

New Jewel Beetles (Coleoptera: Buprestidae) from the Cretaceous of Russia, Kazakhstan, and Mongolia

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Abstract—A new jewel beetle genus, with one species (*Cretofrontolina kzyldzharica* gen. et sp. nov.) from the Upper Cretaceous of Kazakhstan is described based on a body; and three new species of the formal genus *Metabuprestium* are described based on isolated elytra: *Metabuprestium sibiricum* sp. nov. and *M. arkagalense* sp. nov. come from the Arkagala locality (Upper Cretaceous of Russia) and *M. ichbogdense* sp. nov. is from the Shar Tologoi locality (Lower Cretaceous of Mongolia).

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Key words: Coleoptera, Buprestidae, new taxa, Cretaceous, Russia, Kazakhstan, Mongolia.

INTRODUCTION

The fossils described in this publication are of interest because, until recently, no jewel beetles had been known from the Late Cretaceous. The first species was discovered in the collection of the Paleontological Institute of the Russian Academy of Sciences, Moscow (PIN), among the material from southern Kazakhstan (Turonian locality Kzyl-Dzhar), and described as a new genus and species, *Kzylordynia obscura* (Alexeev, 1995). Later, a species of another new genus from the same locality and two additional species from Russia (Turonian of Yakutia, the Arkagala locality) were found in the same collection; they are described in the present paper. Each of these species displays some characters in the system of longitudinal punctate striae on their elytra that are absent or only rarely occur in the Early Cretaceous buprestids and seldom occur in the recent jewel beetles (they are less rare in the subfamilies Psilopterinae and Sphenopterinae). The fourth species described below, from the Lower Cretaceous of Mongolia (Shar Tologoi locality), displays the pattern of longitudinal punctate striae common for the Lower Cretaceous jewel beetles.

The examined specimens are deposited in the collection of PIN.

SYSTEMATIC PALEONTOLOGY

Family Buprestidae Leach, 1815

Subfamily Parathyreinae Alexeev, 1993

Genus *Cretofrontolina* Alexeev, gen. nov.

Etymology. From the Latin *creta* (chalk) and *frons* (forehead).

Type species. *C. kzyldzharica* sp. nov.

Diagnosis. Small beetle, 2.6 times longer than wide, with head nearly as wide as anterior margin of pronotum. Eyes oval, slightly narrowing dorsally. Pronotum very wide, at base 2.1 times wider than long at middle, narrowing anteriorly, weakly in posterior two-thirds and more strongly in anterior one-third. Elytron with nine longitudinal punctate striae; 6th and 7th striae (counting from sutural margin) fading out at one-fifth of elytron length from apex. Intervals with oblique punctate striae. Posterior process of prosternum strongly expanded behind midlength of fore coxae, with pair of lateral pointed prominences behind coxae. Fore and middle coxae round, rather large, almost equal in size, middle pair set much closer together than anterior pair.

Composition. A monotypic genus.

Comparison. The new genus differs from all the described Mesozoic buprestids in the wider pronotum, twice as wide as long medially, and the following combination of characters: the posterior process of the prosternum is very broad, the middle coxae are positioned closer together than the fore coxae, and the 10th longitudinal punctate stria are absent.

Remarks. Among the previously described Mesozoic jewel beetles with the uniform pattern of punctate striae on the elytra, species with nine striae are extremely rare. Among extant jewel beetles, this condition is also rare, occurring more often in Chalcophorinae and Sphenopterinae.

Cretofrontolina kzyldzharica Alexeev, sp. nov.

Plate 4, figs. 1a and 1b

Etymology. From the locality name, Kzyl-Dzhar.

