



Xylotrechus (Kostinicyltus) alakolensis sp. nov. (Coleoptera, Cerambycidae) from East Kazakhstan

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Abstract

Xylotrechus (Kostinicyltus) alakolensis sp. nov. from East Kazakhstan is described. Distinguishing characters from closely related species are presented and discussed. The habitus, male genitalia and habitat of the newly described species are illustrated. The new species differs from *X. (K.) arnoldii* mainly due to its denser pubescence, stockier body sculpture, shape of the scutellum and shorter metatarsomere 1. It can also easily be distinguished from *X. (K.) medvedevi* *inter alia* by its smaller eyes, sparser pubescence of the pronotum and elytra, shorter 3rd antennal joint and more elongate, acute lobes of the protarsomere 3. Moreover, there are distinct differences in the morphology of the male genitalia in both cases. Furthermore, the *Kostinicyltus* subgenus consists exclusively of allopatric representatives and the new described species is distributed about 1,000 km from the known localities of most of the related taxa.

Key words: *X. arnoldii arnoldii*, *X. arnoldii tenebrosus*, *X. medvedevi*, *X. zaisanicus*, *X. katerinae*, *X. volkovitshi*, Chenopodiaceae, Amaranthaceae, new species, allopatric species, taxonomy

Introduction

The genus *Xylotrechus* Chevrolat, 1860, in addition to its nominotypical subgenus, consists of five other subgenera: *Kostinicyltus* Danilevsky, 2009; *Ootora* Niisato & Wakejima, 2008; *Rusticoelytus* Vives, 1977; *Turanoclytus* Sama, 1994 and *Xyloclytus* Reitter, 1913 (Danilevsky 2017). The subgenus *Kostinicyltus* with the type species *Xylotrechus zaisanicus* Plavilstshikov, 1940, was established for three species: *X. zaisanicus*, *X. arnoldii* Kostin, 1974 and *X. medvedevi* Danilevsky, 2009. In the same paper, the author also redescribed the first two species because additional material was discovered in the case of *X. zaisanicus* and because the original description of *X. arnoldii* was deemed inadequate. Three additional taxa were described later by Shapovalov (2014): *X. katerinae* Shapovalov, 2014; *X. volkovitshi* Shapovalov, 2014 and *X. arnoldii tenebrosus* Shapovalov, 2014.

The subgenus is characterised by pale elytra in males, which are covered with a recumbent white pubescence with indistinct or totally absent stripes and a marked sexual dimorphism. It consists of a distinct group of very rare desert species, the larvae of which develop in the roots of Chenopodiaceae (= Amaranthaceae) (Danilevsky 2009). Most taxa are distributed in Kazakhstan but a single species has also been found in Mongolia (*X. medvedevi*) and Turkey (*X. volkovitshi*).

During an entomological expedition in 2017, a new species of the genus *Xylotrechus*, which belongs to the subgenus *Kostinicyltus*, was collected in East Kazakhstan. In this paper, a male specimen belonging to the new species is compared with congeners and most similar taxa.

Material and methods

The specimen of a new species has been thoroughly investigated and compared with descriptions of other representatives of this subgenus and a key to species that is contained in the works of Danilevsky (2009) and

Shapovalov (2014), as well as with high resolution, stacked images of the type material taken by A.M. Shapovalov and presented on the websites www.zin.ru/Animalia/Coleoptera/ and <http://cerambycidae.org>.

The beetle was studied using an Optek SZM7045-J4L microscope at 7–90× magnifications. Photographs of the habitus were taken with a Canon EOS 50D digital camera equipped with a MP-E 65 mm macro lens. Photos of the genitalia were taken with a NIKON SMZ1500 stereoscopic microscope equipped with a Nikon DS-Si1 camera and photos of the habitat at a *locus typicus* were taken with a Canon EOS 600D. The images that were produced were stacked, aligned and combined using Zerene Stacker software (www.zerene.com).

The specimen of a new species was caught by the second author using the sweep-netting method.

The holotype has been deposited in Zoological Museum in Saint-Petersburg (Russia) where other type specimens of the subgenus *Kostinicytus* are located.

Taxonomy

Xylotrechus (Kostinicytus) alakolensis sp. nov.

