A Survey of Mesozoic Buprestids (Coleoptera) from Eurasian deposits

Anatoly VI. ALEXEEV

Orekhovo-Zuevo Pedagogical Institute, Zelenaja 12, Moscow region, 142611, Russia

ALEXEEV, A.V. 1999. A Survey of Mesozoic Buprestids (Coleoptera) from Eurasian deposits. In: AMBA/AM/PFICM98/1.99: 5-9. The results of the revision of materials on mainly from European localities adduced in a monograph by HANDLIRSCH (1906-1908) and a survey of the later materials published mainly from Asian occurrences as well as those on the Triassic of Australia (TILLYARD and DUNSTAN, 1924) are presented in the paper. The absence of authentic finds of buprestids in Triassic localities is marked. A special attention is paid to an interesting peculiarity of the materials on Jurassic and Lower Cretaceous buprestids represented authentically by certain remainders of the whole beetles. All of the whole beetles have wing-cases with only 10 dotted grooves. This feature together with the others allows the determination with much more reliability the classification of the remainders of Mesozoic beetles represented by isolated wing-cases to buprestids.

Key words: beetles, buprestids, Eurasia, Mesozoic, Triassic, Jurassic, Cretaceous, wing-cases

Until quite recently, the basic knowledge on mesozoic buprestids could only be obtained from the only monograph $_t$ on fossil insects by HANDLIRSCH (1906-1908), who critically examined all of the literature and materials available at that time referred to the buprestids family by his predecessors. Mainly these were the remainders represented by isolated wing-cases, rarely - by incomplete specimens and single instances of whole remainders of beetles. He has considered 44 genera and 70 species and forms, all from Europe and Asia with different taxonomic positions including 29 genera and 11 species described by him. Of all considered forms he has attributed to buprestids more or less unequivocally only 4 genera with 7 species, doubtingly - 6 genera with 6 species and alternatively (Buprestidae or Elateridae) he has designated 3 genera with 3 species (all from Europe). Subsequently A.G. PONOMARENKO (1971-1980) while studying the systematic position of the beetles types from Solnhofen Shales of Bavaria, has detected that the beetle erroneously referred to the species *Eurythyrea grandis* DEICHMULLER by OPPENHEIM, and therefore described as a new genus and species *Pseudothyrea oppenheimi* HANDLIRSCH (fig. 4), and which has been attributed to Elateridae by HANDLIRSCH, in fact is undoubtedly a buprestid. As for the specimen of DEICHMULLER, it was determined by him and HANDLIRSCH to the buprestids quite arbitrarily without substantiating any of the structures. *E. oppenheimi* is the sole known whole remainder of Mesozoic buprestids from European localities which as it turned out afterwards enables attempts to establish allied relationships between the buprestids from the localities of Europe and Asia (ALEXEEV, 1996). Later *Chrysobothris ballae* from Spain (Lerida, Montsech) has been described by WHALLEY et JARZEMBOWSKI (1985) who determined it to be recent genus of buprestids, it was then described by me as *Pseudochrysobothris* ALEXEEV (1993), and also *Ancestrimorpha volgensis* ALEX, was described (Russia, Nizhegorodskaya oblast). Both species are represented by whole beetles. In my opinion, at present only 4 genera *(Pseudothyrea, Pseudochrysobothris, Ancestrimorpha, Buprestium* WESTWOOD, part.) with 7 species, may be referred without reservation to be buprestids from European localities, the last of them *(Buprestium)* being represented only by isolated wing-cases, as well as 2-3 genera with reservations: *Agrilium* WESTWOOD (part.), *Ctenicerium* WESTWOOD (part) and perhaps *Lamiophanes* HANDLIRSCH (part.). As to the findings of beetles from Asiatic localities, the two forms designated as buprestids (Russia, Siberia, Ust-Baley locality) are presented by HANDLIRSCH in the group of remainders designated as (Coleopteron), to which all the beetles remainders unable to be diagnosed in his view, more precisely than beyond Order have been attributed. Genus *Planocoleus* HONG (1982) with two species from Central China

