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Upper Liassic beetles (Coleoptera) from Lower Saxony, Germany

With 27 Text-figures, 1 Table and 2 Plates

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Abstract

Revision of some type material of Upper Liassic beetles from Lower Saxony described by BODE (1953) has resulted in substantial reduction in the number of taxa concerned. In this paper 40 monotypic genera and species are recognised as ten genera with sixteen species.

Kurzfassung

[Oberliassische Käfer aus Niedersachsen, Deutschland]

Die große Anzahl von Gattungen und Arten, eingeführt von BODE (1953) für Käfer aus dem oberen Lias von Niedersachsen, kann nicht beibehalten werden. Wie eine Nachuntersuchung von einem Teil des Originalmaterials ergibt, kann die Anzahl der monospezifischen Gattungen (von bisher 40) auf ein Viertel, die Anzahl der Arten auf weniger als die Hälfte (auf nunmehr 16) reduziert werden.

Introduction

More than 90 Coleoptera genera were introduced by BODE (1953) for the same number of species from Upper Lias deposits in Lower Saxony, each species represented by one specimen, i.e. the holotype. In reviewing parts of the BODE collection many of the monotypic species and genera are recognized as synonyms of other taxa simultaneously introduced by BODE. As a result of the revision forty taxa of the monotypic genera and species are reduced to ten genera including sixteen species (Tab. 1).

Admittedly, this revision covers only a part of the BODE Collection, as more of his material is located at other places (Göttingen, Hannover, Clausthal). In order to initiate the taxonomic review the "Braunschweig" specimens were taken into consideration first.

Acknowledgements

The revision was made possible by the kind help of Dr YU. POPOV (Akad. Sci. Moscow) who arranged the loan of BODE's type specimens through Prof. Dr P. CARLS (Geol. Paläontol. Inst. TU Braunschweig). I gratefully acknowledge this support.

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Systematics

[For synonyms of the revised species see Table 1]

Coleoptera
Schizophoridae PONOMARENKO, 1968

Camaricopterus BODE, 1953

Type species: *C. ovalis* BODE, 1953.

Camaricopterus ovalis BODE, 1953

Pl. 1 Fig. 1; Text-fig. 1

Description: Middle sized beetle, dorsoventrally flattened. Length 7·3 mm, width 4·5 mm; length of elytra 5·0 mm. Head is one and half times as broad as long, covered by prothorax. Eyes are on the upper side of head, their apodemae are ring-like. Pronotum transverse, three times as broad as long, weakly tapered anteriorly, anterior margin is strongly concave, anterior angles pointed, posterior ones concave. Prosternum is very short, much shorter than anterior coxae. Coxae are transverse, separate, prosternal processus rounded. Mesosternum short, middle coxae rounded, extended. Metasternum is transverse, roundly tapered anteriorly, twice as broad as long. Metepisterni touch middle coxal cavities. Width of base of prothorax is the same as base of elytrae. Elytra is broadest in the basal third, its apex symmetrical. There is a long "schiza", an internal ridge on lateral part of elytra which appears on the fossil as a long narrow furrow.

Discussion: The elytrae with "schiza" are known among schizophoroid Archostemata and some Adephaga. The abdominal structure of *C. ovalis* is invisible and formal discrimination between one or other group is impossible, however, the outline of the body is typical for schizophoroids not for adephagians. *Camaricopterus* looks especially like *Schizophorus* PONOMARENKO, 1968 and we considered it tentatively as *Camaricopterus* BODE, 1953 in family Schizophoridae.

Coptoclavidae PONOMARENKO, 1961

Amblycephalonius BODE, 1953

Type species: *A. tenuistriatus* BODE, 1953.

Amblycephalonius tenuistriatus BODE, 1953

Pl. 1 Figs 2-3; Text-figs 2-3

Description: Small, elongated, flattened beetle. Length 5·2 mm, width 2·9 mm, length of elytra 3·7 mm. Head is very large, nearly triangular, one and a half times as broad as long, rounded anteriorly. There are apparently two pairs of eyes, their apodemae are visible in the posterior part of head. Prothorax is very short, half length of head, anteriorly tapered. Anterior coxae are transverse, separated by intercoxal process. Mesosternum as long as metasternum, middle coxae are large. Metasternum roundly tapered anteriorly, as long as middle coxae. Hind coxae are transverse, rather long, with straight anterior margins. There are large femoral plates. Elytra three times as long as broad, tapered in the last third, with "schiza" on the lateral part. Lateral margin of elytra is obliquely cut, with oblique striae just in front of border.

Discussion: The holotype of *A. tenuistriatus* is not sufficiently well-preserved for exact determination of its systematic position. Gyrinidae and Coptoclavidae are characterized by two pairs of eyes. A large head, very short prothorax, large middle coxae, the meso- and metasterni of similar length, are all characters of whirligig beetles but small procoxae separated by prosternal process, large coxal plates, and "schiza" are not known in that group. Most probably this beetle belongs to Coptoclavidae, because various members of that family have all these characters.

The holotype of *Tricyrtus tenuistriatus* BODE, 1953 is a poorly preserved beetle, definitely belonging to *A. tenuistriatus* although it is a little larger in size. The proportions of head and prothorax are not correct in the original description because on the original drawing part of the head is shown as part of the prothorax.

From the description and drawing, the holotype of *Barycephalus nudatus* BODE, 1953 belongs to the same species. It has similarly a large head, very short prothorax and large apodemae of eyes.

Tricyrtus tenuistriatus BODE, 1953 and *Barycephalus nudatus* BODE, 1953 are considered to be subjective synonyms of *Amblycephalonius tenuistriatus* BODE, 1953 which is selected because preservation of the holotype is the best of the three specimens.

Trachypachidae LECONTE, 1861
Eodromeinae PONOMARENKO, 1977

Prosynactus BODE, 1953

Type species: *P. scissus* BODE, 1953.