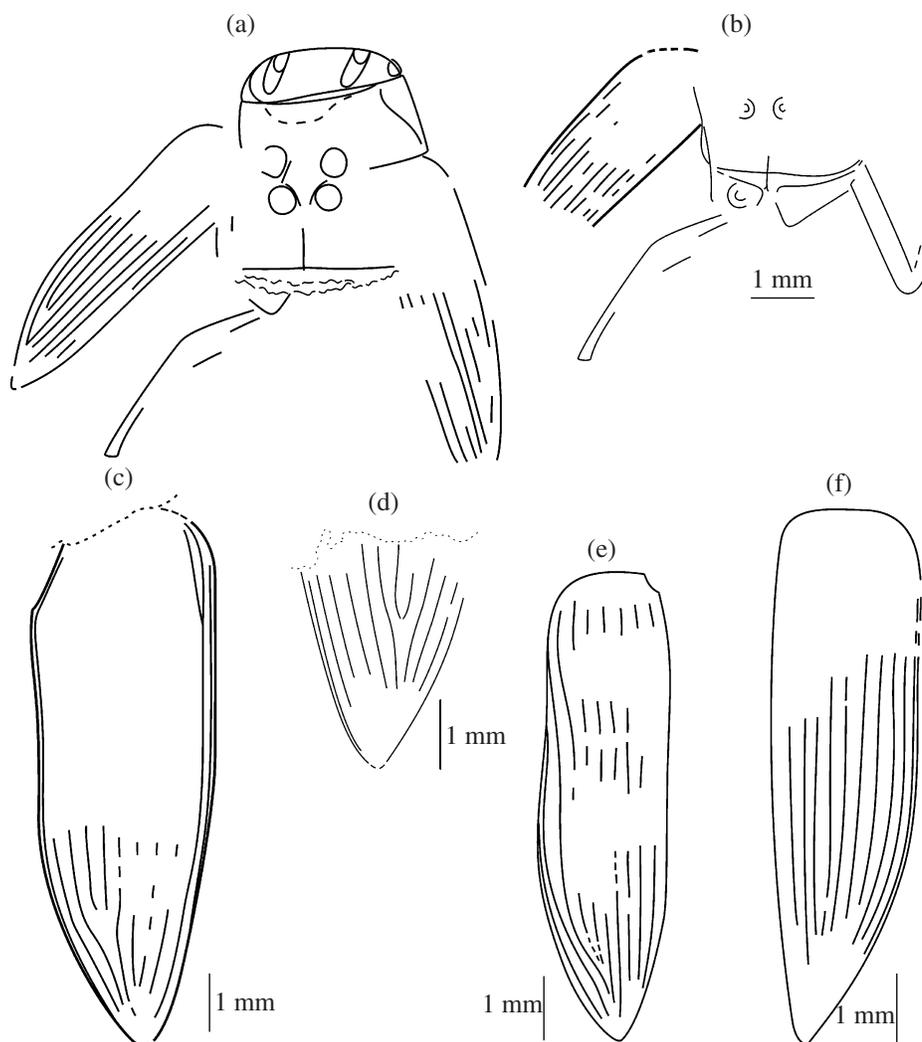


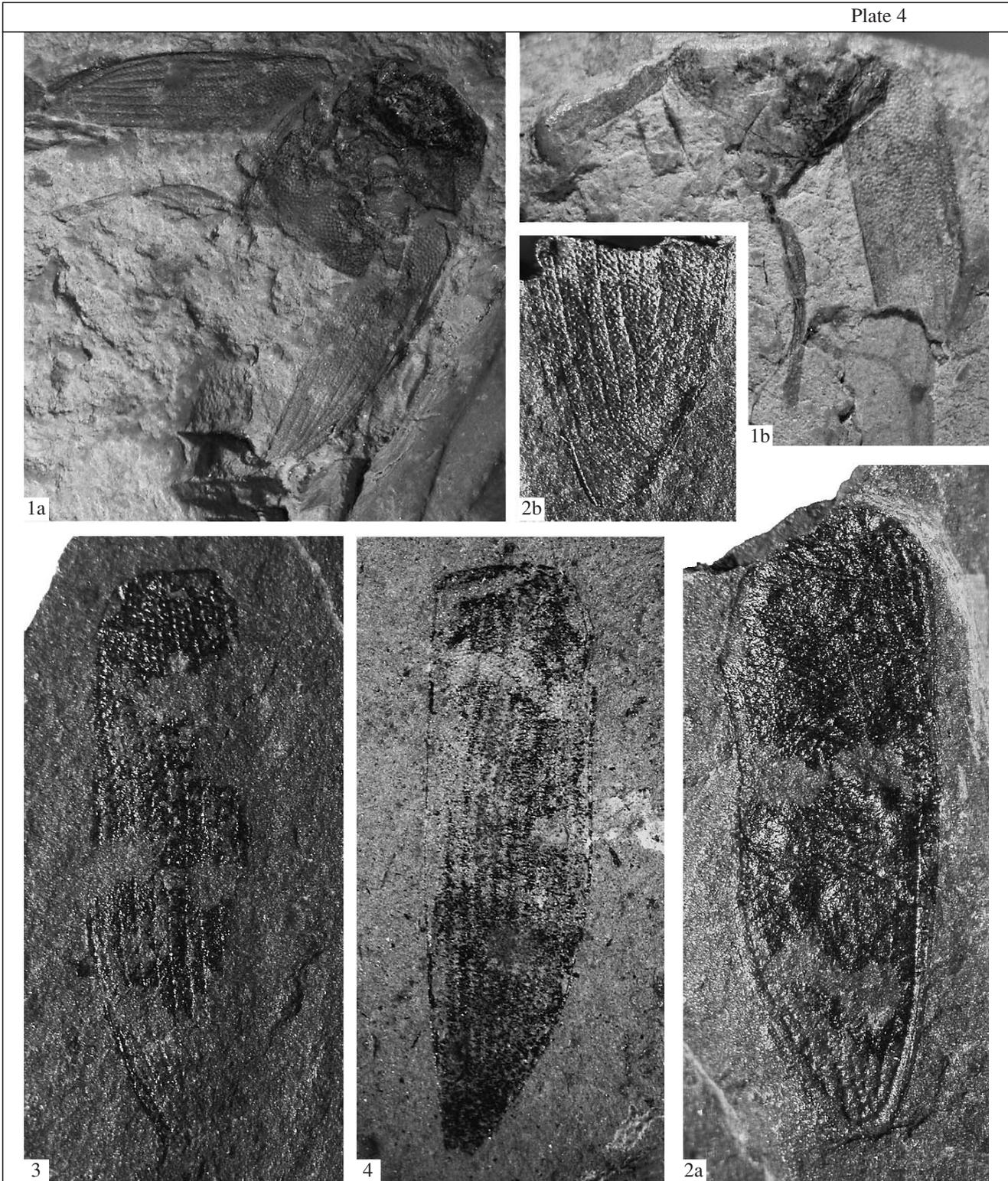
Fig. 1. Fossil jewel beetles: (a, b) *Cretofrontolina kzyldzharica* sp. nov., holotype PIN, no. 2783/104: (a) obverse impression of body, without abdomen, through which outline of the pronotum anterior margin and elytra upper surface are visible; (b) reverse impression of fragment of the thorax and elytron; (c, d) *Metabuprestium sibiricum* sp. nov.: (c) holotype PIN, no. 1832/142, obverse impression of elytron; (d) same, no. 1832/143, reverse impression of posterior one-third of elytron; (e) *M. arkagalense* sp. nov., holotype PIN, 1832/166, obverse impression of elytron; and (f) *M. ichbogdense* sp. nov., holotype PIN, no. 4271/242, obverse impression of elytron. Scale bar, 1 mm.

Holotype. PIN, no. 2783/104, obverse and reverse impressions of a small beetle lacking antennae and abdomen, with a femur, a hind tibia, and some ventral thoracic structures preserved; southern Kazakhstan, Kzyl-Orda Region, northwestern spurs of the Karatau Ridge, Kzyl-Dzhar locality; Upper Cretaceous, Turonian.

