

A new species of the genus *Corimalia* Gozis, 1885 (Coleoptera: Brentidae: Nanophyinae) from the Caucasus

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Abstract

Corimalia strejceki Schön & Skuhrovec, sp. nov. is described and illustrated from the Caucasus, Russia. The new species is compared with the allopatric *C. aliena* (Faust, 1890) differing in size, shape of scales, scale patch close to the scutellum, size of mucrones on the meso- and metatibiae, and also shape of the apex of the penis. Controversy over the number of segments in the antennae in the genus *Corimalia* is summarized. An annotated catalogue and key of all Corimaliini species in the Caucasus is provided.

Key words: Coleoptera, Brentidae, Nanophyinae, Corimaliini, *Corimalia*, taxonomy, new species, Russia, Caucasus

Introduction

The subfamily Nanophyinae Gistel, 1848 is recently classified in the family Brentidae Billberg, 1820, together with five other subfamilies: Apioninae Schoenherr, 1823; Brentinae Billberg, 1820; Eurhynchinae Lacordaire, 1863; Ithycerinae Schoenherr, 1823 and Microcerinae Lacordaire, 1863 (Oberprieler *et al.* 2007, 2014; Bouchard *et al.* 2011; Gunter *et al.* 2016). McKenna *et al.* (2009), on the other hand, included in this family only four subfamilies (Apioninae, Brentinae, Eurhynchinae and Nanophyinae), whereas Ithycerinae and Microcerinae are placed in different clades at the base of Curculionidae Latreille, 1802. A phylogenetic classification of this subfamily based on morphology was provided by Alonso-Zarazaga (1989). The monophyly is well supported by several autapomorphies distinguishing it from the other groups in Brentidae (Alonso-Zarazaga 2014). The subfamily includes 33 genera and approximately 310 known species (Alonso-Zarazaga 2014). It occurs mainly in the Old World (Alonso-Zarazaga 1989; Alonso-Zarazaga & Lyal 1999) and is most diverse in tropical areas (the Palaearctic, Afrotropical and Oriental regions), but of course several genera are also known in temperate regions (Alonso-Zarazaga 2014). The subfamily is divided into two tribes; Corimaliini Alonso-Zarazaga, 1989 and Nanophyini Gistel, 1848, based on some important morphological features; e.g. club compact (Corimaliini) or loosely articulated (Nanophyini), claws separate and divergent (Corimaliini) or fused and parallel (Nanophyini) (Alonso-Zarazaga 2014).

The tribe Corimaliini includes four genera (*Allomalia* Alonso-Zarazaga, 1989 (two spp.), *Corimalia* Gozis, 1885 (ca. 41 spp.), *Hypophyes* Reitter, 1916 (five spp.), *Titanomalia* Alonso-Zarazaga, 1989 (two spp.). All representatives are associated with the plant family Tamaricaceae (Alonso-Zarazaga 2014). Members occur mainly in the Mediterranean and Central Asian regions as well as in the Sahara, Near East and Namibia, especially in steppes and semi-deserts (Alonso-Zarazaga 2014). On the other hand, members of the tribe Nanophyini prefer mesophilous or humid tropical habitats and comprise 29 genera (Alonso-Zarazaga 2014). The genus *Corimalia* is a monophyletic group, based mainly on the absence of the abdominal suture IV in both sexes and the short, thick flagellum in the male genitalia (Alonso-Zarazaga 2014).

Formánek & Melichar (1916) reported *Nanophyes* (*Corimalia*) *auliensis* Pic, 1901 from the Caucasus and Turkestan, although this species has subsequently only been confirmed from Kazakhstan, Russia (Siberia) and

Mongolia (Alonso-Zarazaga 2011). Zherikhin (1972), in his comments on *Corimalia aliena* (Faust, 1890) (= *C. auliensis* (Pic, 1901)) from the Caucasus stated that "In the Zoological museum MGU (Moscow University) are housed 3 specimens of an undescribed species from the Greater Caucasus, very similar to *C. aliena*". The senior author assumes that this comment probably refers to the same undescribed species described below based on the material of Dr. Strejček. The aim of this paper is the description of this new species of the genus, as well as to provide a catalogue and key of all Corimaliini of the Caucasus.

Materials and methods

Specimens are deposited in the following museum and private collections:

JSCP Jaromír Strejček private collection, Prague, Czech Republic;
KSCL Karel Schön private collection, Litvínov, Czech Republic;
NMPC Národní muzeum, Prague, Czech Republic (Jiří Hájek).