(Fig. 1A–F)

Type material. Holotype: male (Fig. 1A): KAZAKHSTAN, East Kazakhstan Region [Шығыс Қазақстан облысы]: 15 km NW of Taskesken [Таскескен] (47°18'N, 80°36'E), 15.06.2017, 627 m.a.s.l., Wojciech T. Szczepański leg.

Description. Morphology. The habitus of the male holotype is presented in Fig. 1A. Body length: 12.1 mm, width (at humeri): 3.7 mm. Integument of whole body brown; legs and antennae lighter, slightly reddish; head and prothorax dark-brown; elytra light-brown. Pubescence of whole body whitish, recumbent and rather sparse; more irregular on head and pronotum; central part of pronotum with shorter hairs or completely hairless; elytra with denser pubescence in central part, especially below scutellum; hairs form distinct median transverse and posterior oblique stripe below and barely discernible rudimentary stripes above hind femora; humeri almost bare; pubescence on propygidium uniform, very dense, almost completely concealing cuticle; ventral side with moderately dense white recumbent pubescence (longer on sternites) and scattered erect setae (Fig. 1B). Head with vertically elongated frons; frontal carina distinct, “V”-shaped; distance between antennal insertions slightly shorter than between ventral eye lobes (Fig. 1C); eyes relatively small, mounted more obliquely than parallel; antennae short, 3rd antennal segment shorter than 1st and about twice as short as 1st and 2nd combined; pubescence of antennae present on all joints, irregular, disappearing towards the ends with single longer setae on segments I–V (Fig. 1D). Prothorax large, rounded laterally, slightly wider (3.7 mm) than longer (3.1 mm) (ratio 0.84), about 2.5 times shorter and of the same width as elytra at humeri (3.7 mm) with dense irregular punctuation and pair of large, distinct, centrally located depressions. Elytra almost parallel-sided, slightly narrowed towards rounded apices, about 2.1 times longer than width at humeri. Last segment of protarsi slightly longer than 2nd and 3rd combined (ratio 1.1); lobes of protarsomere 3 relatively elongate and narrowed towards apex (Fig. 1E); 1st segment of metatarsi shorter (about 0.15 times) than the remaining segments combined, metatarsomeres 2nd and 3rd combined about 2/3 as long as metatarsomere 1 (Fig. 1F). Pygidium and postpygidium rounded.

Male genitalia. Median lobe (Fig. 2A) approx. 1.8 mm long, slightly longer than parameres, relatively slender, lanceolate, widest medially with a distinct narrowing at 2/3 of its length; in this place with small membranous lobes on sides, tip in the shape of a triangle, gradually tapering toward apex, which is slightly rounded; endophallus ca. twice as long as median lobe. **Lateral lobes** (Fig. 2B) approx. 1.75 mm long; lateral lobes of tegmen relatively short, a little shorter than length measured from tegmental ring to base of lateral lobes; apex rounded with long yellow-brown hairs concentrated on top and shorter ones on sides; tegmental ring slightly narrows towards base; manubrium fused and significantly elongated.

Differential diagnosis. With a male body length of 12.1 mm and width of 3.7 mm, *Xylotrechus alakolensis* is the largest known representative of the *Kostinicytus* subgenus. In general, the new species has a relatively narrowest median lobe with the longest and most slender apex of the entire subgenus. Looking at the external habitus, the new species is most similar to *X. arnoldii arnoldii* but it can easily be distinguished by its clearly denser pubescence (especially on the pronotum, outer elytral edges and propygidium), stockier body sculpture,

