. ledouxi* Dubault *et al.*, 2010
- 6(5) Pronotal base punctate in basal foveae or except middle, if impunctate, then basal foveae deep. Metepisternum distinctly longer than wide.
- 7(10) Body large, BL 23.7–27 mm. Tarsi without lateral carina or sulcus, metatarsomere 1 without posterolateral (inner) setae. Pronotal base impunctate between inner basal sulci. Aedeagus smooth ventrally. The *nitidicollis*-group
- 8(9) Elytra black or with almost indistinct violaceous luster along reflexed lateral margin. Sides of pronotum mostly straight in front of obtuse and rounded basal angles (Fig. 2). Internal sac of aedeagus with no sclerites (Figs 62–64). — Indochina, mostly Laos and Vietnam. 1. *T. nitidicollis* Chaudoir, 1868
- 9(8) Elytra with slight yet distinct violaceous luster, more so along reflexed lateral margin. Sides of pronotum mostly

subsinuate in front of more distinct basal angles (Fig. 1). Internal sac of aedeagus with a large dorsal sclerite (Figs 59–61). — Throughout Indochina, no records in Vietnam.

- [2. *T. aurifera* Tschitschérine, 1900]
- 10(7) Body smaller, BL 16.7–22 mm. Tarsi mostly with a distinct lateral carina, metatarsomere 1 with 1–4 posterolateral setae. Pronotal base mostly distinctly punctate between inner basal sulci except medially. Aedeagus more or less densely striated on ventral side. The *lewisii*-group
- 11(14) Apex of median lobe of aedeagus in right dorsolateral view quadrate (Figs 51–52).
- 12(13) Aedeagus in about middle third of ventral side densely striated throughout its width (Fig. 57); internal sac very transverse at base, with well-differentiated bulbs (Figs 65–72). BL 16.7–22 mm (19–22 mm in populations from Vietnam). — Myanmar to Vietnam; southern China (Yunnan). 4. *T. chrysites* Bates, 1892
- 13(12) Aedeagus vaguely to rather distinctly striated along left lateral third to half of ventral side (Fig. 56); internal sac tubiform, slightly transverse at base, with bulbs not or barely differentiated (Figs 73–74). BL 17–18.5 mm [3. *T. lewisii* Bates, 1873]
- 14(11) Apex of median lobe of aedeagus in right dorsolateral view trapezoidal and longer. [*T. bhamoensis* Bates, 1890]

1. *Trigonotoma nitidicollis* Chaudoir, 1868 Figs 2, 7, 15, 23, 31, 39–40, 49, 54, 62–64.

Chaudoir, 1868: 160 ('Cochinchine'); Csiki, 1929: 517; Dubault *et al.*, 2010a: 21; Roux *et al.*, 2016: 96, 160 (part.). — ssp. *minuta* Dubault *et al.*, 2010a: 23 (Phetchabun, Thailand); Roux *et al.*, 2016: 162.

MATERIAL. 5♂♂, 3♀♀, (SIEE), **Vietnam**, Dong Nai Province, Cat Tien National Park, at light HQL 450, 17.V–18.VI.2005 (D. Fedorenko); ♂, 3♀♀ (ZIN), Binh Phuoc Province, IV.2017 (A. Astrashabov); ♂ (SIEE), Gia Lai Province, ~40 km NEE of Pleiku, 14°12'11"N 108°18'54"E, Kon Ka Kinh Natn. Park, h = 890 m, 9–22.V.2016 (D. Fedorenko); 2♀♀ (SIEE), Quang Binh Province, Phong Nha – Ke Bang NP, Bo Trach, h = 375 m, 17°22'14"N 106°13'18"E, 12–21.V.2022 (D. Fedorenko); 2♂♂, ♀ (SIEE), same data except at light; ♀ (SIEE), Minh Hoa Distr., Ke Bang, env. Yen Hop, 14–15.IV.1999 (A. Devyatkin); ♀ (ZIN), **Laos**, 70 km NNW of Ventiane, Nam Lik Eco Vill. on Nam Lik River, 200 m, 18.614469°N, 102.4847°E, 10–30.VI.2017 (A.V. Gorokhov, M. Omel'ko); ♀ (SIEE), **Thailand**, near Chiang Mai, VIII.2005 (A. Sokolov).

Aedeagus and internal sac examined in five or four males, respectively; genitalia and reproductive tract examined in three females.

DIAGNOSIS. A large-sized macropterous species, with forebody dorsum bright metallic and elytra mostly black. Tarsi without lateral sulci or posterolateral setae. Sides of pronotum straight in front of basal angles; these very obtuse and mostly rather widely rounded. Aedeagus (Figs 39–40, 49, 54) smooth ventrally, apex in right dorsolateral view trapezoidal and nearly straight at right margin; internal sac tubiform, without clusters of long and dense spicules (Figs 62–64). Female *bursa copulatrix* very long (Fig. 31).

REDESCRIPTION. For recognition only. BL 23.7–26 mm. Body black, forebody bright metallic, head green, pronotum cupreous green; elytra black, rarely with very slight violaceous or greenish lustre. Labial palps and antennomere 11 more or less reddish brown, exposed labral membrane often reddish yellow. Head and pronotum without meshed micro-

sculpture, elytral microsculpture consisting of uneven isodiametric to subtransverse meshes.

Frontal sulci fine yet deep, reaching the level of anterior supra-ocular seta, each side between and inside anterior and posterior seta with an oblique impressed line. Left mandible obliquely striated at base of dorsal side.

Pronotum (Fig. 2): basal sulci slightly less than a third as long as pronotum, inner as fine impressed lines, these not quite reaching base and slightly converging apicad; outer sulci more shallow, curved outward and merging into lateral groove; a superficial to vague branch emerges from near this sulcus anteriorly to run parallel and close to lateral groove and obliterate $1/3-2/5$ from base. Basal fovea (between inner and outer sulcus) moderately deep, flat and more or less rugulose or sparsely transversely rugose at bottom, finely and rather sparsely punctate, mostly closer to outer sulcus, more seldom nearly impunctate or densely punctate; base impunctate between inner sulci. Apical bead barely shorter than lateral fourths.

Elytral striae deep, densely and rather finely punctate on disc, moderately punctate toward apex and lateral margin. Intervals convex on disc, more so toward lateral margin and still more convex toward apices.

Metatarsomere 1 with 2–4 anterolateral and no posterolateral setae.

GEOGRAPHIC DISTRIBUTION. Widespread in Indochina, mostly in the east (Vietnam and Laos). The species range needs clarification due to confusion of the species with *T. aurifera*.

HABITATS AND HABITS. Most specimens were taken at light, at low altitudes.

COMMENTS. *Trigonotoma nitidicollis* and *T. aurifera* were only based on the holotypes, female or male, respectively. Having found no differences between the type and many non-type specimens examined, except for a distinctive internal sac of aedeagus in a male from 'Paksé', southern Laos, Dubault *et al.* [2010a] recognized the two species as conspecific taxa. Five Figures in Roux *et al.* [2016: 161] show two dor-



Figs 1–6. Head and pronotum: 1 — *Trigonotoma aurifera*, ♂ from Seat Doi Saket, Thailand; 2 — *T. nitidicollis*, ♂ from Phong Nha - Kebang NP; 3 — *T. perraudieri*, ♂ from Wang Nuea, Thailand; 4–5 — *T. chrysites*, ♂♂ from Bat Dai Son NP; 6 — *T. dohnii*, ♂ from Nho Quan env.
Рис. 1–6. Голова и переднеспинка: 1 — *Trigonotoma aurifera*, ♂ из Seat Doi Saket, Таиланд; 2 — *T. nitidicollis*, ♂ из Нац. парка Phong Nha - Kebang; 3 — *T. perraudieri*, ♂ из Wang Nuea, Таиланд; 4–5 — *T. chrysites*, ♂♂ из Нац. парка Bat Dai Son; 6 — *T. dohnii*, ♂ из окр. Nho Quan.

sal habitus of the female holotype (wrongly named ‘Holotype male’), four different aspects of aedeagus, and the internal sac characteristic of *T. nitidicollis* sensu Dubault *et al.*, 2010, yet with no reference to the specimens dissected. The fact that twelve males from Myanmar or Thailand and only four males from Vietnam or Laos had been examined before [Dubault *et al.*, 2010a] might suggest that the major part of the material covered *T. aurifera*, but the male from ‘Paksé’ belonged to *T. nitidicollis*.

According to the description, *T. nitidicollis minuta* has hitherto been considered to represent a local population of the species, distinctive in only having the pronotum wider, with basal angles less rounded, and the body a bit smaller, ca. 20 mm in length, or 20–22 mm [Roux *et al.*, 2016]. It is very similar to a male specimen from Thailand at my hand. Yet, the internal sac of aedeagus is very distinctive from those of the other species of *Trigonotoma*, including *T. nitidicollis* and *T. aurifera*, which may suggest species rank of *T. n. minuta*.

[2. *Trigonotoma aurifera* Tschitschérine, 1900, **stat. rest.**]

Figs 1, 8, 16, 24, 38, 41–42, 50, 55, 59–61.

Tschitschérine, 1900: 155 (‘Cambodge’); Csiki, 1929: 516; Lesne, 1904: 77; Dubault *et al.*, 2010a: 21; Roux *et al.*, 2016: 162.

MATERIAL. 4♂♂, (ISEA, SIEE): ♀ **Thailand**, Prov. Nakhon Savan, 13 km N of Mae Wong vill., 15°54′N 99°33′44″E, h~110 m, banana plantation, 12.VIII.2009 (V.K. Zinchenko); ♂, Chiang Mai Province, Seat Doi Saket, 18°52′N 99°8′E, 2012 (local collector); ♂ (SIEE), near Chiang Mai, VIII.2005 (A. Sokolov); ♂, Lampang Province, Seat Wang Nuea, 19°8′N 99°37′E, 2012 (local collector); ♂, Buriram Province, *Hevea brasiliensis* plantation, 13–14.VII.2013 (A.V. Korshunov).

Aedeagus and internal sac examined in four or two males, respectively; genitalia and reproductive tract examined in the female.

DIAGNOSIS. As for *T. nitidicollis*, except for internal sac of aedeagus as illustrated in Roux *et al.* [2016: 161]: it is different in shape and has two, large, contiguous clusters of multiple, long and dense, spicules (Figs 59–61). In general, sides of pronotum very slightly sinuate in front of base (Fig. 1), pronotal basal angles less rounded; elytra with slight yet distinct violaceous lustre, which is more distinct along reflexed lateral margins; elytral striae more coarsely punctate and deeper, resulting in the intervals being slightly more convex. Elytral microsculpture barely more transverse, consisting of slightly transverse to isodiametric meshes. Female *bursa copulatrix* shorter (Fig. 38).

REDESCRIPTION. As for *T. nitidicollis* except diagnostic features above. BL 24.2–27 mm. Metatarsomere 1 with 3–4 anterolateral and no posterolateral setae.

GEOGRAPHIC DISTRIBUTION. Indochina (Myanmar, Thailand, Cambodia, ?Laos); unknown to me from Vietnam.

HABITATS AND HABITS. The label data of the specimens listed point rather to eurybiotic habits of this species.

COMMENTS. The specimens listed match well the original description, including two distinctive features such as distinct basal angles of the pronotum and the elytra with some purple lustre, whereas *T. nitidicollis* has the basal angles rounded and the elytra black. Therefore it is here identified as *T. aurifera* which invites this name to be resurrected from synonymy of *T. nitidicollis*.

Trigonotoma confusa Dubault *et al.*, 2010, from ‘Bhamo’, Myanmar, is very similar except only that it has the body barely smaller, BL 21–23 mm, and the metatarsomere 1 externally sulcate. Roux *et al.* [2016] mention the latter character in the

key, but they wrongly mention asulcate metatarsomere 1 in the re-description.

[3. *Trigonotoma lewisii* Bates, 1873]
Figs 10, 18, 26, 36, 45–46, 51, 56, 73–74.

Bates, 1873: 284 (‘Hiogo; Nagasaki, ...’); Bates, 1890: 105 (part.); Zhu *et al.*, 2020: 51, 61. — *lewisii*: Harold, 1877: 339; Chaudoir, 1878: 33; Kuntzen, 1911: 182; 1914: 63; Csiki, 1929: 517; Andrewes, 1930: 355; Jedlička, 1962: 319; Dubault *et al.*, 2007: 216; 2010b: 115 (part.); Roux *et al.*, 2016: 168 (part.).

MATERIAL. 14 specimens (ZIN): 2♂♂, ♀, **Japan** (Coll. Bates); ♂, Nagasaki (Coll. Bates); 2♀♀, Shizuoka, env. Izu-Nagaoka, Mt. Katsuragiya, 23.II.1964 (R. Ishikawa); ♀, Aichi, Hoi Co., Mt. Miyajiyama, 1.III.1964 (R. Ishikawa); ♂, ♀, Mt. Kongo, 10.XI.1963; **China**: ♀, Mandzhuria (Coll. Lésileac); 2♂♂, ‘г[ора]. Я-чжоу, О-минь-сянь (Сычуань), 29.III–5.IV.1893, Потанин’ [= Ya’an, Emeishan, Sichuan (G.N. Potanin)]; 2♂♂, same data, except for ‘Дол[ина]. р. Я [= Min Jiang?]’; ♀ (SIEE), NE Guangxi, 15 km N of Langsheng, 1.000 m, 15–22.V.1995 (S. Kurbatov).

Aedeagus and internal sac examined in three or two males, respectively; genitalia and reproductive tract examined in one female.

DIAGNOSIS. A medium-sized macropterous species, with forebody dorsum bright metallic, cupreous green or golden green. Meso- and metatarsus with distinct and usually sharp lateral carina and sulcus above; metatarsomere 1 with one or more posterolateral setae. Aedeagus (Fig. 56) densely, vaguely to rather distinctly striated along left lateral third of ventral side; apex quadrate in right dorsolateral view, with right margin angulate outside oblique dorsal ridge; internal sac tubiform, slightly broadened across base, without well-differentiated bulbs (Figs 73–74).

REDESCRIPTION. For recognition only. Just as for *T. nitidicollis* and *T. aurifera*, excepting body smaller, BL 17–18.5 mm, sometimes 15.4 mm. Elytra with slight violaceous lustre. Pronotal microsculpture superficial yet mostly traceable, consisting of moderately transverse meshes; elytral sculpticells very small, transverse and narrow. Scape just as long as antennomeres 2–4 combined in more than 80% of the specimens measured.

