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JURASSIC AND LOWER CRETACEOUS BUPRESTIDAE (COLEOPTERA) FROM EURASIA

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Abstract: This is a study of buprestids (Buprestidae) from the Jurassic and Lower Cretaceous of European Russia, Southern Kazakhstan and Central Mongolia, which are deposited in the Paleontological Institute of the Russian Academy of Sciences. A new subfamily, 13 new genera, and 15 new species of buprestids are described. In addition, a new genus of Lower Cretaceous buprestids from the Spanish province of Lerida is erected. It had been referred without sufficient basis to the extant genus *Chrysobothris* Esch. Some remarks are made about the morphological evolution of buprestids in the Mesozoic era.

Mesozoic buprestids, unlike Cenozoic, are infrequent. The rather numerous Jurassic beetles, including buprestids, from the Solnhofen Shales described by Deichmuller [3], Oppenheim [5], and Handlirsch [4], were revised by Ponomarenko [1, 2]. With the exception of *Eurythyrea grandis* Deichm. (which Deichmuller did not see) only *Pseudothyrea oppenheimi,* which Handlirsch considered a click beetle, may be reliably referred to the buprestids. Therefore, records of Jurassic buprestids from Russia and Southern Kazakhstan are of considerable interest. Together with Lower Cretaceous buprestids from Southern Mongolia, as well as from other localities in Russia and Mongolia not considered here, they allow certain conclusions regarding the morphological evolution of the Mesozoic Buprestidae. As the record, described below, of the *buprestid Ancestrimorpha volgensis* gen. et sp. nov. from the Bathovian (Batskiy) Stage testifies, and given the general primitiveness of this species, the complex of principal morphological characters of the Buprestidae was formed no later than the Middle Jurassic. In the Upper Jurassic (Karatau, Solnhofen) some forms are already quite similar to extant ones, as noted by Ponomarenko [1], who pointed out numerous similar features between *Pseudothyrea oppenheimi* Handl. and the recent subfamily Buprestinae as well as the absence in this species of a complete division of the mesosternum by the posterior process of the prosternum, which is characteristic of the Buprestinae. In Mesozoic buprestids known to me, it has been almost impossible to elucidate the degree of division of the mesosternum by this process, because the body is fractured along this place.

Even in cursory examination of Jurassic and Lower Cretaceous Buprestidae one important difference distinguishing all Jurassic and most Lower Cretaceous buprestids from all Recent ones is obvious—the straight or weakly arched paracoxal suture which in all Recent subfamilies except

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the Sternocerinae, is anteriorly strongly attenuate trapeziform in the middle, and in some groups has an incompletely divided mesosternum. But in some Lower Cretaceous buprestids is already a tendency toward the appearance of a rather weakly attenuate middle section of the suture in the form of a double arch *(Dicercomorpha longipennis* gen. et sp. nov.) as in the recent Sternocerinae, and a strongly attenuate trapeziform section *(Pseudochrysobothris ballae* (Whalley & Jarzembowski)), as in other extant buprestid subfamilies. Based on this, it is best to separate Mesozoic buprestids with a straight or arched paracoxal suture into a different subfamily, Parathyreinae.

The author sincerely thanks A. G. Ponomarenko and V. V. Zherikhin, without whose assistance this study could not have been completed.

FAMILY **BUPRESTIDAE** LEACH, 1815

SUBFAMILY **PARATHYREINAE** ALEKSEEV SUBFAM. NOV.

Diagnosis. Small to medium-sized, rarely large beetles (5.5-35 mm) with rounded head and elongate oval eyes. Antennae serrate, starting with the 4th segment. Elytra with 10 punctate grooves, punctations rarely indistinct. Front and middle coxae rounded, hind coxae transverse, with anterior margin perpendicular to the longitudinal axis of body. Paracoxal suture straight or slightly arched, not attenuate in the middle. Five visible abdominal sternites, 1st and 2nd sternites fused.

Composition. *Pseudothyrea* Handlirsch, 1906, from Lower Tithonian of Bavaria, and 12 new genera described below.

Comparison. Differs from recent subfamilies and from the two Lower Cretaceous genera with unresolved taxonomical position described below in having a straight or weakly arched paracoxal suture that is not distinctly anteriorly attenuate in the middle.

Genus ***Ancestrimorpha*** Alekseev, gen. nov.

Genus name. From Latin, *ancestor* (ancestor). **Type species.** *A. volgensis* sp. nov.

Diagnosis. Beetle oval, flattened. Head small, narrow. Pronotum almost 2 times as wide as long in middle, unevenly rounded on sides, expanded anteriorly from base, in anterior third more strongly narrowed toward anterior angles. Its sculpture transversely punctate-grooved, punctures large, dense. Elytra more than 3 times as long as wide, arcurately expanded toward middle, and narrowed from middle to apex. Epipleuron not broad, evidently extending to tip of elytron. Intervals with 2-3 rows of punctures and small transverse rugae. Mesosternum incompletely divided by process of prosternum. Paracoxal suture straight. Hind coxae very short, rather abruptly, but not strongly, shortened laterally. All femora expanded.

Composition. Genus monotypic.

Comparison. Differs from all genera in the combination of a narrower head and broad

pronotum, strongly anteriorly expanded in the posterior 2/3 and more steeply arcuately narrowed in the anterior 1/3; in shape of elytra which in anterior half are weakly arcuately expanded back, and in apical half smoothly arcuately narrowed toward suture; and in having very short, weakly laterally shortened hind coxae.

Ancestrimorpha volgensis Alekseev, sp. nov.

PL 1, Gg. 1

Species name. After Volga River.

Holotype. PIN No. 1066/1, cast of beetle without antennae; Nizhegorodskaya Oblast, borehole 68 of the Gorky Geological Profile Crew, depth 277.5-283.2 m (coll. I. Ya. Pedrovskaya, Moscow Branch of VNIGRI [All-Union Petroleum Geological Exploration Research Institute]; layer 12, formation 8); Middle Jurassic, Bathonian.

Description (fig. 1). Head is 0.625 times as wide as pronotum, its width 1.2 times length; eyes are large, elongate oval. Frons between eyes is strongly expanded anteriorly, where it is 1.4 times wider, with arched lateral sides, and transversely punctate sculpture, Vertex is twice as wide as eyes. Pronotum width is 1.9 times length in middle, unevenly arcuately rounded on sides, expanded anteriorly from base in posterior 2/3; anterior margin is notched, posterior margin weakly bimarginate. Elytra are 3.3 times as long as wide at humeri. Prosternum anterior to fore coxae is twice as long as coxa; its posterior process, with arcuately emarginate lateral sides between fore coxae, is as wide as coxa; posterior to coxae it is arcuately emarginately tapered to a narrowly rounded tip, with small dense punctures, and does not entirely divide mesosternum. Fore and middle coxae are rounded. Length of metasternum is 0.55 times width of its base. Hind coxae are short, weakly but rather abruptly shortened laterally. First and last abdominal sternites are twice as long as 2nd, 2nd-4th of equal length; last one is 1.4 times as wide as long, rounded triangular, with rather narrowly rounded tip. Femora are expanded toward anterior third.

Measurements, mm. Length - 12.2, width - 4.1, elytral length - 8.2.

Material. Holotype.

Genus ***Parathyrea*** Alekseev, gen. nov.

Genus name. From Greek, *thyreos* (shield). **Type species.** *P. jurassica* sp. nov.

Diagnosis. Beetle oval, flattened. Head rather small, narrow. Pronotum wide, in posterior 3/4 with inconspicuously arcuately emarginate, almost parallel lateral margins, in anterior 1/4 arcuately tapered toward anterior angles. Scutellum large, rounded trapeziform. Elytra more than 3 times as long as wide at humeri, in anterior 3/5 with almost straight parallel sides, in posterior 1/3 strongly unevenly arcuately narrowed toward apex. Intervals with 2-3 rows of punctures and slender transverse rugae. Posterior process of prosternum between anterior coxae almost as wide as coxa, its lateral margins parallel. Paracoxal suture in middle not attenuate anteriorly. Hind coxae long. First and last abdominal sternites twice as long as 2nd, sternites 2-4