Prosynactus scissus BODE, 1953

Pl. 1 Figs 4-5; Text-figs 4-5

Description: Middle sized, flattened beetle with typical caraboid appearance. Length 11·3 mm, width 4·8 mm, length of elytra 7·0 mm. Head triangular, tapered from the base, as long as broad. Eyes on the sides of head, temple as long as eye, gena shorter. Pronotum is one and a half times as broad as long, broadest posterior of middle, pronotum narrows to the base, its anterior angles pointed. Procoxae are rounded, poststernal process is long and broad. Base of elytrae is broader than the base of prothorax, elytra three times as long as broad, disc of elytra with broad flattened furrows which are as broad as interval between them. Metasternum twice as broad as long, roundish and tapered anteriorly. Metepisterns are

broad, touching mesocoxal cavities. Mesocoxae are separated. Metacoxae are oblique, separating metepistern from the base of abdomen, rather long, with large femoral plates, which are long, reduced to the flank, their length is much greater than width. The abdomen is tapered from the second sternite. The last sternite is longer than the others.

Discussion: The beetle does not resemble lucanids, as stated in the original description, and is undoubtedly a caraboid. Its metepisternum touches the mesocoxal cavity and hind coxae separate from metepistern and abdomen, therefore, *Prosynactus* must be placed in the subfamily Eodromeinae of the family Trachypachidae. It differs from other genera by its posteriorly tapered pronotum and femoral plates reduced to the lateral margin.

The poorly preserved beetle described as *Cardioides ? longealatus* Bode, 1953, undoubtedly belongs to *P. scissus*, however, its size is somewhat smaller (length of beetle 10·0 mm, length of elytra 7·3 mm), its pronotum a little broader and femoral plates shorter. Because of poor preservation of the holotype, *C.? longealatus* Bode, 1953 is considered as a subjective synonym of *Prosynactus scissus* Bode, 1953.

Among the unrevised Bode material *Euenarthrus mandibulatus*, *Liassocarabites praefrictus*, *Megelytrites mutilatus*, *Trapezotrachelus longus*, and *Trigonocephalites sulcatus* are also believed to be subjective synonyms of *P. scissus* Bode, 1953, based on original descriptions and drawings.

Prosynactus gracilis (Bode, 1953)

Pl. 1 Figs 6-7; Text-figs 6-7

Description: Small, flattened beetle with typical caraboid appearance. Length 7·2 mm, width 3·0 mm, length of elytra 4·7 mm. The head is triangular, as broad as long. Eyes are shorter than temples, genae shorter than eyes. Pronotum is one and a half times as broad as long, tapered from the middle posteriorly much more than anteriorly, angles of pronotum are rectangular. Procoxae are rounded, separated by a rather long and broad process. Base of prothorax is shorter than base of elytrae, which is over three times as long as broad. Disc of elytra with very weak, shallow furrow; width of furrow is close to width of intervals. Middle coxae are rounded, separated. Metasternum two and a half times as broad as long, roundly tapered anteriorly. Metepisternum rather broad, touching mesocoxal cavities, separated from base of abdomen by hind coxae. Metacoxae oblique, rather long, with big femoral plates.

Discussion: As this species has the same characters as the previous species it must also belong to the same genus of Eodromeinae. It differs from the type species of the genus – *P. scissus* Bode, 1953, in smaller size, a narrower posterior pronotum, longer metasternum and femoral plates, and shorter last abdominal segment.

The beetle described as *Cardioides incisus* Bode, 1953 resembles in all visible characters the holotype of *Tetragonotrachelus gracilis* Bode, 1953 and must be considered as a subjective synonym of the latter species.

From original descriptions and drawings, unrevised *Liassocarabites pulcher*, *Mesalocistus constrictus*, *Cyclotrachelus exsecatus*, *Cyphospheron virgatus*, and *Rhabdotus cingulatus* may be classified as subjective synonyms of *P. gracilis* (Bode, 1953).

Prosynactus procerus (Bode, 1953)

Pl. 1 Fig. 8; Text-fig. 8

Description: Small, flattened beetle with typical caraboid appearance. Length 4·4 mm, width 1·6 mm, length of elytra 2·8 mm. Head is triangular, tapered anteriorly from the base, its length is slightly greater than width. Eyes are situated on the upper side of head, much shorter than temples but longer than genae. Length of pronotum is somewhat shorter than width, more tapered posteriorly than anteriorly. Bases of elytrae are broader than base of pronotum. Elytra is over three times as long as broad. Disc of elytra with shallow broad furrows, which are as broad as intervals. Hind coxae oblique, separating metepisternum from base of abdomen, with large femoral plates, which are long, very shortened on the flank; lateral margin of femoral plate is slightly concave.

Discussion: Judging by the structure of the hind coxae this beetle is clearly a member of the Eodromeinae. From the form of pronotum and femoral plates it resembles *P. gracilis* but differs in very small size, longer pronotum and excavated lateral margin of femoral plates. These differences are comparable with intraspecific variation within *Prosynactus*.

The beetle described as *Dismorphus molestus* Bode, 1953 may also belong to the same species if its pronotum is incorrectly drawn.

