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NEW JURASSIC AND CRETACEOUS GROUND BEETLES (INSECTA, COLEOPTERA, CARABOIDEA) FROM ASIA

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ABSTRACT: Two new genera and 13 new species of ground beetles of the families Carabidae and Trachypachidae from the Jurassic and Lower Cretaceous of Transbaikalia and Mongolia are described. The Mesozoic ground beetles had no representatives of Recent groups until the Late Upper Cretaceous; therefore the widely accepted explanations for the distinctive distribution of the extant ground beetles cannot be attributed to the movements of continental plates occurring before the Cenozoic.

* * *

The ground beetles, one of the most thoroughly studied Recent beetles, are deliberately used in various general reconstructions, including zoogeography. There has recently been a widespread interest in "vicariance" zoogeography, where the distribution of closely related taxa is considered to be the result of their isolation by the movement of continental plates. Attempts are thus made to interpret the distribution of a number of ground beetles in this manner, including genera and even subgenera which, in the authors' opinions, moved apart even in the Early Mesozoic [5, 8]. In so doing, those authors disregard the fact that not one ground beetle of the Recent type is known from that time, and that all Mesozoic ground beetles described in more or less detail, except for Upper Cretaceous ones, belong to a special Mesozoic group [2]. These are the Trachypachidae--Eodromeinae and the Carabidae--Protorabinae, unknown from the Upper Cretaceous and Cenozoic, but with the first subfamily retaining the Recent relict genus *Systelosoma*. In the vicariance reconstructions, the absence of the corresponding groups of ground beetles in the Mesozoic is not discussed, and it is evidently assumed that they already existed then but whose remains are undiscovered or undescribed. The only way to change this opinion seems to be to describe a considerable number of Mesozoic ground beetles, showing the actual composition of the Mesozoic fauna. New descriptions, of course, cannot totally exclude the possibility that ground beetles of the Recent type existed in the Mesozoic, but they can at least make their existence less likely. Unfortunately, in analyzing the Mesozoic beetle faunas, it is impossible to use not only old descriptions, because of their inadequacy, but also many newer publications, in which the beetles remain undescribed (e.g., in [9]) or their descriptions are quite fantastic (e.g., in [6, 7]). If the figures in the last two publications are correct, the fossils described cannot possibly be ground beetles, or even any beetles. At the same time the published photographs show that these and many other specimens described as belonging to other groups of beetles almost certainly belong to typical Mesozoic ground beetles. Unfortunately, their precise systematic position cannot be ascertained without thorough redescription of these materials.

I describe below a number of forms from the Upper Jurassic and Lower Cretaceous of Transbaikalia and Mongolia. The stratigraphic position of most of their localities was briefly discussed previously [3]; thus it will merely be stated here that there are serious reasons for considering Bon-Tsagan to be the latest of the Lower Cretaceous localities under consideration [1, 4]. In spite of the considerable differences in their ages, the ground beetles show no significant evolutionary gradation. They are all regarded as sample populations from an essentially single Upper Jurassic to Lower Cretaceous ground beetle fauna. Thus at the Bon-Tsagan locality there are forms resembling ground beetles, both from the Baysa locality (the closest in age in Transbaikalia) and from the Jurassic Karatau locality, that have not been

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found in any locality of intermediate age. It can only be noted that the living form of the long-legged, highly mobile Jurassic ground beetles resembles the trachypachids, and the Early Cretaceous resembles the Carabid-Protorabinae. The species described below do not exhaust the whole diversity of ground beetles in these localities. Thus at the Khutel-Khara and Shin-Khuduk localities at least four species each are represented, and at Bon-Tsagan no less than nine species, but their remains are not sufficiently complete for description. It can only be stated that all these fossils belong to typically Mesozoic ground beetles. Of all the Lower Cretaceous remains studied, only one might belong to a ground beetle of the Recent type. Unfortunately, it consists of an isolated elytrum, and is described below among formal taxa.

FAMILY TRACHYPACHIDAE LECONTE, 1861

Genus *Dundorabus* Ponomarenko, gen. nov.

Generic name. From the Mongolian *dund* (middle) and genus *Carabus*.

Type species. *D. glabrus* sp. nov.

Diagnosis. Fairly small beetle with small head, transverse and almost rectangular prothorax and very elongated elytra. Head and pronotum approximately equal in length, and base of elytrum just barely wider than pronotum. Metathorax longer than mid coxae; hind coxae with very long but fairly narrow femoral covers. Elytra smooth. Legs long; hind tibiae no longer than femora.

Specific composition. Genus is monotypic.

Comparison. Differs from most genera in form of femoral covers, which are fairly narrow and almost quadrate. From genera similar in this feature, it differs in small head, which is much narrower than prothorax; and, it differs from *Karatoma* Ponom. 1977, and *Procalosoma* Handl. 1906, in smooth elytra, from *Unda* Ponom. 1977, in elongated body, and from *Evertus* Ponom. 1986, in slightly notched upper labrum and long metathorax.