Description (Figs. 1a, 1b). The body length, measured as the sum of the lengths of the head, pronotum, and elytra, is approximately 2.6 times its width. The head is large, 0.77 times as wide as the pronotum base. The frons is very slightly convex in the transverse direction, more strongly so in the longitudinal direction. The eyes are elongated oval. The anterior margin of the pronotum has a pair of shallow emarginations, weakly arched forwards in the median three-fifths. The

pronotum in its anterior one-third narrows rather abruptly towards its anterior angles; in the posterior two-thirds, it is almost indistinctly narrowed forwards, with a weakly concave margin; its posterior margin is possibly double-concave, very slightly arched backwards in the median part, clearly seen only in a small interval near one posterior angle. The elytron length is 3.4 times its width in the anterior one-fourth. Anteriorly, it is rather strongly and unevenly narrowed towards the base; in its central two-fifths, the elytron is almost parallel-sided; in the posterior two-fifths, it is gradually arcuately narrowed (more strongly so near the apex). The elytron upper surface is rather strongly convex in the transverse direction and weakly convex in the longitudinal direction (more so in the anterior two-fifths). The longitudinal striae with the punctures are

Plate 4



Explanation of Plate 4

Fig. 1. *Cretofrontolina kzyldzharica* sp. nov., holotype PIN, no. 2783/104: (1a) obverse impression of the ventral body surface, without abdomen, through which outline of the pronotum anterior margin and elytra upper surface are visible, $\times 10.1$; (1b) reverse impression of fragment of the thorax and elytron, $\times 12.6$.

Fig. 2. *Metabuprestium sibiricus* sp. nov., holotype: (2a) PIN, no. 1832/142, obverse impression of the elytron, $\times 13.1$; (2b) PIN, no. 1832/143, reverse impression of the posterior one-third of the elytron, $\times 12.0$.

Fig. 3. *Metabuprestium arkagalense* sp. nov., holotype PIN, no. 1832/166, obverse impression of the elytron, $\times 14.0$.

Fig. 4. *Metabuprestium ichbogdense* sp. nov., holotype PIN, no. 4271/242, obverse impression of the elytron, $\times 14.0$.

rather small, separated by distances equal to their diameter. The intervals are uniformly but not very strongly convex, with two to three rows of similar punctures in weak, transverse or oblique striae. The posterior process of the prosternum is very wide between the fore coxae; behind the coxae, its lateral sides have pointed prominences. The distance between the fore coxae is 1.3 times their diameter. The middle coxae are 1.5 times closer to each other than the fore coxae. The structure of the mesosternum is not visible. The metasternum has a median suture. Fragments of the hind coxae and paracoxal suture are visible in the reverse impression; the coxae are transverse.

Measurements (mm): body length, ca. 6.9; body width, 2.7; elytron length, 5.0; elytron width in anterior one-fourth, 1.4.

Material. Holotype.

BUPRESTIDAE INCERTAE SEDIS

Formal genus *Metabuprestium* Alexeev, 1995

Metabuprestium sibiricum Alexeev, sp. nov.

Plate 4, fig. 2

Etymology. Refers to Siberia.

Holotype. PIN, nos. 1832/142, 143, obverse impression of an isolated elytron and reverse impression of its fragment in posterior one-quarter; Russia, Yakutia, Arkagala River Basin, Tal-Yuryakh Creek, Arkagala locality; Upper Cretaceous, Turonian.

Description (Figs. 1c, 1d). The elytron is 2.8 times as long as wide, not very strongly convex in longitudinal or transverse directions; in the anterior one-fourth, it is abruptly narrowed (almost rectilinearly and, more anteriorly, arcuately) towards the arcuately rounded base. From its second one-quarter to the apical one-third, the elytron tapers weakly posteriorly, with a weakly concave lateral margin; its apical one-third tapers unevenly towards the apex, its lateral outline is arcuate and, more apically, straight. The apex is rather broadly rounded. Ten longitudinal punctate striae are present; the sixth and seventh (counting from the suture) fade out at one-fifth of the elytron length from its apex. The punctures in the longitudinal striae are relatively large, usually larger than distances between adjacent punctures. The intervals contain three rows of punctures, situated within oblique striae. Adjacent to the inner margin of the elytron, there is an additional short, adscutellar stria, near which the first longitudinal punctate stria curves out, getting closer to the second stria.

Measurements (mm): length, 8.5; maximum width, 3.0.

Comparison. The new species differs from Mesozoic congeners in the following combination of characters: the elytron apex is relatively broadly rounded, the longitudinal striae are formed by large punctures, and an additional, adscutellar stria is present.