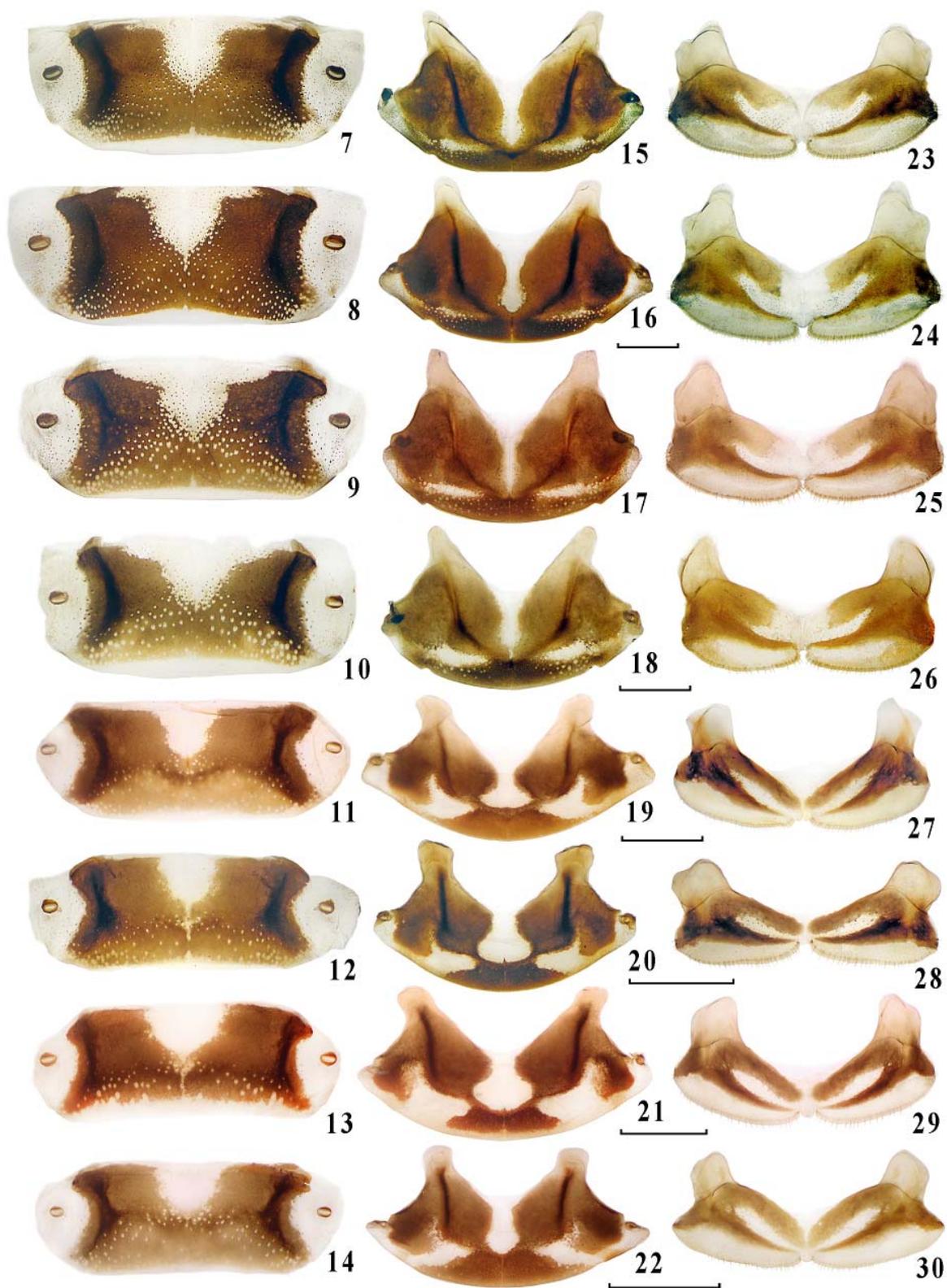
Female *bursa copulatrix* short (Fig. 38).

GEOGRAPHIC DISTRIBUTION. Widespread in China (including Taiwan) to Japan (Kyushu and Honshu), supposedly south of the Yangtze River in China, with all or most of the records in Yunnan referred probably to *T. chrysites*. For a distribution map see Zhu *et al.* [2020].

HABITATS AND HABITS. No data. Supposedly, eurybiotic at lower altitudes.

COMMENTS. This species is here accepted separate from *T. bhamoensis* and *T. chrysites*, which species have formerly been considered as conspecific with [Dubault *et al.*, 2010b] or subspecies of [Roux *et al.*, 2016] *T. lewisii*. Among them, *T. bhamoensis* is only distinctive in having a trapezoidal and longer (*vs.* quadrate) apex of the median lobe of aedeagus.

I have only seen a female paralectotype (ZIN) of *T. bhamoensis* with the labels ‘Bhamò [= Bhanmo = Banmaw]/ Birmania/ Fea IX 1886’ and ‘*Paralectotypus* [red printed]’. It is more similar to *T. piermorvani* Dubault *et al.*, 2010 described from Chiang May, northwestern Thailand, rather than *T. lewisii* and *T. chrysites*. Another female specimen from ZIN Collection, with similar labels ‘Bhamò / Birmania/ Fea VIII 1886’ and ‘*Paratypus* [red printed]’ proved a misidentified specimen of *T. dohrnii*.



Figs 7–30. Pregenital abdominal segments in females of *Trigonotoma* and *Pareuryaptus*: 7, 15, 23 — *T. nitidicollis*; 8, 16, 24 — *T. aurifera*; 9, 17, 25 — *T. chrysites*; 10, 18, 26 — *T. lewisii*; 11, 19, 27 — *P. aethiops*; 12, 20, 28 — *P. parvus*; 13, 21, 29 — *P. morosus* (= *adoxus*); 14, 22, 30 — *P. chaliceolus*; 7–14 — tergite VII; 15–22 — tergite VIII; 23–30 — sternite VIII. Scale bars 1 mm.

Рис. 7–30. Прегенитальные сегменты брюшка самок *Trigonotoma* и *Pareuryaptus*: 7, 15, 23 — *T. nitidicollis*; 8, 16, 24 — *T. aurifera*; 9, 17, 25 — *T. chrysites*; 10, 18, 26 — *T. lewisii*; 11, 19, 27 — *P. aethiops*; 12, 20, 28 — *P. parvus*; 13, 21, 29 — *P. morosus* (= *adoxus*); 14, 22, 30 — *P. chaliceolus*; 7–14 — тергит VII; 15–22 — тергит VIII; 23–30 — стернит VIII. Масштаб: 1 мм.

To prevent some confusion in future, it is worthy of minute note that Dubault *et al.* [2007] designated the lectotype of *T. lewisii*, but then they [Roux *et al.*, 2016] wrongly mentioned the holotype of this species.

4. *Trigonotoma chrysites* Bates, 1892, **stat. rest.**
Figs 4–5, 9, 17, 25, 37, 43–44, 52, 57, 65–72, 148.

Bates, 1892: 354 ('Karin Chebà'); Csiki, 1929: 516; Andrewes, 1930: 353; Jedlička, 1962: 319. — *lewisii*: Dubault *et al.*, 2010b: 119 (part.); Roux *et al.*, 2016: 168 (*lewisii* ssp.). — *concinna* (non Laporte de Castelnau, 1834): Bates, 1890: 105 ('Cochin China'). — *weissi* Dubault *et al.*, 2010b: 118; Roux *et al.*, 2016: 170 (*lewisii* ssp.; 'Indochine'), **nom.nud.** — *bhomoensis*: Kuntzen, 1911: 182; Csiki, 1929: 516; Andrewes, 1930: 353 (part.)

MATERIAL. Paralectotype ♀ (ZIN), labelled 'Carin Cheba/ 900–1100. m./ L.Fea 89' [printed], '*T./ chrysites/ sp.n.*', '*Paratypos*' [red printed]; ♂ (ZIN, non-type specimen!), with labels: '*Carin/ Asciiiii Chebà/ 1200–1300 m./ L.Fea.I – 88*' [printed], '*Paralectotypus*' [red printed].

Other material: ♂ (ZIN), **China**, Yunnan, Kunming, 1.900 m, 15.V.1956 (V. Popov) [in Russian]; ♀ (ZIN) mountains NE of Baoshan, 1.700 m, 28.V.1955 (O.L. Kryzhanovskiy) [in Russian]; ♂ (ZIN), Yun-nan-sen [= Kunming; in Russian]; ♀ (ZIN), 10 km N of Jingdong, 1.250 m, 24.VI.1956 (O.L. Kryzhanovskiy) [in Russian]; ♂ (ZIN), Santaishan, 30 km SW of Manshi, 1.200 m 18.V.1955 (Bushchik) [in Russian]; ♀ (ZIN), Jingping env., 1.300 m 20.V.1956 (Panfilov) [in Russian]; ♀ (ZIN), **Vietnam**, Lao Cai Prov., Sa Pa Distr., Phang Xi Pang Mt, 22°18'59"N, 103°49'16"E, 1.200 m, 12–25.V.1999 (N.L. Orlov); ♂ (ZIN), Tuyen Quang Province, 5 km E Na Hang, 22°20'59"N, 105°25'36"E, 250 m, 4–13.XI.2015 (A. Abramov); ♂, 3♀♀ (SIEE), Ha Giang Province, Tay Con Linh NP, Cao Bo, h~570 m, 22°45'23"N, 104°52'06"E, 15–27.IV.2023 (D. Fedorenko); 11♂♂, 6♀♀ (SIEE), Bat Dai Son Natn. Park, Thanh Van env., h~950 m, 23°06'01"N 104°58'25"E, cornfield, 14–22.IV.2022 (D. Fedorenko); ♀ (SIEE), Phu Tho Province, ~90 km W of Hanoi, Xuan Son Natn. Park, 21°07'52"N, 104°57'07"E, h = 400–470 m, 6–15.VI.2014 (D. Fedorenko); ♂ (SIEE), same data, except for 21°07'29"N, 104°57'28"E, h = 400 m, at light; ♂ (SIEE), same locality, except for 21°08'12"N, 104°57'04"E, h = 450 m, 27.VI–7.VII.2014 (A. Abramov, A. Shchinov); ♀ (SIEE), Ninh Binh Province, 7.5 km SSW of Nho Quan, 20°15'08"N, 105°44'09"E, h~100 m, at light, 1–5.V.2019 (A. Prosvirov); ♀ (ZIN), [Hoa Binh Province], mountains at Cho Ben, 29.XI.1963 (O.N. Kabakov) [in Russian]; ♀ (ZIN), [Nghe An Province,] Phuc Son, XI–XII. (H. Fruhstorfer); 8♂♂, 19♀♀ (SIEE), Ha Tinh Province, Vu Quang Natn. Park, Kim Quang env., h~70 m, 18°17'59"N, 105°22'31"E, floodland forest, 24.V–1.VI.2022 (D. Fedorenko); 2♂♂, ♀ (SIEE), Ke Go Nat. Reserve, 18°06'30"N 106°01', h = 40 m, 7–14.V. 2015 (A. Abramov); ♀ (ZIN), Quang Tri; 10♂♂, 7♀♀ (SIEE), Quang Nam Province, Nam Giang Distr., Song Thanh Natn. Park, 15°33'19"N 107°23'29"E, h = 1070 m, 23.IV–11.V. 2019 (D. Fedorenko); ♂ (SIEE), same data except 15°33'48"N 107°23'22"E, h = 1050 m; ♂ (SIEE), Kon Tum Province, 14°30'17"N 107°43'22"E, Chu Mom Ray Natn. Park, 28 km SW of Dak To, Ro Koi Station, h = 700 m, 1–10.V.2014 (A. Abramov); 2♂♂, ♀ (SIEE), Gia Lai Province, ~40 km NEE of Pleiku, 14°12'11"N 108°18'54"E, Kon Ka Kinh Natn. Park, h = 890 m, 9–22.V.2016 or 24–30.V.2017 (D. Fedorenko); ♂ (ZIN), Binh Phuoc Province, IV.2017 (A. Astrashabov); ♂ (SIEE), Dong Nai Province, Cat Tien

Nat. Park, 21–22.XI.2004 (D. Fedorenko); ♀ (ZIN), same locality, 3–14.XII.2010 (L. Anisytukin, A. Anichkin).

Aedeagus and internal sac examined in 23 or ten males, respectively; genitalia and reproductive tract examined in two females.

DIAGNOSIS. No differences from *T. lewisii* other than male genitalic ones, combined with the body being barely larger in general. Aedeagus (Fig. 57) densely striated on ventral side; internal sac broadened much across base, with a few well-differentiated bulbs (Figs 65–72).

REDESCRIPTION. BL 16.7–22 mm (19–22 mm in populations from Vietnam). Pronotal microsculpture totally obliterate on disc or reduced to small transverse patches here and there.

Left mandible with more or less distinct oblique striation at base of dorsal side. Pronotal sides in front of base indistinctly convex to barely concave and basal angles more or less widely rounded, respectively; basal foveae sparsely punctate to smooth at bottom; base impunctate medially, yet mostly with a few sparse to moderately dense punctures toward inner basal sulci (Figs 4–5). Elytral basal ridge inwardly reaching stria 2 or 3.

Meso- and metatarsus with lateral carina and sulcus varying considerably between specimens as well as between populations: mostly mesotarsomeres 1 and 2 with sulcus and blunt carina in basal half (these weak to absent in some specimens from different localities) while metatarsomeres 1 and 2 with distinct carina and sulcus, these not seldom weak, sometimes either obliterate in apical third or very distinct on metatarsomeres 1–3. Metatarsomere 1 with 3–5 anterior and 1–4 posterior lateral setae.

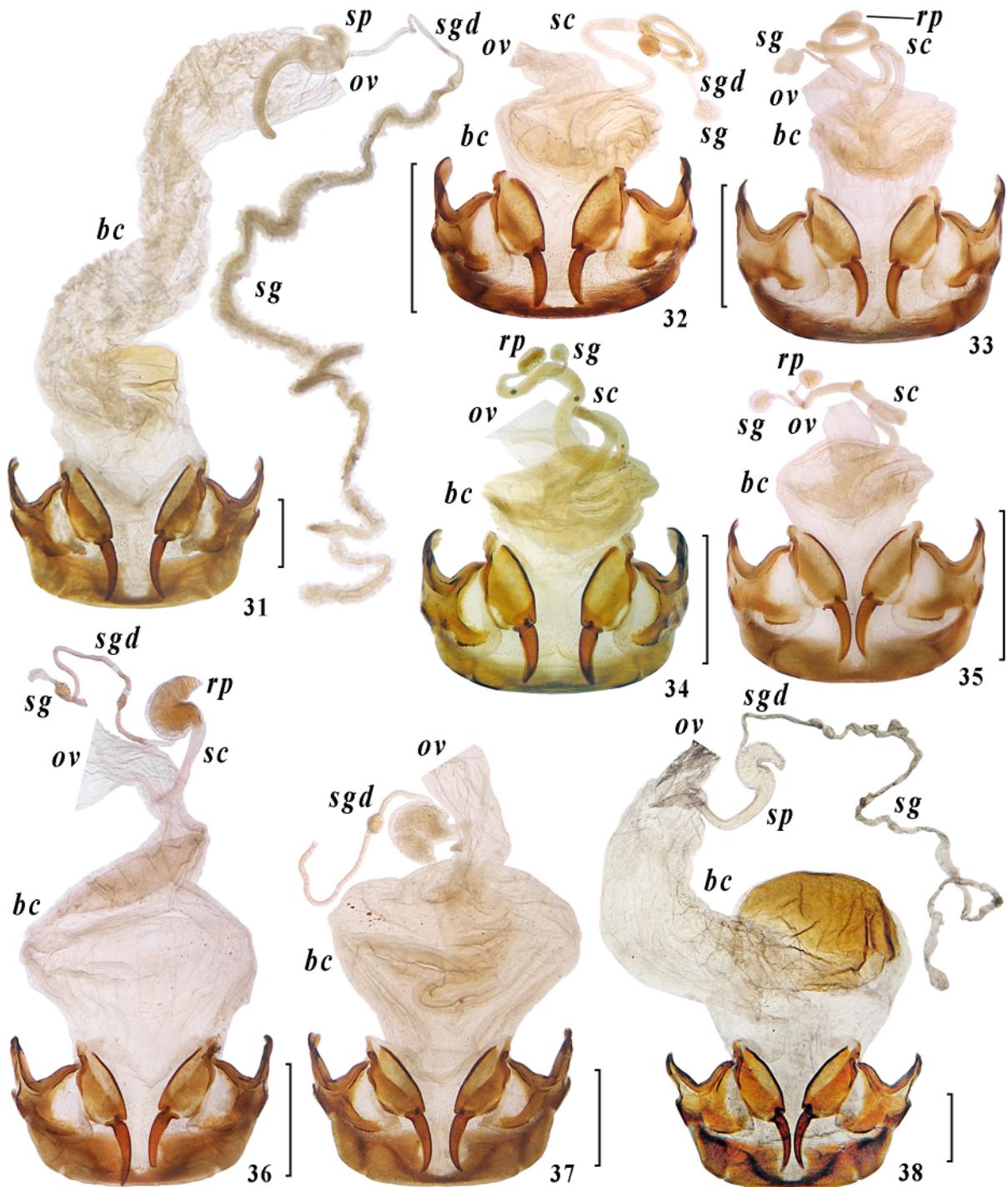
Female *bursa copulatrix* short (Fig. 37).

GEOGRAPHIC DISTRIBUTION. Throughout northern Indochina from Myanmar to Vietnam, ranging north to at least Yunnan, China (Fig. 148).

HABITATS AND HABITS. This species is forest-dwelling yet rather eurybiotic. It is frequent in various forest habitats at lower altitudes (40–1.050 m), mostly along forest trails and forests edges. Some adults were hand collected in corn- or ricefields of northern Vietnam, along with other adult trigonotomines such as *Lesticus buqueti* (Laporte de Castelnau, 1834) and *Pareuryaptus chaldeolus* (Bates, 1873). Some other specimens were taken at light at night and one specimen by window trapping in the Song Thanh NP. The data labels listed above show 1.200–1.700 m as the altitudes the specimens from China and northern Vietnam prefer to occur.