Dundorabus glabrus Ponomarenko, sp. nov.

Pl. IV, fig. 1

Specific name. From the Latin *glabrus* (smooth).

Holotype. PIN 3688/1177, impressions and counterparts of almost complete beetle; Mongolia, Middle Gobi area, 23 km southwest of Bayan-Zhargalan somon, Khoutiyn-Khotgor basin (Khoutiyn-Khotgor locality); Upper Jurassic.

Description (Fig. 1a,b). Head with mandibles of almost equal length and width; mandibles fairly short. Upper labrum anteriorly notched. Antennae thick and fairly short, barely extending beyond base of pronotum. Pronotum has twice width of head, fairly shallow notch forward, and narrows slightly toward vertex and base. Length of pronotum is 1.7 times less than width. Length of metathorax is 1.6 times less than its width, and its posterior margin extends posteriorly very little. Length of posterior coxae with femoral covers is 1.4 times less than their width, and length of femoral covers is somewhat greater than their width. Elytrum is narrowed in apical third. Femora of all legs are fairly thick, extending greatly beyond outline of body; fore and mid tibiae are shorter than femora; hind femora and tibiae of equal length; tarsi long, no shorter than tibiae. Body bears dense punctation, which is coarse on thorax and fine on upper side of body.

KEY TO PLATE IV

- Fig. 1. *Dundorabus glabrus* sp. nov., Holotype PIN 3688/1177 ($\times 6$).
 Fig. 2. *Kanadromeus verrucosus* sp. nov., Holotype PIN 3015/1261 ($\times 6$).
 Fig. 3. *Eodromeus mongolicus* sp. nov., Holotype 3559/6124 ($\times 8$).
 Fig. 4. *Eodromeus sulcatus* sp. nov., Holotype PIN 3664/1599 ($\times 8$).
 Fig. 5. *Protorabus tsaganensis* sp. nov., Paratype PIN 3559/6066 ($\times 9$).
 Fig. 6. *Creterabus orientalis* sp. nov., Holotype PIN 3965/216 ($\times 7.5$).
 Fig. 7. *Nebrorabus nebricoides* sp. nov., Holotype PIN 3559/6063 ($\times 7$).
 Fig. 8. *Nebrorabus baculifer* sp. nov., Holotype PIN 2587/103 ($\times 10$).
 Fig. 9. *Nebrorabus capitatus* sp. nov., Holotype PIN 4081/1 ($\times 8$).



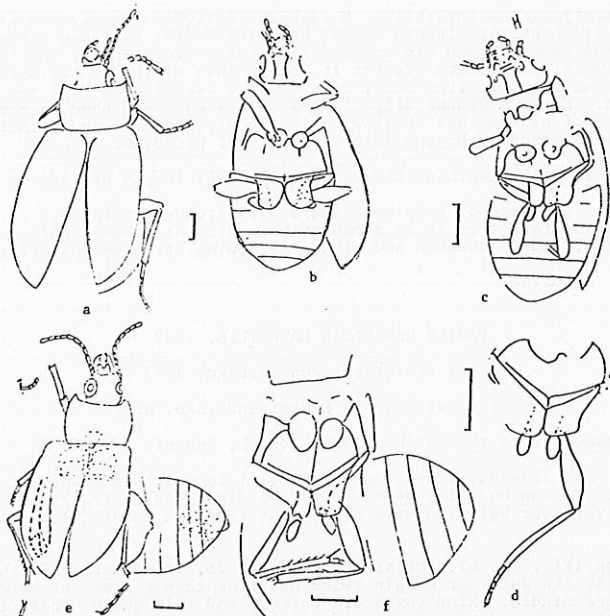


Fig. 1. Representatives of family Trachypachidae: a, b) *Dmdorabus glabrus* sp. nov.; Holotype PIN 3688/1177: a) top; b) bottom; c, d) *Unda pachycephala* sp. nov.: c) Holotype PIN 3795/1125; d) Paratype PIN 3795/1126; e, f) *Karadromeus verrucosus* sp. nov.: e) Holotype PIN 3015/1261; f) Paratype PIN 3015/1267. Scale in all drawings = 1 mm.

Dimensions in mm: Length of beetle 10, width 5; length of elytrum 6.8.

Material. Holotype.

Genus *Unda* Ponomarenko, 1977

Unda pachycephala Ponomarenko, sp. nov.

Specific name. From the Greek *pachys* (thick) and Greek *cephalon* (head).

Holotype. PIN 3795/1125, impression of beetle lacking large part of antennae and legs; Chita region, Chernyshev district, Kuenga River at Shev'ya settlement (Shev'ya locality); ?Upper Jurassic, Ukreyka formation.