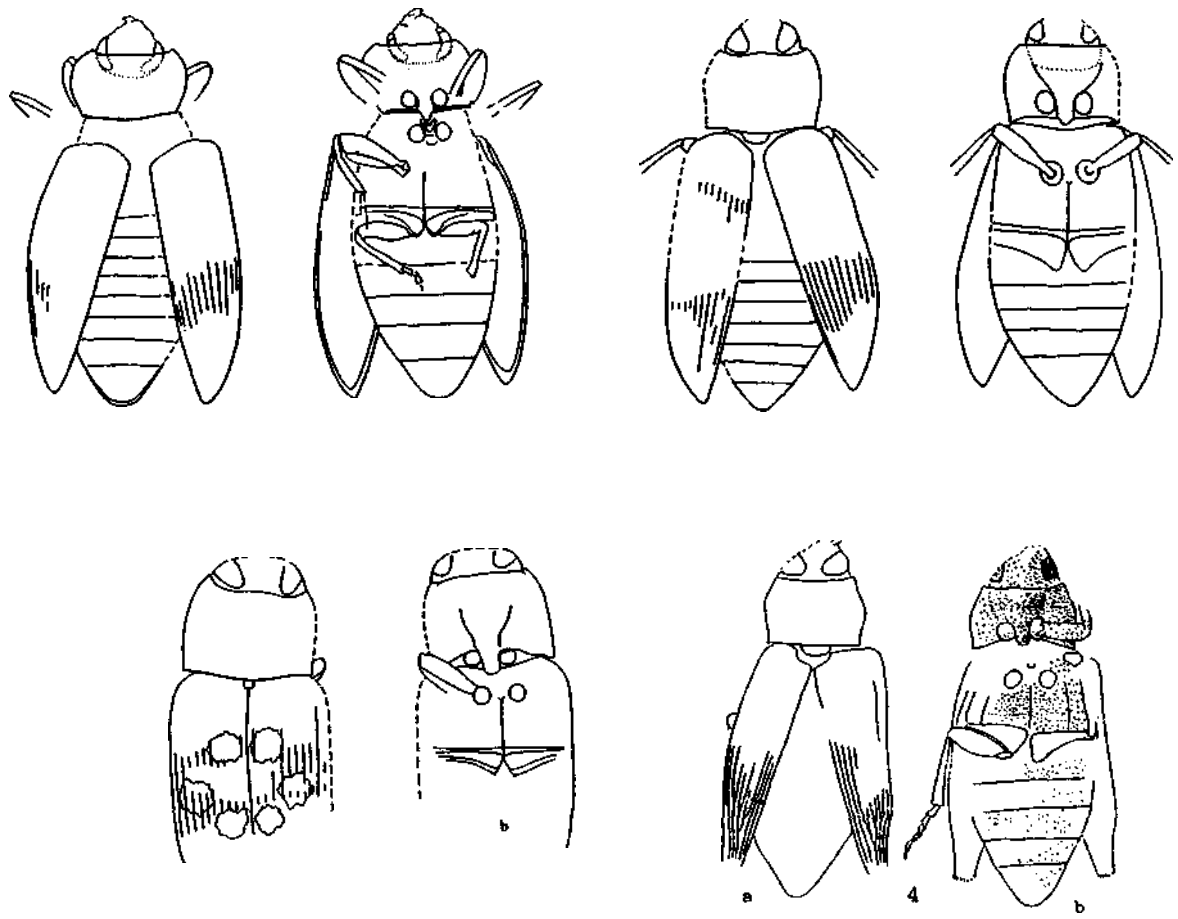

Fig. 1-4. Coleopterous Buprestidae: general aspect, a - from above, b - from below; 1- *Ancestrimorpha volgensis* ALEX. Nizhegorodskaya Oblast; Middle Jurassic; 2- *Parathyrea jurassica* ALEX.; Southern Kazalstan (Karatau-Mikhaylovka locality) Upper Jurassic; 3- *Karatausia maculata* ALEX.; the same locality; 4-*Pseudothyrea oppenheimi* HANDL.; Germania, Bavaria (Solnhofen), Upper Jurassic.