Coreoeicos Bode, 1953

Type species: *C. dilatatus* Bode, 1953

Coreoeicos dilatatus Bode, 1953

Pl. 1 Figs 9-10; Text-figs 9-10

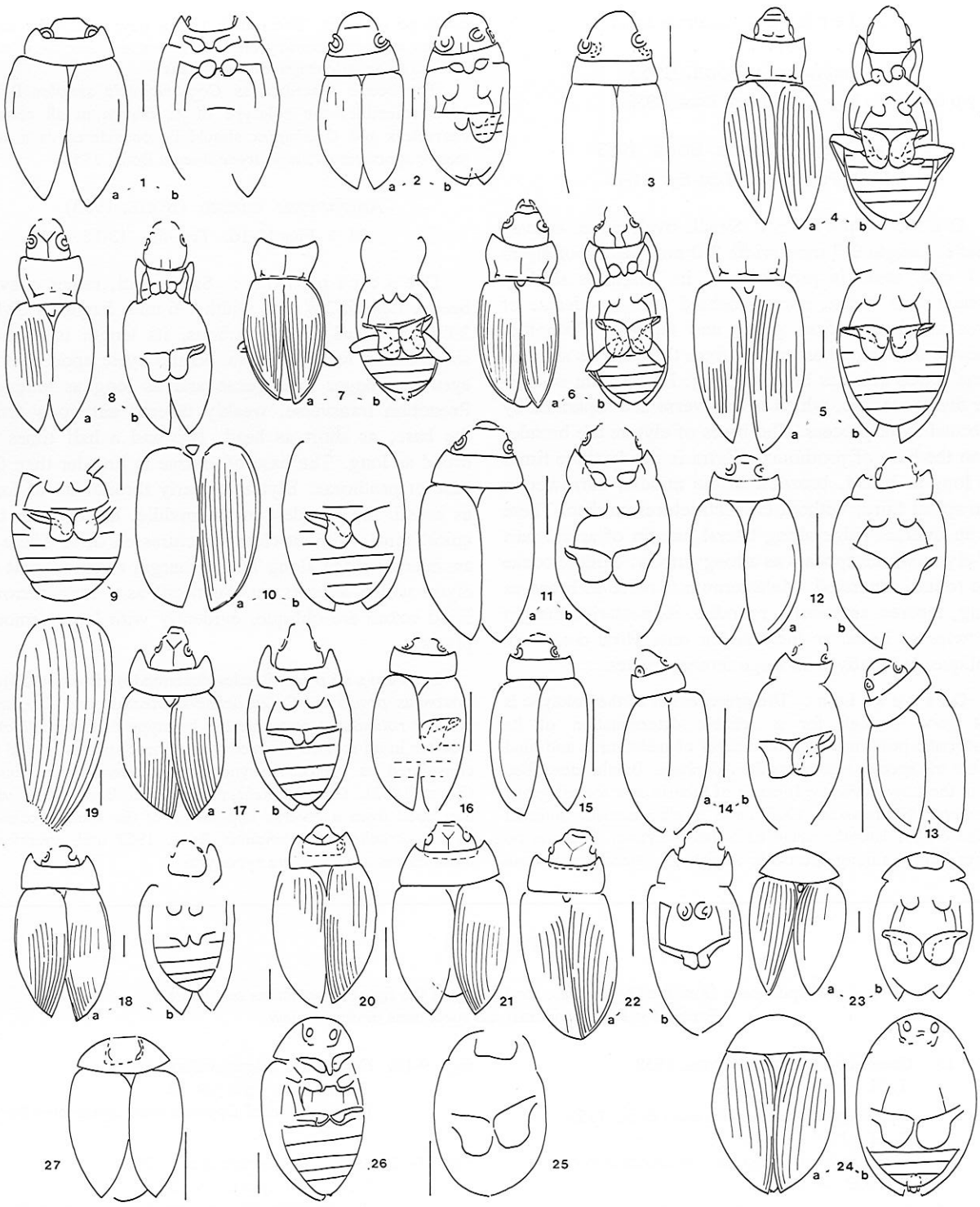
Description: Metasternum and abdomen of a rather large beetle. Width of abdomen 3·5 mm, length of elytra about 5 mm. Metasternum is nearly three times as broad as long, roundly tapered anteriorly. Metepistern is broad, slightly widened anteriorly, touches mesocoxal cavity. Hind coxae are oblique, dividing metepistern and abdomen, rather long. Femoral plates are large, very shortened in the lateral part of coxa. Abdomen tapered posteriorly from the third sternite, the last sternite is slightly longer than the others.

Discussion: The structures of hind coxae and metepistern indicate that this beetle is a member of the Eodromeinae. From the form of femoral plates it resembles *Prosynactus* but is much broader than all beetles of this genus. It resembles several other Jurassic genera in the same characters and cannot be discriminated from them because its pronotum has not been preserved. Therefore, the correct systematic position of the fossil cannot be demonstrated.

T a b l e 1 . Species list of BODE's (1953) identifications with reference to page no., plate, figure and locality (in left half of table) and revised identifications by the present author with reference to illustrations in this paper (in right half of table).