Description (Fig. 1c, d). Head wide, its length less than its width at occiput, and narrowing from base; antennae located markedly forward of eyes. Pronotum almost rectangular, prothorax almost equal in length to fore coxae. Metathorax narrows slightly forward, and its length is four times less than its width. Metepisterna are wide and narrow slightly rearward. Length of femoral covers almost twice less than their width; their elongated part is almost square, their lateral part shortens gradually, and their posterior outer angle is distinct. Abdomen is markedly longer than meso- and metathorax together; last sternite at apex is rounded and only a little longer than others. Hind femur is widest at apical third, hind tibia is much longer than femur, and tarsus is much shorter than tibia. Body smooth; punctuation indistinct; elytrum bears very faint grooves.

Dimensions in mm: Length of body 4.8, its width 2.4; length of elytrum 3.3-3.5; length of hind tibia 1.5.

Comparison. Differs from *U. cursoria* Ponom. 1977, and *U. microplata* Ponom. 1977, in wide metepisterna, and from *U. angulata* Ponom. 1977 in wider head.

Material. Holotype, and paratypes from same locality: PIN 3795/1126 two incomplete elytra and hind leg; PIN 3795/1129 part of abdomen and elytrum; and PIN 3795/1123 metathorax and hind leg.

Genus *Karadromeus* Ponomarenko, 1977

Karadromeus verrucosus Ponomarenko, sp. nov.

Pl. IV, fig. 2

Specific name. From the Latin *verrucosus* (rough, warty).

Holotype. PIN 3015/1261, impressions and counterparts of almost complete beetle; Chita region, Baley district, right bank of Unda River above Zhidka settlement (Unda locality); ?Upper Jurassic, Glushkovskaya formation.

Description (Fig. 1e, f). Length of epicranium is approximately equal to its width at occiput; eyes protrude slightly; temples and cheeks (genae) are shorter than eyes. Antennae extend beyond base of pronotum by three segments; their segments widen markedly from base to apex. Clypeus has two quite long projections. Pronotum is 1.4 times shorter than its width; it is widest in middle, narrows and is slightly rounded forward and backward; its anterior margin notched; anterior angles drawn out, posterior corners almost right-angled. Mesothorax shorter than large mid coxae. Metathorax is 2.5 times shorter than its width. Distance between mid and hind coxae approximately equal to length of hind coxae. Metepisterna are very wide, their width forward not more than 1.5 times greater than width at posterior margin. Hind coxae are slanting; their length is half their width. Femoral covers are quite long, their widest part approximately equal to their length and width, their posterior outer corner protrudes and here cover is longest; laterally from this point cover shortens sharply and reaches metepisternum. Abdomen narrows from base of third sternite; its length is no more than its width; base of last sternite almost twice narrower than base of abdomen. Legs are long, femora extend markedly beyond lateral contours of body. Fore tibia somewhat shorter than femur; four apical segments of tarsus are long, second to fourth twice and apical segment three times longer than their width. Hind femora and tibiae approximately equal in length; tibia has spines on outer margin, and spur is somewhat shorter than basal segment of tarsus. Hind tarsus somewhat longer than tibia, thin, and has long segments. Elytra bear coarse tubercles, pronotum is smoother, and its bottom is smooth.

Dimensions in mm: Length of body 7.3-8.0, width 3.5-3.7; length of elytrum 4.6-5.0.

Comparison. Differs from all other species in having clypeus with projections, in longer pronotum, in coarsely tubercular elytrum, and in femoral covers with projecting posterior outer corner.

Material. Holotype, and paratypes from same locality: PIN 3015/1254 and 1267 disarticulated remains, and PIN 3015/1253 isolated elytrum.

Genus *Eodromeus* Ponomarenko, 1977

Eodromeus mongolicus Ponomarenko, sp. nov.

Pl. IV, fig. 3

Holotype. PIN 3559/6124, impressions and counterparts of beetle lacking large parts of legs and antennae; Mongolia, Bayan-Khongor area, foothills of Dund-Ula south of Lake Bon-Tsagan-Nur (Bon-Tsagan locality); Lower Cretaceous.