Label data are cited in the description, separate labels are indicated by “/”.

Body length of all specimens was measured in dorsal view from the anterior border of the eyes to the apex of the elytra, excluding the rostrum. Width/length ratio of the rostrum was measured as maximum width at apex versus maximum length to the base of the mandibles. Width/length ratios of pronotum, elytra, antennal segments and tarsomeres were taken at the maximum width and length of the respective parts in dorsal view. Dissected male genitalia were studied in glycerine. Male genitalia were mounted dry on the same card as the respective specimen or placed into genitalia micro vials (16.00 mm) with glycerine inside and mounted on the same pin as the respective specimen.

Photographs of adults were taken with Canon EOS 5D mark II in combination with a Canon MP-E65 1–5× macro lens. Photographs of genitalia and body parts were taken with the same camera in combination with Canon 200/2.8 lens and Nikon MPlan 10×. Resulting images are focus stacked, aligned and combined in Zerene Stacker. Final photos were in some ways improved using Adobe Photoshop Elements 11 software. Photographs were taken of paratypes housed in KSCL.

The terminology of the rostrum and the genitalia follows Oberprieler *et al.* (2014).

Taxonomy

Corimalia strejceki Schön & Skuhrovec, sp. nov.

(Figs 1, 3, 5–8, 13)

Material examined. HOLOTYPE: ♂, Tamarix sp. [handwritten] / USSR - Caucasus centr., Teberda, 1500 m, 11.6.1986, J. Strejček lgt. [printed] / c/11-30 [handwritten] (NMPC). PARATYPES: 1 ♂ and 3 ♀♀, Tamarix sp. [handwritten] / USSR - Caucasus centr., Teberda, 1500 m, 11.6.1986, J. Strejček lgt. [printed] / c/11-30 [handwritten] (2 ♀♀ JSCP, 1 ♂ and 1 ♀ KSCL); 1 ♂, Tamarix sp. [handwritten] / USSR - Caucasus centr., Teberda, 1500 m, 14.6.1986, J. Strejček lgt. [printed] / c/11-30 [handwritten] / Gen. ? cf. *Corimalia*, J. Strejček det. 2011 [handwritten] (JSCP); 1 ♂ and 1 ♀, Ca. Kislovodsk, V. 912, Roubal [printed] / N. languidum. [handwritten] (JSCP). All specimens are provided with additional red printed label: HOLOTYPE [or PARATYPE, respectively], *Corimalia strejceki* sp. n., K. Schön design. 2015

Description. (Figs 1, 3, 5–8, 13). Body length without rostrum 2.92–3.25 mm. Colouration of body and legs testaceous; antennae yellow-orange; club dark brown to black apically; head (except forehead), rostrum, pronotum, elytral suture, dorsal side of femora, apical part of teeth on femora in males, distal part of tibia and tarsomeres to varying degrees dark brown to black. Ventral part of body dark brown to black with the exception of last abdominal sternite and pygidium testaceous. Colouration, however, also dependent on the degree of sclerotization (e.g., specimens from Kislovodsk mostly tawny with less intense darkening of above mentioned parts of body). Body and extremities covered with narrow piliform scales of differing densities. Head covered with piliform scales especially on forehead and temples, completely covering integument, underside of head contrasting smooth and

shiny. Funicle segments 1–5 with infrequent suberect setae, funicle segment 6 apically covered with short adjacent cilia at high density; club covered with cilia as funicle segment 6. Pronotum in middle with narrowing stripe of whitish slightly thicker piliform scales from apical to basal margin; sides of pronotum also with high density of piliform scales, partly with white scales at level of humeral angles, or below with narrower goldish scales; disk of pronotum also with goldish coloured, but finer, scales. Base of elytral intervals 1 and 2 with adjacent piliform scales in high density (roughly as on pronotum) creating a rectangular patch as long as six widths of interval 2; some specimens without scales in interval 1 at base of elytra, and with distinct baldness; humeral angles also covered by scales in high density; intervals with several rows of softer scales, somewhat stronger at elytral apex; scales not covering the integument, with the exception of a patch at the base of the elytra and humeral angles; interval 7 apically with one short distinct erect specialized seta. Femora and tibia except their apices covered by adjacent, softer hairlike scales, not overlapping the integument. Dorsal part of tarsomeres covered by narrow bristles, sides of tarsomeres I and II particularly with longer, stronger bristles, bent downward toward to bottom side thereof, giving the impression of "spined" margins of the ventral side of tarsomeres I and II.