Camaricopterus ovalis	217	Taf. 10	Fig. 248	Grassel	*	*Camaricopterus ovalis*	Pl. 1	Fig. 1	Text-figs 1a-b
Amblycephalonius tenuistriatus	228	Taf. 11	Fig. 282	Grassel	*	*Amblycephalonius tenuistriatus*	Pl. 1	Fig. 2	Text-figs 2a-b
Tricyrtus tenuistriatus	230	Taf. 11	Fig. 287	Grassel	*	*Amblycephalonius tenuistriatus*	Pl. 1	Fig. 3	Text-figs 3
Barycephalus nudatus	228	Taf. 11	Fig. 283	Hondelage		*Amblycephalonius tenuistriatus*			
Prosynactus scissus	224	Taf. 11	Fig. 271	Beienrode	*	*Prosynactus scissus*	Pl. 1	Figs 4a-b	Text-figs 4a-b
Cardioides ? longealatus	221	Taf. 11	Fig. 262	Grassel	*	*Prosynactus scissus*	Pl. 1	Fig. 5	Text-figs 5a-b
Euenarthrus mandibulatus	223	Taf. 11	Fig. 268	Grassel		*Prosynactus scissus*			
Liassocarabites praefrictus	226	Taf. 11	Fig. 276	Grassel		*Prosynactus scissus*			
Megelytrites mutilatus	227	Taf. 11	Fig. 279	Grassel		*Prosynactus scissus*			
Trapezotrachelus longus	215	Taf. 10	Fig. 243	Hondelage		*Prosynactus scissus*			
Trigonocephalites sulcatus	239	Taf. 11	Fig. 274	Hondelage		*Prosynactus scissus*			
Tetragonotrachelus gracilis	224	Taf. 11	Fig. 269	Beienrode	*	*Prosynactus gracilis*	Pl. 1	Fig. 6	Text-figs 6a-b
Cardioides incisus	221	Taf. 11	Fig. 261	Beienrode	*	*Prosynactus gracilis*	Pl. 1	Fig. 7	Text-figs 7a-b
Liassocarabites pulcher	226	Taf. 11	Fig. 277	Grassel	*	*Prosynactus gracilis*			
Mesalocistus constrictus	222	Taf. 11	Fig. 265	Grassel		*Prosynactus gracilis*			
Cyclotrachelus exsecatus	222	Taf. 11	Fig. 264	Schandelah		*Prosynactus gracilis*			
Cyphospheron virgatus	220	Taf. 10	Fig. 260	Hondelage		*Prosynactus gracilis*			
Rhabdotus cingulatus	223	Taf. 11	Fig. 266	Hondelage		*Prosynactus gracilis*			
Leptynticus procerus	221	Taf. 11	Fig. 263	Beienrode	*	*Prosynactus procerus*	Pl. 1	Fig. 8	Text-figs 8a-b
Dysmorphus molestus	228	Taf. 11	Fig. 280	Hondelage		*Prosynactus procerus*			
Coreoeicos dilatatus	236	Taf. 11	Fig. 304	Hondelage	*	*Coreoeicos dilatatus*	Pl. 1	Fig. 9	Text-fig. 9
Ooperioristus applanatus	220	Taf. 10	Fig. 259	Hondelage	*	*Coreoeicos dilatatus*	Pl. 1	Fig. 10	Text-figs 10a-b
Amphoxyne lineata	217	Taf. 10	Fig. 251	Beienrode	*	*Amphoxyne lineata*	Pl. 1	Fig. 11	Text-figs 11a-b
Cryptauchenia simplex	218	Taf. 10	Fig. 252	Hondelage	*	*Amphoxyne lineata*	Pl. 1	Fig. 12	Text-figs 12a-b
Loxostelidotus minutus	218	Taf. 10	Fig. 253	Beienrode	*	*Amphoxyne minuta*	Pl. 1	Fig. 13	Text-fig. 13
Loxoncus procerus	218	Taf. 10	Fig. 254	Hondelage	*	*Amphoxyne minuta*	Pl. 1	Fig. 14	Text-figs 14a-b
Cricotrachelites rotundatus	210	Taf. 10	Fig. 229	Grassel	*	*Amphoxyne minuta*	Pl. 1	Fig. 15	Text-fig. 15
Coilotrachelus lineatus	209	Taf. 10	Fig. 224	Beienrode	*	*Amphoxyne minuta*	Pl. 1	Fig. 16	Text-fig. 16
Cricotrachelites (?) similis	211	Taf. 10	Fig. 233	Grassel	*	*Amphoxyne minuta*			
Aposphinctus conservatus	223	Taf. 11	Fig. 267	Beienrode	*	*Aposphinctus conservatus*	Pl. 2	Fig. 17	Text-figs 17a-b
Spalacoides simplex	214	Taf. 10	Fig. 239	Grassel	*	*Aposphinctus conservatus*	Pl. 2	Fig. 18	Text-figs 18a-b
not mentioned			on slab 252	Hondelage	*	*Aposphinctus conservatus*	Pl. 2	Fig. 19	Text-fig. 19
Tolype rotundata	212	Taf. 10	Fig. 234	Beienrode	*	*Aposphinctus rotundatus*	Pl. 2	Fig. 20	Text-fig. 20
Streblocardioides striatus	210	Taf. 10	Fig. 227	Beienrode	*	*Aposphinctus striatus*	Pl. 2	Fig. 21	Text-fig. 21
Hexameristus inflatus	210	Taf. 10	Fig. 228	Hondelage		*Aposphinctus striatus*			
Zetemenos sexlineatus	230	Taf. 11	Fig. 289	Grassel	*	*Zetemenos sexlineatus*	Pl. 2	Figs 22a-b	Text-figs 22a-b
Sphaerocantharis defossa	213	Taf. 10	Fig. 236	Grassel	*	*Sphaerocantharis defossa*	Pl. 2	Fig. 23	Text-figs 23a-b
Theornithion striatum	217	Taf. 10	Fig. 249	Grassel	*	*Sphaerocantharis striatus*	Pl. 2	Fig. 24	Text-figs 24a-b
Microcarpides lineatus	232	Taf. 11	Fig. 293	Beienrode	*	*Sphaerocantharis striatus*	Pl. 2	Fig. 25	Text-fig. 25
Rhysopsalis distorta	214	Taf. 10	Fig. 240	Beienrode	*	*Rhysopsalis distorta*	Pl. 2	Fig. 26	Text-fig. 26
Syntomopterus latus	209	Taf. 10	Fig. 223	Beienrode	*	*Syntomopterus latus*	Pl. 2	Fig. 27	Text-fig. 27

[Editorial note: By courtesy of Prof. Dr P. CARLS, the specimens marked with an asterisk (formerly deposited at the Geological Institute, TU Braunschweig) are now entrusted to the care of the Senckenberg Museum, Frankfurt am Main.]



Text-figs 1-27. Diagrams of Upper Liassic beetles from Lower Saxony. For revised identification of species see Table 1 opposite. – Scale bar = 1 mm. Letters refer to dorsal (a) and ventral (b) views; numbers without letters refer to dorsal views, except for Text-figs 9, 25, 26 (ventral).

Only the elytrae and abdomen have been preserved on the holotype of *Ooperioristus applanatus* Bode, 1953. This beetle may belong to the same species as the holotype of *C. dilatatus*, having the same structure of elytrae with shallow broad furrows. The name *Ooperioristus applanatus* Bode, 1953 should be considered as a subjective synonym of *Coreoeicos dilatatus* Bode, 1953.

Adephaga *incertae sedis*

Amphoxyne Bode, 1953

Type species: *A. lineata* Bode, 1953.