Description (Fig. 2a-f). Fairly small, quite wide and flattish beetle. Head short, transverse, and narrows little forward. Temples and cheeks much shorter than eyes. Gula narrow, its width in middle half its length. Pronotum almost rectangular, narrows in anterior third and before posterior corners; its length is approximately half its width. Mesepimere long, and barely widens toward sides. Metathorax narrows sharply but rounded forward; its length is one-third its width; distance between mid and hind coxae is longer than mid coxae; posterior margin of metathorax projects slightly and angularly rearward. Hind coxae are slightly shortened laterally, their covers are a little longer than wide, length of covers is half the width of coxae, and posterior margin of cover has shallow notch. Abdomen narrows from base to third segment; base of last sternite is 1.5 times narrower than base of

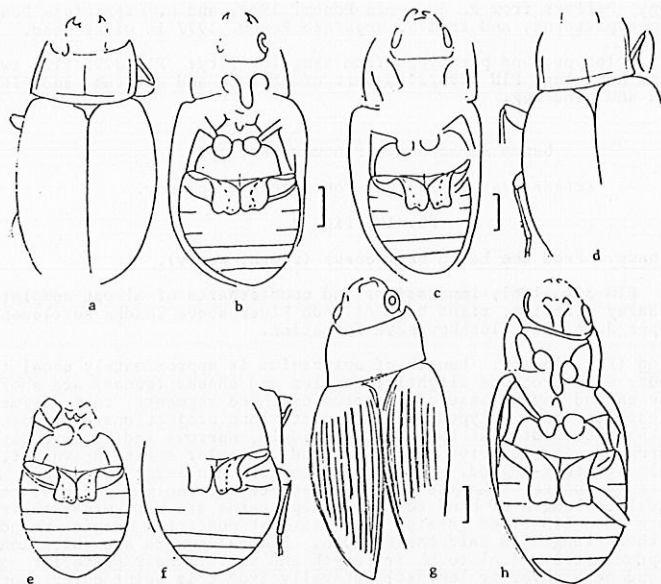


Fig. 2. Representatives of genus *Eodromeus*: a-f) *E. mongolicus* sp. nov.; a, b) Holotype PIN 3559/6124: a) top; b) bottom; c) Paratype PIN 3559/1706; d) Paratype PIN 3559/6138; e) Paratype PIN 3559/1709; f) Paratype PIN 3559/6140; g, h) *E. sulcatus* sp. nov., Holotype PIN 3664/1599: g) top; h) bottom.

abdomen. Elytrum widens from base approximately to middle and then narrows again. Disc of elytrum smooth. Femora are fairly thick, extend slightly beyond lateral outlines of body; tibiae are thin and widen slightly toward apex; tarsi have thin, long segments. Spur on hind tibia is short.

Dimensions in mm: Length of body 7.2-8.0, width 3.0-4.0; length of elytrum 4.5-5.0.

Comparison. In smooth elytra, wide prothorax and long metathorax, new species is very close to *E. dissectus* Ponom. 1986, but differs from it in wider body, prothorax narrowing more strongly posteriorly, and longer and less deeply notched femoral covers.

Material. Holotype and 10 paratypes from same locality.

Eodromeus sulcatus Ponomarenko, sp. nov.

Pl. IV, fig. 4

Specific name. From the Latin *sulcus* (groove, furrow).

Holotype. PIN 3664/1599, impressions and counterparts of beetle lacking antennae and large parts of legs; Mongolia, Middle Gobi area, Shin-Khuduk' well 40 km southwest of Undur-Shil' somon (Shin-Khuduk locality); Lower Cretaceous, Shin-Khuduk formation.

Description (Fig. 2g, h). Fairly small and flat beetle. Head short, its width 1.5 times its length; temples and cheeks much shorter than eyes. Gula narrow, its length twice its width in middle. Pronotum narrows slightly forward from its middle; its length is almost half its width. Prothorax in front of fore coxae is 1.3 times longer than coxae, and prothoracic process extends far beyond fore coxae. Mesepimeron

is long, and barely widens laterally. Metathorax narrows strongly and is rounded anteriorly; it is short, its length almost half its width; distance between mid and hind coxae is not shorter than mid coxae. Hind coxae are strongly shortened laterally; their femoral covers are greater in length than width and are markedly notched laterally. Abdomen narrows from base; base of last sternite is half the length of base of abdomen. Elytrum widens slightly beyond its base and then narrows beyond its middle; disc of elytrum has shallow, slightly discernible, indistinct grooves. Fore femur extends markedly beyond lateral margin of pronotum.

Dimensions in mm: Length of body 8.0, width 3.8; length of elytrum 5.5.

Comparison. In shape of body and elytra with grooves, resembles *E. sternalis* Ponom. 1977, but differs from it in somewhat more elongated body, narrower gula, shorter prothorax, and in abdomen and elytra narrowing strongly posteriorly.

Material. Holotype.

FAMILY CARABIDAE LATREILLE, 1802

Genus *Protorabus* Ponomarenko, 1977

Protorabus crassus Ponomarenko, sp. nov.

Specific name. From the Latin *crassus* (thick, dense).

Holotype. PIN 3924/33, impression of beetle, in which structure of head, prothorax, extremities and end of abdomen cannot be discerned; Chita region, Shelopugino district, Shiviya River below Shiviya settlement (Shiviya locality); Lower Cretaceous, Daya formation.