Head (Figs. 1, 3). Rostrum long; in dorsal view, sides straight from base to apex, sometimes only slightly enlarged in area of antennal insertion; dorsum of basal part shagreened, then central fine keels on its sides with one or two rows of oval punctures; between dorsal margins of antennal scrobes and described dorsal structures of rostrum, sometimes plain area extending from base of rostrum as a slender flatter keel extending further dorsally, all these structures in the approximate area of the antennal insertions, or only shortly behind; thence towards apex of rostrum smooth, firstly in high density, then in lower density punctate with small oval punctures; dorsal margins of scrobes densely punctate, then prolonged by a line of the same punctures to apex, as on dorsal side of apex; in lateral view, scrobes stretching from base of rostrum up to antennal insertion shortly behind middle of rostrum, dorsal margin inserted at about half height of eye, ventral margin follows line of genae below eye, and continues up to antennal insertion; both delimiting margins parallel; interior of scrobes in particular at base of ventral margin densely granulate, then this granulation gradually disappearing to apex; lateral side behind scrobes smooth with several oval punctures. Head shortly conical (length from base of rostrum to margin of pronotum = 0.29–0.37 mm). Eyes round, not projecting beyond outline of head. Forehead wide, nearly as wide as half of apex of rostrum; connection with dorsal part of rostrum base at obtuse angle as is characteristic for tribe Corimaliini (Alonso-Zarazaga, 1989). Vertex short, behind eyes slightly sunken.

Antennae slender, inserted in middle of rostrum. Scape long (about 0.6 mm), slender, in short apical part club-shaped enlargement; about 0.7–0.8 times as long as a funicle and club together. Funicle segment 1 (pedicel) slender (0.14–0.19 mm in males, 0.16–0.19 mm in females); funicle segment 2 elongate, less than twice as long as pedicel, apically slightly enlarged; funicle segments 3–5 about equal length (from 0.16 to 0.19 mm in total), slender, towards club, with slightly club-shaped enlargement; funicle segment 6 again inverted conical with straight sides, slightly longer and slightly wider than funicle segment 5. Club three-segmented, elongated, spindle-shaped (0.27–0.37 mm), as long as funicle segments 2–5 together, slender (width 0.10 mm in males, 0.08 mm in females).