Material. Holotype.

Metabuprestium arkagalense Alexeev, sp. nov.

Plate 4, fig. 3

Etymology. From the Arkagala River.

Holotype. PIN, no. 1832/166, obverse impression of an isolated elytron; Russia, Yakutia, Arkagala River Basin, Tal-Yuryakh Creek, Arkagala locality; Upper Cretaceous, Turonian.

Description (Fig. 1e). The elytron width is 3.6 times its width at the posterior one-third of its length (the elytron sutural margin between the anterior one-eighth and the posterior one-third of the elytron length is visible only in two small intervals; in the posterior third, only along the pigmented area). In the anterior one-eighth, the elytron tapers towards its base, with a weakly arcuate lateral margin and an almost straight anterior margin; its sutural margin, in the place of the anterior angle, it has a concave emargination in the shape of a rounded triangular scutellum; elsewhere in its anterior one-third, the elytron is parallel-sided, with straight sides. In its central part, the elytron expands slightly posteriorly, with a straight lateral margin. In its posterior third, the elytron tapers very strongly towards the somewhat pointed apex; the elytron lateral margin here is strongly convex and, more apically, very slightly convex. The surface of the anterior two-thirds of the elytron is very slightly convex in both the longitudinal and transverse directions; it is relatively strongly convex in the posterior one-third. Ten longitudinal punctate striae are present; the ninth and tenth (counting from the suture) begin from the lateral margin, the sixth and seventh fade out at one-fifth of the elytron length from its apex. The punctures in the longitudinal striae are relatively large, the distances between adjacent punctures vary from one to one-and-a-half diameters of the puncture. The intervals contain smaller punctures arranged in oblique striae.

Measurements (mm): length, 7.3; maximum width, 2.0.

Comparison. The new species differs from the previously described Mesozoic species in the ninth and tenth longitudinal punctate striae beginning from the lateral margin.

Material. Holotype.

Metabuprestium ichbogdense Alexeev, sp. nov.

Plate 4, fig. 4

Etymology. From Ikh-Bogdo Mountain.

Holotype. PIN, no. 4271/242, reverse impression of an isolated elytron with its apex broken off; Mongolia, Bayan-Khongor Aimag, southeast of Ikh-Bogdo Mountain, 33 km north of Bayan-Teg Somon, southwest of Tsagan-Obo, Shar Tologoi locality; Lower Cretaceous, Aptian, Bon-Tsagan Group, Shar Tologoi Formation.

Description (Fig. 1f). The elytron width is 3.7 times its width at the middle of the basal quarter. Anteriorly and posteriorly, the elytron surface is rather strongly convex in both the longitudinal and transverse

directions. In its anterior one-eighth, the elytron strongly arcuately tapers towards the base; beginning from the anterior two-eighths to the end of the anterior half, it is parallel-sided, with its lateral margin just barely concave; in the posterior half, it tapers strongly towards the apex; the lateral margin is convex and, in the posterior one-fifth, almost straight. Apparently, the elytron apex is pointed. Ten longitudinal punctate striae are present; in the anterior one-third of the elytron, striae 1–6 (counting from the suture) are distinctly arched towards its outer margin; the 7th and 8th striae fade out at one-fifth of the elytron length from its apex. The punctures in the longitudinal striae are relatively large, the distances between adjacent punctures vary from one-and-a-half to two diameters of the puncture. The intervals contain relatively small punctures, which form more or less irregular rows in transverse or oblique striae.

M e a s u r e m e n t s (mm): elytron length, 7.5; maximum width, 2.0.

C o m p a r i s o n. The new species differs from Mesozoic congeners in the 7th and 8th longitudinal punctate striae fading out at one-fifth of the elytron length from its apex and in the 1st to 6th longitudinal striae being curved laterally in the anterior one-third of the elytron.

M a t e r i a l. Holotype.

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REFERENCES

1. A. V. Alexeev, "New Forms of Buprestidae (Coleoptera) from the Mesozoic of Russia, Kazakhstan, and Mongolia," *Paleontol. Zh.*, No. 4, 75–85 (1995).