Amphoxyne lineata Bode, 1953

Pl. 1 Figs 11-12; Text-figs 11-12

Description: Small, oval, rather convex beetle. Length 3·7 mm, width 2·0 mm, length of elytra 2·7 mm. Head is prognathous, its length is slightly greater than width, narrow behind eyes; apodemae of eyes are longer than genae and temples. Pronotum transverse, tapered anteriorly from the base, as short as head, three times as broad as long. Prosternum is shorter than procoxae, which is transverse and separated by a broad stout process. The bases of elytrae are broader than the base of prothorax. Elytra is nearly three times as long as broad, broadest in the middle, narrower in the apical third, without clear structures on disc. There is an internal ridge along lateral margin of apical part of elytra which appears as a long furrow. Middle coxae are round, separated. Metasternum is twice as broad as long, tapered anteriorly, rounded, its posterior margin is twice as broad as the anterior one. Hind coxae are oblique, evidently with large femoral plates.

Discussion: The preservation of the holotype is not good enough for a reliable determination of its systematic position. In the structures of metathorax and hind coxae the species resembles the Adephaga. Beetles described from the Lower-Middle Jurassic of Siberia as a formal genus *Memptus* Handlirsch, 1906 have a characteristic internal ridge on the lateral margin of isolated elytrae. There is no other family among Mesozoic Adephaga where *Amphoxyne* could be included. The erection of a new family for these beetles appears untimely and the genus *Amphoxyne* is considered to be Adephaga *incertae sedis*.

The beetle described as *Cryptauchenia simplex* Bode, 1953 resembles the holotype of *A. lineata* in all revised characters and *C. simplex* should be considered as a subjective synonym of *Amphoxyne lineata* Bode, 1953.

Amphoxyne minuta (Bode, 1953)

Pl. 1 Figs 13-16; Text-figs 13-16

Description: Small oval, rather convex beetle. Length 2·8 mm, width 1·6 mm, length of elytra 2·0 mm. Head is prognathous, its length is slightly shorter than width, narrow behind eyes; apodemae of eyes are longer than genae and as long as temples. Pronotum transverse, weakly tapered anteriorly from the base, as short as head, two and a half times as broad as long. The base of elytrae is broader than the base of prothorax. Elytra is nearly three times as long as broad, the broadest in the middle, narrower in the apical third, without clear structures on disc. There is an internal ridge along lateral margin of apical part of elytra which appears on the fossil as a long furrow. Hind coxae are oblique, evidently with large femoral plates.

Discussion: Beetles described by Bode (1953) as *Loxoncus procerus*, *Coilotrachelus lineatus*, and *Cricotrachelites rotundatus* resemble the holotype of *Loxostelidotus minutus* in all revised characters and these species should be considered as subjective synonyms of *Amphoxyne minuta* (Bode, 1953). *Cricotrachelites (?) similis* Bode, 1953 was described from a reverse impression of the same specimen as *Cricotrachelites rotundatus* Bode, 1953 and, therefore, these names are objective synonyms.

Plate 1

All specimens from the Upper Lias; for locality of the figured specimens see Table 1.
Except for Fig. 9 (ventral), all specimens in dorsal view.

Fig. 1. *Camaricopterus ovalis* Bode, 1953
1. Holotype; × 8.

Figs 2-3. *Amblycephalonius tenuistriatus* Bode, 1953
2. Holotype; × 10.
3. Holotype of *Tricyrtus tenuistriatus* Bode, 1953; × 10.

Figs 4-5. *Prosynactus scissus* Bode, 1953
4. Holotype (a), and b) under alcohol; × 5.
5. Holotype of *Cardioides ? longealatus* Bode, 1953; × 5·8.

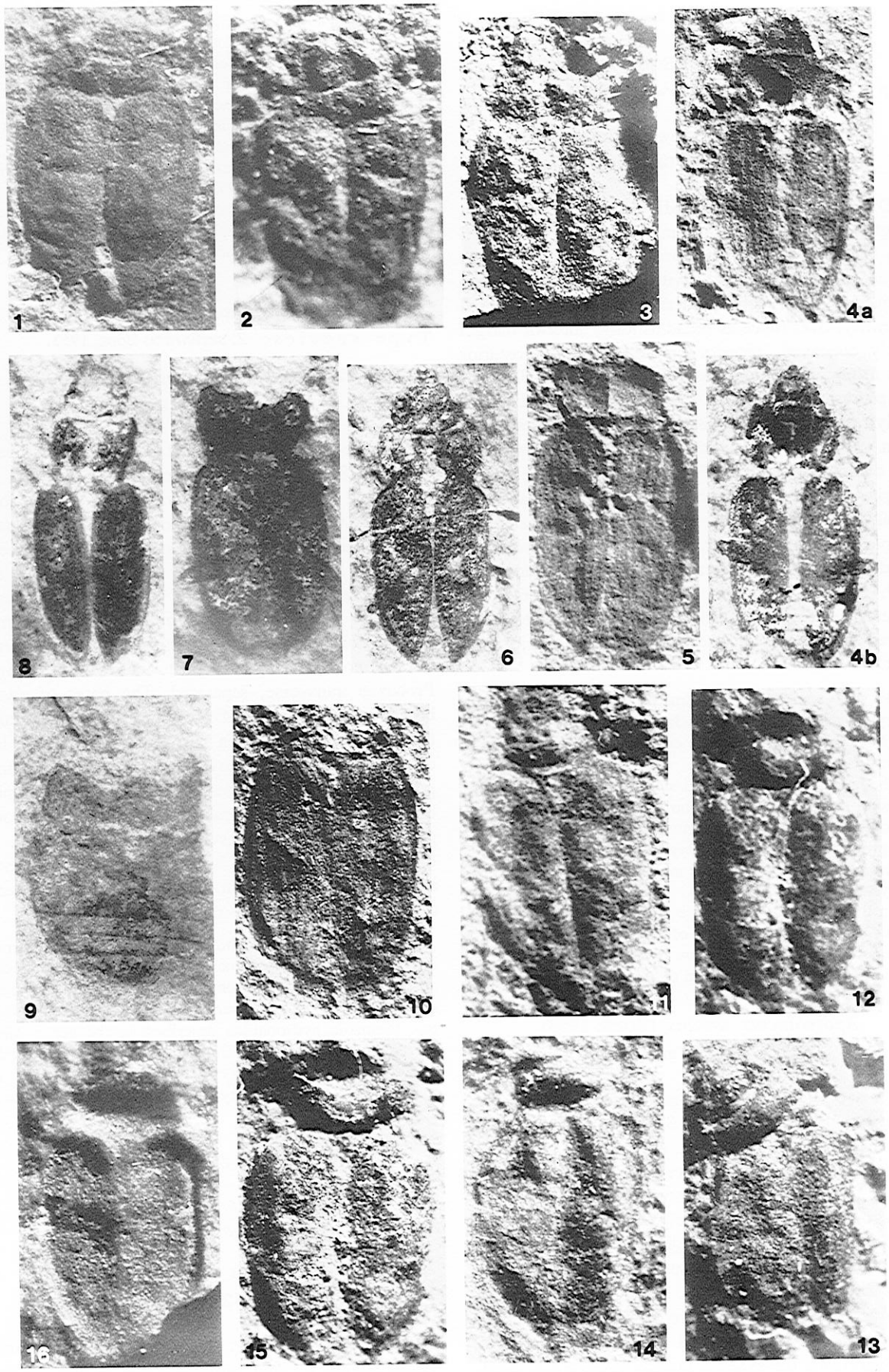
Figs 6-7. *Prosynactus gracilis* (Bode, 1953)
6. Holotype of *Tetragonotrachelus gracilis* Bode, 1953; × 9.
7. Holotype of *Cardioides incisus* Bode, 1953; × 8.