COMMENTS. This species is rather monomorphic, with only slight morphometric differences found between adults from different populations (Tabs 2, 4). In particular, the head becomes a bit narrower in general and the pronotal base tends to be barely broader relative to the apex toward the south of the species range. Differences in shape of the internal sac of aedeagus are more distinct: males from southern populations have aedeagi more differentiated, with basal bulbs enlarged, than males from the northern populations (compare Figs 65–66 and Figs 67–70; yet no specimen from Cat Tien NP as the southernmost known population to dissect). While being not quite gradual and continuous, these difference invite drawing a boundary line that separates the northern population group from the southern one somewhere between the Vu Quang National Park and the Ke Go Nature Reserve, Ha Tinh Province (Fig. 148).

On the other hand, the fact that the discussed changes of the internal sac are somewhat gradual makes subspecies status of *T. chrysites* and *T. lewisii* not improbable. However, I consider both as separate species until intergradation zone is discovered in China.



Figs 31–38. Tergite IX and reproductive tract in females of *Trigonotoma* and *Pareuryaptus*: 31 — *T. nitidicollis*; 32 — *P. parvus*; 33 — *P. morosus* (= *adoxus*); 34 — *P. aethiops*; 35 — *P. chalceolus*; 36 — *T. lewisii*; 37 — *T. chrysites*; 38 — *T. aurifera*; *bc* — bursa copulatrix; *ov* — common oviduct; *rp* — receptacle; *sc* — seminal canal; *sg* — spermathecal gland; *sgd* — spermathecal gland duct; *sp* — spermatheca. Scale bars 1 mm.
Рис. 31–38. Тергит IX и репродуктивный тракт самок *Trigonotoma* и *Pareuryaptus*: 31 — *T. nitidicollis*; 32 — *P. parvus*; 33 — *P. morosus* (= *adoxus*); 34 — *P. aethiops*; 35 — *P. chalceolus*; 36 — *T. lewisii*; 37 — *T. chrysites*; 38 — *T. aurifera*; *bc* — копулятивная сумка; *ov* — непарный яйцевод; *rp* — семеприемник; *sc* — семепровод; *sg* — железа сперматеки; *sgd* — проток железы сперматеки; *sp* — сперматека. Масштаб: 1 мм.

The male specimen (ZIN) with red label '*Paralectotypus*' does not belong to the type series because its locality, Carin Asciiu Chebà, has not been mentioned in the original description.

5. *Trigonotoma ledouxi* Dubault, Lassalle et Roux, 2010
Fig. 95.

Dubault *et al.*, 2010b: 124 (Tam Dao); Roux *et al.*, 2016: 154.

MATERIAL. ♀ (ZIN), Vietnam, Tam Dao, at night, 19.VIII.1985 (M. Savitsky) [in Russian].

DIAGNOSIS. Distinctive from the other species of the *lewisi*-group by metepisterna short, about as long as wide, pronotal sides subconvex toward basal angles, basal foveae very shallow and impunctate, and body larger.

REDESCRIPTION. For recognition only. Body as in Fig. 95. Supposedly apterous. BL 21–24 mm. Pronotal microsculpture hardly traceable, consisting of moderately transverse meshes; elytral microsculpture consisting of dense transverse lines. Left mandible distinctly obliquely striated at base of dorsal side.

Mesotarsi without lateral sulci, metatarsomere 1 in basal half and metatarsomere 2 at extreme base with a nearly indistinct dorsolateral sulcus; metatarsomere 1 with four anterolateral setae and single posterolateral seta. Median lobe of aedeagus with apex rather long obtusoid and curved to the right [Dubault *et al.*, 2010b: Pl. 9, Figs 2–3; Roux *et al.*, 2016: 155].

GEOGRAPHIC DISTRIBUTION. Endemic to the Tam Dao mountain ridge, northern Vietnam.

HABITATS AND HABITS. No data.

6. *Trigonotoma dohrnii* Chaudoir, 1852
Figs 6, 47–48, 53, 58, 75–76.

Chaudoir, 1852: 71 (Hongkong); 1968: 159; Bates, 1889: 275. — *dohrnii*: Lesne, 1904: 77; Csiki, 1929: 516; Andrewes, 1924: 469; 1930: 353; Jedlička, 1962: 318; Roux *et al.*, 2016: 166; Zhu *et al.*, 2020: 51. — *crenata* Chaudoir, 1868 ('Indes orientales'; *dohrnii* var. loc.?).; Roux *et al.*, 2016: 166.

MATERIAL. 20 specimens: 2♂♂ (ZIN), **China**, without exact locality; ♀ (ZIN), Prov. Kwangsi, Nanning; ♂, ♀ (ZIN), 'Hong-Kong, coll. Bates'; ♂ (ZIN), 'Siam' [= **Thailand**]; ♂ (SIEE), Central **Laos**, Vang Vieng, 30.III–5.IV.2010 (A. Sokolov); ♂ (ZIN), Ventian, Kabakov; ♀ (SIEE), **Cambodia**, Mondulhiri Province, Sen Monorom, 19°29'02"N, 107°10'51"E, h~780 m, at light, 1–5.VI.2014 (I. Melnik); ♀ (ZIN), [**Vietnam**, Cao Bang Province] Bao Lac (Tonkin); ♂ (ZIN), [Hoa Binh Province,] mountains at Cho Ben, 29.XI.1963 (O.N. Kabakov) [in russian]; 3♂♂, ♀ (SIEE), Ninh Binh Province, 7.5 km SSW of Nho Quan, 20°15'08"N, 105°44'09"E, h~100 m, at light, 1–5.V.2019 (A. Prosvirov); ♂ (ZIN), [Nghe An Province,] Phuc Son; ♂ (ZIN), Dak Lak Province, Yok Don Natn. Park, 26.XI.1993 (Gorokhov); ♂ (SIEE), Dong Nai Province, Cat Tien Nat. Park, 10.VI.2005, at light HQL450 (D. Fedorenko); ♀ (ZIN), 'Saigon, coll. Bates' ♂, ♀ (ZIN), 'Cochinchine'.

Aedeagus and internal sac examined in five or four males, respectively.

DIAGNOSIS. A medium-sized species with body rather uniform dark coloured and pronotum (Fig. 6) very densely punctate along base; pronotal base wide; sides subsinuate in front of it; posterolateral seta much inside basal angle, these just traceable. Aedeagus (Figs 75–76): median lobe smooth ventrally, apex in right dorsolateral view subquadrate and curved to the right; internal sac tubiform, without well-differentiated bulbs.

REDESCRIPTION. For recognition only. BL 19–22.5 mm. Body dorsum deep metallic green, without or with purplish luster, or forebody very deep green to nearly black in couple with elytra black; elytra moderately shiny (♂) or dull (♀), with microsculpture barely transverse to isodiametric, rather superficial or coarse, respectively.

Pronotum subquadrate, sides subsinuate in front of base; base laterally oblique toward almost indistinct angles; posterolateral seta much inside these latter. Base moderately and very densely to confluent punctate. Basal foveae flat to subconvex, basal sulci a third as long as pronotum, inner sulci deep, slightly converging apicad, outer ones more shallow.

Elytra very long, about three fourths as long as wide, broadest slightly behind middle. Basal ridge inwardly reaching stria 2. Striae deep, rather coarsely punctate. Intervals convex, more so toward apex.

Mesotarsi without, metatarsomere 1 in basal half with very weak lateral carina and sulcus, these being very blunt or very shallow, respectively. Metatarsomere 1 with 2–4 antero- and 0–1 posterolateral setae.

GEOGRAPHIC DISTRIBUTION. Indochina from Myanmar to Vietnam and China south of the Yangtze River.

HABITATS AND HABITS. No data, except that most specimens were collected at lower altitudes, at lights in the night-time.

7. *Trigonotoma perraudieri* Bates, 1889
Figs 3, 77–80.

Bates, 1889: 275 ('Mytho' [= My Tho, southern Vietnam]); Tschitschérine, 1900: 155; Andrewes, 1930: 355; Jedlička, 1962: 317; Roux *et al.*, 2016: 140. — *perraudieri*: Kuntzen, 1911: 182. — *perraudieri*: Kuntzen, 1914: 73.

MATERIAL. Seven specimens, 2♂♂, 5♀♀, including: ♂ (ZIN), 'Siam [= **Thailand**]', coll. Bates'; ♂, Lampang Province, Wang Nuea, 19°8'N, 99°37'E, V.2011 (local collector); ♀ (ZIN), 'Cochinchine [= southern **Vietnam**]', Vignes, 1898'; ♀ (ZIN), Saigon (Coll. Lésileac).

Aedeagus and internal sac examined in one male.

DIAGNOSIS. A large-sized clone of *T. dohrnii*, except that the pronotum is impunctate between the basal foveae. Aedeagus and its internal sac very characteristic (Figs 77–80): apex of median lobe in dorsal view straight, subquadrate and rounded; internal sac double, consisting of two separate parts, basal and apical, the latter with a large left basal bulb and strong sclerite at its base.

REDESCRIPTION. Unnecessary here except as follows: BL 21–27.8 mm. Body dorsum uniform metallic green or bronzed; elytra shiny in male, with microsculpture distinct, consisting of barely transverse to isodiametric meshes.

Pronotum (Fig. 3) with basal angles obtuse and rounded. Basal foveae more narrow while basal extension of lateral bead wider than in *T. dohrnii*, from nearly impunctate and transversely rugulose to finely and very densely punctate at bottom.

Elytral intervals convex, more so toward apex and toward lateral margin, to nearly flat on disc.

Tarsi neither laterally carinate nor sulcate. Metatarsomere 1 with 1–2 antero- and 1 posterolateral setae.

GEOGRAPHIC DISTRIBUTION. Thailand to Vietnam.

HABITATS AND HABITS. No data.

COMMENTS. Jedlička [1962] wrongly mentioned the type from 'Siam'.

Pareuryaptus Dubault, Lassalle et Roux, 2008

Dubault *et al.*, 2008a: 241; 2008b: 197; Roux *et al.*, 2016: 22, 47; Li *et al.*, 2022: 1. – *Trigonotoma* (part.): Tschitschérine, 1900: 161; Kirschenhofer, 2007: 11.

Type species: *Trigonotoma curtula* Chaudoir, 1868.

DIAGNOSIS. As for *Trigonotoma* except as follows. Antennal scape from barely longer than antennomeres 2 and 3 to almost as long as those 2 to 5 combined; pedicel without seta; clypeus subsinuate so that labral membrane is not or narrowly exposed; inner four labral setae proximate; mentum with lateral lobes angulate and much in front of median tooth. Elytra without setigerous pores, stria 7 with two preapical setae, basal ridge inwardly reaching stria 1. Mesoventricle without precoxal tooth, metepisterna long. Metacoxa with single, anterolateral, seta. Meso- and metatatarsomere 1 with anterolateral (outer) carina, tarsi without lateral setae. Terminal labial palpomere securiform in male. Median lobe of aedeagus nearly symmetrical in dorsal view, with apex very short and rounded.

REDESCRIPTION. Body macropterous, rather small to medium-sized, BL 11–16 mm, sometimes up to 22 mm;

dorsum shiny black or brown black, without or with slight metallic green or violaceous luster; lateral bead of pronotum slightly to indistinctly brownish. Eyes medium-sized, convex, gena and neck constriction indistinct. Mandibles moderate in length, with apex very pointed and strongly incurved. Frontal sulci deep s-shaped, reaching the level of anterior supra-ocular seta. Shape of maxillary palpomeres 3 and 4 dependent on particular species or species group.

Pronotum (Figs 81–92) cordiform to nearly circular, except for base and apex truncate, broadest two fifths or little more from apex. Lateral bead rather thick, broadened and flattened toward base. Basal foveae very deep and narrow, densely to confluent punctate, often reduced to outer basal sulcus only, combined with inner one shallow or vague; outer basal sulcus directly extended into lateral groove inside lateral bead. Basal bead missing, apical bead distinct just inside angles. Base and lateral groove often distinctly punctate. Median line well impressed, obliterate apically, either fine and obliterate basally or deepened in basal half and reaching basal margin.

Elytra short and wide, with sides slightly rounded or parallel, humeri rather widely rounded yet distinct, and apices



Figs 39–48. Median lobe of aedeagus: 39–40 — *Trigonotoma nitidicollis*; 41–42 — *T. aurifera*; 43–44 — *T. lewisii*; 45–46 — *T. chrysites*; 47–48 — *T. dohrnii*; 39, 41, 43, 45, 47 — left aspect; 40, 42, 44, 46, 48 — right aspect. Scale bars 1 mm.

Рис. 39–48. Средняя доля эдеагуса: 39–40 — *Trigonotoma nitidicollis*; 41–42 — *T. aurifera*; 43–44 — *T. chrysites*; 45–46 — *T. lewisii*; 47–48 — *T. dohrnii*; 39, 41, 43, 45, 47 — слева; 40, 42, 44, 46, 48 — справа. Масштаб: 1 мм.



Figs 49–58. Median lobe of aedeagus: 49, 54 — *Trigonotoma nitidicollis*; 50, 55 — *T. aurifera*; 51, 56 — *T. lewisii*; 52, 57 — *T. chrysites*; 53, 58 — *T. dohrnii*; 49–53 — dorsal aspect; 54–58 — ventral aspect. Scale bars 1 mm.

Рис. 49–58. Средняя доля эдеагуса: 49, 54 — *Trigonotoma nitidicollis*; 50, 55 — *T. aurifera*; 51, 56 — *T. lewisii*; 52, 57 — *T. chrysites*; 53, 58 — *T. dohrnii*; 49–53 — сверху; 54–58 — снизу. Масштаб: 1 мм.

rounded combined. Striae deep, punctate; parascutellar striae (= base of stria 1) very short to missing. Intervals flat to convex, more convex before apex.

Venter coarsely and more or less densely punctate along sides of meso- and metathorax; punctuation of propleura and metepisterna varying much between specimens of a species from sparse

to missing; and abdominal sternites II–IV (sometimes II–VI) very unevenly, sparsely to moderately, punctate and often with 1–2 large and deep sublateral puncture. Prosternal process not beaded, its posterior inclination wide and flat to sharply carinate.

Protibiae with four apical (preapical-to-apical) spinules at outer edge (vs. three in *Trigonotoma* and *Trigonaptus* or



Figs 59–64. Aedeagus, median lobe with everted and inflated internal sac: 59–61 — *Trigonotoma aurifera*; 62–44 — *T. nitidicollis*; 59, 62 — left aspect; 61, 64 — right aspect; 60, 63 — dorsal aspect; *ds* — dorsal sclerite. Scale bars 1 mm.

Рис. 59–64. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 59–61 — *Trigonotoma aurifera*; 62–44 — *T. nitidicollis*; 59, 62 — слева; 61, 64 — справа; 60, 63 — сверху; *ds* — дорзальный склерит. Масштаб: 1 мм.



Figs 65–76. Aedeagus, median lobe with everted and inflated internal sac: 65–72 — *Trigonotoma chrysites* (65–66 — ♂ from Kon Ka Kinh NP; 67–68 — ♂ from Vu Quang NP; 69–70 — ♂ from Xuan Son NP; 71–72 — ♂ from Bat Dai Son NP); 73–74 — *T. lewisii*, male from 'Japan'; 75–76 — *T. dohrnii*; 65, 67, 69, 71, 73 — left dorsolateral aspect; 66, 68, 70, 72, 74 — left aspect; 75 — ventral aspect; 76 — dorsal aspect. Scale bars 1 mm.

Рис. 59–64. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 65–72 — *Trigonotoma chrysites* (65–66 — ♂ из Нац. парка Кон Ка Kinh; 67–68 — ♂ из Нац. парка Vu Quang; 69–70 — ♂ из Нац. парка Xuan Son; 71–72 — ♂ из Нац. парка Bat Dai Son); 73–74 — *T. lewisii*, ♂ из 'Японии'; 75–76 — *T. dohrnii*; 65, 67, 69, 71, 73 — слева и сверху; 66, 68, 70, 72, 74 — слева; 75 — снизу; 76 — сверху. Масштаб: 1 мм.

two apical in *Lesticus*). Metatibia with 1–4 setae at outer margin.