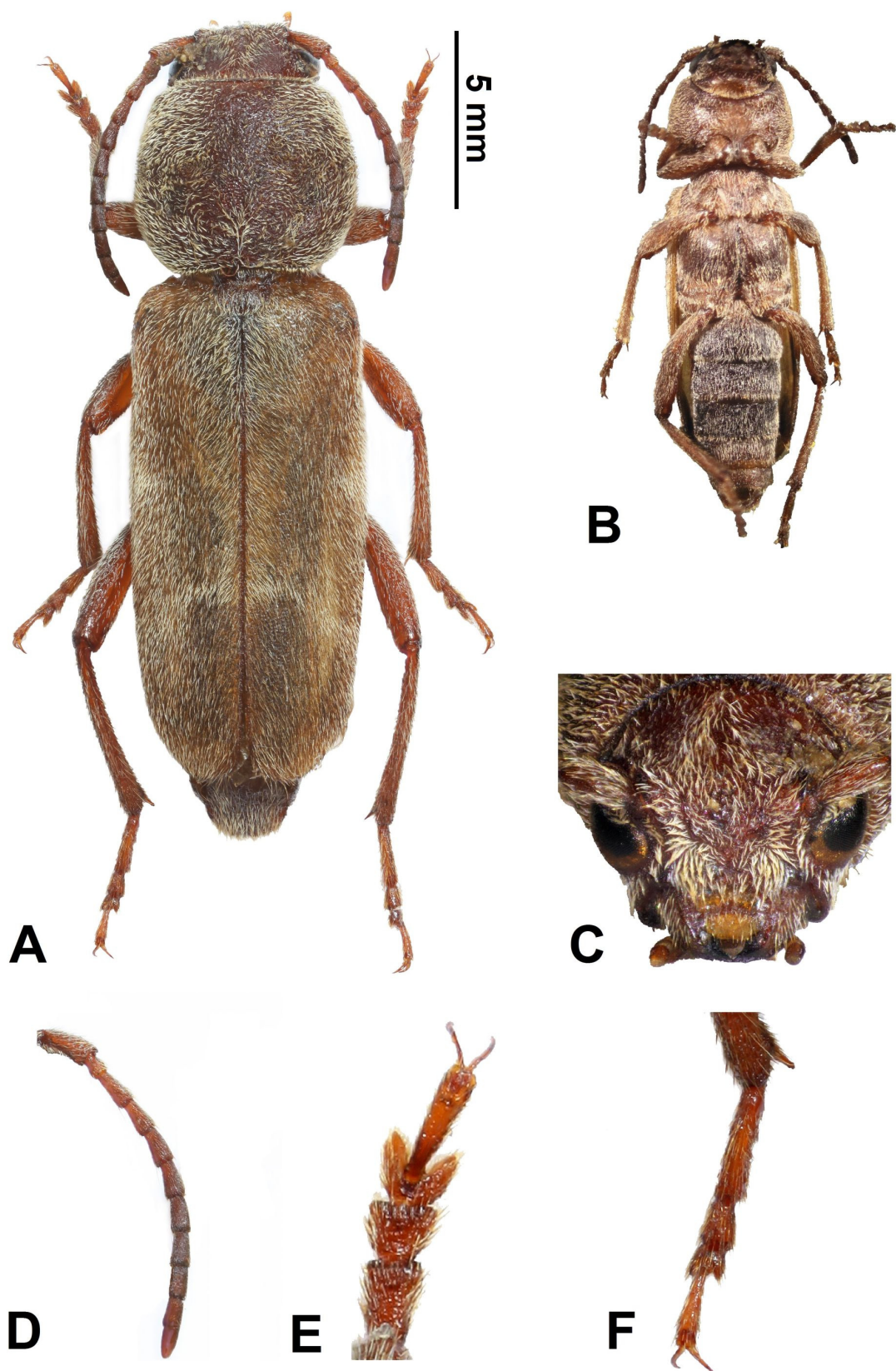


FIGURE 1. Habitus, head, antenna and tarsi of *Xylotrechus alakolensis* sp. nov. (male, holotype): **A** habitus, dorsal view; **B** habitus, ventral view; **C** head; **D** antenna; **E** protarsus; **F** metatarsus.