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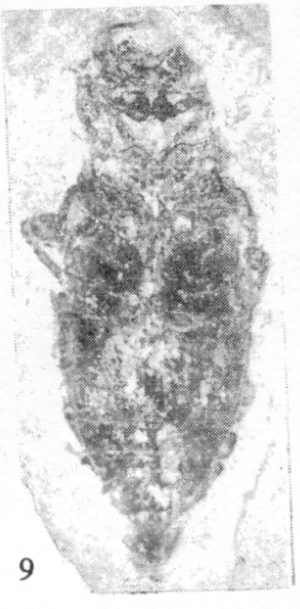
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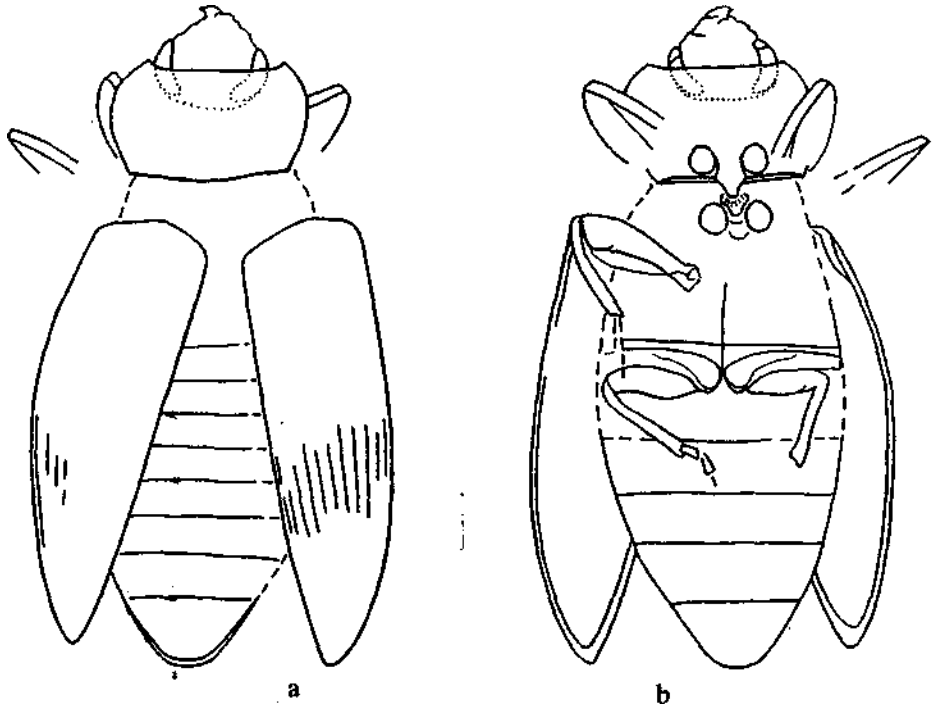

Fig. 1. *Ancestrimorpha volgensis* sp. nov., holotype No. 1066/1: a - dorsal view, *b* - ventral view.

of equal length; last sternite rounded triangular, its width 1.8 times length. Middle femora barely expanded.

Composition. 'Genus monotypic.

KEY TO PLATE I

Fig. 1. *Ancestrimorpha volgensis* sp. nov., holotype PIN, No. 1066/1 (x5.4). Fig. 2. *Parathyrea jurassica* sp. nov., holotype PIN, No. 2997/530 (X2.3). Fig. 3. *Karatausia maculata* sp. nov., holotype PIN, No. 2997/2035 (X5.5). Fig. 4. *Acmaeoderimorpha ignota* sp. nov., holotype PIN, No. 2239/1323 (x10.0). Fig. 5. *Mongoligena popovi* sp. nov., holotype PIN, No. 3559/5775 (X5.5). Fig. 6. *Mongoligena curta* sp. nov., holotype PIN, No. 3559/5771 (X4.8). Fig. 7. *Paleas maculipennis* sp. nov., holotype PIN, No. 3559/5767 (x5.0). Fig. 8. *Crassisoma indistinctum* sp. nov., holotype PIN, No. 3559/5782 (x6.8). Fig. 9. *Elegantella ponomarenkoi* sp. nov., holotype PIN, No. 3559/5797 (x5.5).

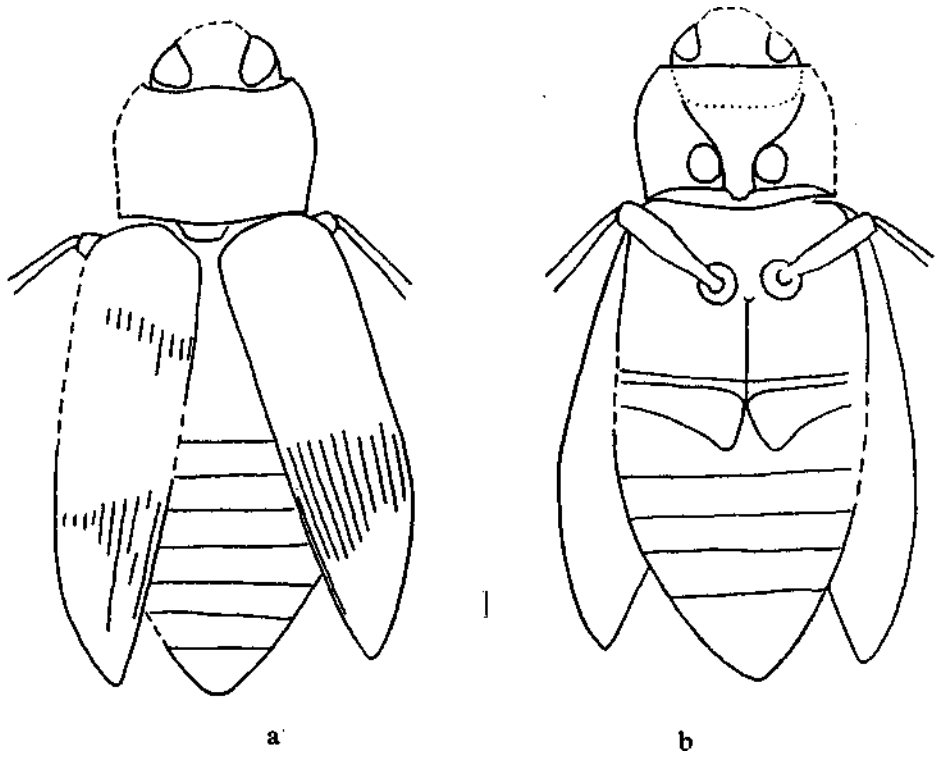

Fig. 2. *Parathyrea jurassica* sp. nov., holotype No. 2997/530: *a* - dorsal view, *b* - ventral view.

Comparison. Somewhat resembles *Pseudothyrea* Handlirsch, 1906, but differs in having a wider pronotum without a deep notch on the lateral margin in the posterior 2/5 and, particularly, in shapes of elytra which in the posterior third are strongly arcuately narrowed toward a narrowly rounded unextended tip.

Parathyrea jurassica, Alekseev, sp. nov.

PL. 1, fig. 2

Holotype. PIN, No. 2997/530 (600), mold and cast of beetle without antennae, fore and hind legs; Southern Kazakhstan, Chimkent Oblast, Auliye near Mikhaylovka (Karatau-Mikhaylovka locality); Upper Jurassic, Karabastau Formation.

Description (fig. 2). Oval, flattened beetles have indistinct punctate sculpture. Head is 0.625 times as wide as pronotum. Eyes are broad, large, elongate oval, longer than temples. Frons between eyes is expanded anteriorly where it is 1.4 times wider; on sides it is weakly arcuate, markedly convex, with a median longitudinal impression continued on vertex; sculpture of frons has large punctures. Vertex is as wide as eyes. Pronotum is 1.5 times wider than long in middle;

anterior margin is indistinctly bimarginate, posterior one weakly bimarginate. Scutellum is transverse, 3 times wider than long. Elytra are 3.5 times longer than wide at humeri. Tips of elytra are narrowly rounded, intervals with 2-3 rows of punctures visible in places and with slender transverse rugae. Prosternum anterior to fore coxae is 3 times as long as coxa. Fore and middle coxae are rounded, equally spaced. Length of metasternum is 0.42 times width of its base. Hind coxae are long, with arcuately indented posterior margin, smoothly shortened laterally.

Measurements, mm. Length - 24.3, width - 7, elytral length - 15.3.

Material. Holotype.

Genus ***Karatausia*** Alekseev, gen. nov.

Genus name. From Karatau Range. ***Type* species.** *K. maculata* sp. nov.

Diagnosis. Head large, 0.77 times as wide as pronotum. Pronotum not very wide, in posterior 3/4 with almost straight parallel lateral sides, in anterior 1/4 distinctly unevenly narrowed toward anterior angles. Scutellum round, very small. Elytra in anterior 3/5 with almost parallel sides, posteriorly narrowed toward the apex, intervals with 2-3 rows of punctures, elytral disc with large spots. Width of posterior process of prosternum almost as wide as coxa, between coxae its lateral margins parallel. Paracoxal suture in middle not attenuate anteriorly. Hind coxae very short. First and second abdominal sternites fused.

Composition. Genus monotypic.

Comparison. Differs from known Jurassic and Lower Cretaceous genera in a complex of characters: rectilinear, subparallel lateral margins of pronotum in posterior 3/4, its bimarginate anterior and posterior margins; very small rounded scutellum; 6 large spots arranged in the form of a hexagon hi the central part of the elytra.

Karatausia maculata Alekseev, sp. nov.

Pl. 1, fig. 3

Species name. From Latin, *maculatus* (spotted).

Holotype. PIN No. 2997/2035, mold and cast of beetle without posterior part of elytra, tip of abdomen, anterior part of head, antennae and legs; Southern Kazakhstan, Chimkent Oblast, Auliye near Mikhaylovka (Karatau-Mikhaylovka locality); Upper Jurassic, Karabastau Formation.