Secondary sexual characters. Protarsomeres 1–3 dilated and biserially squamose on ventral side in male. Labial palpomere 3 securiform in male, subtriangular in female. Elytra not or barely shorter in female than in male. Mesotibia slightly longitudinally rugulose in about apical third of anterolateral face, with a small latero-apical tooth just above longer movable apical spur, in male, nearly smooth and without tooth in female.

Internal sac of aedeagus (Figs 11–30, 138–147) with additional, separate, hooked to bifid dorsobasal bulb.

Female pregenital segments, genitalia and reproductive tract (Figs 32–35) as for *Trigonotoma*, except for stigmata of tergite VIII exposed dorsally (vs. cryptic due to incurved latero-apical portions of the tergite) and spermathecal receptacle small and capitate. Bursa copulatrix short.

GEOGRAPHIC DISTRIBUTION. Indochina from Myanmar to Vietnam, southern China, including Taiwan; single species is known from Sumatra.

HABITATS AND HABITS. Protibiae with apical spinules increased from 2–3 to four in number suggest an adaptation to burrowing in rather solid soils. These are characteristic of forests edges, larger forest trails, some agrocenoses rather than forests proper, and the fact that some species (e.g., *P. chalceolus*) have been collected in very large numbers in cornfields makes me suppose similar habitats for other member-species of the genus. Many specimens were taken at light at night.

COMMENTS. This genus was at first considered and keyed as a group compact of five species similar to *Trigonotoma chalceola* [Tschitschérine, 1900]. Then it was enlarged to ten species [Kirschenhofer, 2007], and afterwards erected to a separate genus and extensively revised [Dubault *et al.*, 2008a: 241, 2008b; Roux *et al.*, 2016], with a few new species described, to include altogether 18 species currently. Most of these species are very similar to one another in appearance as well as in shape of aedeagus so that only lengths ratio of the apical two maxillary palpomeres and particular shape of the terminal palpomere often

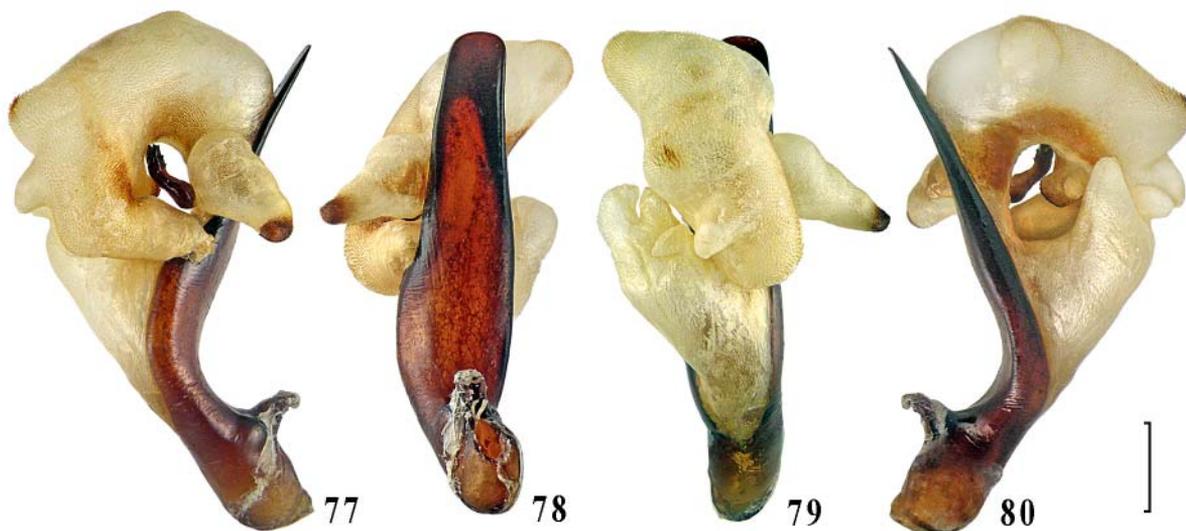
serve for the purpose of species identification. Besides, some of the species included were described by comparing them with voluntarily chosen rather than similar congeners. For instance, *P. loeffleri* was diagnosed from *P. aethiops* instead of *P. adoxus* or *P. morosus*, thus leaving differences between the former and the latter two species unclear.

The shape and length/width ratio of the terminal maxillary palpomere as diagnostic features of the species are worthy of special note. These characteristics, especially the first, depend much on the behavior of the palpomere in course of drying a dead specimen. During this performance the palpomere either retains its membranous apex subconvex or becomes increasingly truncated at apex as the latter invaginates. For the reason many species defined by particular shape of the palpomere in their descriptions are in fact very similar in this character. These species are, e.g., *P. aethiops*, *P. glastentalum*, *P. curtulus*, *P. cambodgiensis* and *P. luangphabangensis* on one hand and *P. adoxus*, *P. loeffleri*, *P. morosus* and *P. namtap*, on the other.

The median line of the pronotum is another feature of little individual variation in a species. *Pareuryaptus curtulus*, *P. chalceolus*, *P. adoxus*, *P. loeffleri*, *P. morosus*, *P. namtap* and *P. parvus* have the pronotum with median line reaching the base, which is densely punctate in addition in most of them, while the other congeners have the median line obliterate from behind and the base impunctate.

KEY (PRELIMINARY) TO SPECIES OF *PAEURYAPTUS* FROM VIETNAM:

- 1(22) Pronotal base impunctate between basal foveae (Figs 81–89).
- 2(3) Antennae long, with scape indistinctly longer than antennomeres 2 and 3 combined. Mandibles slender, left one straight at outer margin except apex. Elytral microsculpture isodiametric. Pronotum (Fig. 81) quadrate, with sides straight in front of obtuse and blunt basal angles, median line obliterate basally. Lateral bead very slightly dilated



Figs 77–80. *Trigonotoma perraudieri*, median lobe of aedeagus with everted and inflated internal sac: 77 — left aspect; 78 — ventral aspect; 79 — dorsal aspect; 80 — right aspect. Scale bar 1 mm.

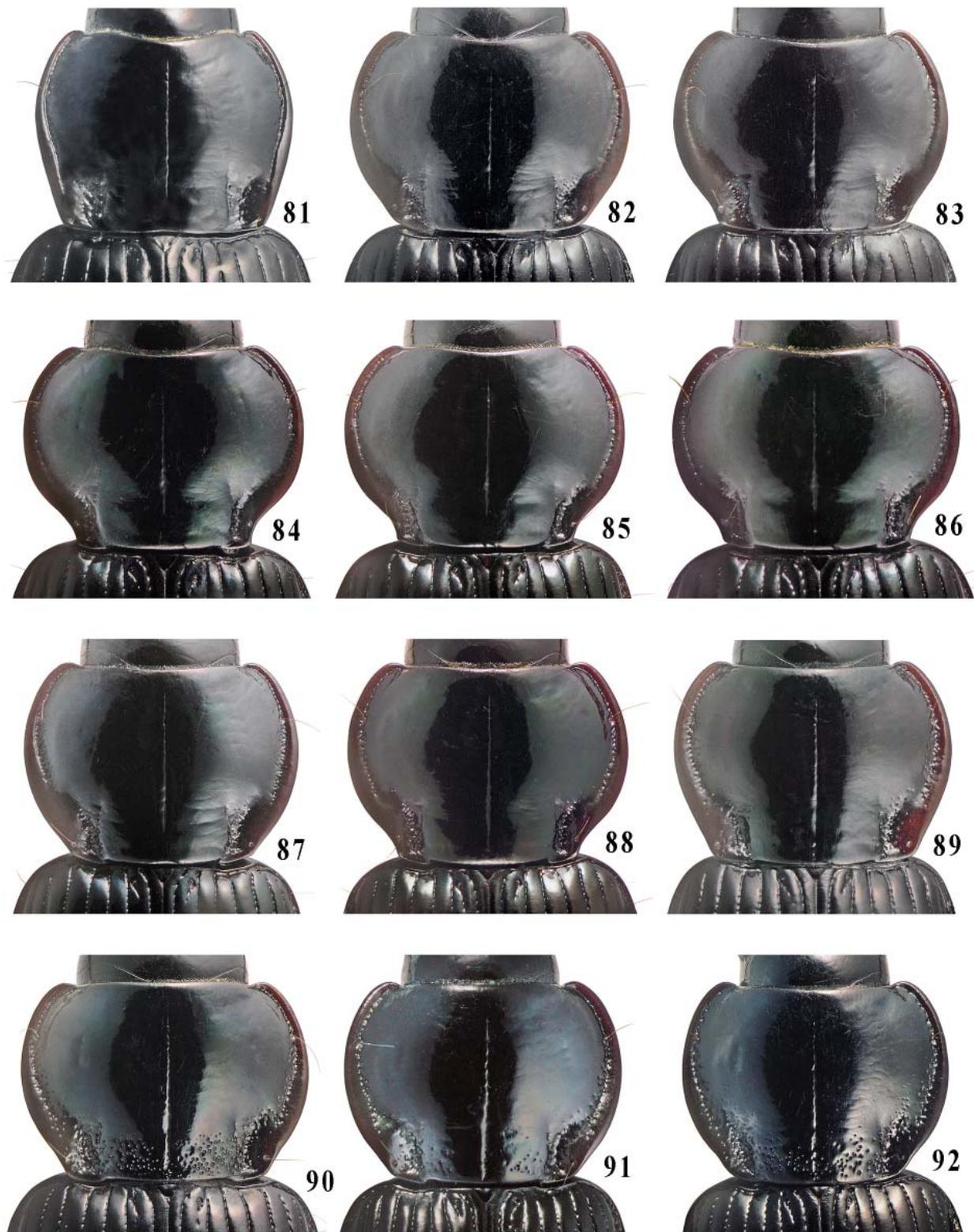
Рис. 77–80. *Trigonotoma perraudieri*, средняя доля эдеагуса с вывернутым и надутым внутренним мешком: 77 — слева; 78 — снизу; 79 — сверху; 80 — справа. Масштаб: 1 мм.

- in basal half; lateral groove almost straight toward base, crenulate in apical two thirds. Basal foveae moderately deep, moderately wide and rather sparsely punctate, with outer sulcus short and separated from lateral groove. — Northern Vietnam and southern China. 1. *P. exiguus* Dubault *et al.*, 2008
- 3(2) Antennae shorter, scape long, barely shorter than antennomeres 2–4 or 2–5 combined. Mandibles triangular, with outer margin rounded. Elytral microsculpture consisting of transverse meshes or dense transverse lines except one species. Pronotum transverse, sides rounded to sinuate in front of base. Pronotal bead conspicuously dilated outside basal foveae due to inner basal sulcus directly extended into lateral groove.
- 4(21) Maxillary palpomere 3 only slightly shorter than palpomere 4. Scape barely shorter than antennomeres 2–4 combined.
- 5(18) Median line of pronotum obliterate basally (Figs 81–88), not or very slightly deeper in basal than in apical half.
- 6(7) Body small, BL 11–13 mm. Sides of pronotum straight to subsinuate in front of obtuse and blunt basal angles. Maxillary palpomere 4 subfusiform and slender, 4.3 times as long as wide, mp3L/mp4L 0.6. — Central Laos. [*P. laosensis* (Kirschenhofer, 2007)]
- 7(6) Body larger, BL > 13 mm. Sides of pronotum straight to sinuate in front of base, basal angles obtuse and rounded to rectangular and sharp. Maxillary palpomere 3 longer in general, mp3L/mp4L 0.74–0.92.
- 8(9) Body large, BL 18–22 mm, dorsum bronzed green. Sides of pronotum deeply concave in front of base; basal angles right and sharp; basal foveae impunctate or almost so. Terminal maxillary palpomere subfusiform, long and narrow. Elytral microsculpture consisting of dense transverse lines. — Vietnam, Laos. *P. chalcodes* (Andrewes, 1923)
- 9(8) Body smaller, BL 13–17 mm.
- 10(11) Sides of pronotum deeply concave in front of base; basal angles right and sharp; basal foveae moderately punctate. Elytral microsculpture isodiametric. Terminal maxillary palpomere subfusiform, long and narrow. Dorsum black. — Laos, Myanmar. [*P. gilletti* Dubault *et al.*, 2008]
- 11(10) Sides of pronotum straight to distinctly sinuate in front of base; basal angles subrectangular to obtuse, sharp to rounded. Terminal maxillary palpomere nearly parallel-sided or very slightly dilated apicad. Elytral microsculpture consisting of transverse meshes. Dorsum often with more or less distinct metallic, green or bronzed green, luster.
- 12(15) Inclination of prosternal process sharply carinate (Fig. 94).
- 13(14) Sides of pronotum straight or indistinctly sinuate in front of very obtuse basal angles. Body larger, BL 15 mm. — Southern Vietnam. 6a. *P. c. cambodgiensis* Dubault *et al.*, 2008
- 14(13) Sides of pronotum sinuate in front of base, basal angles subrectangular and sharp. Body smaller, BL 13–14.5 mm. — Laos, Central Vietnam, S. China. 6b. *P. c. luangphabangensis* Kirschenhofer, 2011, **stat.n.**
- 15(12) Inclination of prosternal process wide, flat to convex (Fig. 93).
- 16(17) Pronotum with lateral groove indistinctly punctate in apical half only; sides straight or indistinctly sinuate in front of base, basal angles very obtuse to rounded, lateral bead increasingly broadened basad, wide medially and basally (Figs 82–83). BL 13–16 mm. — Myanmar to Vietnam. 2. *P. aethiops* (Tschitschérine, 1897)
- 17(16) Lateral groove of pronotum finely yet distinctly punctate, with punctate area reaching or interrupted just in front of basal fovea; sides distinctly sinuate in front of slightly obtuse and sharp basal angles; lateral bead slightly broadened toward base (Figs 84–86). BL 13–14.5 mm. — Thailand, N-Vietnam. 3. *P. glastenvalum* (Morvan, 1992)
- 18(5) Median line of pronotum reaching base and mostly distinctly deeper in basal than in apical half (Figs 89–92). Sides of pronotum subconvex to indistinctly sinuate in front of very obtuse and just traceable basal angles. Maxillary palpomere 4 subparallel-sided, broadest about a third from base and barely narrowed apicad.
- 19(20) Body large, BL 15 mm. Maxillary palpomere 4 barely longer, almost five times as long as wide, mp3L/mp4L 0.8. — Southern Vietnam. 5. *P. curtulus* (Chaudoir, 1868)
- 20(19) Body small, BL 11–13 mm. Sides of pronotum mostly subconvex or straight in front of basal angles (Fig. 89). Maxillary palpomere 4 slightly shorter, 3.2–4.25 times as long as wide, mp3L/mp4L 0.7–0.8. — Central and southern Vietnam. 4. *P. parvus* Dubault *et al.*, 2008
- 21(4) Maxillary palpomeres 3 about half as long as subfusiform palpomere 4. Scape barely shorter than antennomeres 2–5 combined. Sides of pronotum straight in front of obtuse and blunt basal angles. BL 14 mm. — Laos. [*P. laolumorum* Dubault *et al.*, 2008]
- 22(1) Pronotum densely punctate along base, as well as along lateral grooves (Figs 90–92). Maxillary palpomere 3 about half as long as subfusiform palpomere 4. Scape barely shorter than antennomeres 2–5 combined. Sides of pronotum straight or indistinctly sinuate in front of obtuse and blunt to rounded basal angles.
- 23(24) Terminal maxillary palpomere somewhat oval, short and wide, 2–2.5 times as long as wide. Body small, BL 10.7–12.4 mm. — S-China to S-Vietnam. 6. *P. chalcceolus* (Bates, 1873)
- 24(23) Terminal maxillary palpomere subfusiform, long and narrow, 3.3–5.0 times as long as wide. Body larger, BL 11.7–15.9 mm. — Thailand, Laos, Cambodia, Vietnam, S-China (Yunnan). 7. *P. morosus* (Tschitschérine, 1900)

1. *Pareuryaptus exiguus* Dubault, Lassalle et Roux, 2008
Fig. 81.

Dubault *et al.*, 2008: 201 (Ha Giang); Roux *et al.*, 2016: 60; Li *et al.*, 2022: 8.