Fig. 8. *Prosynactus procerus* (Bode, 1953)
8. Holotype; × 12.

Figs 9-10. *Coreoeicos dilatatus* Bode, 1953
9. Holotype; × 10.
10. Holotype of *Ooperioristus applanatus* Bode, 1953; × 9.

Figs 11-12. *Amphoxyne lineata* Bode, 1953
11. Holotype; × 15.
12. Holotype of *Cryptauchenia simplex* Bode, 1953; × 9.

Figs 13-16. *Amphoxyne minuta* (Bode, 1953)
13. Holotype of *Loxostelidotus minutus* Bode, 1953; × 18.
14. Holotype of *Loxoncus procerus* Bode, 1953; × 19.
15. Holotype of *Cricotrachelites rotundatus* Bode, 1953; × 18.
16. Holotype of *Coilotrachelus lineatus* Bode, 1953; × 18.



A.G. PONOMARENKO : Upper Liassic beetles from Lower Saxony

Hydrophilidae LEACH, 1815

Aposphinctus BODE, 1953

Type species: *A. conservatus* BODE, 1953.

Aposphinctus conservatus BODE, 1953

Pl. 2 Figs 17-19; Text-figs 17-19

Description: Middle sized, oval beetle. Length 9·0 mm, width 4·8 mm, length of elytra 5·7 mm. Head covered by prothorax, triangular, the width a little greater than length, with distinct Y-shaped epicranial "suture". Pronotum transverse, roundly tapered anteriorly, over twice as broad as long, anterior margin deeply concaved, anterior corners pointed, posterior ones nearly rectangular, posterior margin broadly convex posteriorly. Procoxae transverse, separated. Bases of elytrae broader than base of prothorax, elytra tapered in the apical third, with ten narrow furrows which lack distinctive features. Furrows curved along sutural margin of elytra and reach the external margin in the apical third. Middle coxae separated. Metasternum transverse, tapered anteriorly, two and a half times as broad as long. Metepistern broad anteriorly, does not touch mesocoxal cavity. Hind coxae transverse, the longest mesially. Abdomen with five visible sternites, tapered from the base of second one, the posteriormost short.

Discussion: The structure of the elytral furrows is very typical for Mesozoic hydrophilids. Other characters, except for the separated middle coxae, do not contradict this systematic position.

The holotype of *Spalacoides simplex* BODE, 1953 appears to belong to *A. conservatus*. The difference in the structure of prothorax given in the original description is incorrect. The pronotum of both holotypes has the same shape. Therefore, *Spalacoides simplex* may be considered a subjective synonym of *A. conservatus*.

On the slab N 252, with the holotype of *Cryptauchenia simplex*, there is an impression of an isolated elytra which is the same as the elytra of *A. conservatus* except for a somewhat larger size (length of elytra 6·2 mm).

Aposphinctus striatus (BODE, 1953)

Pl. 2 Fig. 21; Text-fig. 21

Description: Small sized, oval, convex beetle. Length 6·2 mm, width 3·7 mm, length of elytra 4·5 mm. Head prognathous, covered by prothorax, triangular, one and a half times as broad as long, with distinct Y-shaped epicranial "suture". Pronotum transverse, roundly tapered anteriorly, two and a third times as broad as long, anterior margin deeply concave, posterior margin convex. The bases of elytrae are broader than base of prothorax, elytra two and a half times as broad as long, tapered in the apical third, with ten narrow sulci which are curved along sutural margin of elytra and reach the external margin in the apical third.

Discussion: The structure of the elytral furrows is the same as on the holotype of *A. conservatus*, the type species of the genus. Other characters confirm this species as a member of the genus *Aposphinctus*. It differs from the type species in smaller size and shorter head, and from *A. rotundatus* (Pl. 2 Fig. 20) in the shape of the pronotum with pointed anterior corners and convex posterior margin.

Judging from the original drawing, the holotype of *Hexameristus inflatus* BODE, 1953 is a member of the same species except for its somewhat larger size (length of beetle 4·7 mm) and the name *H. inflatus* is considered a subjective synonym of *Streblocardioides striatus* BODE, 1953.