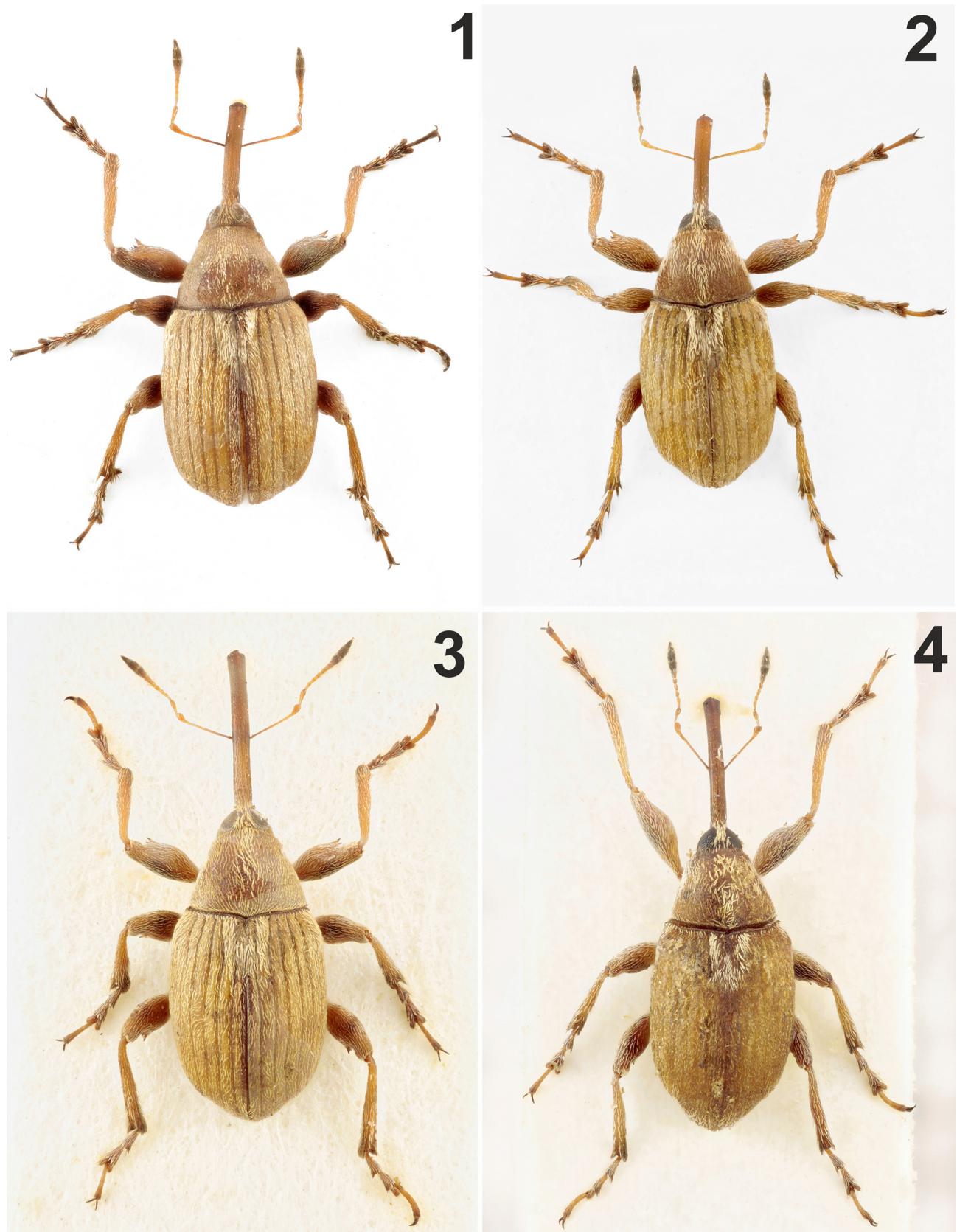
Pronotum (Figs. 1, 3) subconical, only slightly constricted behind apical margin (ratio (with apical margin) = 1.14–1.33, ratio (with basal margin) = 0.70–0.85; length 0.76–0.93 mm, width at apical margin 0.62–0.72 mm, basal margin 1.09–1.24 mm); sides slightly rounded; prescutellar fovea absent as characteristic for subfamily Nanophyinae; basal margin slightly sinuous wavy, crenulate, with small but distinct dark teeth; surface finely, shallowly and densely punctate.

Elytra (Figs. 1, 3) short, oval (ratio = 1.00–1.18, length 1.74–2.02 mm, width 1.61–1.86 mm); continuously tightened to base of pronotum, widest behind middle; distinct humeral angles, but only slightly convex; base of elytra slightly sinuous as well as base of pronotum, distinctly crenulate; striae narrow, shallow, without distinct punctures; intervals slightly convex, 2.0–2.5 times wider than striae.