MATERIAL. ♀ (SIEE), Vietnam, Hoa Binh Province, Mai Chau env., Chieng Chau Vill., 20°38'57"N 105°03'59"E, h=180 m, at light, 17–24.IV.2019 (A. Prosvirov); 2♀♀ (SIEE), Ninh Binh Province, 4.5 km SW of Ninh Binh, Thon Ka Luong Vill., 20°13'30"N 105°56'11"E, h=130 m, at light, 26–30.IV.2019 (A. Prosvirov).



Figs 81–92. Pronotum: 81 — *Pareuryaptus exiguus* from Mai Chau; 82–83 — *P. aethiops*; 84–86 — *P. glastenvalum* from Pai, Thailand; 87 — *P. c. cambodgiensis*; 88 — *P. c. luangphabangensis* from Phong Nha - Kebang NP; 89 — *P. parvus*; 90 — *P. morosus* (= *adoxus*); 91 — *P. morosus*; 92 — *P. chaldeolus* from Bat Dai Son NP; 82–83, 87, 89–91 — specimens from Cat Tien NP.

Рис. 81–92. Переднеспинка: 81 — *Pareuryaptus exiguus* из Май Чау; 82–83 — *P. aethiops*; 84–86 — *P. glastenvalum* из Рай, Таиланд; 87 — *P. c. cambodgiensis*; 88 — *P. c. luangphabangensis* из Нац. парка Phong Nha - Kebang; 89 — *P. parvus*; 90 — *P. morosus* (= *adoxus*); 91 — *P. morosus*; 92 — *P. chaldeolus* из Нац. парка Bat Dai Son; 82–83, 87, 89–91 — экз. из Нац. парка Cat Tien.

DIAGNOSIS. A slender species with mandibles slender, left mandible straight at left margin; antennal scape barely longer than antennomeres 2 and 3 combined (a1L/a2–3L~1.05); pronotum subquadrate and rather narrow (Fig. 81), with sides straight or indistinctly sinuate in front of base; base impunctate between basal foveae, basal angles obtuse, blunt or rounded, with seta just in the angle, median line obliterate at base. Elytral microsculpture isodiametric.

Similar to *P. lucidus* (Andrewes, 1931) from Sumatra, from which it is distinctive chiefly in having less distinct basal angles of the pronotum [Dubault et al., 2008].

REDESCRIPTION. Some details only. BL 11.5–13.9 mm. Body dorsum black.

Apical two maxillary palpomeres rather short, palpomere 3 barely shorter than palpomere 4, which is parallel-sided or very slightly dilated apicad, ca. 2.5 times as long as wide. Pronotum subquadrate, lateral bead only slightly dilated in basal half, not dilated there toward base. Lateral groove finely, very densely to confluent punctate at bottom in front of basal foveae; these moderately deep, almost flat, rather wide and sparsely rugose-punctate; inner basal sulcus in form impressed line, about as deep as outer one. Elytra slightly more than a fourth (vs. not more than two fifths in the other congeners) wider than pronotum. Posterior inclination of prosternal process wide and rounded (widely costate).

For aedeagus see Lee et al., [2022].

GEOGRAPHIC DISTRIBUTION. Described based on the only female from Vietnam; recorded in Guangxi, China, yet absent from distribution map of the genus [Lee et al., 2022], this being a lapse.

HABITATS AND HABITS. No data except that adults flight to lights at night.

2. *Pareuryaptus aethiops* (Tschitschérine, 1897)

Figs 11, 19, 27, 34, 82–83, 96–97, 106, 111, 140.

Tschitschérine, 1897: 264 (*Trigonotoma*; ‘Birmanie’); 1898: 36; Dubault et al., 2008: 207; Roux et al., 2016: 56.

MATERIAL. 15♂♂, 19♀♀ (SIEE), Vietnam, Dong Nai Province, Cat Tien Nat. Park, 17., 21. and 30.V.2005, at light HQL450 (D. Fedorenko).

Aedeagus and internal sac examined in five males; genitalia and reproductive tract examined in two females.

DIAGNOSIS. A medium-sized species. Mandibles rounded laterally; antennal scape barely shorter than antennomeres 2 to 4 combined; sides of pronotum straight to subsinuate in front of base; base impunctate between basal foveae, basal angles obtuse or very so, blunt to rounded; posterolateral seta in or slightly anterior to the angle; median line obliterate basally. Elytral microsculpture hardly traceable, consisting of moderately to slightly transverse meshes. Internal sac of aedeagus with basal bulb hooked (Fig. 106).

REDESCRIPTION. BL 13.2–16 mm. Body dorsum black, elytra with almost indistinct aeneous luster. Penultimate maxillary palpomere barely shorter than terminal one, the latter slightly less than four times as long as wide, parallel-sided or almost so, with apex rounded to truncate.

Pronotum subcordate to indistinctly so (Figs 82–83), lateral bead increasingly broadened basad from narrow apically to wide basally. Lateral groove very finely to indistinctly punctate at bottom in apical half only. Basal foveae rather wide and moderately deep, outer basal sulcus very deep, inner one as impressed line, shallow anteriorly.

Elytral intervals mostly slightly convex to almost flat on disc.

Posterior inclination of prosternal process rather wide. Propleura with 0–8 coarse punctures.

Aedeagus (Figs 96–97, 106–111, 140): almost symmetrical; internal sac at a slightly acute angle with apex of aedeagus, its distal part rather short and running parallel to aedeagus, with preapical bulb rather small, proximal vesicle imperceptible, distal one just at base of dorsal sclerite.

GEOGRAPHIC DISTRIBUTION. Myanmar, Vietnam.

HABITATS AND HABITS. No data except that adults flight to light at night.

COMMENTS. Some smaller specimens have body dorsum nearly uniform black, pronotal basal foveae narrow, and elytral intervals convex.

3. *Pareuryaptus glastenvalum* (Morvan, 1992)

Figs 84–86, 93, 98–99, 107–112, 141.

Morvan, 1992: 59 (*Trigonotoma*; Doi Sutep, Chiang Mai); Dubault et al., 2008: 207, 209; Roux et al., 2016: 80. — *aethiops*: Kirshenhofer, 2007: 13 (*Trigonotoma*), part.

MATERIAL. ♂, 3♀♀ (SIEE), Thailand, Mae Hong Son Province, env. Pai, h~600 m, 19°21'42"N, 98°27'46"E – 19°22'N, 98°30'29"E, 27.IV–9.V.2013 (I. Melnik); ♂, 2♀♀ (SIEE) same data, except for 19°21'48"N, 98°27'57"E, at light, 2–9.V.2013; ♂ (SIEE), Lampang Province, 30 km SE of Lampang City, env. Wiang Kosui Nat. Park, 450 m, 18°04'01"N, 99°39'52"E, 30.V.2010 (V.K. Zinchenko); ♂, ♀ (ISEA), Thailand, Phitsanulok Province, 8 km E of Nakhon Tai, flood plain, h=120–200 m, 17°06'N, 100°50'E, 28–29.V.2010 (A.V. Korshunov); ♀ (ZIN), Vietnam, Dien Bien Phu, 16.V.1963 (O.N. Kabakov).

Aedeagus and internal sac examined in three or two males, respectively.

DIAGNOSIS. Very similar and close to *P. aethiops*, being distinctive in having the body barely smaller in general; dorsum with a bit stronger greenish luster; sides of pronotum deeply sinuate in front of obtuse yet sharp basal angles, basal foveae narrow and deep, with inner basal sulcus very shallow to vague, lateral bead less wide in basal half and still less so at base, lateral groove mostly finely yet distinctly punctate in apical two thirds; elytral intervals convex.

Internal sac of aedeagus (Figs 98–99, 107–112, 141) similar, except for proximal and distal vesicles small yet distinct and separate from dorsal sclerite.

REDESCRIPTION. BL 12.4–15 mm. Body dorsum black, pronotum often with very slight greenish luster or violaceous luster toward sides of base; elytra with faint greenish luster, interval 9 black or indistinctly violaceous. Pronotum cordate (Figs 84–86). Propleura with a group of coarse and sparse to moderately dense punctures outside sternopleural suture.

GEOGRAPHIC DISTRIBUTION. Thailand; first reported from Vietnam.

HABITATS AND HABITS. No data.

4. *Pareuryaptus parvus* Dubault, Lassalle et Roux, 2008

Figs 12, 20, 28, 32, 89, 124–125, 131, 137, 142.

Dubault et al., 2008: 204 (‘Djiring Annam’ [= Di Linh, Lam Dong Prov.]); Roux et al., 2016: 60.

MATERIAL. 2♀♀ (SIEE), Vietnam, Dong Nai Province, Cat Tien Nat. Park, 24.V.2006 (S. Golovatch); 5♂♂, 6♀♀ (SIEE), same data except various dates between 17.V. and 5.VI.2005, at light HQL 450 (D. Fedorenko); 2♀♀ (SIEE), Binh Phuoc Province, Bu Gia Map Nat. Park, 12°11'37"N, 107°12'21"E, h=350–540 m, 12–23.IV.2009 (D. Fedorenko); 2♀♀ (SIEE), Dak Lak Province, Chu Yang Sin Nat. Park, 12°25'25"N, 108°21'53"E,

Krong Kmar River, upper flow, h=970 m, 15–30.V.2014 (D. Fedorenko); ♀ (SIEE), Gia Lai Province, ~40 km NEE of Pleiku, 14°12'11"N, 108°15'54"E, Kon Ka Kinh Natn. Park, h=890 m, 9–22.V.2016 (D. Fedorenko).

Aedeagus and internal sac examined in three or one male, respectively; genitalia and reproductive tract examined in two females.

DIAGNOSIS. Rather a small species. Mandibles triangular and rounded at outer margins; antennal scape barely shorter than antennomeres 2 to 4 combined; sides of pronotum straight or rounded in front of base; base impunctate between basal foveae, basal angles very obtuse and blunt, with seta in or slightly anterior to the angle; median line reaching base. Elytral microsculpture consisting of narrow transverse meshes. Internal sac of aedeagus with basal bulb bifid (Fig. 131).

REDESCRIPTION. BL 11–12.4 mm. Body dorsum black. Penultimate maxillary palpomere 2/3–3/5 as long as terminal one, the latter 3–4 times as long as wide, subparallel-sided, barely narrower at apex than at middle.

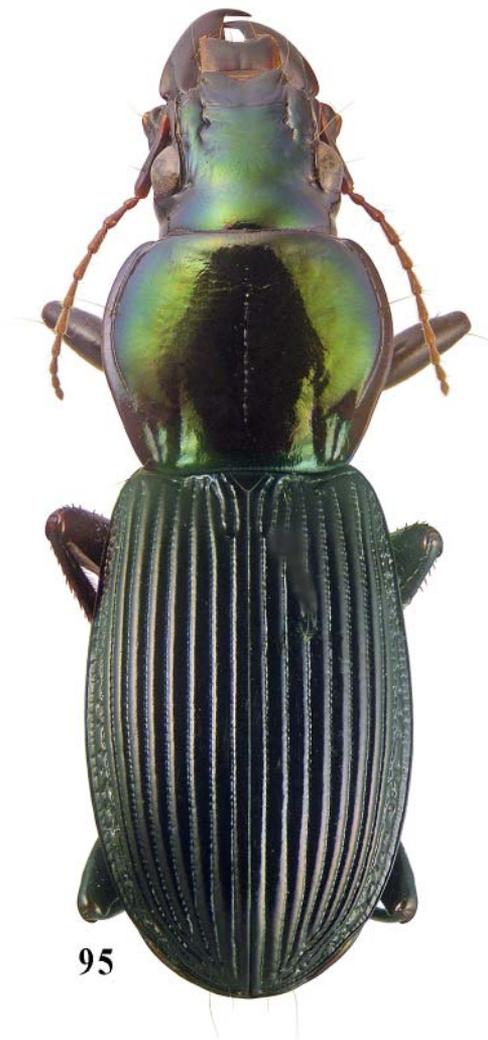
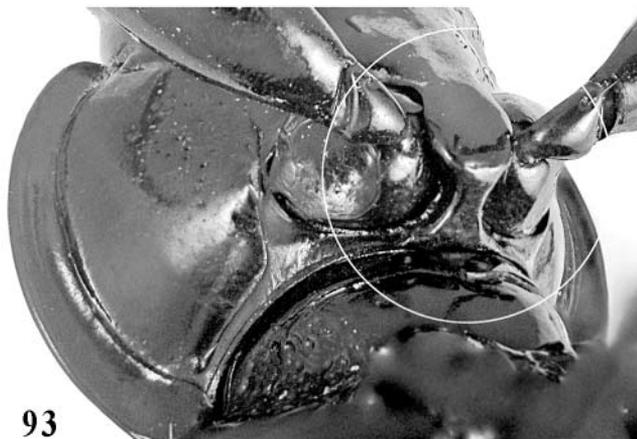
Pronotum (Fig. 89): lateral bead fairly thick, increasingly broadened basad, wide basally. Lateral groove and basal foveae finely, densely to confluent punctate, with punctures traceable just inside the groove, extended onto basal dilations of lateral bead, sparse or missing just in front of basal foveae. Basal sulci confluent into a very deep basal fovea, diverging anteriorly, with inner sulcus obliterate or reduced to 1–3 proximate punctures.

Elytral intervals convex.

Posterior inclination of prosternal process rather wide. Propleura with 0–9 coarse punctures.

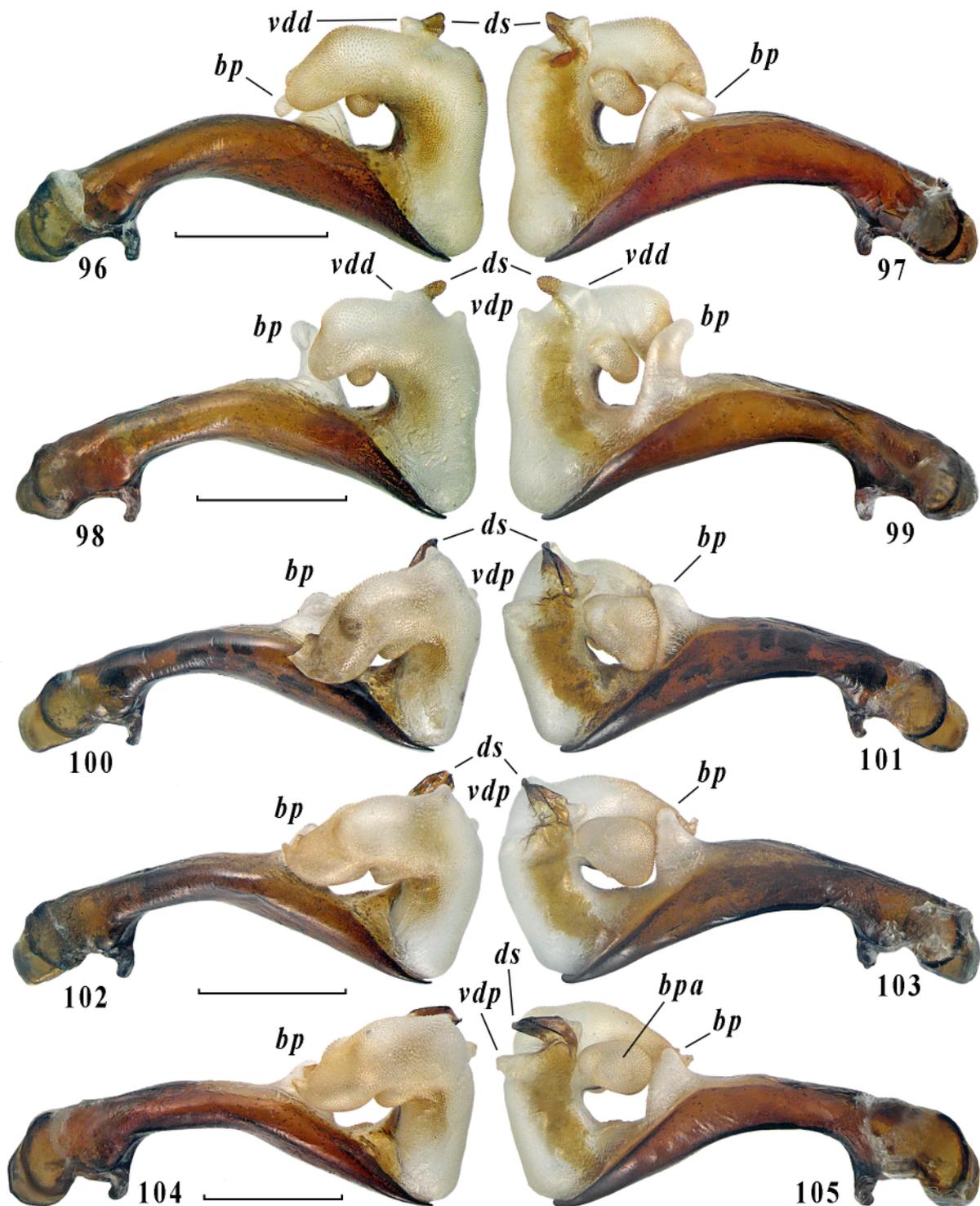
Aedeagus (Figs 124–125, 131–137, 142): almost symmetrical; internal sac at a slightly acute angle with apex of aedeagus; two vesicles, proximal and especially distal, on each side of dorsal sclerite both large, the former sclerotized, the latter just at base of the sclerite.