Description (Fig. 3a, b). Metathorax very short, its length half the width at posterior margin, its anterior margin twice narrower than posterior; metepisterna become wider before middle. Hind coxae are oblique and triangular; their lateral margin is almost straight and not notched; femoral covers are approximately equal in length and width. Elytrum has thin grooves but no distinct puncta.

Dimensions in mm: Length of beetle about 7.0, width 3.6; length of elytrum 5.5.

Comparison. More closely resembles Jurassic species, especially *P. nigrimonticola* Ponom. 1977, but differs from them in shape of femoral covers of hind coxae which are not notched laterally. In this feature it resembles *P. planus* Ponom. 1977, from which it differs in smaller size, longer femoral covers and shorter metathorax that narrows more strongly forward.

Remarks. Because of incomplete preservation (structures of pronotum and apex of abdomen are unknown), it cannot be proved that this fossil belongs to *Protorabus*; beetle is assigned to this genus, however, because only *Protorabus* has species with grooves on elytra and similar shape of femoral covers of hind coxae.

Material. Holotype.

Protorabus tsagensis Ponomarenko, sp. nov.

Pl. IV, fig. 5

Specific name. From Lake Bon-Tsagan-Nur in Mongolia.

Holotype. PIN 3559/1739, impressions and counterparts of almost complete beetle; Mongolia, Bayan-Khongor area, foothills of Dund-Ula south of Lake Bon-Tsagan-Nur (Bon-Tsagan locality); Lower Cretaceous.

Description (Fig. 3c-e). Head transverse, triangular, with protruding mandibles. Epicranium is 1.5 times shorter than its width at occiput; temples and cheeks are shorter than eyes. Antennae are short and just barely extend beyond base of prothorax. Pronotum is 1.6 times shorter than its width; its sides have fairly flat, posteriorly widening bevel; base has wide flat transverse impression; disc of pronotum has longitudinal incised line in middle. Metathorax is three times shorter than its width at posterior margin. Hind coxae oblique and strongly shortened laterally; femoral covers somewhat greater in length than in width. Abdomen narrows just barely to base of last sternite; tip of abdomen blunt. Elytrum narrows in apical third; disc bears thin sharp grooves in fairly small points; second and fifth groove from sutural margin join before apex, third and fourth end blindly between them. Femora of legs widen slightly, tibiae widen toward apex, and fore tibia curved inward.

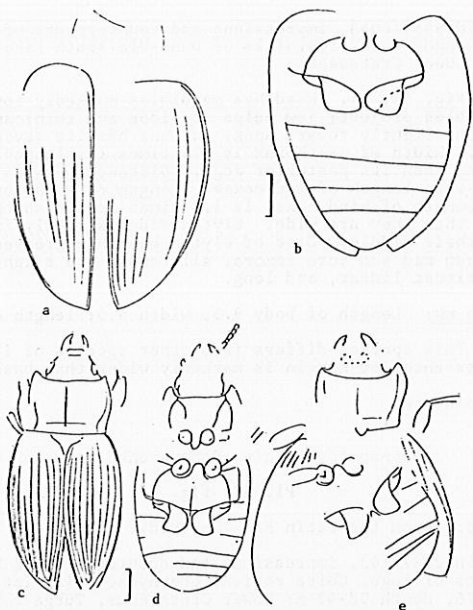


Fig. 3. Representatives of genus *Protorabus*: a, b) *P. crassus* sp. nov., Holotype PIN 3924/33: a) top; b) bottom; c-e) *P. tsaganensis* sp. nov.; c, d) Holotype PIN 3559/1739: c) top; d) bottom; e) Paratype PIN 3559/6066.

Dimensions in mm: Length of body 8.2-8.6, width 4.2-4.5; length of elytrum 5.0-5.1.

Comparison. In shape and proportions of prothorax, metathorax and hind coxae, new species most closely resembles *P. nigrimonticola* Ponom. 1977; it differs in shorter antennae and mandibles, somewhat longer metathorax, and abdomen narrowing less toward its apex.

Material. Holotype, also paratype PIN 3559/6066 from same locality.

Genus *Cretorabus* Ponomarenko, 1977

Cretorabus orientalis Ponomarenko, sp. nov.

Pl. IV, fig. 6

Specific name. From the Latin *orientalis* (eastern).

Holotype. PIN 3965/216, impressions and counterparts of almost complete beetle; Mongolia, eastern Gobi area, 70 km southwest of Sayn-Shand, Mt. Khutel-Khara (Khutel-Khara locality); Upper Jurassic to lower part of Lower Cretaceous.

