

Review of Curculionoid Beetles of the Genus *Arnoldibelus* Leg. from the Jurassic of Kazakhstan (Coleoptera: Nemonychidae)

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Abstract—The genus *Arnoldibelus* is reviewed. Two new species, *A. zherichini* and *A. gratshevi*, closely related to *A. karatavicus*, from the Middle–Late Jurassic of the Karatau Mountains are described. An identification key to species of the genus *Arnoldibelus* is provided.

Key words: Coleoptera, Nemonychidae, Eobelinae, *Arnoldibelus*, Jurassic, Karabastau Formation, Kazakhstan, review, new species.

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INTRODUCTION

The Mesozoic curculionoid beetle fauna of the Karatau locality (Kazakhstan, South Kazakhstan Region, Baidibekskii District, fossil site near the village of Mikhailovka; Middle–Upper Jurassic, Karabastau Formation) is extremely rich and still insufficiently described (Gratshev and Zherikhin, 2003). Two curculionoid families, Nemonychidae and Ithyceridae, have been recorded in this locality (Legalov, 2009a, 2009b, 2009c). Undescribed species belonging to the recently established genus *Arnoldibelus* have been found among the material stored in the Borissiak Paleontological Institute of the Russian Academy of Sciences, Moscow (PIN). The examination of this material allowed reviewing the genus *Arnoldibelus*.

SYSTEMATIC PALEONTOLOGY

Family Nemonychidae Bedel, 1820

Subfamily Eobelinae L. Arnoldi, 1977

Tribe Probelini Legalov, 2009

Genus *Arnoldibelus* Legalov, 2009

Arnoldibelus: Legalov, 2009c, p. 287.

Type species *Belonotaris karatavicus* L. Arnoldi, 1977.

Diagnosis. Large (7.6–8.5 mm), robust, weakly flattened, relatively strongly chitinized, dark brown beetles. Position of rostrum close to ventral; rostrum weakly evenly curved or almost straight, sometimes narrowing towards apex. Antenna relatively short, probably attached to middle of rostrum in males and proximal to middle in females. Flagellomeres elongate. Club wider than flagellum, relatively compact. Head capsule large, wider than long. Eyes medium-sized, circular, nonconvex, greater than ro-

strum in diameter. Frons more or less strongly convex. Pronotum almost flat in dorsal view, with distinct lateral rib. Pronotal disk probably almost smooth. Elytra more or less flattened, probably with weak punctured grooves. External margin of elytra with weak incision near metacoxa. Precoxal portion of prosternum more or less elongate. Metasternum more or less elongate. Procoxa positioned near base of prosternum. Femora thickened. Tibiae almost straight, without mucro. Tarsi nondilated. Abdominal ventrites homonomous.

Species composition. *A. karatavicus*, *A. zherichini*, sp. nov., and *A. gratshevi*, sp. nov. from the Middle–Upper Jurassic of Kazakhstan.

Comparison. The genus *Arnoldibelus* is similar to the genus *Probelus* L. Arnoldi, 1977, from which it is distinguished by the tibiae without mucro and by the large body size.

Key to Species of the Genus *Arnoldibelus*

1. Rostrum shorter, more strongly curved. Frons more convex. Body narrower..... *A. karatavicus*
—Rostrum longer, almost straight. Frons less convex. Body wider..... 2
2. Profemur wider. Antenna attached to middle of rostrum. Precoxal portion of prosternum less elongate..... *A. zherichini*
—Profemur narrower. Antenna attached proximal to middle of rostrum. Precoxal portion of prosternum more elongate..... *A. gratshevi*

Arnoldibelus karatavicus (L. Arnoldi, 1977)

Belonotaris karatavicus: Arnoldi, 1977, pp. 156–157, text-fig. 87; Legalov, 2009b, p. 203.

Arnoldibelus karatavicus: Legalov, 2009c, p. 287, pl. 1, fig. a.

H o l o t y p e. PIN, no. 2066/2552, part and counterpart of adult beetle (probably male); Karatau–Mikhailovka locality; Karabastau Formation.

D e s c r i p t i o n (Fig. 1a). The beetle is relatively strongly chitinized. The rostrum is 10.3 times as long as wide in the middle, 1.6 times as long as the pronotum, 0.377 as long as the body, smoothly and weakly curved, almost not narrowing towards the apex. The frons is strongly convex. The diameter of the eye is slightly greater than the width of the rostrum basally. The temple is slightly shorter than the eye. The antenna is attached at the middle of the rostrum, 0.77 as long as the rostrum, extends beyond the anterior margin of the pronotum. The flagomeres are elongate trapeziform. The club is almost twice as wide as the flagellum, relatively short. The elytra are weakly convex, 2.49 times as long as the pronotum. The precoxal portion of the prosternum is strongly elongate. The metaventrite is weakly elongate. The metepisternum is wide. The abdominal apex is not covered by the elytra. The abdominal ventrites are almost homonomous. The pygidium is clearly visible. The procoxa is positioned near the base of the prosternum. The tibiae are dilated. The tarsi are long, with elongate trapeziform tarsomere 1.

M e a s u r e m e n t s, mm. Body length without rostrum, 8.5.

M a t e r i a l. Holotype.

Arnoldibelus zherichini Legalov, sp. nov.

E t y m o l o g y. The species is named after the late paleoentomologist V.V. Zherikhin.

H o l o t y p e. PIN, no. 2997/453, part and counterpart of adult beetle (probably male); Karatau–Mikhailovka locality; Karabastau Formation.