Description (fig. *3a-b).* Flattened beetle has very large elongate oval eyes. Frons between eyes is linearly expanded forward, where it is 1.3 times as wide. Vertex is almost as wide as eye. Pronotum is 1.4 times wider than long in middle; anterior and posterior margins are bimarginate; sculpture is punctate-grooved, transversely arcuate; posterior angles are straight. Elytra at humeri are a little more than half as wide as pronotum. Two sutural spots are at 1/3 and 2/3 length of elytra and a lateral spot in middle at 2/3 length; possibly, large spot is at base of elytra

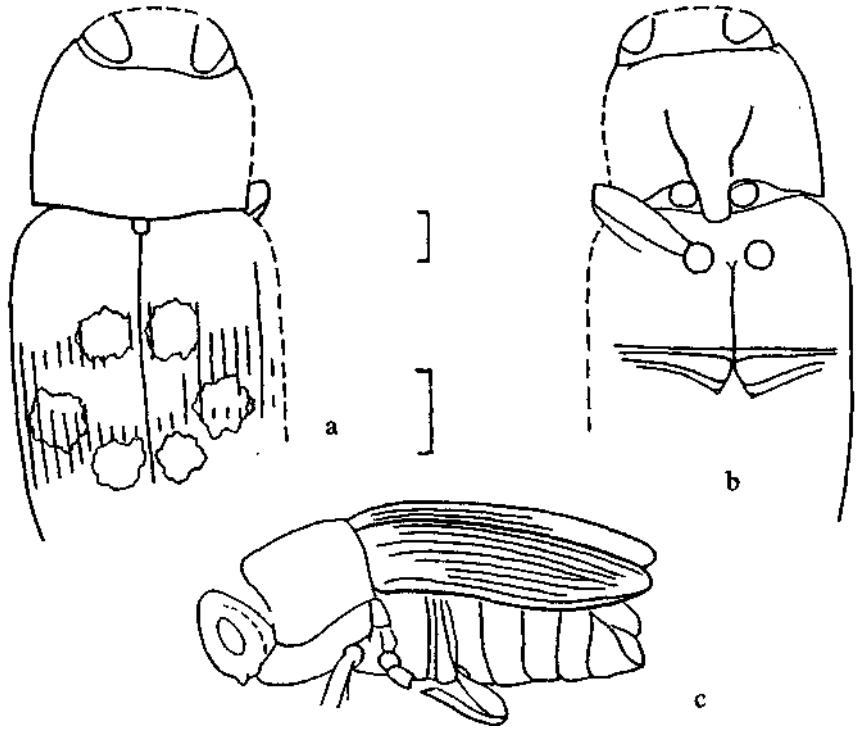

Fig. 3. *Karatausia* gen. nov. *and Acmaeoderimorpha* gen. nov.: *a, b - K. maculata* sp. nov., holotype No. 2997/2035; a - dorsal view, *b* - ventral view; *c -A. ignota* sp. nov., holotype No. 2239/1323, lateral view.

and small longitudinal spot on lateral margin in middle anterior 1/3. Prosternum anterior to front coxae is 2.3 times as long as coxa; its process continues back more than half length of coxa, broadly rounded at tip. Fore and middle coxae are rounded. Metasternum is 0.42 times as long as wide at base. Paracoxal suture is straight. Hind coxae are smoothly and slightly emarginately shortened to the side. First abdominal sternite is twice as long as 2nd.

Measurements, mm. Length of impression - 10.6; length of beetle, most likely ~ 14, width - 4.8; elytral length ~ 10.

Material. Holotype.

Genus *Acmaeoderimorpha* Alekseev, gen. nov.

Genus name. From genus *Acmaeodera.* **Type species.** *A. ignota* sp. nov.

Diagnosis. Beetle strongly convex transversely, evidently cylindrical or subcylindrical, weakly convex longitudinally. Head large, weakly convex. Eyes small, elongate oval. Pronotum weakly

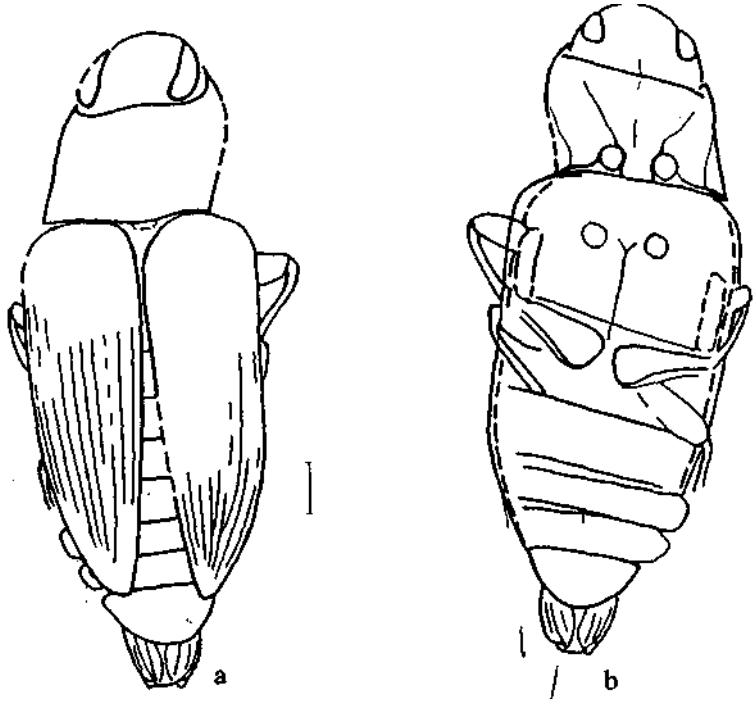

Fig. 4. *Mongoligena popovi* sp. nov., holotype No. 3559/5775:
a -dorsal view, *b* - ventral view.

expanded frontally. Elytral weakly convex longitudinally, more strongly in the anterior third, strongly convex transversely; intervals raised, with 2-3 rows of punctures. Paracoxal suture in the middle not attenuate anteriorly. Hind coxae very short. First and 2nd abdominal sternites of equal length, longer than 3rd. Hind femora expanded.

Composition. Genus monotypic.

Comparison. Differs from all known Jurassic and Lower Cretaceous genera in having a cylindrical or subcylindrical body.

Acmaeoderimorpha ignota Alekseev, sp. nov.

PL **1, fig. 4**

Species name. From Latin, *ignotus* (unknown).

Holotype. PIN, No. 2239/1323, mold and cast in lateral view, without antennae; Southern Kazakhstan, Chimkent Oblast, Auliye near Mikhaylovka (Karatau-Mikhaylovka locality); Upper Jurassic, Karabastau Formation.

Description (fig. 3c). Eyes are small, 0.42 times head depth, elongate oval, greatest diameter

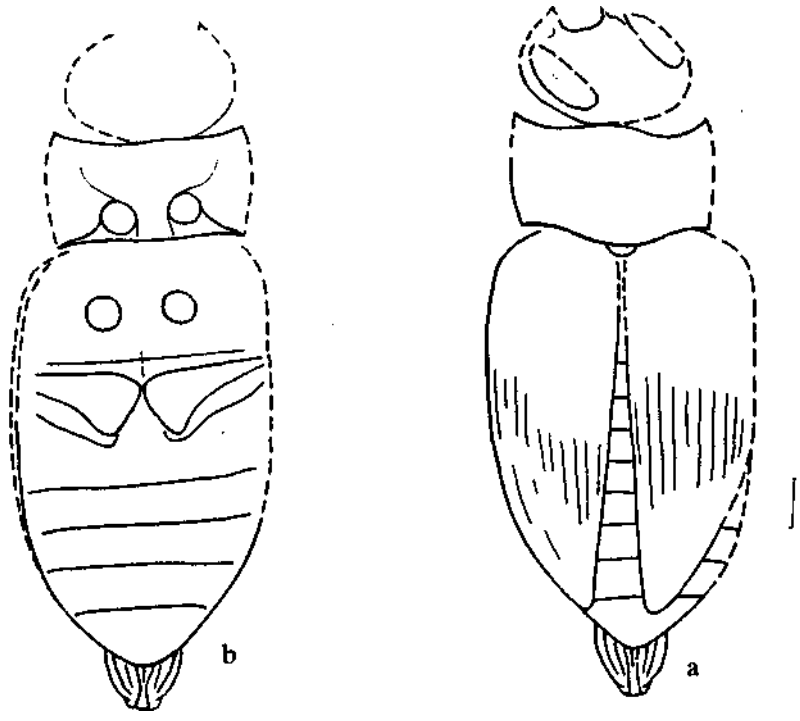

Fig. 5. *Mongoligena curta* sp. nov., holotype No. 3559/5771: *a* - dorsal view, *b* - ventral view.

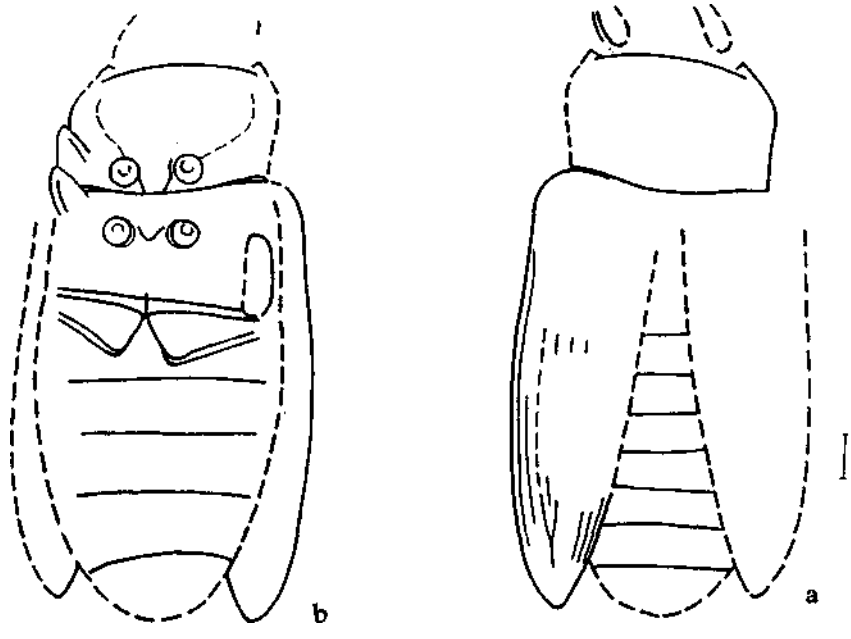

Fig. 6. *Mongoligena vulgata* sp. nov., holotype No. 3559/5766: *a* - dorsal view, *b* - ventral view.

is twice smallest diameter. Frons and vertex are punctate-grooved. Pronotum in posterior half has slightly arcuately emarginate lateral margins, evidently with bimarginate anterior and posterior margins; it is almost flat longitudinally and strongly convex transversely, punctate grooved. Scutellum is not visible. Elytra in anterior 2/3 have slightly arcuately emarginate lateral margins, in posterior third almost rectilinearly narrowed toward broadly rounded apices; epipleura are developed to apex. Fore and middle coxae are rounded. Paracoxal suture is straight. Hind coxae are strongly evenly shortened laterally. Third and 4th abdominal sternites are of equal length, last sternite a little longer than 1st, with broadly, bluntly rounded tip, hi anterior half convex longitudinally, in posterior half slightly impressed. Hind femora are expanded toward apical third.