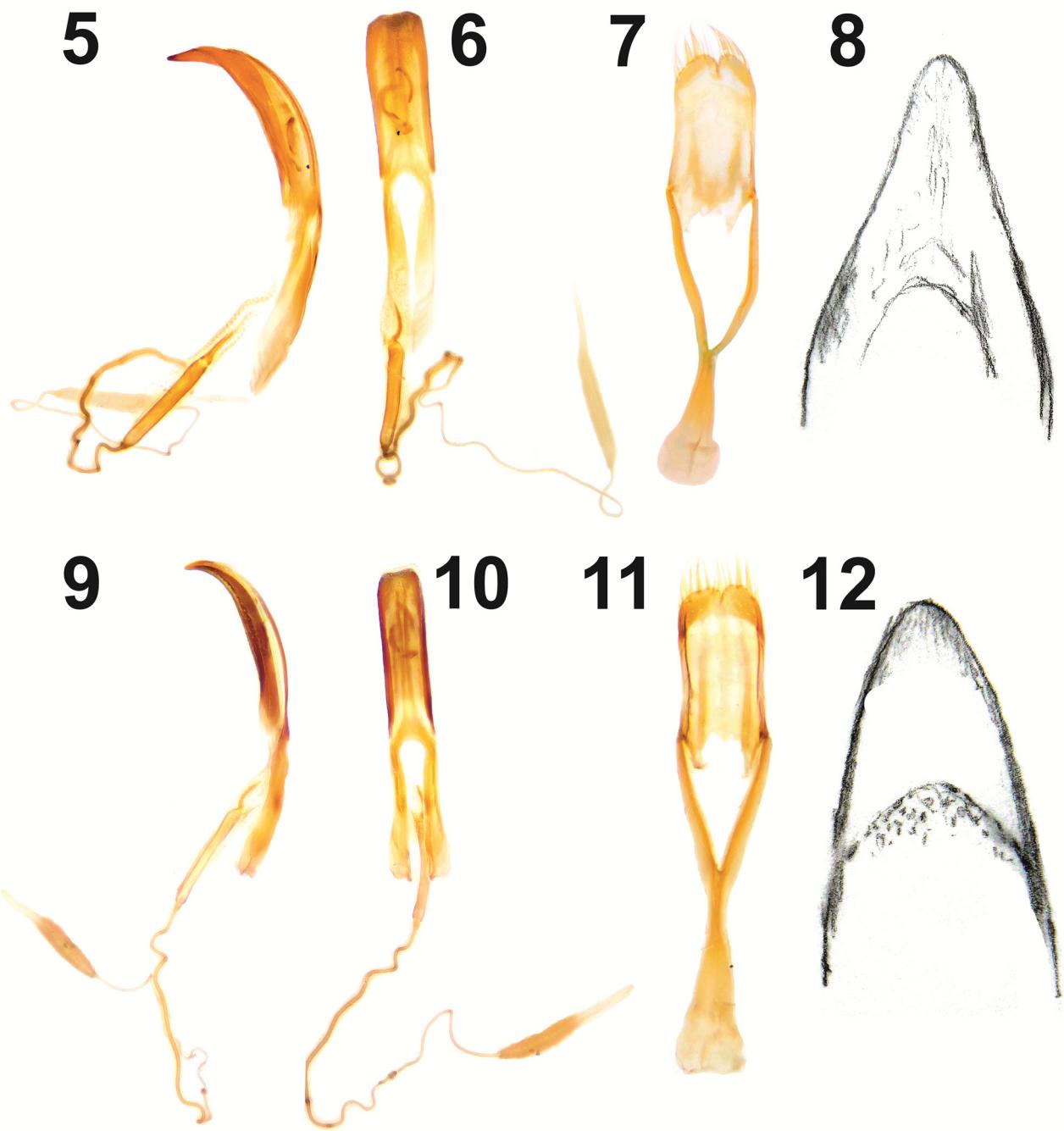
Legs (Figs. 1, 3, 13). Femora strong, with one large proximal and two or three small distal teeth (count of small teeth different also on femora of one specimen). Tibiae nearly straight, apically outside perimeter of the tapered portion with high density apical comb of setae. Tarsomeres I and II about equal length, elongated triangular (ratio = 1.43–2.00); tarsomere III bilobed, short; onychium long, narrow (ratio = 5.00–6.67), apically with two simple claws.

Sexual Dimorphism. Rostrum in males slightly longer than pronotum, and in females almost twice as long as pronotum (ratio = 1.20–1.38 in males, 1.85–1.97 in females); in males 5.3–6.1 times, and in females 8.2–9.2 times as long as width of apex; and in females more finely punctured and particularly in apical half shinier than in males

as typical for other *Corimalia*. Antennae inserted near middle of rostrum (0.56 in males, 0.46 in females). Apical inner margin in meso- and metatibiae in males extend into distinct triangular mucro, partly overlapped by extending apical comb of setae. Apex of meso- and metatibiae in females without mucrones.



FIGURES 1–4. 1—*Corimalia strejceki*, paratype, male, habitus, 2—*Corimalia aliena*, male, habitus, 3—*Corimalia strejceki*, female, habitus, 4—*Corimalia aliena*, female, habitus.



FIGURES 5–12. *Corimalia strejceki*, paratype, male genitalia (5–8). 5—penis, lateral view, 6—penis, dorsal view, 7—tegmen, 8—apex of penis; *Corimalia aliena*, male genitalia (9–12). 9—penis, lateral view, 10—penis, dorsal view, 11—tegmen, 12—apex of penis.

Male genitalia. Penis (Figs 5–6) symmetrical; relatively short and slender; in lateral view slightly curved, apex partially hooked, median part straight; pedon shorter than temones; apex elongated (Fig. 8). Tegmen (Fig. 7) with tegminal ring longer than free short tegminal apodeme; parameral plate subarticulated; apical plate divided by median notch in two very short parameroid lobes bearing long and numerous setae. Spiculum gastrale asymmetrical as typical for Nanophyidae, manubrium very long; left arm distinctly more elongate; extensions present on both arms, but distinctly reduced.

