

***Karolinella karolinaezuzannae*, a new genus and new species from China
(Coleoptera: Scarabaeidae: Aphodiinae)**

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Abstract. Based on single male specimen of Aphodiini from China a new genus is erected and a new species *Karolinella karolinaezuzannae* gen. nov. and sp. nov. is described. The diagnosis of the new genus and species are given. Photographs of new taxon are presented.

INTRODUCTION

During examination of materials from my collection I found a single specimen of undescribed Aphodiini species, which additionally proved to be a member of an undescribed genus. A few of its features make it a very characteristic taxon, impossible to mistake with any other known genus, or species, although when we use the key to genera by Dellacasa et al. (2001) its determination can be problematic as shown in the discussion.

MATERIAL AND METHODS

The specimen was observed with a Nikon SMZ-U stereoscopic microscope. The photos published here were taken by the use of the Canon EOS 5D Mark III connected with Canon MP-E 65 mm macro lens. Photographs were edited in Helicon Focus programme.

For morphological terms used in the description of epipharyngeal structures I follow Dellacasa et al. (2001).

The holotype of the new species is indicated by a red, printed label added to the same pin and bearing the status of the specimen, sex, its name, name of the author, month and year of the designation.

The holotype is deposited in private collection of author.

Addenda and remarks are found in brackets, separate label lines are indicated by slash (/), separate labels by double slash (/).

RESULTS

Karolinella gen. nov.

Type species. *Karolinella karolinaezuzannae* sp. nov. by the original designation.

Description. Moderately large (5.5 mm), elongate, moderately convex, shiny, glabrous. Pronotum and head blackish, elytra dark brown. Head relatively wide with genae protruding considerably more than eyes. Clypeus with broad, deep emargination in the middle, rounded on each side, margins glabrous rather narrowly bordered. Frontoclypeal suture in form of fine line, not tuberculate. Pronotum convex, transverse, with very slightly rounded sides. Anterior margin not bordered; sides and hind angles bordered; base serrulate, more clearly on the sides. Punctuation of pronotum double. Scutellum small, triangular with sides slightly ogival. Elytra elongate, with ten striae and ten intervals, and without humeral denticles. Punctures in striae moderately large, crenating distinctly the intervals. Protibiae with three distinct teeth on outer margin, and also with a few smaller, rather indistinct, irregularly spaced teeth at lower side. In male, apical spur of protibiae rather narrow, very distinctly downturned and bent outwards. In male, inferior apical spur of mesotibiae distinctly inwardly bent before apex. Metatibiae superior apical spur similar in length to the first tarsal segment. Metatibiae apex fimbriate with rather short spinules, very slightly unequal in length. In male, meso-metaventral plate very distinctly concave, with fine, very sparse punctuation. Aedeagus elongate, with paramera slightly shorter than phallobase, at apex indistinctly upturned, with large membranous processes. Epipharynx transverse, with sides nearly straight, anteriorly slightly sinuate on each side of corypha. Corypha weakly protruding with few short cels. Tormae long.

Differential diagnosis. See discussion below.

Etymology. Names of the new genus and new species are both dedicated to my daughter Karolina (Zuzanna). Feminine in gender.

Karolinella karolinaezuzannae sp. nov.

(Figs. 1-11)

Type locality. China: N Sichuan, Zhangla (Kungani), pass between Songpan and Juijagov, 4200 m.

Type material. Holotype (♂): CHINA: “N Sichuan, Zhangla (Kungani) / pass between Songpan and / Juijagov 4200 m., 06.07.2015 / leg. V. Patrikeev // HOLOTYPE (♂) / *Karolinella* gen. nov. / *karolinaezuzannae* sp. nov. / det. Ł. Minkina (12.2016) [red printed label]”.

Description of holotype (♂). Dorsum (Fig. 1). Total body length 5.5 mm. Body elongate, moderately convex, head and pronotum except for somewhat paler extremities blackish, elytra dark brown, slightly paler on sides before apex, shiny. Dorsal surface glabrous.

Head (Fig. 8) relatively wide, slightly convex, shiny, without microreticulation. Clypeus anteriorly finely but clearly bordered, very distinctly sinuate at middle, rounded on each

side, not notched before genae, with border not bristled. Genae rounded, distinctly more protruding than eyes, with few setae. Frontoclypeal suture fine, but rather distinctly visible, not tuberculate. Clypeus distinctly punctate, punctuation fine, rather sparse, but deep, and slightly rough, especially before frontal suture.

Pronotum transverse, wide, with the same width as base of elytra, widest near the middle, rather moderately convex, shiny, without microreticulation, with double punctuation: smaller, rather regular, rather dense, moderately fine punctures and larger, slightly irregular, rather dense, quite large punctures. Anterior angles rounded; hind angles ogivally rounded. Sides and hind angles bordered, with few short, sparsely located setae; anterior margin not bordered; basal margin serrulate. Serrulation more distinct on sides of base of pronotum (Fig. 9).