D e s c r i p t i o n (Fig. 1b). The beetle is strongly chitinized. The rostrum is 17.3 times as long as wide in the middle, 2.48 times as long as the pronotum, approximately 0.67 as long as the body, very weakly curved, narrowing towards the apex. The frons is convex. The eye diameter is slightly smaller than the width of the rostrum basally. The temple is weakly elongate, almost equal in length to the eye diameter. The antenna is attached at the middle of the rostrum, 0.69 as long as the rostrum, reaches the eye; the 7th flagellomere is dilated. The club is twice as wide as the flagellum, with almost trapeziform segment 1, wide; segment 2 is transverse, wider than segment 1; segment 3 is teardrop-shaped. The elytra are probably flattened, 2.7 times as long as the pronotum. The precoxal portion of the prosternum is elongate. The metaventrite is strongly elongate. The metepisternum is relatively narrow. The abdominal ventrites are probably homonomous. The procoxa is positioned near the base of the prosternum. The tibiae are weakly dilated. The tarsi are long, with elongate tarsomere 1, tarsomere 2 almost equal in length to tarsomere 1, tarsomere 3 almost bilobate, longer than wide.

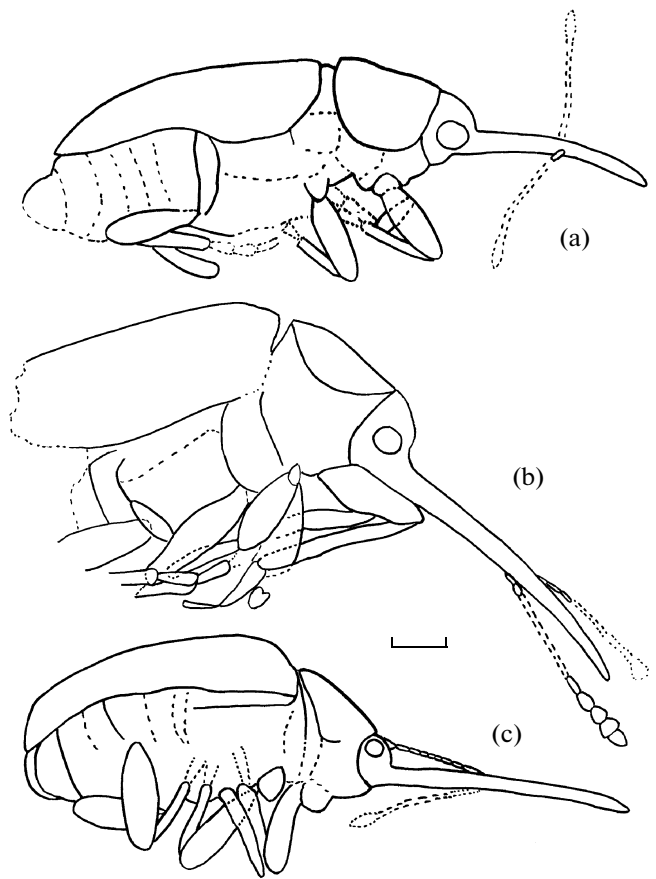


Fig. 1. Species of the genus *Arnoldibelus*: (a) *A. karatavicus* (L. Arnoldi, 1977), holotype PIN, no. 2066/2552, lateral view; (b) *A. zherichini*, sp. nov., holotype PIN, no. 2997/453, lateral view; (c) *A. gratshevi*, sp. nov., holotype PIN, no. 2904/958, ventrolateral view. Scale bar, 1 mm.

M e a s u r e m e n t s, mm. Body length without rostrum, 8.5.

D e s c r i p t i o n. The new species is closely similar to *Arnoldibelus gratshevi* and differs in the antenna attached proximal to the middle of the rostrum and in the distinctly elongate precoxal portion of the prosternum. It is distinguished from *A. karatavicus* by the longer, almost straight rostrum, the less convex frons, the wider body, and the attachment point of the antenna.

M a t e r i a l. Holotype.

Arnoldibelus gratshevi Legalov, sp. nov.

E t y m o l o g y. The species is named after the late paleoentomologist V.G. Gratshev.

H o l o t y p e. PIN, no. 2904/958, part and counterpart of adult beetle (probably female); Karatau–Mikhailovka locality; Karabastau Formation.

D e s c r i p t i o n (Fig. 1c). The beetle is relatively strongly chitinized. The rostrum is 17.5 times as long as wide in the middle, 2.33 times as long as the pronotum, 0.67 as long as the body, almost straight, weakly

narrowing towards the apex. The frons is convex. The eye diameter is equal to the width of the rostrum base. The temple is short, shorter than the eye diameter. The antenna is attached proximal to the middle of the rostrum, 0.60 as long as the rostrum, reaches the middle of the pronotum. The club is wider than the flagellum, probably relatively compact. The elytra are probably flattened, 2.47 times as long as the pronotum. The precoxal portion of the prosternum is strongly elongate. The metaventrite is elongate. The metepisternum is narrow. The pygidium is visible from under the elytra. The abdominal ventrites are probably homonomous; ventrite 5 is longer than ventrite 4. The procoxa is positioned near the base of the prosternum. The tibiae are dilated.

M e a s u r e m e n t s, mm. Body length without rostrum, 7.6.

D e s c r i p t i o n. The new species differs from the closely related *Arnoldibelus zherichini* in the antennae attached to the middle of the rostrum and in the weakly elongate precoxal portion of the prosternum.

M a t e r i a l. Holotype.

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