Differential diagnosis. The tribe Corimaliini could be divided into several working groups on the basis of several morphological features (e.g., shape of elytral base, width of forehead, presence of mucro on meso- and metatibiae, and shape of apex of penis) (Giordani-Soika 1937; Schön K., unpublished data). A set of these features

identical to those expressed in *Corimalia strejceki* sp. nov. (forehead wide as half of width of rostrum, base of elytra crenulate, meso- and metatibia with mucro, and apex of penis symmetrical), is known for *Corimalia aliena* (Faust, 1890) (Figs 2, 4, 9–12, 14) and also *Corimalia helenae* Korotyaev & Zherikhin, 1996, which both are very similar also in colouration and shape of scales (lancet-shaped or more or less piliform) instead of *Corimalia latifrons* (Pic, 1897), which is covered by white spindle-shaped scales (see Giordani-Soika 1937). The species *Corimalia helenae* is distinctly smaller (body length without rostrum 1.90–2.65 mm) than both species *C. strejceki* and *C. aliena*. The most similar species to the new described species is *C. aliena* differing in the following characters; size, shape of scales, scale patch close to the scutellum, size of mucrones on the meso- and metatibiae, and also shape of the apex of the penis. The described species *C. strejceki* is slightly larger (body length without rostrum 2.92–3.25 mm) than *C. aliena* (body length without rostrum 2.77–3.02 mm) and also slightly larger than any other *Corimalia* species. Scales of *C. aliena* are lancet-shaped (pointed on both sides), but scales of *C. strejceki* are more or less piliform with a point only on one side. However it must be noted that these conclusions were based on limited material (8 specimens of *C. strejceki* and 4 specimens of *C. aliena*), and study of more material may modify those conclusions. Some small differences are visible also in the scale patch close to the scutellum; *C. aliena* has a significant baldness in the middle of the patch toward the base of elytra, while this is present in only a few specimens of *C. strejceki*. The mucrones on the meso- and metatibiae apically in males of *C. strejceki* are distinctly larger than those in males of *C. aliena*. These two species have distinct differences also in the shape of the apex of the penis, where apex of *C. strejceki* is distinctly tapered and more elongate than apex of *C. aliena* (see Figs 8, 12). Extensions on spiculum gastrale of *C. aliena* distinctly larger than extensions of *C. strejceki*.



FIGURES 13–14. 13—*Corimalia strejceki*, paratype, mucro and comb of setae on apex of metatibia in male; 14—*Corimalia aliena*, mucro and comb of setae on apex of metatibia in male.

Etymology. The species name honours a gentleman and prominent Czech coleopterologist, specialist in the families Curculionidae and Chrysomelidae sensu lato, Dr. Jaromír Strejček, who collected this species during his travels in Teberda.

Biology. Adults were collected by beating *Tamarix* sp. in meadows in the valley of a mountain river during a warm (ca 18°C) cloudy evening (ca 6–7 p.m.). *Tamarix* specimens have distinctly large buds in June, and the size of the shrubs was no more than 1.5 metres tall (J. Strejček, pers. comm.).

Distribution. Russia: Caucasus centr., Teberda, Kislovodsk.

Morphological remarks. Voss (1960) erected the new subgenus *Pseudocorimalia* Voss, 1960 for two new species *Corimalia exsanguis* Voss, 1960 and *Corimalia pilosella* Voss, 1960 based on the following characters; six-segmented funicle, three-segmented club with a vague final segment and elytra without humeral angles. Zherikhin (1972) listed *Corimalia aliena* (Faust, 1890) with either five or six segments in the funicle, and also observed that Voss (1964) presented a similar state, with variable number of segments in the funicle, for the species *Corimalia discreta* Voss, 1964 and *Corimalia gyrata* (Peyerimhoff, 1929). Furthermore, Zherikhin (1972) listed that the variability in the count of segments in the funicle is widespread in the genus *Corimalia* Gozis, 1885 and denies the possibility of using this character to define subgenera. Alonso-Zarazaga (1989) in the key of Palaearctic taxa of the subfamily Nanophyinae noted unequivocally that species of the genus *Corimalia* have the funicle strictly with 5