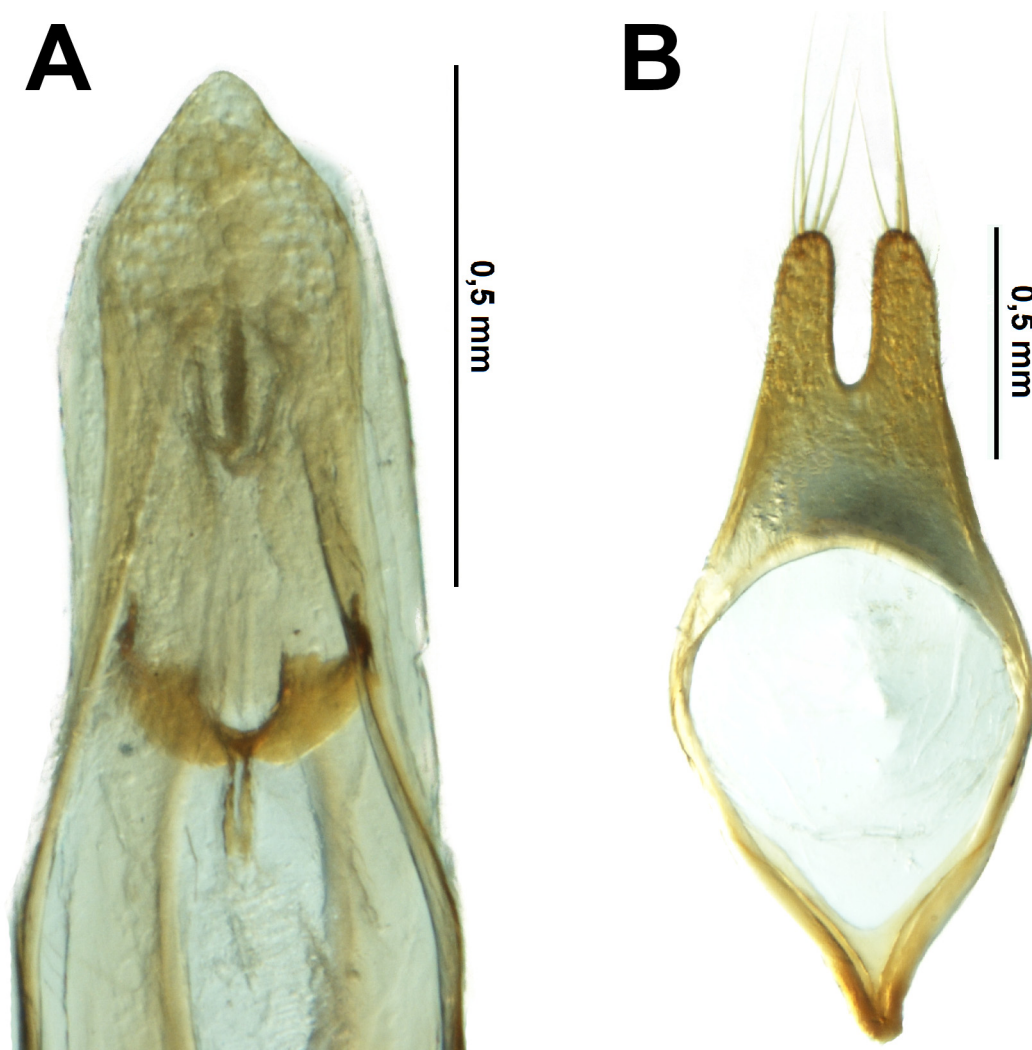


FIGURE 2. Male genitalia of *Xylotrechus alakolensis* sp. nov.: **A** apex of median lobe, ventral view; **B** lateral lobes, dorsal view.

larger body size (12.1 mm and 7.4 mm, respectively), darker elytra with less rounded and undarkened apices, a larger and more rounded scutellum, as well as by a shorter metatarsomere 1 (shorter than the remaining segments combined) and more elongate and acute lobes of protarsomere 3. Moreover, there are distinct differences in the morphology of the genitalia. The median lobe is more slender with a distinctly more elongated apex, the lateral lobes are less indented and the manubrium is more elongated. Compared to *X. arnoldii tenebrosus*, the new species has, *inter alia*, a clearly lighter body colour (especially of the legs and head); a stockier sculpture; a less hairy pronotum, scutellum and legs with sparser and thinner whitish (not yellowish in the case of the pronotum) pubescence; a denser pubescence of the elytra and propygidium, which almost completely conceals the cuticle, and a finer and barely noticeable elytral punctuation. The apex of the median lobe is clearly more elongated; the lateral lobes have a wider manubrium, which is shorter and wider at apex. The new species can also easily be separated from the second *Kostinicytus* species which has a pattern on the elytra – *X. medvedevi* – by smaller eyes and shorter distance between the antennal insertions (almost identical to the distance between the ventral eye lobes in *X. medvedevi*), shorter 3rd antennal joint (shorter than the first), sparser and shorter pubescence of pronotum and elytra, lack of a wide median stripe without white pubescence on the pronotum and distinctly more elongate, acute lobes of the protarsomere 3. The male genitalia of both species are clearly different. *X. alakolensis* is easy to distinguish from the three remaining species, *X. zaisanicus*, *X. katerinae* and *X. volkovitshi*, due to the presence of clearly visible elytral stripes that form a pattern; a much shorter, thinner and sparse pubescence and more parallel elytra, as well as the shape of the male genitalia.