(Gansu Province, Upper Cretaceous) described as buprestids after isolated wing-cases and also a whole beetle from Lower Cretaceous of Mongolia (Mjangad locality) referred to a new species of the same genus by A.G. PONOMARENKO (1986) who suggested to regard it as a formal genus, are most likely not buprestids. It becomes particularly distinct when considering the structure of the latter — *P. mjangadiensis* PONOM., which has round eyes, wing-cases without arched concavity in a forward 3/5 of lateral edges, extended to the forward end of episterna of metasternum, obliquely located back coxae, the forward edges of which form a noticeable angle, the medial 1/3 is extended, the lateral 2/3 is a narrow strip. Such a situation with the insufficiency of our knowledge in Mesozoic buprestids took a turn for the better quite recently, thanks to the remarkable numerous materials collected during the expeditions conducted by the workers of the Laboratory of Arthropods at the Paleontological Institute of the Russian Academy of Sciences. The bulk of these materials on buprestids has been recently published (ALEXEEV, 1993, 1995, 1996). According to the revised data, 16 genera with 31 species have been described, including 14 genera with 16 species described after the remainders of whole or nearly whole beetles, one genus with reservations and 15 species — after isolated wing-cases, incomplete remainders and after beetles in the lateral position placed into the formal genus *Metabuprestium* ALEXEEV (1995), to which we attributed such species of buprestids that, as a rule, are represented by isolated wing-cases with 10 longitudinal dotted grooves, or by beetle remains insufficient to draw a sound comparison.

The study of the remainders of whole beetles has shown that Mesozoic buprestids, since Upper Jurassic (fig. 1-14) have habitually and after a complex of characteristic morphological features (texture of a head, forms of eyes and antennae, form and