Zetemenos BODE, 1953

Type species: *Z. sexlineatus* BODE, 1953.

Zetemenos sexlineatus BODE, 1953

Pl. 2 Fig. 22; Text-fig. 22

Description: Small sized, flattened beetle. Length 3·8 mm, width 1·7 mm, length of elytra 2·7 mm. Head slightly narrow anteriorly, as broad as long, with distinct Y-shaped epicranial "suture". Gena is longer than eye. Pronotum transverse, over twice as broad as long, roundly tapered anteriorly and also posteriorly from the posterior third, anterior margin somewhat shorter than posterior one, anterior margin deeply concave, anterior corners pointed, posterior ones almost rectangular; posterior margin straight. Procoxae transverse, separated. The bases of elytrae broader than the base of prothorax, elytra tapered in the apical third, with ten narrow furrows which lack distinctive features. Furrows curved along sutural margin of elytra and reach the external margin in the apical third. Middle coxae separated. Middle coxae contiguous. Metasternum transverse, tapered anteriorly, 1·7 times as broad as long. Metepistern broadened anteriorly and does not touch mesocoxal cavity. Posterior coxae transverse, longest mesially.

Discussion: The structure of the elytral furrows is very typical for Mesozoic hydrophilids. Other characters do not contradict this systematic position. From the visible structures, the beetle has very few differences from numerous Mesozoic hydrophilids described in the genus *Mesosperchus* PONOMARENKO, 1977 and the latter must be considered as subjective synonym of *Zetemenos* BODE, 1953. The species of the genus are very close in shape and dimensions.

Polyphaga *incertae sedis*

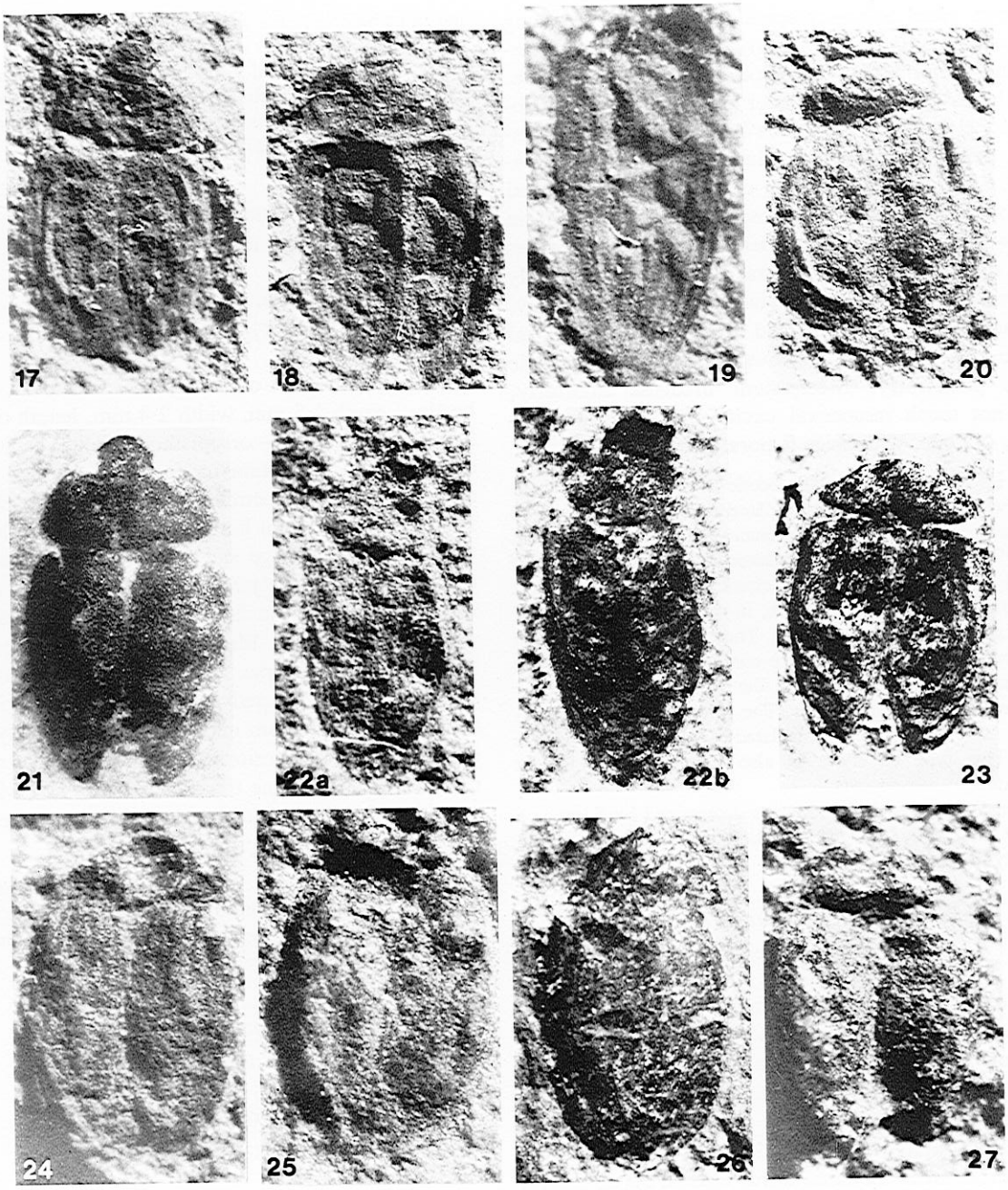
Sphaerocantharis defossa BODE, 1953

Type species: *Sp. defossa* BODE, 1953.

Sphaerocantharis defossa BODE, 1953

Pl. 2 Fig. 23; Text-fig. 23

Description: Middle sized, oval, convex beetle. Length 7·1 mm, width 4·7 mm, length of elytra



All specimens from the Upper Lias; for locality of the figured specimens see Table 1.
Except for Figs 25, 26 (ventral), all specimens in dorsal view.