GEOGRAPHIC DISTRIBUTION. Southern and Central Vietnam: Binh Phuoc, Dong Nai, Lam Dong, Dak Lak and Gia Lai provinces.



Figs 93–95. *Pareuryaptus* and *Trigonotoma*: 93–94 — prothorax of *P. glastentralum* (93) and *P. c. luangphabangensis* (94), right posteroventral aspect; 95 — *T. ledouxi*, ♀ from Tam Dao, dorsal habitus.

Рис. 93–95. *Pareuryaptus* и *Trigonotoma*: 93–94 — переднегрудь *P. glastentralum* (93) и *P. c. luangphabangensis* (94) вентрально, справа и сзади; 95 — *T. ledouxi*, ♀ из Там Дао, габитус сверху.



Figs 96–105. Aedeagus, median lobe with everted and inflated internal sac: 96–97 — *P. aethiops*; 98–99 — *P. glastenvallum*; 100–103 — *P. cambodgiensis luangphabangensis* from Phong Nha - Kebang NP (100–101) and Kon Ka Kinh NP (102–103); 104–105 — *P. c. cambodgiensis*; 96, 98, 100, 102, 104 — left aspect; 97, 99, 101, 103, 105 — right aspect; *bp* — proximal bulb; *bpa* — preapical bulb; *ds* — dorsal sclerite; *vdd* — distal dorsal vesicle; *vdp* — proximal dorsal vesicle. Scale bars 1 mm.

Рис. 96–105. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 96–97 — *P. aethiops*; 98–99 — *P. glastenvallum*; 100–103 — *P. cambodgiensis luangphabangensis* из Нац. парков Phong Nha - Kebang (100–101) и Кон Ка Kinh (102–103); 104–105 — *P. c. cambodgiensis*; 96, 98, 100, 102, 104 — слева; 97, 99, 101, 103, 105 — справа; *bp* — проксимальный пузырь; *bpa* — предвершинный пузырь; *ds* — дорзальный склерит; *vdd* — дистальный дорзальный пузырёк; *vdp* — проксимальный дорзальный пузырёк. Масштаб: 1 мм.

HABITATS AND HABITS. No data except that adults flight to light at night.

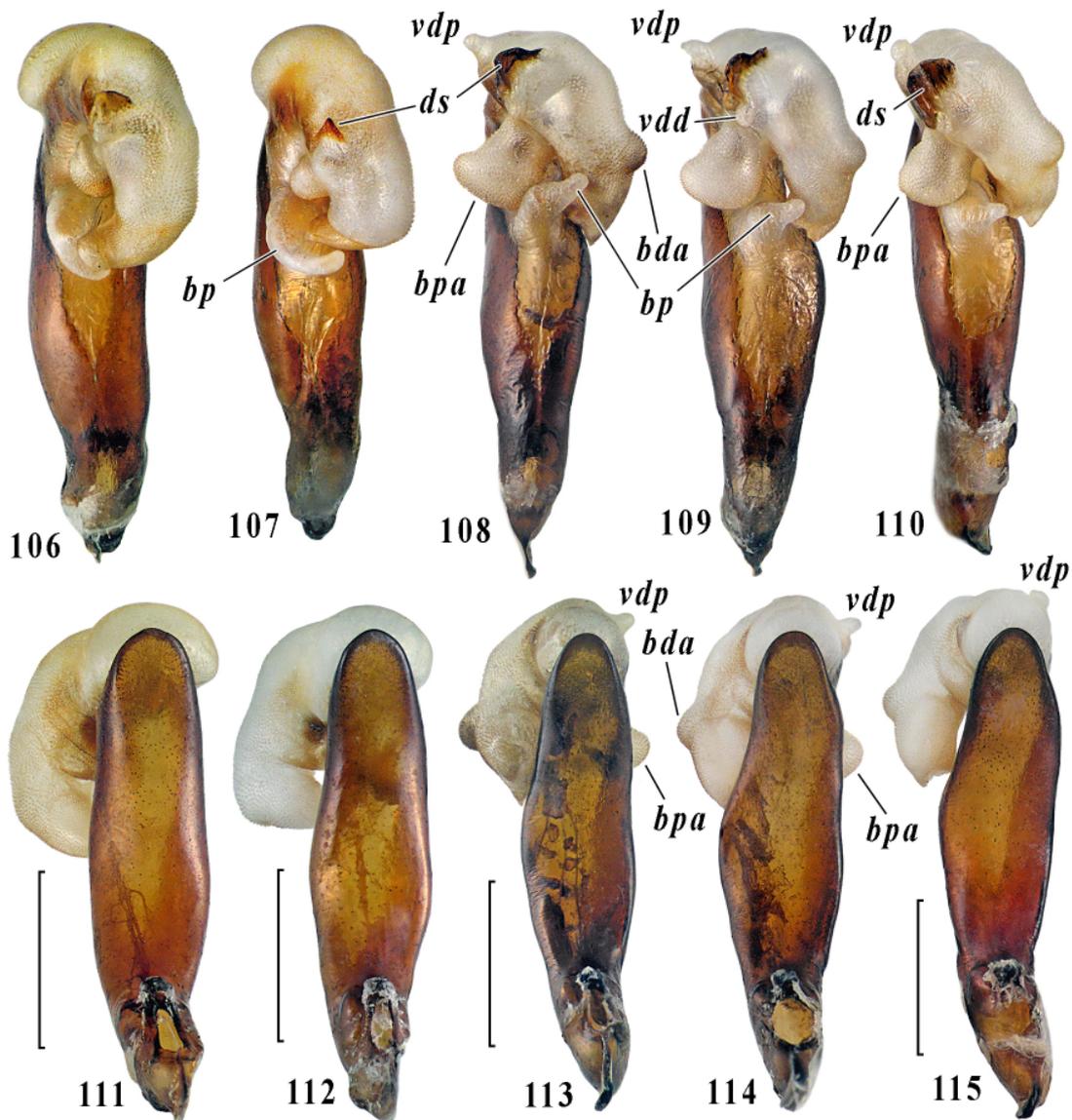
COMMENTS. Maxillary palpomeres 3 and 4 vary between populations of this species in shape and proportions (Tab. 4). The specimens from the northern populations (Chu Yang Sin NP, Kon Ka Kinh NP) are hardly more different from the southern ones (Cat Tien NP, Bu Gia Map NP) than these latter from *P. curtulus* (mp4L/W 4.8). Because *P. parvus* and *P. curtulus* otherwise are very similar, the latter name is not unlikely to cover large-sized specimens of *P. parvus*.

5. *Pareuryaptus curtulus* (Chaudoir, 1868)

Chaudoir, 1868: 160 (*Trigonotoma*; Laos); Tschitschérine, 1900: 162; Dubault *et al.*, 2008: 209; Roux *et al.*, 2016: 72.

MATERIAL. No specimen examined, except for the holotype illustrated [Roux *et al.*, 2016].

DIAGNOSIS. A medium-sized species with median line of pronotum conspicuous and reaching basal margin, combined with apical two maxillary palpomeres subequally long, mp3L/mp4L 0.82, and terminal palpomere long subparallel-sided, almost five times as long as wide, mp4L/W 4.8. Pronotum indis-



Figs 106–115. Aedeagus, median lobe with everted and inflated internal sac: 106, 111 — *Pareuryaptus aethiops*; 107, 112 — *P. glastenvallum*; 108–109, 113–114 — *P. cambodgiensis luangphabangensis* from Phong Nha – Kebang NP (108, 113) and Kon Ka Kinh NP (109, 114); 110–115 — *P. c. cambodgiensis*; 106–110 — dorsal aspect; 111–115 — ventral aspect; *bp* — proximal bulb; *bpa* — preapical bulb; *ds* — dorsal sclerite; *vdd* — distal dorsal vesicle; *vdp* — proximal dorsal vesicle. Scale bars 1 mm.

Рис. 106–115. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 106, 111 — *Pareuryaptus aethiops*; 107, 112 — *P. glastenvallum*; 108–109, 113–114 — *P. cambodgiensis luangphabangensis* из Нац. парков Phong Nha - Kebang (108, 113) и Kon Ka Kinh (109, 114); 110–115 — *P. c. cambodgiensis*; 106–110 — сверху; 111–115 — снизу; *bp* — проксимальный пузырь; *bpa* — предвершинный пузырь; *ds* — дорзальный склерит; *vdd* — дистальный дорзальный пузырёк; *vdp* — проксимальный дорзальный пузырёк. Масштаб: 1 мм.



Figs 116–125. Aedeagus, median lobe with everted and inflated internal sac: 116–117 — *Pareuryaptus chalceolus* from Bat Dai Son NP; 118–123 — *P. morosus* from Cat Tien NP (118–121) and Thailand (122–123); 124–125 — *P. parvus*; 116, 118, 120, 122, 124 — left aspect; 117, 119, 121, 123, 125 — right aspect; *bp* — proximal bulb; *bpa* — preapical bulb; *ds* — dorsal sclerite; *vdd* — distal dorsal vesicle; *vdp* — proximal dorsal vesicle. Scale bars 1 mm.

Рис. 116–125. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 116–117 — *Pareuryaptus chalceolus* из из Нац. парка Bat Dai Son; 118–123 — *P. morosus* из Нац. парка Cat Tien (118–121) и Таиланда (122–123); 124–125 — *P. parvus*; 116, 118, 120, 122, 124 — слева; 117, 119, 121, 123, 125 — справа; *bp* — проксимальный пузырь; *bpa* — предвершинный пузырь; *ds* — дорзальный склерит; *vdd* — дистальный дорзальный пузырёк; *vdp* — проксимальный дорзальный пузырёк. Масштаб: 1 мм.

tinctly sinuate in front of very obtuse and just traceable basal angles. Otherwise hardly different from *P. parvus*.

GEOGRAPHIC DISTRIBUTION. Only known from the type locality. Dubault *et al.* [2008] also reported two female and one male specimens from Saigon, southern Vietnam.

HABITATS AND HABITS. No data.

6. *Pareuryaptus cambodgiensis* Dubault, Lassalle et Roux, 2008

Dubault *et al.*, 2008: 200, 207 ('Angkor'); Roux *et al.*, 2016: 76.

DIAGNOSIS. A medium-sized species defined chiefly by sharply carinate inclination of prosternal process. Mandibles laterally rounded; antennal scape barely shorter than antennomeres 2 to 4 combined; pronotal base impunctate between basal foveae, median line obliterate basally. Elytral microsculpture hardly traceable, consisting of moderately transverse meshes. Internal sac of aedeagus (Fig. 110) with basal bulb hooked (all males examined).

REDESCRIPTION. Aedeagus (Figs 100–105, 108–110, 113–115, 138–139): slightly asymmetrical in dorsal/ventral view, with left margin angulate at middle, indistinctly sinuate between the angle and apex, this latter curved barely to the left. Internals sac in lateral view at right angle with apical half of aedeagus; with preapical bulb and preapical vesicle large, distal vesicle small and situated on right side of base of dorsal sclerite; distal part with a low yet distinct dorsoapical bulb.

HABITATS AND HABITS. This species appears to be eurybiotic rather than forest-dwelling. Four specimens examined were taken along forest edges at light, and the other four were hand collected along roads or in a cropfield.

COMMENTS. This species is here subdivided into two subspecies. These have hitherto been recognized as separate species, both being rather different in appearance. But their aedeagi, with internal sacs, are very similar and thus argue for the contrary.

6a. *Pareuryaptus cambodgiensis cambodgiensis*
Dubault, Lassalle et Roux, 2008
Figs 87, 104–105, 110, 115, 138.

MATERIAL. ♂ (SIEE), Vietnam, Dong Nai Province, Cat Tien Nat. Park, at light HQL450, 21.V.2005 (D. Fedorenko).

DIAGNOSIS. A larger-sized subspecies distinctive in having body dorsum with indistinct greenish luster, sides of pronotum indistinctly sinuate in front of base, basal angles very obtuse and just traceable, with posterolateral seta in the angle.

REDESCRIPTION. BL 16–16.5 mm. Body dorsum black, elytra indistinctly greenish toward lateral margin, interval 9 indistinctly violaceous.

Pronotum subcordate (Fig. 87), sides of base rather oblique. Lateral bead broadened basad, narrow anteriorly, moderately wide medially, wide basally. Lateral groove very finely and very densely punctate in apical two thirds. Basal foveae moderately wide, deep, finely and confluent punctate at bottom; outer basal sulcus very deep, inner one as impressed line anteriorly while merging into basal fovea basally.

Propleura with 3–4 coarse punctures outside sternopleural suture.

Elytral intervals convex.

GEOGRAPHIC DISTRIBUTION. Cambodia, Thailand; first recorded in Vietnam.

6b. *Pareuryaptus cambodgiensis luangphabangensis*
Kirschenhofer, 2011, **stat.n.**
Figs 87, 100–103, 108–109, 113–114, 139.

Kirschenhofer, 2011: 33 (Luang Phabang, Laos); Roux *et al.*, 2016: 78.

MATERIAL. ♂, ♀ (SIEE), Vietnam, Gia Lai Province, ~55 km ENE of Pleiku, 14°17'45"N 108°26'57"E, Kon Ka Kinh Natn. Park, h = 600 m, 8–20.V.2017 (D. Fedorenko); ♂ (SIEE), Quang Binh Province, Phong Nha – Ke Bang NP, Bo Trach, h = 375 m, 17°22'14"N 106°13'18"E, 12–21.V.2022 (D. Fedorenko); ♂, ♀ (SIEE), same data except at light; 2♀♀, same data, except for 17°23'26"N 106°13'03"E.

DIAGNOSIS. Distinctive from the nominotypical subspecies in the following characters: body smaller, dorsum with distinct metallic green luster to rather bright metallic green; pronotum cordate, with sides deeply concave in front of base, basal angles sharp, obtuse to subrectangular, posterolateral seta inserted much anterior to the angle.

REDESCRIPTION. BL 13–15 mm. Body dorsum black, elytra with distinct green luster, pronotum entirely or along base with slight green luster, interval 9 indistinctly violaceous. Other differences, rather variations, can include basal foveae rather narrow and/or less densely punctate, inner basal sulcus obliterate basally, sides of base slightly oblique, and propleura with 0–9 coarse punctures.

GEOGRAPHIC DISTRIBUTION. Laos, Thailand; first recorded in Vietnam.

7. *Pareuryaptus chalceolus* (Bates, 1873)
Figs 14, 22, 30, 35, 92, 116–117, 126, 132, 143.

Bates, 1873: 328 (*Trigonotoma*; Hong Kong); 1889: 276; Tschitschérine, 1900: 162; Kuntzen, 1914: 62; Andrewes, 1924: 469; 1930: 353; Jedlička, 1962: 316; Dubault *et al.*, 2008: 206, 208; Roux *et al.*, 2016: 84; Li *et al.*, 2022: 10. — *annamensis* Jedlička, 1962: 313 (*Trigonotoma*; 'Cuatung' [= Cua Tung, Quang Tri Pr.]). — ? ssp. *formosanus* Jedlička, 1962: 314 (*Trigonotoma*; 'Takao', Taiwan); Dubault *et al.*, 2008: 206, 208; Li *et al.*, 2022: 12.