Scutellum small, triangular, with sides slightly ogival, without punctures; shiny; with a trace of microreticulation.

Elytra elongate, moderately convex, very slightly widened posteriorly, widest posteriorly of midlength, with ten striae and ten intervals, without humeral denticles, glabrous; shiny, without microreticulation. Striae distinct with distinct, moderately large punctures. Punctures in striae distinctly indenting the margins of intervals. First and tenth, second and ninth, third and eighth, fourth, and seventh, fifth, and sixth striae joined before apex; eighth and ninth striae shortened before elytral base. Intervals shiny, very slightly convex, with simple irregular punctuation; the punctures here are moderately fine, but quite deep.

Femora finely and sparsely punctate; profemora with a row of large, punctures equipped with macroseta near posterior border; mesofemora with row of large, punctures equipped with macroseta near anterior border; metafemora with only few large, punctures equipped with macrosetae on sides. All femora shiny without microreticulation. Protibiae distinctly tridentate on outer margin; proximally with few very small teeth, upper side smooth, shiny, with a few extremely small punctures, with long, rather narrow, very distinctly bent downward and outward apical spur (Fig. 8). Meso- and metatibiae with strong transverse carinae, apically fimbriate (Figs. 7, 11), with rather short spinules of slightly unequal length. Mesotibiae inferior apical spur distinctly bent inwardly. Metatibiae superior apical spur with same length as basal metatarsomere. Claws narrow, moderately arcuate.

Macropterous.

Venter (Fig. 2). Meso-metaventral plate shiny, very distinctly concave in middle, with very fine and very sparse punctuation, without microreticulation. On the border of meso-metasternal plate with concentration of fine punctures and with very short macrosetae. Sternites moderately shiny, very densely, moderately coarsely punctate; with distinct microreticulation. All punctures on sternites with short, very thin in middle, and very long on sides macrosetae. Pygidium with structure similar to sternites, but more densely punctate.

Aedeagus (Figs. 4, 5) elongate, with paramere slightly shorter than their basis, at apex indistinctly upturned, with large, longitudinal membranous processes.

Epipharynx (Fig. 6) transverse, with sides nearly straight, anteriorly slightly sinuate on each side of corypha. Corypha weakly protruding, with few short celtes. Tormae long.

Distribution. China: Sichuan.



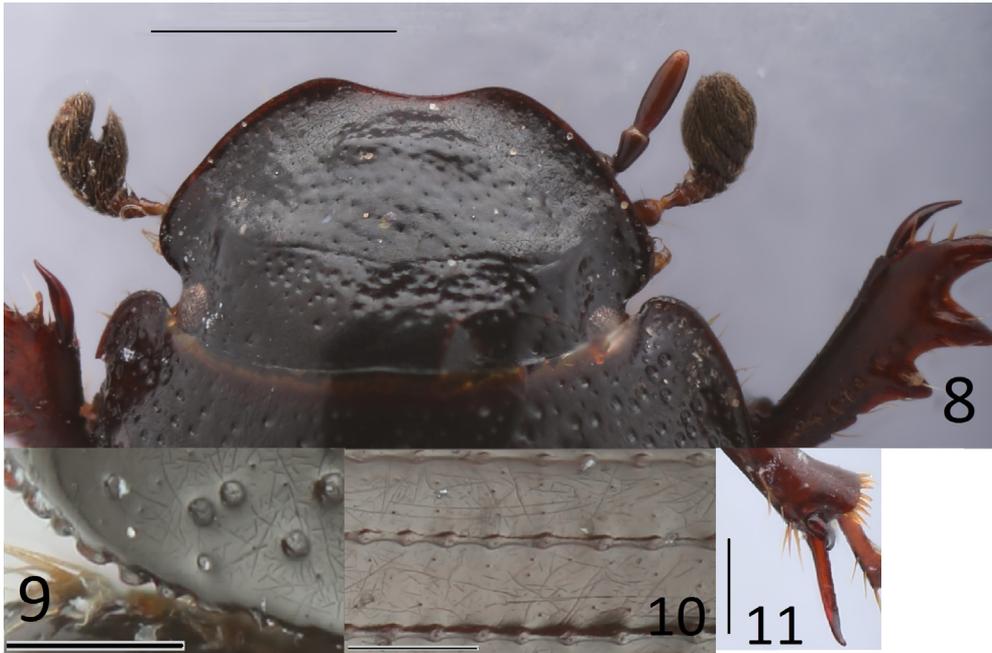
Figs. 1-3. Habitus of *Karolinella karolinaezuzannae* sp. nov., ♂: 1- dorsal view, 2- ventral view, 3- lateral view. Figs. 1-3: scale line: 1.0 mm.