Description (Fig. 4a, b). Small, fairly flat and very wide beetle. Head large and triangular, its length somewhat less than its width. Temples much shorter than eyes. Length of gula is 1.3 times greater than its width; it is much narrower than submentum, and lateral parts of mentum are quite long. Antennae extend greatly beyond base of pronotum; their proximal segments are cylindrical and long; first segment is twice thicker than second. Width of pronotum is 1.8 times its length; pronotum is widest in anterior third, and stretched out anteriorly to base; anterior corners of pronotum and drawn out. Prothorax in front of coxae is 1.5 times longer than they are; prothoracic process on apex is rounded and extends far beyond fore



Fig. 4. Genus *Cretorabus*: a, b) *C. orientalis* sp. nov., Holotype PIN 3965/216: a) top; b) bottom; c, d) *C. ovalis* sp. nov., Holotype PIN 3559/6125: c) top; d) bottom.

coxae. Width of metathorax is twice its length. Width of hind coxa is 2.5 times less than its length; coxa is sharply shortened laterally, but anteriorly femoral covers extend in narrow lobe almost to lateral margins of coxae. Abdomen narrows from base of fourth segment. Elytra smooth, widen somewhat from base, and narrow in their apical third. Legs are quite short; hind femora just barely and fore coxae markedly extend beyond lateral contours of body. Fore tibia is linear, and almost equal in length to femur.

Dimensions in mm: Length of body 9.5, width 4.5; length of elytrum 6.0.

Comparison. In its wide and fairly flat body, this species resembles *C. latus* Ponom. 1977, but differs from it in longer metathorax.

Material. Holotype.

Cretorabus ovalis Ponomarenko, sp. nov.

Specific name. From the Latin *ovalis* (oval).

Holotype. PIN 3559/6125, positive impression of beetle lacking distal parts of antennae and legs; Mongolia, Bayan-Khongor area, foothills of Dund-Ula south of Lake Bon-Tsagan-Nur (Bon-Tsagan locality); Lower Cretaceous.

Description (Fig. 4c, d). Wide, fairly flat beetle of medium size. Head short; antennae have short bead-like segments. Length of pronotum is almost half its width; pronotum narrows from its middle; its anterior margin is quite deeply notched, and its anterior corners drawn out. Metathorax is short, its length half its width; its posterior margin projects angularly in middle. Hind coxae quite long, their length 2/5 their width; femoral covers strongly shortened laterally and extend somewhat beyond middle of coxae; length of femoral covers is greater than their width. Abdomen narrows from base of fourth sternite. Elytra smooth, widen slightly from base and then narrow again in anterior third. Legs are short; femora widen strongly in apical third; fore tibiae are shorter than femora and widen almost from base to apex; basal segments of fore tarsi widen.

Dimensions in mm: Length of body about 14.0, width 8.0; length of elytrum 9.5-9.7.

Comparison. In wide, fairly flat body and short metathorax it resembles *C. latus* Ponom. 1977, but differs from it in longer hind coxae.

Material. Holotype, and Spec. 3559/6121 from same locality may be same species, but it differs in narrower fore tibiae and tarsi.

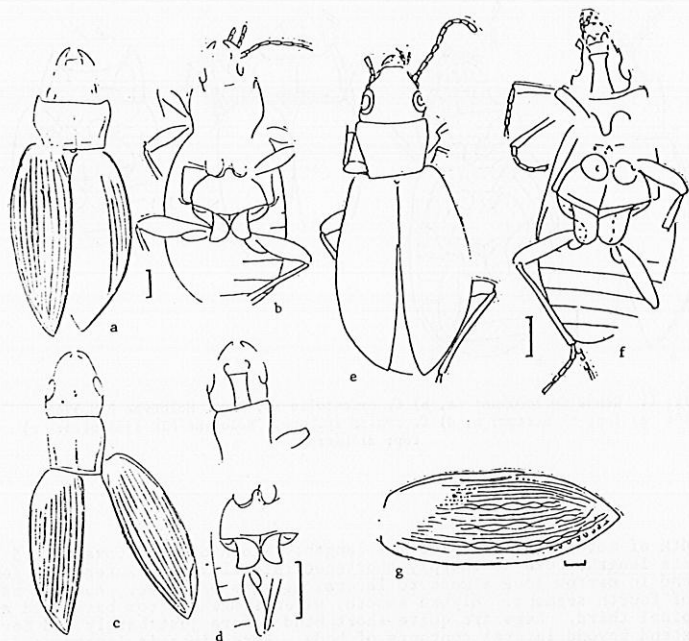


Fig. 5. *Nebrorabus* gen. nov. and *Carabites caraboides* sp. nov.: a, b) *N. nebrionoides* sp. nov.; Holotype PIN 3559/6063: a) top; b) bottom; c, d) *N. baculum* sp. nov., Holotype 2587/103: c) top; d) bottom; e, f) *N. capitatus* sp. nov., Holotype PIN 4081/1: e) top; f) bottom; g) *C. caraboides* sp. nov., Holotype PIN 1598/4.

Genus *Nebrorabus* Ponomarenko, gen. nov.

Generic name. From genera *Nebria* and *Carabus*.