Measurements, mm. Length - 5.5; depth at base of metathorax - 2; head depth - 1.2; elytral length - 3.5.

Material. Holotype.

Genus *Mongoligena* Alekseev, gen. nov.

Genus name. After Mongolia. **Type species.** *M. popovi* sp. nov.

Diagnosis. Small beetle with small dense deep punctures merging dorsally into transverse grooves. Head large. Pronotum rather wide, in posterior half with straight, weakly arched, sometimes emarginate lateral sides in anterior half weakly arched, rounded, tapered toward anterior angles; greatest width in middle or anterior to middle; anterior and posterior margins weakly emarginate. Scutellum transverse, rounded trapeziform. Base of elytra considerably wider than pronotum. Elytra 3.1-3.5 times as long as broad at humeri, in anterior 3/5 narrowed back, in posterior third slightly arcuately narrowed toward usually very narrowly rounded apex, with transverse punctate grooves. Prosternum with posterior process not entirely dividing mesosternum. Paracoxal suture in middle not attenuate anteriorly. Hind coxae usually rather short, strongly shortened to side. Legs with expanded femora.

Composition. Three species, described below.

Comparison. Differs from all known genera in the subfamily in the combination of characters: elytra at the base much wider than the pronotal base; elytra markedly tapered back in anterior 3/5, with very narrowly rounded apex; sculpture consisting of smaller dense deep punctures coalescing dorsally in transverse grooves.

Mongoligena popovi Alekseev, sp. nov.

Pl. 1, fig. 5 Species

name. In honor of paleoentomologist Yu. A. Popov.

Holotype. PIN, No. 3559/5775, mold of beetle (female) with middle and indistinct hind leg, without antennae; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range south of

Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 4). Eyes are elongate oval, longer than temples. Frons between eyes is wide, on sides has almost straight, subparallel sides, with punctate grooved sculpture. Vertex is 3 times as wide as eye. Pronotum is 1.5 times as wide as long in middle, in posterior half arcuately, slightly emarginately expanded frontally, in anterior half weakly arcuately rounded, weakly narrowed toward anterior angles; its greatest width is anterior to middle; anterior and posterior margins are weakly bimarginate; sculpture is punctate grooved, transversely arched. Elytra are 3.4 times as long as wide at humeri, in anterior 3/5 almost rectilinearly tapered back, in intervals are 3-4 punctures in transverse grooves. Bases of elytra are considerably wider than base of pronotum. Prosternum anterior to fore coxae is 3 times as long as coxa; posterior process is 1.2 times as wide as coxa, projecting back beyond fore coxae no more than 3/4 their length. Middle coxae are rounded, like fore ones, and equal to them in length; distance between them is 1.4 times greater than between fore ones. Metasternum is 0.48 times as long as broad at base. Paracoxal suture is straight. Hind coxae are rather short. First abdominal sternite is 1.3 times as long as 2nd, 2nd-4th are of equal length, ultimate one is 1.5 times as long as 4th, 2 times as broad as long, with wide bluntly rounded tip. Middle legs have expanded femora.

Measurements, mm. Length (without ovipositor) - 12.4, width - 5; elytral length - 8.

Material. Holotype, and paratype No. 3559/5773, and apparently Nos. 3559/2236 and 3559/2253 from the same locality.

Mongoligena curia Alekseev, sp. nov.

Pl. 1, fig. 6

Species name. From Latin, *curtus* (shortened).

Holotype. PIN, No. 3559/5771, mold of beetle (female) with fragment of middle femur and apical part of ovipositor, without antennae; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 5). Eyes are elongate oval, longer than temples. Frons between eyes has straight parallel lateral sides, is punctate grooved. Vertex is 2.7 times as wide as eye. Pronotum is 1.6 times as wide as long in middle, with weakly arcuately rounded lateral sides; anterior and posterior margins are weakly bimarginate, posterior more strongly; sculpture is punctate grooved, transversely arched. Scutellum is not visible. Elytra are 3.1 times as long as broad at humeri, almost rectilinearly tapered back in anterior 3/5, in posterior 1/3 almost rectilinearly tapered to very narrowly rounded tip. Prosternum anterior to fore coxae is twice as long as coxa; posterior process is as wide as fore coxa; its tip is not visible. Fore and hind coxae are rounded, distances between fore and hind coxae identical, equal to width of coxa. Metasternum is 0.34 times as long as wide at base. Paracoxal suture is straight. Hind coxae are strongly and rather abruptly shortened to side. First abdominal sternite is 2.5 times as long as 2nd, 2nd-4th are almost of equal length, apical sternite is 1.5 times as along as 4th, 2.8 times as wide as long, rounded triangular, with rather narrow rounded tip.

Measurements, mm. Length (without ovipositor) - 13.2, width - 4.9; elytral length - 8.

Comparison. Differs from other species in genus in proportions of pronotum, which is 1.5 times as wide as long in the middle, in smaller length of the elytron which is 3.2 times as long as broad at humeri, and in the identical distance between anterior and posterior coxae.

Material. Holotype.

Mongoligena vulgata Alekseev, sp. nov.

Species name. Prom Latin, *vulgatus* (common).

Holotype. PIN, No. 3559/5766, mold of beetle without anterior part of head, tip of last abdominal segment, antennae and hind legs; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 6). Elongate oval eyes are longer than temples. Frons between eyes has straight parallel lateral sides. Vertex is 3 times as wide as eye. Pronotum is 1.7 times as wide as long in middle, with very weakly arcuately emarginate lateral margins in posterior 2/5; in anterior 3/5 arcuately rounded, very weakly expanded frontally, with greatest width anterior to middle, more strongly narrowed toward anterior angles; anterior and posterior margins are weakly bimarginate. Scutellum is 2.6 times as wide as long. Elytra is 3.5 times as long as wide at humeri, in anterior 3/5 with slightly arcuately indented lateral margin, somewhat narrowed back, in posterior 1/3 arcuately narrowed toward apex. Prosternum anterior to fore coxae is 3 times as long as coxa; posterior process between fore coxae is as wide as coxa, projects back past coxae no more than 3/4 of their length. Distances between fore and between middle coxae are almost identical. Metasternum is 0.36 times as long as wide at base; episterna have straight, parallel lateral margins. Paracoxal suture is straight. Hind coxae are rather long, with very weakly arcuately emarginate posterior margins, rather smoothly, strongly shortened to side. Abdominal sternites 1-4 are of almost equal length, apical sternite a little longer. Fore and middle femora are expanded.

Measurements., mm. Length of beetle ~ 14 (impression - 13.6), width - 5.3; elytral length - 9.6.

Comparison. Differs from other species in the genus in shape of pronotum, which in the posterior 2/5 has lateral sides weakly arcuately emarginate, in its proportions (1.7 times as wide as long), and in the narrower elytra (3.5 times as long as broad at humeri).

Material. Holotype.

Genus ***Mongolobuprestis*** Alekseev, gen. nov.

Genus name. From Mongolia and the genus *Buprestis*. **Type species.** *M. gratiosus* sp. nov.