MATERIAL. 57♂♂, 31♀♀ (SIEE), Vietnam, Ha Giang Province, Bat Dai Son Natn. Park, Thanh Van env., h~950 m, 23°06'01"N 104°58'25"E, cornfield, 14–22.IV.2022 (D. Fedorenko); ♀ (ZIN), 'China', 'Trigonotoma/ chalceola/ H.W. Bates./ Ex coll. H.W. Bates.?'; ♀ (ZIN), 'Hong Kong/ Trigonotoma/ chalceola/ H.W. Bates./ Ex coll. H.W. Bates.?'; ♂, China; ♀, Hong Kong.

Aedeagus and internal sac examined in five or two males, respectively; genitalia and reproductive tract examined in two females.

DIAGNOSIS. A small-sized species, easily recognizable chiefly by apical two maxillary palpomeres being particular in shape, terminal palpomere somewhat oval, very short and wide, twice as long as penultimate one. Mandibles laterally rounded; antennal scape barely shorter than antennomeres 2 to 5 combined. Pronotum densely punctate along all margins except apex, with median line reaching base and deepened in basal half; sides straight or indistinctly sinuate in front of very obtuse, blunt to rounded, basal angles; posterolateral seta in or slightly anterior to the angle. Elytral microsculpture very superficial, consisting of moderately to slightly transverse meshes. Internal sac of aedeagus with a bifid basal bulb (Fig. 126).

REDESCRIPTION. BL 10.7–12.4 mm. Body dorsum shiny black, sometimes elytra with nearly indistinct greenish luster.

Pronotum indistinctly cordate (Fig. 92); lateral bead rather narrow in apical third, moderately wide behind, wider basally.

All margins moderately punctate, densely so along base (not seldom rather sparsely on each side of median line), densely to confluent punctate in basal foveae, densely at bottom of lateral groove and on each side of this groove in basal two thirds where punctures almost reach lateral margin. Basal foveae narrow and very deep, inner basal sulcus shallow and indistinct from dense punctation.

Elytral intervals convex to almost flat on disc.

Posterior inclination of prosternal process costate and moderately wide. Propleura with 0–3, sometimes eight, coarse punctures.

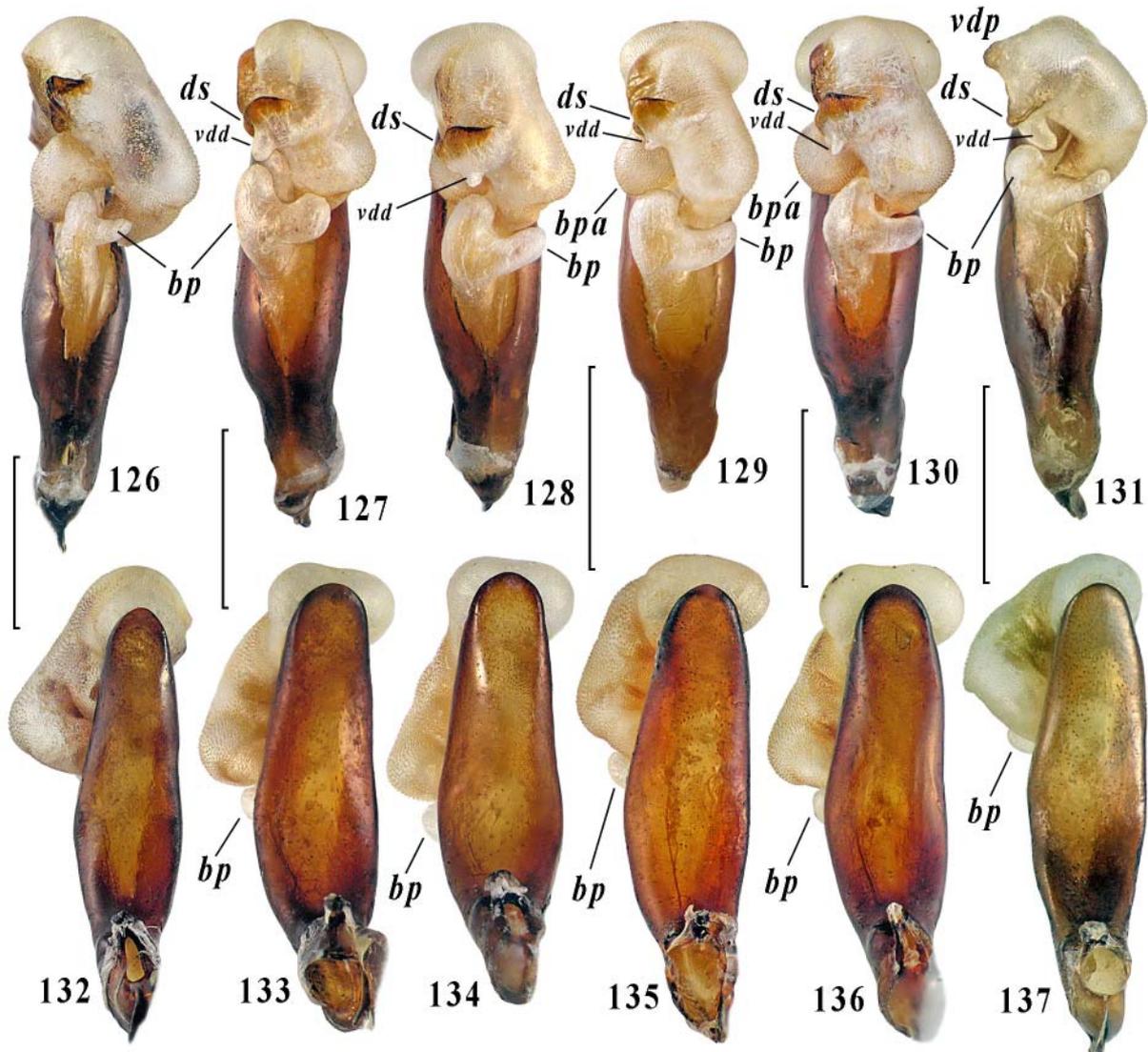
Aedeagus (Figs 116–117, 126, 132, 143) more or less symmetrical; internal sac perpendicular to apical half of aedeagus, with distal part long; preapical bulb large, dorsal vesicles dis-

tant from dorsal sclerite, proximal vesicle very small yet traceable, distal one minute and nearly indistinct.

GEOGRAPHIC DISTRIBUTION. Southern China (Hunan, Guangxi, Guangdong, Hong Kong, Macao [Andrewes, 1924], Fujian, Hainan, Taiwan [Kuntzen, 1914]), Vietnam: Vinh Phuc, Bac Ninh, Thai Binh, Hoa Binh, Quang Tri, Ninh Thuan provinces, south to Ho Chi Minh City (Saigon [Bates, 1889]). For distribution map see Lee *et al.* [2022].

HABITATS AND HABITS. In the environs of the Bat Dai Son National Park, adults of this species occurred on exposed cornfield ground in very large numbers in the night-time.

COMMENTS. Jedlička [1962] discriminated his *P. formosanus* from *P. annamensis* chiefly by the pronotum densely (vs. sparsely) punctate, combined with subtle differences in the



Figs 126–137. Aedeagus, median lobe with everted and inflated internal sac: 126, 132 — *Pareuryaptus chalceolus* from Bat Dai Son NP; 127–130, 133–136 — *P. morosus* from Thailand (127–128, 133–134) and Cat Tien NP (129–130, 135–136); 131, 137 — *P. parvus*; 126–134 — dorsal aspect; 132–137 — ventral aspect; *bp* — proximal bulb; *bpa* — preapical bulb; *ds* — dorsal sclerite; *vdd* — distal dorsal vesicle; *vdp* — proximal dorsal vesicle. Scale bars 1 mm.

Рис. 126–137. Эдеагус, средняя доля с вывернутым и надутым внутренним мешком: 126, 132 — *Pareuryaptus chalceolus* из Нац. парка Bat Dai Son; 127–130, 133–136 — *P. morosus* из Таиланда (127–128, 133–134) и Нац. парка Cat Tien (129–130, 135–136); 131, 137 — *P. parvus*; 126–134 — сверху; 132–137 — снизу; *bp* — проксимальный пузырь; *bpa* — предвершинный пузырь; *ds* — дорзальный склерит; *vdd* — дистальный дорзальный пузырёк; *vdp* — проксимальный дорзальный пузырёк. Масштаб: 1 мм.

body colour as well as in shape of the pronotum, BL being 10–11 mm in *P. formosanus*, 12 mm in *P. annamensis* or 11 mm in *P. chalceolus*. Dubault *et al.* [2008] recognized *P. formosanus* as a subspecies of *P. chalceolus* distinctive from the nominotypical subspecies in only having the body smaller, yet they did not indicated BL for these subspecies separately each. Li *et al.* [2022] discriminate the only examined specimen of *P. ch. formosanus* from *P. ch. chalceolus* by the pronotum sparsely (*vs.* densely) punctate between the basal foveae. This difference is just the opposite to that in the original description, and the body lengths, 11.7 mm or 11.9–14.5 mm, respectively, are hardly comparable because of highly limited material of the former subspecies.

It follows that all these 'intersubspecific' differences are controversial and very slight; some of them may have come from individual or perhaps clinal variability of not more than single species. Yet, I refrain here from formally synonymizing *P. formosanus* and *P. chalceolus* because no specimen of *P. formosanus* has been examined by me.

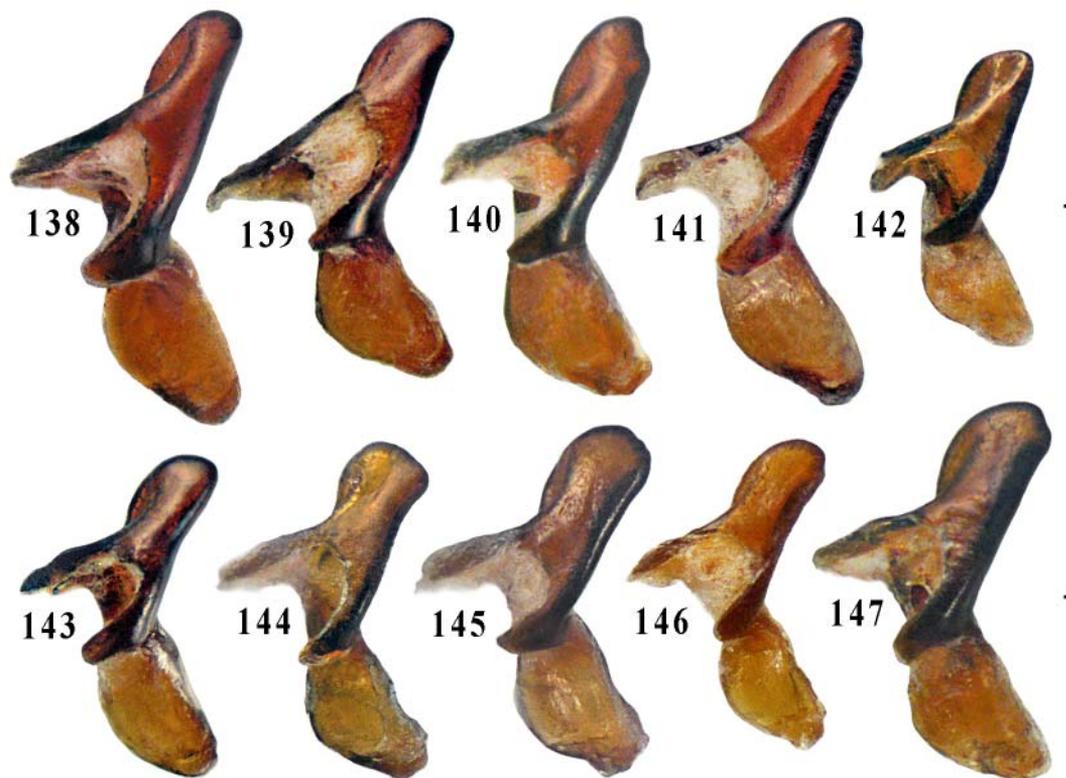
8. *Pareuryaptus morosus* (Tschitschérine, 1900)
Figs 13, 21, 29, 33, 90–91, 118–123, 127–130, 133–136, 144–147.

Tschitschérine, 1900: 162, 164 (*Trigonotoma*; 'Cambodge'); Lesne, 1904: 78; Jedlička, 1962: 315; Dubault *et al.*, 2008: 206, 210; Roux *et al.*, 2016: 58. — *nampiap* Kirschenhofer, 2011: 36 (Mt Phou Phakhao, Laos); Roux *et al.*, 2016: 68, **syn.n.** — *adoxus* Tschitschérine,

1900: 162 (*Trigonotoma*; Saigon); Jedlička, 1962: 315; Dubault *et al.*, 2008: 206; Roux *et al.*, 2016: 52; Li *et al.*, 2022: 3, **syn.n.** — *loeffleri* Kirschenhofer, 2007: 9 (*Trigonotoma*; Doi Pha Hom Pok, N. Thailand); Dubault *et al.*, 2008: 206, 210; Roux *et al.*, 2016: 74, **syn.n.** — ? *cyanelus* Tschitschérine, 1900: 162, 165 (*Trigonotoma*; Chau Doc, southern Vietnam); Dubault *et al.*, 2008: 206, 209; Roux *et al.*, 2016: 74.

MATERIAL. *P. morosus*: ♂, 4 ♀♀ (SIEE), Vietnam, Dong Nai Province, Cat Tien National Park, at light HQL 450, 17.V.–18.VI.2005 (D. Fedorenko); ♂ (SIEE), Thailand, Ta Phraya District, La Lu Nat. Park, h = 132 m, at light, 14°02'36"N, 102°33'13"E, 17.V.2010 (V.K. Zinchenko); ♂ (ISEA), same data, except for 14°02'31.3"N, 102°34'04.6"E, 15–19.V.2010 (A.V. Korshunov); ♂ (SIEE), Prov. Nakhon Ratchasima (Korat): Saeng Sang, Lam Sae Dam, National Park Tha Plan, h = 250 m, 14°16'40"N/ 102°25'28.5"E, 23–26.VI.2013 (A.V. Korshunov). — *P. adoxus*: 4 ♂♂, 13 ♀♀ (SIEE), Vietnam, Cat Tien National Park, at light HQL 450, various dates between 17.V. and 19.VI.2005 (D. Fedorenko); 2 ♂♂, 3 ♀♀ (SIEE), Ba Ria – Vung Tau Province, Xuen Moc Nature Reserve, at light, 17.V.1991 (N. Belyaeva); ♀ (ZIN), Cochinchine, Cap St. Jacques; ♂ (ZIN), '*Trigonotoma/ curtula* Chaud/ Cochinchine'; 2 ♀♀ without labels except 'к[оллекция]. Чичерина [с. Tshitsherin]'; ♂, 'Saigon/ coll./ Lésiléuc'.

P. cyanelus?: ♀ (ISEA), Thailand, Ta Phraya Distr., La Lu Natn. Park, h = 122 m, 14°02'31.3"N, 102°34'04.6"E, 15–19.V.2010 (A.V. Korshunov); ♂, Prov. Nakhon Ratchasima (Korat): Saeng Sang, Lam Sae Dam, National Park Tha Plan,



Figs 138–147. Right paramere, left aspect: 138 — *Pareuryaptus c. cambodgiensis*; 139 — *P. c. luangphabangensis*; 140 — *P. aethiops*; 141 — *P. glastenvalum*; 142 — *P. parvus*; 143 — *P. chalceolus*; 144–147 — *P. morosus* from Thailand (144 — La Lu NP; 145 — Tha Plan NP) и Cat Tien NP (146–147). Scale bar 1 mm.

Рис. 138–147. Правая парамера слева: 138 — *Pareuryaptus c. cambodgiensis*; 139 — *P. c. luangphabangensis*; 140 — *P. aethiops*; 141 — *P. glastenvalum*; 142 — *P. parvus*; 143 — *P. chalceolus*; 144–147 — *P. morosus* из Таиланда (144 — Нац. парк La Lu; 145 — Нац. парк Tha Plan) и Нац. парка Cat Tien (146–147). Масштаб: 1 мм.

h=250 m, 14°16'40"N/ 102°25'28.5"E, 7–8.VI.2010 (A.V. Korshunov).

Aedeagus and internal sac examined in eight (four of *P. adoxus* and four of *P. morosus*) or six (three of *P. adoxus* and three of *P. morosus*) males, respectively; genitalia and reproductive tract examined in two females (of *P. adoxus*).

DIAGNOSIS. As for *P. chalceolus*, except for body medium-sized, terminal maxillary palpomere slender and subfusiform, and elytral microsculpture consisting of moderately to very transverse meshes.