Type species. *N. baculum* sp. nov.

Diagnosis. Fairly small beetle with elongated, fairly flat body. Head large and triangular, its length approximately equal to length of prothorax, its width at occiput not more than 1.5 times narrower than base of prothorax. Prothorax narrowing strongly rearward, and its base much narrower than elytra at humeri. Metathorax longer than coxae. Hind coxae oblique, their femoral covers strongly shortened laterally. Elytra with thin point-like grooves or smooth; their length about three times their width. Legs long, femora extending by almost one-third beyond lateral contours of body; hind tibiae longer than femora.

Specific composition. Three species described below, from Lower Cretaceous in Transbaikalia and Mongolia, and perhaps also *Protorabus elongatus* Ponomarenko 1986, from Lower Cretaceous in Mongolia; it was described on basis of insufficiently complete remains, but has elytra of similar structure.

Comparison. Differs from all other genera of its subfamily in elongated body with strongly rearward-narrowing pronotum and longer elytra and legs, which extend far beyond lateral contours of trunk.

Nebrorabus nebrionoides Ponomarenko, sp. nov.

Pl. IV, fig. 7

Specific name. From genus *Nebria*.

Holotype. PIN 3559/6063, impressions and counterparts of almost complete beetle; Mongolia, Bayan-Khongor area, foothills of Dund-Ula south Lake Bon-Tsagan-Nur (Bon-Tsagan locality); Lower Cretaceous.

Description (Fig. 5a, b). Head has mandibles markedly longer than they are wide at occiput. Mandibles project; jaw palps are long and thin; antenna have long, thin segments that widen slightly toward apex; antenna has its seventh extending beyond base of prothorax. Width of prothorax is 1.5 times its length; its anterior margin is one-fourth wider than its posterior edge. Distance between mid and hind coxae is 1.5 times greater than length of mid coxae. Length of metathorax is 2.3 times less than its width. Length of hind coxae is 1.7 times less than their width; femoral covers are longer than they are wide. Elytra widen slightly from base and then begin to narrow before their middle. Disc of elytra has thin grooves. Hind femora are markedly longer than mid and fore femora; all femora are slightly and evenly flattened. Tibiae are thin, almost linear, and long.

Dimensions in mm: Length of body 9.5, width 4.5; length of elytrum 5.7.

Comparison. This species differs from other species of its genus in wider pronotum, which at its anterior margin is markedly wider than base of head.

Material. Holotype.

Nebrorabus baculum Ponomarenko, sp. nov.

Pl. IV, fig. 8

Specific name. From the Latin *baculum* (rod).

Holotype. PIN 2587/103, impressions and counterparts of beetle lacking antennae and large parts of legs; Chita region, Chernyshev district, left bank of Undurga River, Borehole 176, depth 38-43 m; Lower Cretaceous, Turga formation.

Description (Fig. 5c, d). Head with mandibles slightly greater in length than in width, widest beyond eyes; temples long, no shorter than eyes; cheeks shorter than eyes. Mandibles almost twice shorter than epicranium. Pronotum small, shorter and narrower than head, its length somewhat less than its width; its greatest width is in anterior third. Mesothorax is 2.5 times less in length than in width at its posterior margin. Elytra quite flat and elongated, their length being 3.5 times their width. Tip of elytrum pointed and shifted toward sutural margin. Disc of elytrum has thin grooves without distinct points; along outer edge of apical one-fourth of elytrum is deep groove bearing two large points at its beginning and end; these points are evidently bristle-bearing pores. Two grooves nearest to suture join before apex; remaining grooves approach outer groove but do not come into contact with it.

Dimensions in mm: Length of body 5.2, width 1.5; length of elytrum 2.8.

Comparison. This species differs from *N. nebrionoides* in narrower pronotum and from *N. capitatus* in elytra having grooves with points.

Material. Holotype.

Nebrorabus capitatus Ponomarenko, sp. nov.

Pl. IV, fig. 9

Specific name. From the Latin *caput* (head).

Holotype. PIN 4081/1, impression and counterparts of almost complete beetle; Chita region, Baley district, Onokhovskiy graben, Borehole 2699, depth 99 m; Lower Cretaceous, Leskovskaya series.