Distribution. To date, this species is only known from the type material locality in Kazakhstan – East Kazakhstan Region, about 15 km NW of Taskesken.



FIGURE 3. General view of the type locality of *Xylotrechus alakolensis* sp. nov.



FIGURE 4. Detailed view of the plant community and habitat of *Xylotrechus alakolensis* sp. nov.

Biology. The holotype was collected in a steppe habitat with a very rich plant community (roadside vegetation) (Figs 3, 4) using the sweep-netting method, and therefore the exact host plant cannot be determined for certain. As for the other representatives of the *Kostinicyltus* subgenus, the new species is probably related to Chenopodiaceae (= Amaranthaceae). It is possible, however, that the larvae of this beetle may also develop in the roots and stems of other plant families (e.g. Asteraceae) since the specimens of the genus *Artemisia* were very numerous on the plot and appeared to be one of the most suitable hosts.

The only undamaged male specimen was collected in mid-June, which may indicate the beginning of the occurrence of this species in late May or early June. Unfortunately, in spite of the further intensive exploration of the site, no additional specimens of the new species were found.

Remarks. Record of “*Xylotrechus arnoldii*” from Alakol nature reserve (Kadyrbekov & Childebaev 2007) after a single male, which was previously classified by Danilevsky (2009) as probably misidentified *X. zaisanicus* and provisionally attributed later to *X. katerinae* by Shapovalov (2014), can be related with the new species. However, it should be noted that the authors have not had the opportunity to study the discussed specimen.

Etymology. The specific epithet *alakolensis* is a toponym referring to the lake that is located in the region of the type locality, Alakol Lake (Kazakh: Алакөл).

Discussion

An identification key for the subgenus *Kostinicyltus* is not included in this paper because it was already published by Shapovalov (2014). The description of this new species provides sufficient information to allow its identification and differentiation from all of the related taxa. The morphological details and high-quality figures presented here support the identification of the species. Since we have not received permission to use the original photographs of the habitus or male genitalia of the holotypes mentioned in this paper, the morphological details of other species (including the median and lateral lobes) can be compared in Shapovalov (2014).

The *Kostinicyltus* subgenus consists exclusively of allopatric representatives and the newly described species is distributed about 1,000 km from the known localities of most of the related taxa—*X. arnoldii arnoldii*, *X. a. tenebrosus* and *X. medvedevi*. In the case of the last species mentioned, in addition to the distance, the Mongolian Altai Mountains (Khüiten Peak 4374 m.a.s.l.) are an additional geographic barrier.

It is also noteworthy that the new species was collected in a steppe habitat as opposed to the other taxa of this subgenus, which clearly suggests its distinctiveness. According to Danilevsky (2009), all species are found in desert landscapes and their larvae develop in the roots of Chenopodiaceae (= Amaranthaceae). The previously known specimens were found in habitats such as sand dunes and the clay soils between them, or sandy xerophytic deserts.

To date, the following host plants of *Kostinicyltus* representatives are known: *Atriplex cana* for *X. arnoldii arnoldii* and *Kraschennikovia* sp. for *X. a. tenebrosus*, *Krascheninnikovia* (= *Eurotis*) *eversmanniana* and probably also *Anabasis* sp. for *X. katerinae* and *Halocnemum strobilaceum* for *X. volkovitshi*.

Since most of the type material of the *Kostinicyltus* subgenus is very poor, many aspects still need to be studied in this group. The morphological variability of most taxa, as well as the females of some species, remains unknown. There are probably several more taxa to describe in the deserts and steppes of Central Asia, and therefore further research on this interesting group of cerambycids should be conducted.

Acknowledgements

We are grateful to Lech Kruszelnicki (Poland) for taking the main photograph of the habitus. We also want to express special thanks to Adam Larysz (Upper Silesian Museum, Poland) for his help in taking the photographs of the genital structure and to Oimahmad Rahmonov (University of Silesia, Poland) for his assistance in determining the possible host plants.

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