Diagnosis. Oval small beetle. Head not very large. Pronotum not very wide, with weakly

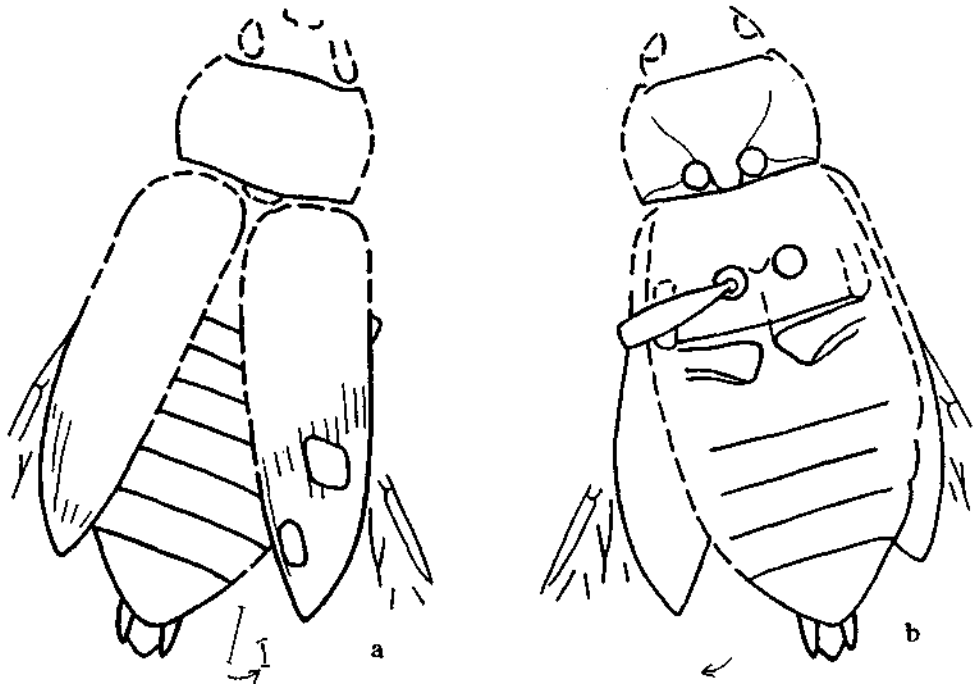

Fig. 7. *Mongolobuprestis gratiosus* sp. nov., holotype No. 3559/2283: a - dorsal view, *b* - ventral view.

arcuately rounded lateral sides, with greatest width in middle; anterior and posterior margins weakly bimarginate. Scutellum transverse, with rounded trapeziform basal part. Elytra 3.4 times longer than wide at humeri, in anterior 3/5 almost parallel-sided, with almost straight outer lateral margins, in posterior 2/5 unevenly, strongly arcuately narrowed to very narrowly rounded tip; intervals smoothed, with 2-3 rows of punctures, with spots. Posterior process of prosternum almost as wide as coxa, continued back beyond coxae not more than 2/3 their length. Paracoxal suture in middle not attenuate anteriorly. Hind coxae rather short, smoothly, not very strongly arcuately shortened to side. First abdominal sternite 2.5 times as long as 2nd. Middle femora expanded.

Composition. Genus monotypic.

Comparison. Differs externally from similar genera of the subfamily in a complex of characters; in having the elytra unevenly arcuately rounded to the tip in the posterior 2/5, its smoothed surface sculpture with 2-3 rows of punctures in the intervals, with spots; in the hind coxae being short, smoothly, not very strongly shortened to the side; in the long 1st abdominal sternite (2.5 times as long as 2nd).

Mongolobuprestis gratiosus Alekseev, sp. nov.

Species name. From Latin, *gratiosus* (pleasing).

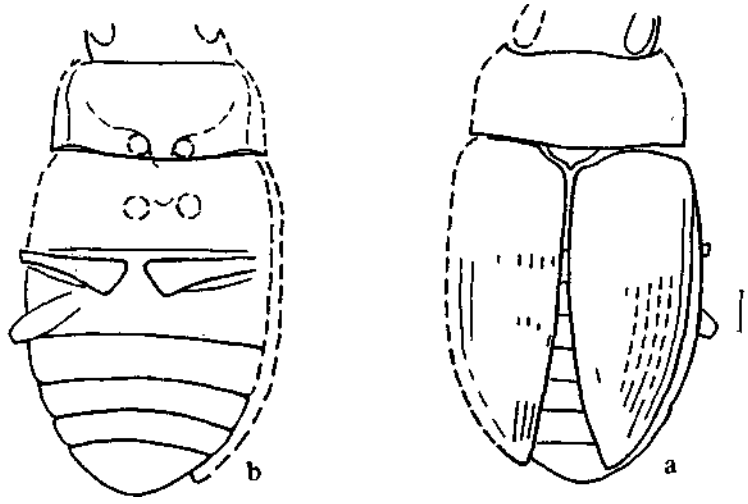

Fig. 8. *Paramongoligena transversicollis* sp. nov., holotype No. 3559/5770: *a* - dorsal view, *b* - ventral view.

Holotype. PIN, No. 3559/2283, mold and cast of beetle (male) with apical part of wing and aedeagus, without legs and antennae; Mongolia, Bayan Khongorskiy Aymak, foothills of the Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 7). Eyes are elongate oval, longer than temples. Frons between eyes is wide, with arcuately convex lateral sides; sculpture is punctate grooved. Vertex is 2.4 times as wide as eye. Pronotum is 1.6 times as wide as long; sculpture is punctate grooved, transverse-arcuate. Scutellum is trapeziform, 3.3 times as wide as long. In apical 2/5 elytron has 2 spots. Prosternum anterior to fore coxae is 2.8 times as long as coxa. Distances between fore and between hind coxae are identical. Metasternum is 0.34 times as long as wide at base. Episterna have straight, subparallel lateral margins. Paracoxal suture is straight. Hind coxae have unevenly arcuately indented posterior margins. Abdominal sternites 2-4 are of almost equal length, last one 1.8 times as long as 2nd, rounded triangular, 2.2 times as wide as long.

Measurements, mm. Length (without genitalia) - 10.9, width - 4.2; elytral length - 7.5.

Material. Holotype.

Genus ***Paramongoligena*** Alekseev, gen. nov.

Type species. *P. transversicollis* sp. nov.

Diagnosis. Small beetle with wide body. Head not very large. Pronotum 2.1 times as wide as long in middle, in posterior 4/5 almost rectilinearly narrowed from base. Scutellum large, almost cordate. Elytron 2.5 times as long as wide at humeri, in anterior 3/5 somewhat tapered back, in posterior 2/5 arcuately narrowed toward a rounded apex. Paracoxal suture in middle not

attenuate anteriorly. Hind coxae rather short. First abdominal sternite 2 times as long as second. Hind femora slightly expanded.

Composition. Genus monotypic.

Comparison. Differs from known genera of the subfamily in the shape of the broad pronotum which in the posterior 4/5 is almost rectilinearly narrowed back, as well as in having a wider and short elytron which is 2.5 times as long as wide at the humeri.

Paramongoligena transversicollis Alekseev, sp. nov.

Species name. From Latin, *transversus* (transverse) and *collis* (hill).

Holotype. PIN, No. 3559/5770, cast of beetle without fore and middle legs and antennae; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 8). Body is 2.1 times as long as wide. Head is 0.77 times as wide as pronotum. Frons is broad, between eyes with straight parallel sides, densely covered with impressed punctures. Eyes are elongate oval. Vertex is 2.7 times eye width. Pronotum is anteriorly steeply rounded to anterior angles, anterior and posterior margins are distinctly bimarginate, posterior angles acute; sculpture is transverse-arcuate, punctate grooved. Elytron has 2-3 rows of punctures in intervals. Hind coxae are rounded, distance between them a little less than width of coxa. Metasternum is about 0.33 times as long as wide at base. Paracoxal suture is straight. Hind coxae are rather short, with unevenly arcuately indented posterior margins, rather abruptly but not strongly shortened to side. Second abdominal sternite is 1.5 times as long as 3rd, 3rd and 4th of equal length, last sternite is 1.8 times longer than 4th, rounded triangular, 2.3 times as wide as long.

Measurements, mm. Length - 11.3, width - 5.4; elytral length - 8.5.

Material. Holotype.

Genus ***Paleas*** Alekseev, gen. nov.

Genus name. From Greek, *palaios* (ancient). **Type species.** *P. maculipennis* sp. nov.

Diagnosis. Head large. Pronotum 1.5 times as wide as long in middle, in posterior 2/3 almost rectilinearly weakly expanded forward, anteriorly weakly arcuately narrowed to anterior angles. Scutellum trapeziform. Elytron 3.6 times as long as wide at humeri, in anterior 3/5 posterior to humerus slightly arcuately notched, narrowed back, in posterior 2/5 first arcuately then rectilinearly tapered to very narrowly rounded tip, with slender sinuous transverse groove; separating rows of rounded granulations, with 3 spots on the disc. Posterior process ol prosternum extends back beyond fore coxae not more than 3/4 length of coxa. Paracoxal suture in middle not attenuate anteriorly. Hind coxae long. First abdominal sternite 1.3 times as long as 2nd, 2nd 1.3 times as long as 3rd, last sternite roundedly trapeziform, with small indentation at apex. Fore femora expanded.

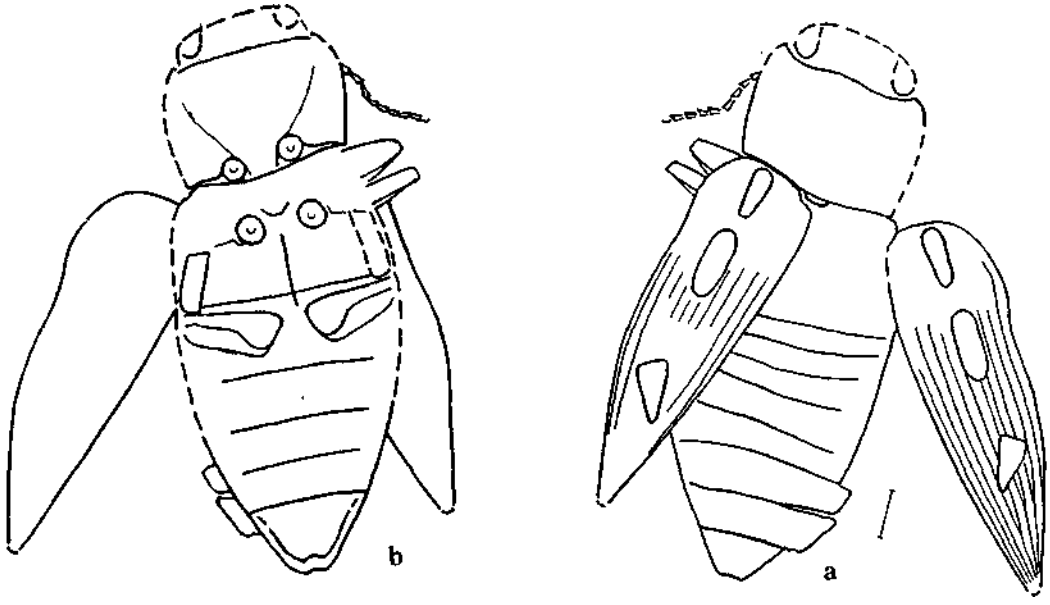

Fig. 9. *Paleas maculipennis* sp. nov., holotype No. 3559/5767: *a* - dorsal view, *b* – ventral view.