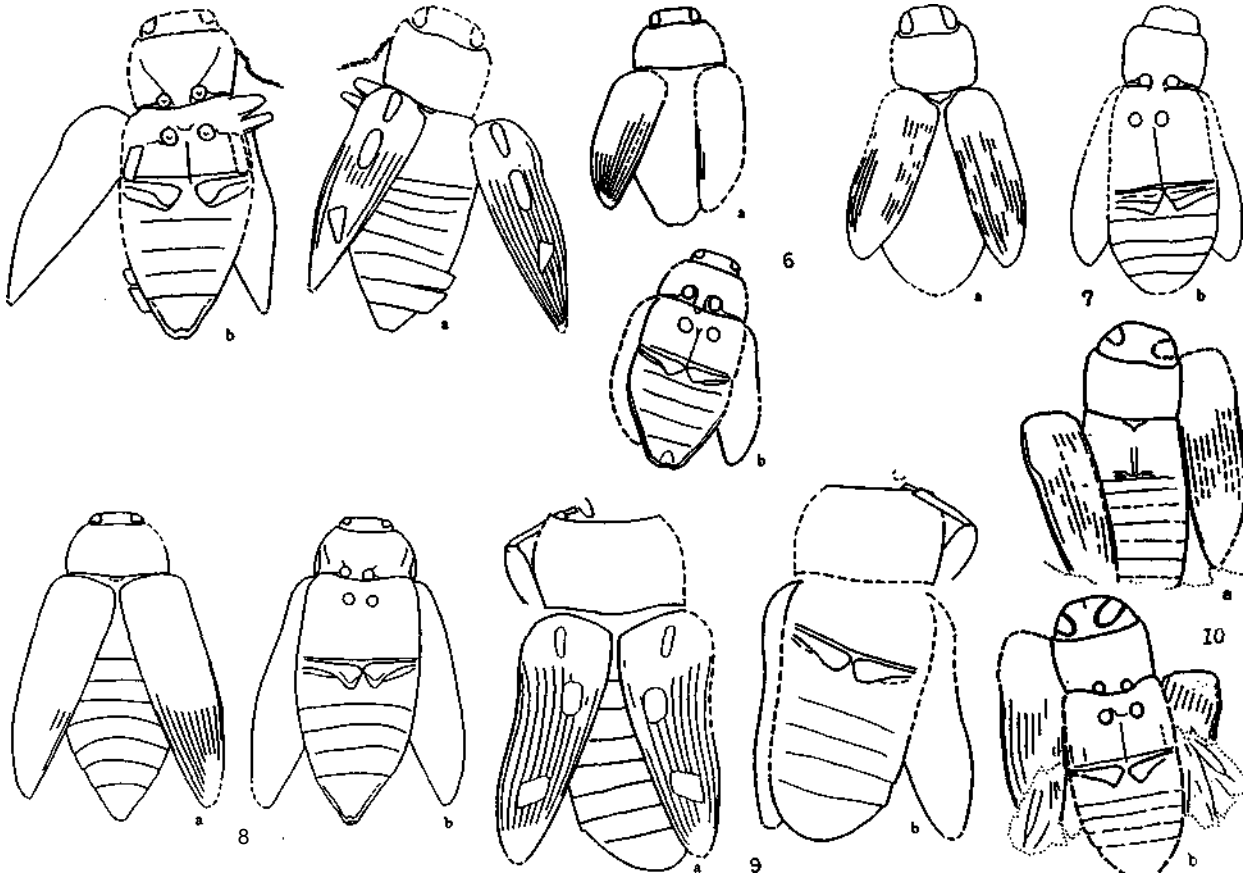

Fig. 4-10. Coleopterous Buprestidae: general aspect, a - from above, b - from below; 5- *Paleas maculipennis* ALEX.; Mongolia, Bayan-Khongorskiy Aymak (Bon Tsagan locality); Lower Cretaceous; 6- *Crassisoma indistinctum* ALEX., in the same place; 7- *Elegantella ponomarenkoi* ALEX., in the same place; 8- *Stigmoderimorpha rasnitsyni* ALEX., in the same place; 9- *Umerata mirabilis* ALEX., in the same place; 10- *Brevista zherichini* ALEX., in the same place.

sculpture of wing-cases, construction of a sternum including a longitudinal medial suture and episterne of metamorax, availability of a paracoxal suture, form of coxae, position of hind coxae, absence of trochantinal suture along their forward edges, the number of abdominal sternits) nothing to differ them substantially from recent buprestids, except for the form of paracoxal suture which is straight or slightly arcuate concave from the Jurassic and the majority of Lower Cretaceous buprestids (in the Upper Cretaceous whole buprestids are not found). No doubt there existed forms with a different sculpture of wing-cases in the Mesozoic, in particular the incomplete remainders of a presumably buprestid, whose wing-cases have only dotty sculpture. The reason of such a phenomenon in the fauna of Mesozoic buprestids can be supposed to be in the fact that the genera and species with 10 longitudinal dotted grooves had the largest quantity of beetles. The elicited singularity, from my point of view, is of practical interest because it enables a more precise diagnosis of the attribution to buprestids of the beetles known after isolated wing-cases with 10 grooves. Certainly, this indication should be used in a complex of others characteristics and, above all, together with the form of wing-cases, but the wing-cases without grooves or smooth ones are not reliable as the sole factors for determining the form, since the similar form is rarely present in different suborders, including Archostemata *(Malmelater prisons* OPPENH). Unfortunately there are also forms similar to buprestids which have even 10 longitudinal grooves but they are extremely rare.

After this feature, unavailable in recent buprestids, the Mesozoic subfamily Parathyreinae ALEXEEV (1993) has been distinguished. However, one genus and a species from the Lower Cretaceous of Mongolia *(Dicercoptera longipennis* ALEX. , fig