Description (Fig. 5e, f). Small, fairly flat beetle with drop-shaped outline of body. Head quite long, narrowing forward, its length equal to its width at occiput. Eyes large, slightly protuberant, and much longer than temples. Length of gula twice its width; it is a little narrower than submentum; lateral parts of mentum are short. Antennae just barely extend beyond base of pronotum; their basal segments are cylindrical and their apical segments slightly beaded. Length of pronotum is 1.3 times less than its width at anterior margin and equal to its width at posterior margin; pronotum narrows strongly posteriorly; elytra at humeri are much wider than base of pronotum. Anterior margin of pronotum very slightly notched, its posterior margin straight. Prothorax in front of fore coxae is almost twice longer than they

are. Mid coxae are large, round and longer than mesothorax. Length of metathorax is twice less than its width at posterior margin; its anterior margin is much narrower than posterior, which projects rearward in angle. Length of hind coxa almost twice less than its width; femoral cover strongly shortened laterally, and length of its mesal part is greater than width. Last sternite of abdomen is 1.7 times longer than preceding ones. Elytra smooth. Femora are quite long and project markedly beyond lateral contours of body. Fore tibia is just barely shorter than femur and equal in length to tarsus. Mid femur almost twice longer than fore femur; mid tibia and tarsus approximately equal to femur. Hind tibia much longer than femur, and tarsus twice shorter than tibia.

Dimensions in mm: Length of body 7.8, width 3.3; length of elytrum 4.7.

Comparison. Differs in smooth elytra.

Material. Holotype.

Form genus *Carabites* Ponomarenko, 1972

Carabites caraboides Ponomarenko, sp. nov.

Specific name. From genus *Carabus*.

Holotype. PIN 1598/4, impression of elytrum; Chita region, Borzya district, Kharanor deposit, Borehole 584; Lower Cretaceous, Kutinskaya formation.

Description (Fig. 5g). Fairly large, strongly convex elytrum, widest before apical third. Humeral margin slanted rearward, but humeral angle is discernible. Suture margin convex; outer margin somewhat notched in anterior half of elytrum. Scutellary groove quite long. Disc bears 16 grooves; points on them are indistinct. Interval between second and third grooves has round tubercles before apex of elytrum. Third and fourth, seventh and eighth, and eleventh and twelfth grooves converge into pairs, transforming intervals between them into series of longitudinally oval tubercles. First to sixth grooves bend before apex along sutural margin and contact on groove bypassing outer margin. Fourteenth to sixteenth grooves run along outer margin until they meet sixth groove. Seventh to thirteenth grooves turn before end and do not form clear mergings.

Dimensions in mm: Length of elytrum 13, width 4.

Comparison. Other species assigned to this formal genus do not have elytra with intervals between disc grooves transformed into longitudinal tubercles.

Remarks. Elytra of above structure are known only in ground beetles of supertribe Carabitae *sensu* Kryzhanovskiy, 1976. Larger number of grooves of elytrum are also known in genus *Omophon*, but elytrum of latter is short and does not have rows of longitudinal tubercles present on elytrum described here, which are so characteristic of genera *Carabus* and *Cyohrus*.

Material. Holotype.

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THE FIRST DISCOVERY OF SCALE-BEARING BLENNIES (TELEOSTEI) IN THE SARMATIAN OF MOLDAVIA

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ABSTRACT: A new species of scale-bearing blennies (Clinidae)--*Clinitrachus gratus* is described in detail from the Lower Sarmatian of northern Moldavia. This represents the first find of fossil Clinidae in the USSR and the second reliably identified fossil species of this family.

* * *

The family of scale-bearing blennies (Clinidae) includes fairly small fishes characterized by a body covered with scales, by a protuberant mouth with conical teeth, and by the spiny part of their dorsal fin exceeding the soft part in length. The family occurs widely in the Recent marine fish fauna in tropical and warm temperate waters, predominantly near the shores; the scale-bearing blennies usually prefer a rocky bottom. The Clinidae are subdivided into two subfamilies [6, 16] (although recently their rank is often raised to the family level [15, 17]: the large-scaled Labrisominae (more primitive, and occurring almost exclusively in the New World), and the small-scaled Clininae (extensively distributed). Within the Clininae are distinguished several tribes [16, 19], which include both egg-laying and viviparous forms. The viviparous Clininae attain their greatest expansion in South Africa [19], although individual forms of them also exist in the Indo-Pacific region. Of the viviparous scale-bearing blennies, only one species has penetrated into the Atlantic basin--*Clinitrachus argentatus* (Risso), which now inhabits the Mediterranean Sea.

Fossil clinid fishes are extremely rare. From the Eocene at Bolcan (northern Italy) Agassiz [9] described *Pterygocephalus* and *P. paradoxus*, which he likened to the long-spined fish (Dactylopteriformes). Other nineteenth century authors [11, 24] followed Müller (as Blot [14] notes) in considering the name *Pterygocephalus* to be a synonym of the Recent genus of marine blennies *Cristiceps* Cuvier et Valenciennes, but assigned this genus to the scorpion-like fishes. Woodward in 1901 [23] restored the validity of the genus *Pterygocephalus*, assigning it to the Blenniidae (*sensu lato*), and considered it to be related to *Cristiceps*. In his publication of the Recent Clinidae Hubbs [16] distinguished *Pterygocephalus* as a special family. Finally, according to the latest data [13, 14], *Pterygocephalus* is once again not related to

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