REDESCRIPTION. As for *P. chalceolus*, except as follows: BL 11.7–15.9 mm. Elytra with more or less distinct greenish luster, elytral interval 9 same coloured or almost so; sometimes pronotum with slight violaceous luster along sides and base. Pronotum as in Figs 90–91: more finely punctate in general, mostly with few or no punctures inside lateral groove. Basal foveae moderately wide and less deep, with outer sulcus and shallow inner sulcus traceable, sometimes narrow and deep. Elytral intervals nearly flat to convex. Posterior inclination of prosternal process rather narrow subconvex to subcostate. Propleura nearly smooth, mostly with 0–2, rarely up to eight, coarse punctures.

Aedeagus (Figs 118–123, 127–130, 133–136, 144–147): internal sac at a slightly acute angle with apical half of aedeagus, its distal part moderately long; preapical bulb large, proximal dorsal vesicle missing, proximal one small yet distinct, while varying slightly in size, at a distance from dorsal sclerite.

GEOGRAPHIC DISTRIBUTION. Thailand to Vietnam.

HABITATS AND HABITS. No data except that all the specimens examined were taken at light at low altitudes. In the Cat Tien National Park, this light was positioned at the edge of broad-leaved monsoon forest near the Dong Nai river.

COMMENTS. *Pareuryaptus morosus*, *P. adoxus* and *P. cyanellus* were described together based on the holotypes only, female from Cambodia or male from Saigon, or male from Chau Doc, respectively. According to the descriptions, these three, especially the former two, were very similar to each other and originated from fairly close localities. Flat elytral intervals, combined with body barely larger, 14 mm in length (vs. convex intervals, in couple with BL 13 mm), were only the character combination to differentiate *P. adoxus* from *P. morosus*.

My comparison between numerous specimens from the Cat Tien NP led me primarily to the conclusion that there existed separate two, larger (BL 13.6–15.9 mm) or smaller (BL 11.7–13.3 mm), species. However, aedeagi, including internal sacs, re-examined are very similar in both and the other differences are subtle. These only concern body ratios (Table) and may have come from differences between the specimens measured in body size. Other two morphometrics, mp4L/W and mp3L/mp4L, are more different, while varying between specimens of smaller size (*P. morosus*) from different localities such as southern Vietnam, Laos, and Thailand.

Pareuryaptus loeffleri and *P. namptap* are here considered as conspecific with *P. morosus*, as they have no significant differences from *P. adoxus* or *P. morosus*, respectively. Both were described as distinctive from either *P. aethiops* or *P. curtulus*, yet by no comparison with similar species such as *P. adoxus* or *P. morosus*, or *P. chalceolus*. Besides, the terminal maxillary palpomere of *P. namptap* as originally illustrated in Kirschenhofer [2011: Abb.4] somewhat disagrees with that illustrated in Roux *et al.* [2016: 69]. It is slightly longer, mp4L/W 4.1 (vs. 3.7), thus being hardly different from those of the examined specimens of *P. morosus* from the Cat Tien NP (Tab. 4) or China [Li *et al.*, 2022]. Similar values of the ratio (mp4L/W 3.3–3.6) are peculiar to some specimens from Thailand, which are not different from the other examined ones of *P. morosus*

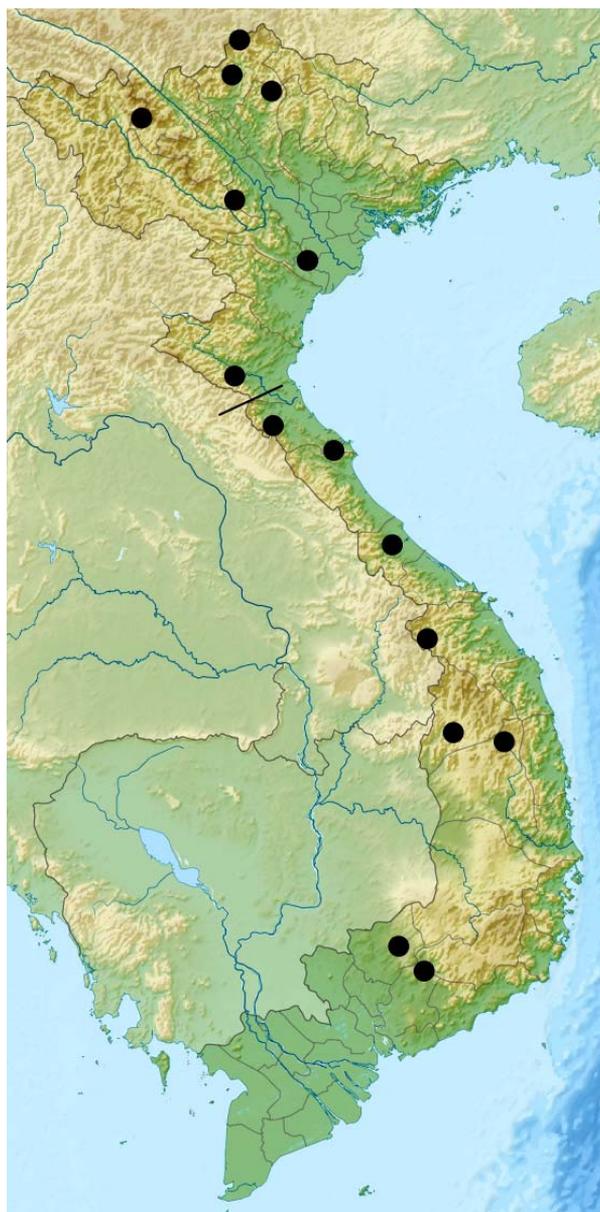


Fig. 148. Geographical distribution map for *Trigonotoma chrysites* in Vietnam. Black line separates between northern and southern populations (see the text).

Рис. 148. Карта распространения *Trigonotoma chrysites* во Вьетнаме. Чёрная линия разделяет северные и южные популяции (см. в тексте).

in appearance, as well as in endophallic characters. Finally, Dubault *et al.* [2008] demonstrated that slightly bluish body dorsum of the holotype of *P. cyanellus* was an artifact, which reduced the character combination to diagnose *P. cyanellus* from *P. morosus* to the only character, the palpomere 4 being by comparison broadest, mp4L/W 3.1. This might suggest that *P. cyanellus* and *P. morosus* are conspecific, with their differently shaped terminal maxillary palpomeres coming from high individual or geographical variability of one species.

The name *P. morosus* is here selected as valid since the holotype of *P. adoxus* has not been found in ZIN Collection, T.S. Tshitsherin Collection included, while all the four speci-

Table 1. Body ratios in species of *Trigonotoma*.
Таблица 1. Индексы пропорций тела видов *Trigonotoma*.

Species/ locality	n	PW/HW	mean	PW/PL	mean	PB/PA	mean	EW/PW	mean	EL/EW	mean
<i>T. nitidicollis</i> : CT	7:	1.51-1.58	1.54	1.29-1.34	1.31	1.08-1.18	1.14				
	4♂♂							1.14-1.20	1.17	1.62-1.69	1.67
	3♀♀							1.17-1.21	1.19	1.62-1.64	1.63
PhN, ♀ Yen Hop	6:	1.44-1.55	1.49	1.24-1.34	1.29	1.02-1.17	1.11				
	2♂♂							1.17-1.18	1.18	1.65	1.65
	4♀♀							1.22-1.24	1.24	1.59-1.66	1.62
<i>T. aurifera</i>	5:	1.50-1.60	1.55	1.29-1.38	1.32	1.05-1.10	1.08				
	4♂♂							1.17-1.20	1.19	1.62-1.68	1.66
	♀							1.23	1.23	1.59	1.59
<i>T. lewisi</i> : Japan, China	6	1.45-1.51	1.47	1.27-1.34	1.31	1.06-1.10	1.07	1.18-1.26	1.22	1.59-1.64	1.62
<i>T. chrysites</i> : YU (3) + SaPa (1)	4	1.46-1.58	1.54	1.28-1.31	1.29	1.04-1.06	1.05	1.18-1.26	1.20	1.63-1.70	1.66
BDS	7:	1.48-1.53	1.51	1.29-1.32	1.31	1.01-1.11	1.06				
	4♂♂							1.15-1.19	1.17	1.66-1.70	1.67
	3♀♀							1.17-1.21	1.19	1.54-1.63	1.59
KKK, CMR, ST, Ke Go	13:	1.46-1.68	1.57	1.25-1.37	1.31	1.0-1.12	1.06				
	8♂♂							1.11-1.18	1.13	1.65-1.70	1.66
	5♀♀							1.17-1.22	1.19	1.57-1.64	1.61
in toto:	26(20:)	1.46-1.68	1.55	1.25-1.37	1.30	1.0-1.12	1.06				
in toto:	12♂♂							1.11-1.19	1.14	1.65-1.70	1.66
in toto:	8♀♀							1.17-1.22	1.19	1.54-1.64	1.60
<i>T. ledouxii</i>	♀	1.50		1.23		1.02		1.13		1.62	
<i>T. dohmii</i>	5♂♂, 2♀♀	1.44-1.48	1.46	1.28-1.34	1.31	1.19-1.32	1.26	1.16-1.22	1.20	1.71-1.77	1.73
<i>T. perraudieri</i>	♂	1.52	1.52	1.30	1.30	1.29	1.29	1.22	1.22	1.68	1.68

BDS — Bat Dai Son NP; CMR — Chu Mom Ray NP; CT — Cat Tien NP; CYS — Chu Yang Sin NP; KKK — Kon Ka Kinh NP; PhN — Phong Nha-KeBang NP; ST — Song Thanh NP; YU — Yunnan, China.

Table 2. Body ratios in species of *Pareuryaptus*.
Таблица 2. Индексы пропорций тела видов *Pareuryaptus*.

Species/ locality	n	PW/HW	mean	PW/PL	mean	PB/PA	mean	EW/PW	mean	EL/EW	mean
<i>P. exiguus</i>	3♀	1.55–1.59	1.56	1.29–1.35	1.32	1.11–1.15	1.13	1.26–1.29	1.28	1.53–1.56	1.55
<i>P. c. cambodgiensis</i>	♂	1.56	1.56	1.40	1.40	0.98	0.98	1.16	1.16	1.53	1.53
<i>P. c. luangphabangensis</i> : KKK	♂, ♀	1.61–1.62	1.62	1.38–1.39	1.39	0.94–0.96	0.95	1.16–1.17	1.17	1.52–1.56	1.54
<i>P. c. luangphabangensis</i> : PhN	2♂♂, 3♀♀	1.51–1.57	1.55	1.39–1.42	1.41	0.92–0.98	0.94	1.13–1.19	1.16	1.47–1.56	1.51
in toto:	7	1.51–1.62	1.57	1.38–1.42	1.40	0.92–0.98	0.95	1.13–1.19	1.16	1.47–1.56	1.52
<i>P. aethiops</i>	3♂♂, 3♀♀	1.56–1.59	1.57	1.44–1.53	1.47	0.97–1.02	1.0	1.14–1.19	1.16	1.50–1.57	1.54
<i>P. glastervalum</i>	3♂♂, 2♀♀	1.54–1.55	1.55	1.40–1.43	1.42	0.91–0.98	0.95	1.19–1.23	1.21	1.52–1.55	1.53
<i>P. parvus</i>	3♂♂, 3♀♀	1.57–1.62	1.59	1.37–1.44	1.40	1.02–1.08	1.05	1.11–1.16	1.14	1.47–1.50	1.49
<i>P. morosus</i> : CT, Cmb, Thai	3♂♂, 4♀♀	1.54–1.63	1.60	1.33–1.43	1.39	0.91–1.0	0.95	1.10–1.18	1.16	1.47–1.57	1.52
(= <i>P. adoxus</i>)	3♂♂, 3♀♀	1.56–1.61	1.58	1.38–1.45	1.42	0.97–1.02	1.0	1.12–1.20	1.16	1.48–1.56	1.52
<i>P. chalconotus</i> : BDS	7:	1.60–1.70	1.64	1.35–1.41	1.37	0.88–0.96	0.92	1.12–1.16	1.14	1.43–1.53	1.49
	3♂♂									1.49–1.53	1.51
	4♀♀									1.43–1.50	1.47

BDS — Bat Dai Son NP; Cmb — Cambodia; Thai — Thailand; CT — Cat Tien NP; KKK — Kon Ka Kinh NP; PhN — Phong Nha-Kebang NP; ST — Song Thanh NP.

Table 3. Body ratios in species of *Trigonotoma*.
Таблица 3. Индексы пропорций тела видов *Trigonotoma*.

Species/ locality		mp4A / Li	mean	lp3A / Li	mean	n	a1L / a234L	mean
<i>T. nitidicollis</i>	4♂♂	0.35–0.44	0.39	1.43–1.67	1.54	5♂♂	0.83–0.88	0.85
	4♀♀			0.33–0.40	0.38		0.91–0.96	0.93
<i>T. aurifera</i>	3♂♂	0.40–0.43	0.42	0.62–0.68	1.56	♀, 4♂♂	0.86–0.89	0.88
	♀			0.49	0.49		0.92	0.92
<i>T. chrysites</i> : Vietnam	8♂♂			1.33–1.67	1.49	5♂♂, 5♀♀	0.91–1.0	0.99
Bat Dai Son NP	4♂♂	0.37–0.41	0.39	1.34–1.48	1.42			
	3♀♀			0.37–0.44	0.30			
<i>T. ledouxi</i>	♀			0.44	0.44		1.16	1.16
<i>T. dohrnii</i>	5♂♂	0.50–0.55	0.52	1.74–2.11	1.87	5♂♂, 2♀♀	0.94–1.03	0.98
<i>T. perraudieri</i>	♂	0.58	0.58	1.89	1.89		0.85	0.85

Table 4. Body ratios in species of *Pareuryaptus*.
Таблица 4. Индексы пропорций тела видов *Pareuryaptus*.

Species/ locality	n	mp3L / mp4L	mean	mp4L / W	mean	a1L / a23L	mean
<i>P. exiguus</i>	3♀♀	0.71–0.77	0.73	2.1–2.6	2.4	1.04–1.05	1.05
						a1L / a234L	mean
<i>P. c. cambodgiensis</i>	♂	0.87	0.87	4.8	4.8	0.84	0.84
<i>P. c. luangphabangensis</i>	3♂♂, 3♀♀	0.81–0.92	0.88	3.3–4.0	3.7	0.83–0.97	0.90
<i>P. aethiops</i>	2♂♂, 4♀♀	0.76–0.89	0.83	3.6–3.9	3.7	0.82–0.90	0.86
	2♂♂					0.82–0.83	0.83
	2♀♀					0.87–0.90	0.89
<i>P. glastenvalum</i>	3♂♂, 4♀♀	0.76–0.86	0.81	3.2–4.4	3.7	0.77–0.89	0.82
	3♂♂			4.0–4.4	4.2	0.77–0.81	0.79
	3♀♀			3.2–3.7	3.3	0.82–0.89	0.85
<i>P. parvus</i> : CT	3♂♂, 3♀♀	0.67–0.78	0.72	3.8–4.25	4.0	0.82–0.94	0.86
CYS, KKK	3♀♀	0.74–0.79	0.77	3.2–3.3	3.3	0.82–0.86	0.83
						a1L / a2345L	mean
<i>P. morosus</i> (= <i>adoxus</i>): CT	3♂♂, 4♀♀	0.50–0.54	0.52	4.6–5.0	4.8	0.90–0.96	0.92
<i>P. morosus</i> : CT	♂, 3♀♀	0.45–0.47	0.49	3.9–4.4	4.2	0.92–0.98	0.95
Cambodia	♀	0.52	0.52	4.4	4.4	1.0	1.0
Thailand	♂, ♀	<u>0.48</u> –0.50	0.49	<u>3.3</u> –3.6	3.5	<u>0.88</u> –0.90	
in toto:	2♂♂, 5♀♀	0.45–0.52	0.48				
<i>P. chalceolus</i> : BDS	3♂♂, 4♀♀	0.44–0.53	0.47	2.1–2.6	2.3	0.88–0.98	0.89

BDS — Bat Dai Son NP; CT — Cat Tien NP; CYS — Chu Yang Sin NP; KKK — Kon Ka Kinh NP.

mens of *P. adoxus* from this collection being misidentified as *Trigonotoma curtula*.

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