Figs 17-19. *Aposphinctus conservatus* BODE, 1953
17. Holotype; × 7.
18. Holotype of *Spalacoides simplex* BODE, 1953; × 7.
19. Elytra; × 9·5.

Fig. 20. *Aposphinctus rotundatus* (BODE, 1953)
20. Holotype of *Tolype rotundata* BODE, 1953; × 9.

Fig. 21. *Aposphinctus striatus* (BODE, 1953)
21. Holotype of *Streblocardioides striatus* BODE, 1953; × 8.

Fig. 22. *Zetemenos sexlineatus* BODE, 1953
22. Holotype (a), and b) under alcohol; × 7.

Fig. 23. *Sphaerocantharis defossa* BODE, 1953
23. Holotype; × 6.

Figs 24-25. *Sphaerocantharis striatus* (BODE, 1953)
24. Holotype of *Theornithion striatum* BODE, 1953; × 13.
25. Holotype of *Microcarpides lineatus* BODE, 1953; × 13.

Fig. 26. *Rhysopsalis distorta* BODE, 1953
26. Holotype; × 11.

Fig. 27. *Syntomopterus latus* BODE, 1953
27. Holotype; × 20.

5·5 mm. Head ortho- or opisthognathous, half as long as pronotum. Pronotum slightly turned down, its anterior and posterior margins appear as a part of a circle. The bases of elytrae broader than the base of prothorax, elytra broadest in the basal third, tapered distally, with weak furrows which lack distinctive features. Steadily furrows reach the margins in the apical part of elytra. The furrow closest to the sutural margin follows the entire margin, whereas the next one reaches only the middle of the elytra. Middle coxae widely separated. Metasternum transverse, tapered anteriorly, two and a half times as broad as long, with paracoxal suture and longitudinal furrows which go from middle coxae posteriorly. Metepistern broadest anteriorly, does not touch mesocoxal cavity. Hind coxae transverse, oblique, with large femoral plates.

Discussion: The beetle is not sufficiently well-preserved for exact systematic placement. Ventrally inclined head and prothorax and large femoral plates are reminiscent of the Triassic triaplids but the latter have a different type of elytral structure. From these characters, the beetle most probably belongs to polyphagian, in which the large femoral plates are known for eucinetids. They also have an inclined head but their middle coxae are contiguous. Elytra with the shortened furrow second from the sutural margin is very common for Mesozoic beetles. The genus *Dzeregia* Ponomarenko, 1984 was created for isolated Mesozoic elytrae of this type. This type of elytra is also known among Recent Byrrhidae.

The fossil on slab Cl 133 was determined by Bode as a heteropteran body, but it really belongs to the beetles and possibly to this species.

Sphaerocantharis striatus (Bode, 1953)

Pl. 2 Figs 24-25; Text-figs 24-25

Description: Small sized, oval, convex beetle. Length 3·5 mm, width 2·5 mm, length of elytra 2·7 mm. Head ortho- or opisthognathous, half as long as pronotum. Pronotum slightly inclined, its anterior margin appears rounded, the posterior one straight. The bases of elytrae as broad as base of prothorax, elytra broadest in the basal third, tapered distally, with weak furrows which lack distinctive features. Steadily furrows reach the margins in the apical part of elytra. The furrow closest to the sutural margin follows the entire margin, whereas the next one reaches only the middle of the elytra. Middle coxae widely separated. Metasternum transverse, tapered anteriorly, with paracoxal suture and longitudinal furrows which go from middle coxae posteriorly. Metepistern broadest anteriorly, does not touch mesocoxal cavity. Hind coxae transverse, oblique, with large femoral plates. The suture between basal abdominal sternites weak; the three apical sternites are almost equal to each other. The male genitalia are probably trilobed.

Discussion: Judging from all important visible characters, the beetle is related to the genotype *S. defossa* and must belong to the same genus. It differs from the type species in much smaller size.

A poorly preserved beetle described as *Microcarpides lineatus* Bode, 1953 belongs to *S. striatus* and the name *M. lineatus* should be considered as a subjective synonym of *Theornithion striatum* Bode, 1953.

Rhysopsalis Bode, 1953

Type species: *R. distorta* Bode, 1953

Rhysopsalis distorta Bode, 1953

Pl. 2 Fig. 26; Text-fig. 26

Description: Small sized, oval, convex beetle. Length 4·5 mm, width 2·4 mm, length of elytra 3·5 mm. Head ortho- or opisthognathous, half as long as pronotum. Pronotum inclined, its anterior margin appears as part of a circle, the posterior one straight. Prosternum short, not longer than procoxae, which are transverse with a large and very long process between them. The bases of elytrae as broad as base of prothorax, elytra broadest in the basal third, tapered distally, without any furrow. Middle coxae widely separated. Metasternum transverse, two and a half times as broad as long, weakly tapered anteriorly, with longitudinal furrows which go from middle coxae posteriorly. Metepistern broadest anteriorly, does not touch mesocoxal cavity. Posterior coxae transverse. Abdomen with five sternites, third and fourth ones are the shortest, the fifth the longest.

Discussion: All important visible characters especially in the inclined head and prothorax indicate that the beetle is related to *Sphaerocantharis*, the only difference is the elytra which lacks furrows.

Syntomopterus Bode, 1953

Type species: *S. latus* Bode, 1953

Syntomopterus latus Bode, 1953

Pl. 2 Fig. 27; Text-fig. 27

Description: Small sized, oval, convex beetle. Length 2·5 mm, width 1·3 mm, length of elytra 2·0 mm. Head and prothorax inclined, elytrae smooth. No other visible structures.

Discussion: From the inclined head and prothorax and smooth elytrae *S. latus* can be related to *Rhysopsalis* but it is smaller and should not be considered as the second species of this genus because of the absence of visible details.

Reference

Bode, A. (1953): Die Insektenfauna des ostniedersächsischen oberen Lias. – Palaeontographica, **103**, Abt. A, Lief. 1-4: 1-375, 1 Kte. 15 Taf.; Stuttgart.