Composition. Genus monotypic.

Comparison. Differs from other genera of the subfamily hi the combination of characters: elytral shape, proportions and sculpture and shape of the apical abdominal sternite (elytron in apical 2/5 first arcuately, then rectilinearly tapered to a very narrowly rounded tip; its length 3.6 times width at the humeri, sculpture with transverse rows of delicate rounded granulations separated by sinuous grooves; ultimate sternite rounded trapeziform with narrowly arcuately notched tip).

Paleas maculipennis Alekseev, sp. nov.

Pl. **1, fig. 7 Species**

name. From Latin, *macula* (spot) and *penna* (wing).

Holotype. PIN, No. 3559/5767, mold and cast of beetle with antenna, fore and middle leg; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 9). Small beetle has elongate oval eyes, longer than temples. Antennae are serrate from the 4th segment, 3rd segment is longer than 2nd and 4th, 5th shorter than 4th,

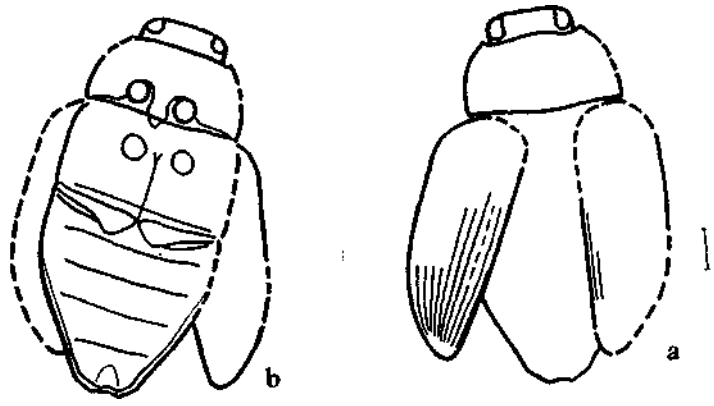

Fig. 10. *Crassisoma indistinctum* sp. nov., holotype No. 3559/5782: *a* - dorsal view, *b* - ventral view.

segments 5-9 are same length. Frons between eyes is apparently slightly arcuately notched on sides, slightly expanded anteriorly. Vertex is 2.4 times as wide as eye. Anterior margin of pronotum is indistinctly, posterior margin distinctly, bimarginate, sculpture is punctate grooved, transversely arcuate. Scutellum is transverse, small, trapeziform. Elytron has 10 longitudinal grooves and transverse sinuous rows of small round granulations separated by very slender sinuous grooves: 3rd and 4th and 5th and 6th grooves fuse at point 1/5 length of elytron from its apex; grooves formed after fusion again fuse at point 1/10 length of elytron from its apex; 7th and 8th grooves fuse at approximately level of fusion of 5th and 6th grooves. Elytron apparently has 3 spots: two longitudinal spots in middle of elytron, smaller of which is in anterior 1/5, larger extends to 2nd half of elytron. Third spot is wedge-shaped, oblique, in first half of posterior third of elytron, from its middle almost to inner margin. Prosternum anterior to fore coxae is 2.9 times as long as coxa; posterior process is a little wider than fore coxa. Middle coxae are larger than fore coxae. Metasternum is 0.4 times as long as wide at base. Episterna have straight parallel sides. Paracoxal suture is straight. Hind coxae are arcuately abruptly, strongly shortened to side. Second abdominal sternite is 1.3 times as long as 3rd, 3rd and 4th are of equal length, apical one as long as first. Fore, and most likely, other legs have expanded femora.

Measurements, mm. Length of impression - 10, width - 4.2; elytral length - 7.3.

Material. Holotype.

Genus ***Crassisoma*** Alekseev, gen. nov.

Genus name. From Greek, *crassus* (dense) and *soma* (body).

Diagnosis. Head small. Pronotum 2 times as wide as long in middle, strongly evenly arcuately narrowed anteriorly. Elytron 3.2 times as long as wide at humeri, in basal 3/5 almost parallel-sided, in posterior 1/3 arcuately narrowed to apex, with 10 slender punctate grooves, indistinct against background of punctures in intervals of same size as in grooves. Posterior

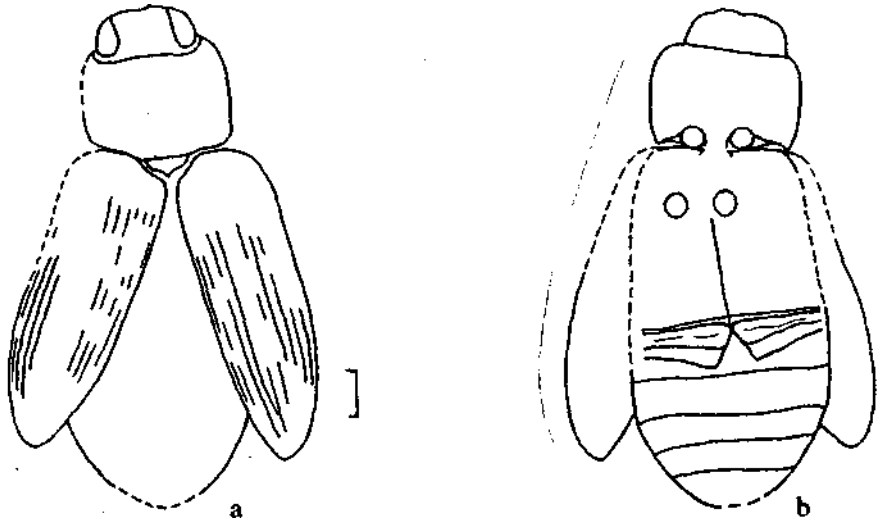

Fig. 11. *Elegantella ponomarenkoi* sp. nov., holotype No. 3559/5797: *a*-dorsal view, *b* - ventral view.

process of prosternum between fore coxae almost as wide as coxae, protruding behind them at least length of coxa, entirely dividing mesosternum. Paracoxal suture in middle not attenuate anteriorly. Hind coxae rather short, strongly, smoothly shortened to side. Abdominal sternites 1-4 of almost equal length, last sternite roundedly pentagonal, at tip with broad shallow indentation.

Composition. Genus monotypic.

Comparison. Differs from all genera of the subfamily in a complex of characters: in having the pronotum strongly tapered anteriorly and 1.9 times as wide as long in the middle; in the weakly distinguishable longitudinal punctate grooves on the elytron masked by the background punctures, and in the trapeziform shape of the apical abdominal sternite which is arcuately notched at the apex.

Crassisoma indistinctum Alekseev, sp. nov.

PL **1, fig. 8**

Species name. From Latin, *indistinctus* (indistinct).

Holotype. PIN, No. 3559/5782, mold and cast of beetle without antennae and legs; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 10). Head is 0.625 times as wide as pronotum. Eyes are elongate oval,

longer than temples. Frons is broad, between eyes with slightly arcuate, parallel lateral margins; sculpture is punctate grooved. Vertex is 2.4 times as wide as eye. Pronotum is 1.9 times as wide as long in middle, with smoothly arcuately rounded lateral margins, in posterior 1/3 almost parallel-sided, in anterior 2/3 strongly tapered anteriorly; anterior margin is weakly notched, posterior margin is straight; sculpture is punctate grooved, transverse arcuate. Scutellum is not visible. Prosternum anterior to fore coxae is 1.6 times as long as coxa. Distance between middle coxae is equal to distance between fore coxae. Length of metasternum is 0.33 times width at base. Paracoxal suture is straight. Hind coxae have indistinctly arcuately notched anterior and weakly notched posterior margins. Last abdominal sternite is 1.4 times as long as 4th, 2 times as long as wide, with apical arcuate indentation. In ventral view sculpture is punctate grooved.

Measurements, mm. Length - 9.2; width - 4.3; elytral length - 5.6.

Material. Holotype.

Genus ***Elegantella*** Alekseev, gen. nov.

Genus name. From Latin, *elegantulus* (elegant, very beautiful).

Type species. *E. ponomarenkoi* sp. nov.

Diagnosis. Head rather broad. Pronotum 1.5 times as wide as long in middle, in posterior 1/4 weakly arcuately expanded frontally, in middle part with barely noticeable arched parallel sides, in anterior 1/4 slightly narrowed to anterior angles, posterior angles broadly rounded. Scutellum rather large, slightly cordate. Elytron 3.1 times as long as wide at humeri, in anterior 3/5 with parallel-sided lateral margins, in posterior 2/5 unevenly arcuately tapered to apex. Posterior process of prosternum between fore coxae with arcuately indented lateral margins, with 3-tipped apex, perhaps entirely dividing mesosternum. Paracoxal suture in middle not attenuate anteriorly. Hind coxae not very short, smoothly shortened to side. First abdominal sternite 1.4 times as long as 2nd.