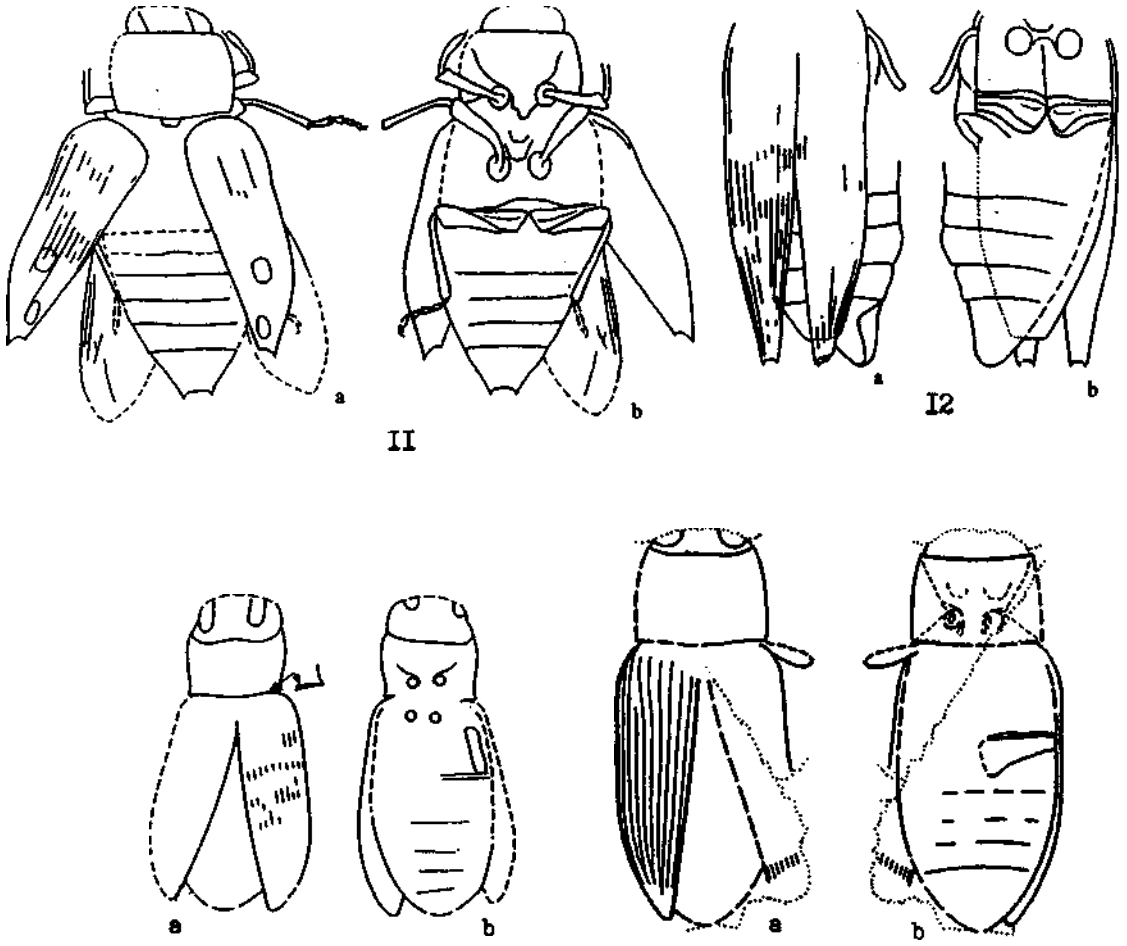

Fig. 11-14 Coleopterous Buprestidae: general aspect, a - from above, b - from below; 11- *Pseudochrysobothris ballae* WHAL. at JARZEMB.; Spain, Montsech; Lower Cretaceous; 12- *Dicercoptera longipennis* ALEX.; Mongolia, Bayan-Khongorskiy Aymak (Bon Tsagan locality); Lower Cretaceous; 13- *Cretothyrea obtanda* ALEX.; Russia, Chitinskaya Oblast (Semen locality), Lower Cretaceous; 14- *Kzylordynia obscura* ALEX.; Southern Kazakhstan, Kzyl-Ordynskaya Oblast (Kzyl-Ordynskaya locality), Upper Cretaceous.