segments, and in comments on this genus explains the sixth segment as the isodiametric first segment of the club, supported by its identical spots and vestiture to a club, but different from previous segments in the funicle. A three-segmented club and six-segmented funicle has been mentioned already by Reitter (1890) in the description of *Nanophyes fausti* (currently in the genus *Corimalia*). This situation is also evident in other species, e.g. *Corimalia aliena*, *C. helenae* Korotyaev & Zherikhin, 1996, *C. chinensis* (Faust, 1890) and others. On the other hand, species with a shorter and wider club (e.g. *Corimalia postica* (Gyllenhal, 1838)) have evidently only a five-segmented funicle. However, the evaluation of the affiliation of the controversial segment of the antenna is not the subject of this paper, and it could be a subject for some future detailed morphological review.

Check list of Corimaliini species from Caucasus

Allomalia setulosa (Tournier, 1868) (*Nanophyes*)

- = *biskrensis* H. Brisout de Barneville, 1869 (*Nanophyes*)
- = *juncta* Pic, 1919 (*Nanophyes*)
- = *ruficolor* Pic, 1935 (*Nanophyes*)
- = *separata* Pic, 1925 (*Nanophyes*)
- = *thoracica* Pic, 1925 (*Nanophyes*)

Corimalia fausti fausti (Reitter, 1890) (*Nanophyes*)

Corimalia helenae Korotyaev & Zherikhin, 1996

Corimalia strejceki Schön & Skuhrovec, sp. nov.

Hypophyes hyalinus (Zherikhin, 1972) (*Corimalia*)

- = *betpakdalensis* Bajtenov, 1982 (*Corimalia*)

Hypophyes minutissimus (Tournier, 1868) (*Nanophyes*)

- = *alfieri* Pic, 1926 (*Nanophyes*)
- = *externenotatus* Pic, 1935 (*Nanophyes*)
- = *fayoumensis* Pic, 1935 (*Nanophyes*)
- = *liliputanus* H. Brisout de Barneville, 1869 (*Nanophyes*)
- = *maculithorax* Pic, 1897 (*Nanophyes*)
- = *maculatus* Tournier, 1868 (*Nanophyes*)
- = *modicenotatus* Pic, 1901 (*Nanophyes*)
- = *scapularis* Pic, 1925 (*Nanophyes*)
- = *unidentatus* Pic, 1929 (*Nanophyes*)
- = *tepensis* Pic, 1929 (*Nanophyes*)

Titanomalia komaroffi (Faust, 1877)

- = *auletoides* Reitter, 1911 (*Nanophyes*)

Key to the species of the tribe Corimaliini from Caucasus

1. Antenna with four-segmented funicle 2
- Antenna with five (six) segmented funicle 5
2. Body black. Rostrum distinctly bent. First two protarsomeres approximately of the same length, slender and distinctly elongate, protarsomere II more than 2.2 times as long as wide *Titanomalia komaroffi*
- Body yellow, sometimes a few brown spots. Rostrum straight. First two protarsomeres also approximately of the same length, but wider and less elongate, protarsomere II less than 2.0 times as long as wide. 3
3. Base of elytra without distinct line of black denticles. Club compact without distinctly differentiable segments. *Hypophyes minutissimus*
- Base of elytra with distinct line of black denticles. Club compact, more elongate, and with distinctly differentiable segments. 4
4. Internal side of femora with one small, but distinct tooth. Elytra elongate, 1.20–1.33 times as long as wide. Penis symmetric. *Hypophyes hyalinus*
- Internal side of femora with one large and one small tooth, both distinct. Elytra oval, 1.10–1.23 times as long as wide. Penis asymmetric *Allomalia setulosa*
5. Length of body less than 1.6 mm *Corimalia fausti fausti*

- Length of body more than 1.9 mm 6
- 6. Length of body 1.90–2.65 mm. Apex of meso- and metatibia in males with distinct mucro, which partially overlapped by apical comb of setae. Length of rostrum in males 0.68–0.89 mm, and in females 0.78–1.13 mm (rostrum in females 1.18× as long as in males) *Corimalia helenae*
- Length of body 2.92–3.25 mm. Apex of metatibia in males with distinct mucro, but mesotibial mucro distinctly smaller. Length of rostrum in males 1.03–1.13 mm, and in females 1.50–1.71 mm (rostrum in females 1.46× as long as in males). *Corimalia strejceki*

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