DISCUSSION

The species of the new genus certainly belong to the tribe Aphodiini because of the abdominal ventrites not being fused one with another, very distinct transverse carinae on middle and metatibiae, as well by shape of epipharynx and number of other features. The new genus has some very characteristic features, but a some of them make it problematic to place according to the key to genera of Aphodiini by Dellacasa et al. (2001). Scutellum is a triangle, but with slightly ogival sides; meso- and meta tibiae have at apex quite short spinules (but not so distinctly short as for example *Parammoecius* Seidlitz, 1891), with



Figs. 4-7. *Karolinella karolinaezuzannae* sp. nov., ♂: 4- aedeagus, dorsal view, 5- aedeagus, lateral view, 6- epipharynx, 7- mesotibia, front view. Figs 4, 5: scale line: 1.0 mm. Fig. 6: scale line: 0.1 mm. Fig. 7: scale line: 0.5 mm.



Figs. 8-11. *Karolinella karolinaezuzannae* sp. nov., ♂: 8- head and protibiae, 9- base of pronotum on sides, 10- structure of elytra, 11- mesotibia, ventral view. Fig. 8: scale line: 1.0 mm. Figs. 9-11: scale line: 0.25 mm.

only slightly unequal length, which can be misleading. Shapes of inferior apical spur of mesotibiae, apical spur of protibiae of males, structure of ventral side of protibiae, aedeagus, epipharynx, distinctly concave meso-metaventral plate are very characteristic, and can be helpful in identification, but it is difficult to refer them to other Aphodiini. In my opinion most characteristic is shape of base of pronotum, which is bordered only on a very short part - in hind angles, and on is serrulate remaining surface. Serrulation is distinctly visible on sides, in the middle is less distinctly visible, because that part of border is more downward turned. Serrulation here is better visible, when it is observed from the front, or side. In this case I propose to modify the key to genera by Dellacasa et al. (2001) in couple 10:

- | | |
|--|------------------------------|
| 10. Pronotum with lateral and/or basal margins more or less strongly serrulate. | 11 |
| - Pronotum with basal and lateral margins not serrulate. | 12 |
| 11. Pronotum with lateral margin serrulate. Apterous species. | |
| <i>Mozartius</i> Nomura & Nakane, 1951; <i>Koreoxyomus</i> Kim, 1996 | |
| - Pronotum with lateral margin not serrulate. Macropterous species. | <i>Karolinella</i> gen. nov. |

The new genus is placed in the key near the genera *Mozartius* Nakane, 1951, and *Koreoxyomus* Kim, 1996. However, in my opinion, it is most closely related to the genera *Pseudacrossus* Reitter, 1892, and *Qingaphodius* Král, 1997. The new genus is most similar to these genera because of: proportions and colour of body, shape of head (clypeus distinctly sinuate in the middle, with sides rounded, genae more protruding than eyes, frontoclypeal

suture not tuberculate), anterior margin of pronotum not bordered, triangular, small scutellum with ogival sides, slightly similar spinules at apex of meso- and metatibiae, as well by modified inferior apical spur of mesotibiae, and by structure of epipharynx.

However, because of very characteristic shape of aedeagus, different from all members of both genera, very characteristic, nearly entirely serrulate base of pronotum, distinctly apically bent inferior spur of mesotibiae, shape of spinules at apex of meso- and metatibiae, the new species becomes unique not only when compared with both mentioned genera but with all other Aphodiini as well.

The new genus can be placed near *Pseudacrossus* Reitter, 1892, and *Qingaphodius* Král, 1997 in the key to genera of Dellacasa et al. because: *Karolinella* gen. nov. has hind tibiae apex with rather short spinules of only slightly unequal length, base of pronotum serrulate nearly along entire length, elytra quite glabrous. However, relatively numerous species from both compared genera cannot be identified with the key to genera of Dellacasa et al. (some of them have distinct humeral denticles, or base of pronotum bordered etc.).

The new genus can be distinguished from *Pseudacrossus* Reitter, 1892 by: inferior apical spur of mesotibiae apically distinctly bent in males (*Pseudacrossus* Reitter, 1892 have inferior apical spur of mesotibiae apically truncate in males), aedeagus with paramere having an apical longitudinal membranous process (aedeagus in *Pseudacrossus* Reitter, 1892 is without membranous process).

The new genus can be distinguished from *Qingaphodius* Král, 1997 by: normal shape of mesotibiae of males (males of *Qingaphodius* Král, 1997 have mesotibiae with brush of dense, short and thick setae), and shape of aedeagus (membranous process at apex of aedeagus in *Qingaphodius* Král, 1997 is much wider, and general shape of aedeagus is much different).

From the two genera mentioned here, the genus *Karolinella* gen. nov. can be additionally easily distinguished by nearly entirely serrulate base of pronotum, and very distinctly concave meso-metaventral plate.

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