Composition. Genus monotypic.

Comparison. Differs from other Jurassic and Lower Cretaceous genera in strong longitudinal impression of the frons and in shape of pronotum which is very weakly arcuately rounded on almost parallel sides, has anterior margin strongly bimarginate and posterior one weakly bimarginate, and has broadly rounded posterior angles.

Elegantella ponomarenkoi Alekseev, sp. nov.

PI. **1, fig. 9 Species name.** In

honor of the paleoentomologist, A. G. Ponomarenko.

Holotype. PIN, No. 3559/5797, mold and cast of beetle without antennae, posterior segment of abdomen and legs; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

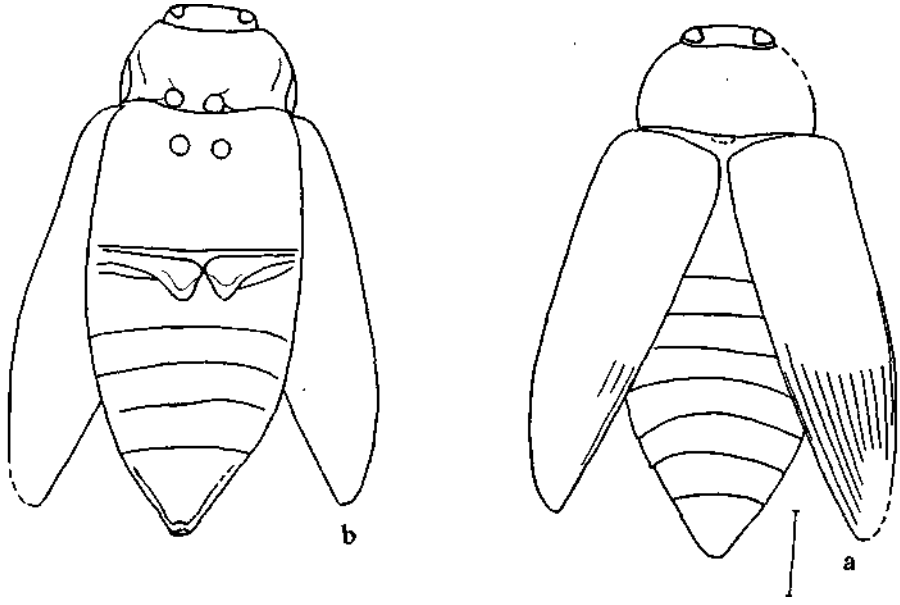

Fig. 12. *Stigmoderimorpha rasnitsyni* sp. nov., holotype No. 3559/5798: *a* – dorsal view, *b* - ventral view.

Description (fig, 11). Head is wide, eyes are large, wide, elongate oval, longer than temples. Frons between eyes has almost straight, subparallel sides, strongly longitudinally impressed. Vertex is 2.1 times as wide as eye. Anterior margin of pronotum is strongly, posterior weakly bimarginate. Frons, vertex, and pronotum are densely punctate grooved. Scutellum is transverse, with short pointed apex. Apex of elytron is blunt anterior to suture; in intervals has 2-3 rows of punctures and weak rugae. Prosternum anterior to fore coxae is 2.7 times as long as coxa. Fore and middle coxae are rounded, hind coxa a little more broadly spread out. Metasternum is 0.71 times as long as wide at base. Paracoxal suture is straight. Hind coxae have rather weakly arcuately indented posterior margins, rather strongly shortened to side. Abdominal sternites 2-4 are of almost equal length, last segment is a little longer, very wide.

Measurements, mm. Length ~ 10.5; length of impression - 9.6, width - 4.2; elytral width - 6.5.

Material. Holotype.

Genus *Stigmoderimorpha* Alekseev, gen. nov.

Genus name. From genus *Stigmodera.* **Type species.** *S. rasnitsyni* sp. nov.

Diagnosis. Small beetle with small head, head 0.53 times as wide as pronotum. Pronotum approximately 2 times as wide as long in middle, with unevenly arcuately rounded lateral sides, strongly narrowed anteriorly in anterior 3/4; anterior margin weakly emarginate, posterior margin

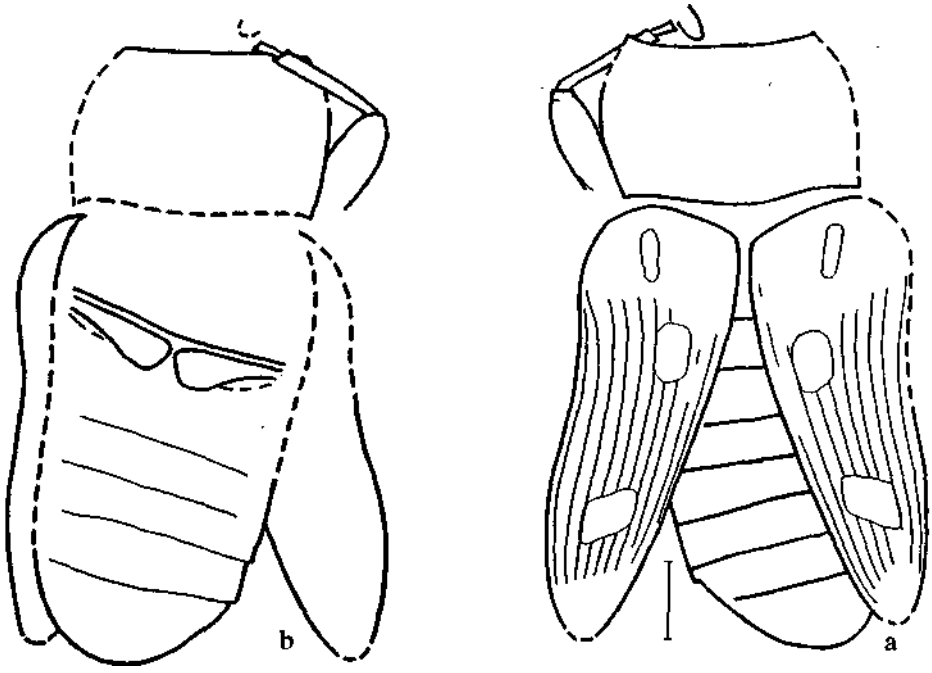

Fig. 13. *Umerata mirabilis* sp. nov., holotype No. 3559/2281: *a* - dorsal view, *b* -ventral view.

weakly bimarginate. Elytron 3.6 times as long as wide at humeri, in anterior 3/5 with almost rectilinearly outer margin, somewhat tapered back, in posterior 2/5 unevenly arcuately narrowed to apex, with short coarse transverse rugae. Paracoxal suture not attenuate frontally. Hind coxae rather long, abruptly arcuately shortened to side. First abdominal sternite 1.9 times as long as 2nd, last sternite almost triangular, with narrowed arcuate indented apex.

Composition. Genus monotypic.

Comparison. Differs from all known genera of the subfamily in the combination of characters: small head, broad, very strongly narrowed forward pronotum with arcuately rounded lateral margins, and long, tapered-back elytra with very coarse transverse rugae.

Stigmoderimorpha rasnitsyni Alekseev, sp. nov.

Species name. In honor of paleoentomologist A. P. Rasnitsyn.

Holotype. PIN, No. 3559/5798, mold and cast of beetle without legs and antennae; Mongolia, Bayan Khongorskiy Aymak, foothills of Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Zhuriltskaya Stratum.

Description (fig. 12). Eyes are longer than temples, not protruding, small, elongate oval. Frons is almost flat. Vertex is 2 times as wide as eye. Pronotum is 2.1 times as wide as long in

middle, its sculpture is punctate grooved, transverse arcuate. Scutellum is indistinctly visible. Elytron has short coarse transverse rugae, intervals are convex; 3rd and 4th longitudinal grooves fuse at distance from apex equal to a little less than 1/4 width of elytron in middle part, 5th and 6th and 7th and 8th fuse at point equal to about 3/4 width. Paracoxal suture is straight. Abdominal sternites 2-4 are of equal length, apical sternite is 1.3 times as long as 2nd.

Measurements, mm. Length - 6.3, width - 2.5; elytral length - 5.

Material. Holotype.

Genus ***Umerata*** Alekseev, gen. nov.

Genus name. From Latin, *umerus* (humerus). **Type species.** *U. mirabilis* sp. nov.

Diagnosis. Small, stout beetle. Pronotum rather weakly arcuately rounded on sides; anterior margin slightly emarginate, posterior weakly bimarginate. Elytron 2.4 times as long as wide at humeri, in anterior 3/5 posterior to humerus with strongly unevenly arcuately indented outer lateral margin, strongly narrowed toward posterior half, then weakly toward posterior 2/5, whence weakly arcuately tapered toward rather broadly rounded tip, with spots on disc. Paracoxal suture in middle not attenuate anteriorly. Hind coxae short, with smoothly arcuately indented posterior margin, rather strongly shortened to side. First abdominal sternite 2 times as long as 2nd, sternites 2-4 of equal length, posterior one 1.5 times as long as 4th, broad.

Composition. Genus monotypic.