12) is known — it has a double arched paracoxal suture plucked forward to a central section as with the recent species of subfamily Julodinae, and with another genus and species from the Lower Cretaceous of Spain *(Pseudochrysobothris ballae* WHAL. and JARZ., fig. 11) the paracoxal suture is strongly plucked forwards in the trapeziform central section, as in the majority of recent subfamilies. And there is one more singularity that Mesozoic buprestids possess. All of the remainders of whole beetles known have wing-cases with 10 longitudinal dotted grooves partially merging in the back 1/3 (if they are preserved). Evaluating the available materials, of Mesozoic buprestids of Eurasia and the assessment of the part of them by HANDLIRSCH and using to this end additional materials of Triassic buprestids of Australia cited with reservations by DUNSTAN (TILLYARD and DUNSTAN, 1924), we must admit that authentic findings of buprestids in Triassic deposits are not yet discovered. There are no characteristic features of buprestids in these remainders. It is necessary to note the scantiness of authentic materials from Jurassic localities and their extreme scantiness from the deposits of Upper Cretaceous. The main bulk of authentic materials on buprestids belongs to the Lower Cretaceous of, Kazakhstan, Russia, and especially of Mongolia. Furthermore, a small number of findings of isolated wing-cases of buprestids is known from the deposits of England and solitary whole beetles from Spain.

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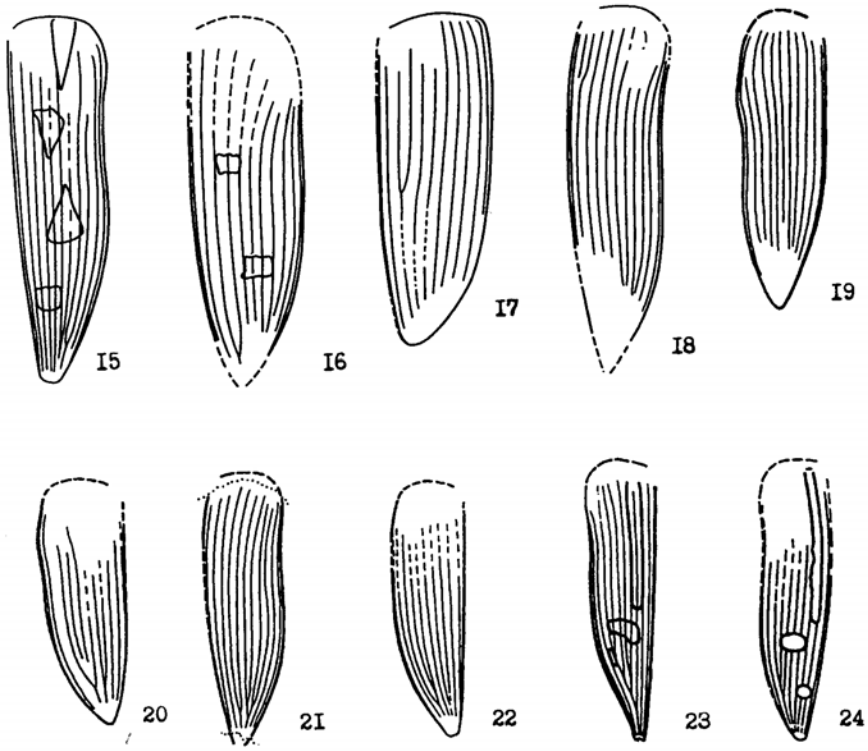

Fig. 15-24. Coleopterous Buprestidae: isolated elytra; 15- *Metabuprestium cuneomaculatum* ALEX.; Russia, Chitinskaya Oblast (Semen locality), Lower Cretaceous; 16- *M. latipenne* ALEX.; Russia, Buriatia (Baysa locality), Lower Cretaceous; 17- *M. furcatorugosum* ALEX., in the same place; 18- *M. vltimense* ALEX., in the same place; 19- *M. bontsaganense* ALEX.; Mongolia, Bayan-Khongorskiy Aymak (Bon Tsagan locality), Lower Cretaceous; 20- *M. cretaceum* ALEX., in the same place; 21- *M. dundulense* ALEX., in the same place; 22- *M. granulipenne* ALEX., in the same place; 23- *M. nobile* ALEX., in the same place; 24- *M. shartologoiense* ALEX.; Mongolia, Bayan-Khongorskiy Aymak (Shar-Tologoy locality), Lower Cretaceous

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