Comparison. Differs from all known genera of the subfamily hi the shape and proportions of the elytron (2.4 times as long as broad at the humeri, posterior to humerus strongly, unevenly narrowed to posterior half, more weakly to posterior 2/5).

Umerata mirabilis Alekseev, sp. nov.

Species name. From Latin, *mirabilis* (wonderful).

Holotype. PIN, No. 3559/2281; mold and cast of beetle without most of head, prosternum, antennae, middle and hind legs; Mongolia, Bayan Khongorskiy Aymak, foothills of the Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (Fig. 13). Eyes are elongate oval. Frons is apparently wide, between eyes with straight parallel sides, with large dense punctures. Sculpture of pronotum is punctate grooved, transverse arcuate. Scutellum is not visible. Punctures in elytral grooves are a little smaller than punctures in intervals, intervals with 1-3 rows of punctures. Disc has 3 spots — a small, narrow one in middle posterior to base, and two large wide ones: a longitudinal roundedly rectilinear spot at end of first third of disc and start of second third closer to the inner margin, and an oblique spot in form of parallelogram at beginning of posterior third, in middle. Paracoxal suture is slightly arcuate. Last abdominal sternite most likely has broadly rounded tip. Fore femora are expanded, middle and hind ones apparently as well.

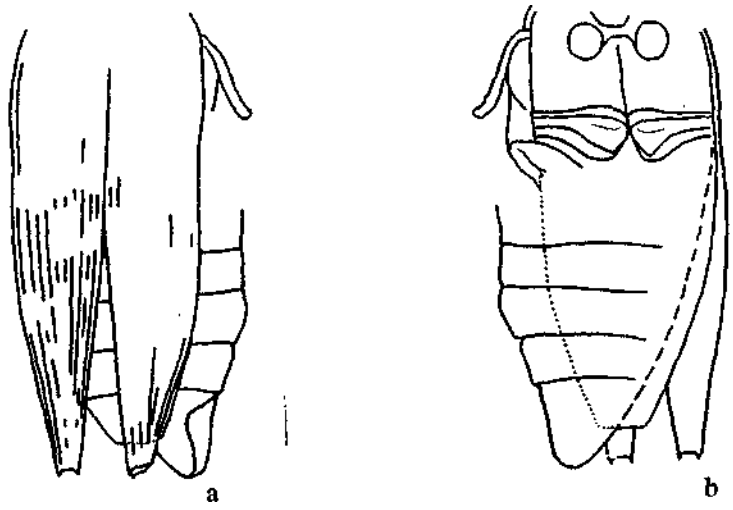

Fig. 14. *Dicercomorpha longipennis* sp. nov., holotype No. 3559/ 2250: a - dorsal view, *b* - ventral view.

Measurements, mm. Length of impression - 8.7, width - 4.2; elytral length - 5.8.

Material. Holotype.

BUPRESTIDAE INCERTAE SUBFAMILIAE

Genus ***Dicercomorpha*** Alekseev, gen. nov.

Genus name. From genus *Dicerca.* **Type species.** *D. longipennis* sp. nov.

Diagnosis. Elytron 4.7 times as long as wide at humeri, in anterior 3/5 with weakly arcuately notched lateral margin, parallel-sided, in posterior 2/5 slightly notched, strongly tapered to a somewhat attenuate tip with transversely trapeziform indented margin; elytral surface with 10 longitudinal punctate grooves, intervals with 1-2 rows of punctures. Paracoxal suture in middle with double bend, weakly attenuate forward. Hind coxae rather long, strongly shortened to side. First abdominal sternite 2.7 times longer than 2nd. Hind femora expanded.

Composition. Genus monotypic.

Comparison. Differs from known genera in having a very long first abdominal sternite which is 2.7 times as long as the 2nd (in other genera not more than 2.4 times as long). Differs from other Jurassic and Lower Cretaceous genera, in addition, in having a very narrow elytron (4.7 times as long as wide at humeri), strongly tapered and attenuated into a narrow, transversely

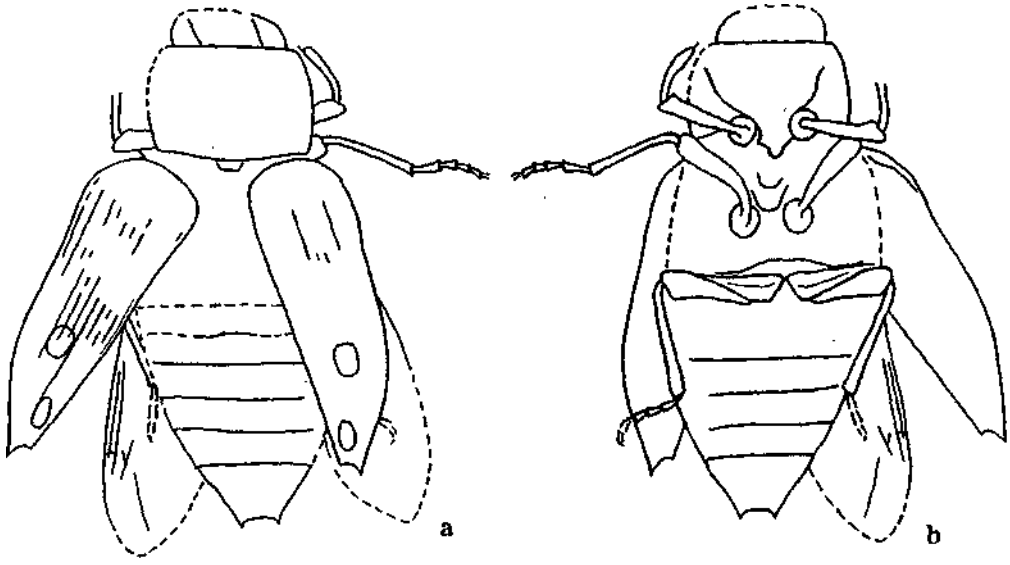

Fig. 15. *Pseudochrysobothris ballae* Whalley & Jarzembowski, holotype BMNH No. Jh 59501; a - dorsal view, *b* - ventral view (after [6]).

notched tip, and baying paracoxal suture in middle with a double bend and weakly attenuate forward.

Dicercomorpha longipennis Alekseev, sp. nov.

Species name, from Latin, *longus* (long) and *penna* (wing).

Holotype. PIN; Ko. 3559/2250, mold and cast of beetle without head, prothorax, antennae, fore and middle legs; Mongolia, Bayan Khongorskiy Aymak, foothills of the Dund-Ula Range S of Lake Bon Tsagan Nur (Bon Tsagan locality); Lower Cretaceous, ? Aptian, Bontsagan Series, Khuriltskaya Stratum.

Description (fig. 14). Notch in lateral margin of elytron is delimited laterally by sutural and outer teeth; elytron at apex is 0.29 times as wide as in middle part. Middle coxae are rounded, distance between them a little less than width of coxa. Length of metasternum is 0.50 times its width at base. Hind coxae have unevenly arcuately indented posterior margin. Last abdominal sternite is 1.5 times as long as 2nd, sternites 2-4 are same length.

Measurements, mm. Length - 9.6, width - 4.6; elytral length - 9.6.

Material. Holotype.

Genus ***Pseudochrysobothris*** Alekseev, gen. nov.

Genus name. From genus *Chrysobothris.*

Type of species. *Chrysobothris ballae* Whalley & Jarzembowski, 1985; Lower Cretaceous, Berriasian-Valanginian; Spain.

Diagnosis. Frons wide (fig. 15), between eyes with straight, almost parallel lateral sides. Vertex 2.1 times as wide as eye. Pronotum 1.5 times as wide as long in the middle, with weakly evenly arcuate parallel lateral margins, straight anterior margin and indistinctly bimarginate posterior margin. Scutellum trapeziform. Elytron 3 times as long as wide at humeri, markedly narrowed toward posterior third, in central part with arcuately weakly notched lateral margin, in posterior 1/4 almost rectilinearly tapered to strongly unevenly indented apex obliquely anteriorly cut off toward suture; with 10 longitudinal punctate grooves and with two well-defined oval spots in posterior 2/5. Prosternum anterior to fore coxae 2.5 times as long as coxa, wide, rounded trapeziform. Fore and hind coxae rounded, distance between fore coxae 1.5 times as great as between middle ones. Posterior process of prosternum with 3-tipped apex, not dividing mesosternum entirely. Metasternum 0.30 times as long as broad at base. Paracoxal suture in middle anteriorly strongly attenuate trapeziform. Hind coxae short, with unevenly weakly notched posterior margin, strongly shortened to side. Anterior abdominal sternite 2.4 times as long as 2nd, sternites 2-4 of equal length, ultimate sternite 2 times as long as 2nd, trapeziform, with arcuately notched lateral margins and deeply, unevenly arcuately indented tip. Femora slightly expanded apically.

Composition. Genus monotypic.

Comparison. Differs from all known Jurassic and Lower Cretaceous genera in the shape of the elytron which has the apex cut off toward the suture obliquely inwardly and forward and strongly unevenly arcuately indented; in the paracoxal suture, attenuate anteriorly trapeziform in the middle; the shape of the ultimate abdominal sternite which is trapeziform, with arcuately notched lateral sides and apical margin. Differs from extant genus *Chrysobothris* Esch. in having a wide frons with straight, subparallel lateral sides, wide vertex (2.1 times as wide as eye), the elytron with 10 longitudinal punctate grooves and the apex obliquely cut off and arcuately notched; the mesosternum is not completely divided by the posterior process of the prosternum.

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