

## New Mesozoic Ithyceridae Beetles (Coleoptera)

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**Abstract**—A new subfamily, Mongolocarinae subfam. nov. of the family Ithyceridae, from the Middle–Upper Jurassic and Lower Cretaceous of Asia is described. It includes five genera with five species: *Palaeocar* gen. nov. (with *P. princeps* sp. nov.), *Mongolocar* gen. nov. (*M. orcinus* sp. nov.), *Praecar* gen. nov. (*P. stolidus* sp. nov.), *Karacar* gen. nov. (*M. contractus* sp. nov.), and *Baissacar* gen. nov. (*B. passarius* sp. nov.).

**Keywords:** Coleoptera, Ithyceridae, Mesozoic, Asia, new taxa.

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### INTRODUCTION

The family Ithyceridae is a relatively poorly known group of primitive curculionoid beetles. The family includes four well-distinguished subfamilies (Carinae, Ulyaninae, Slonikinae, and Ithycerinae) (Legalov, 2009). The Carinae develop in fruits of gymnosperms. The mode of life of the Ulyaninae and Slonikinae is unknown. The single known species of the Ithycerinae, distributed in western North America, has terrestrial mode of life, with larvae developing in the soil. Members of this family have a homonomous or almost homonomous abdomen, usually single gular suture, and reduced labrum. Ithycerids probably differentiated from the family Nemonychidae because of adaptation to living in fruits and, possibly, in vegetative organs.

The earliest ithycerids are known from the Middle–Upper Jurassic of Karatau (two species described below) and the Upper Jurassic of Mongolia (*Gobicar ponomarenkoi* Gratshev et Zherikhin, 1999). Five species have been described from the Jurassic–Cretaceous boundary beds of China (Liu and Ren, 2006, 2007). Ithycerids were the major curculionoids in the Early Cretaceous (16 species, including those described below, from the subfamilies Carinae, Ulyaninae, and Slonikinae). The majority of members of this family are fossil taxa (Voss, 1953; Arnoldi, 1977; Zherikhin, 1977, 1993; Gratshev and Zherikhin, 1999; Zherikhin and Gratchev, 2004; Gratshev et al., 1997; Gratshev, 1999; Legalov, 1999; Gratshev and Zherikhin, 2000a, 2000b; Liu and Ren, 2006, 2007; Soriano et al., 2006; Soriano, 2009). Several species from the subfamilies Carinae and Ithycerinae are known in the Recent fauna (Legalov, 2009).

The late V.G. Gratshev in his unfinished dissertation assigned new taxa of Mesozoic curculionoids to Nemonychidae. Legalov (2009) believes that some of them should be referred to Ithyceridae, because the basal attachment of antenna is a character of primitive Ithyceridae. The latter systematic position is accepted in this publication. The material described here is stored in the Borissiak Paleontological Institute of the Russian Academy of Sciences (PIN).

### SYSTEMATIC PALEONTOLOGY

#### Family Ithyceridae Schoenherr, 1823

#### Subfamily Mongolocarinae Gratshev et Legalov, subfam. nov.

**Diagnosis.** Body weakly dorsoventrally flattened or not flattened. Rostrum narrow and long, or usually thick and relatively short, positioned medially on head. Antenna short, attached within basal half of rostrum length, usually near base of rostrum. Eyes not protruding. Pronotum with lateral rib. Mesocoxae teardrop-shaped, closely spaced, their external margins partly covering mesepimeron and mesepisternum. Metepisternum entering mesocoxal cavity; thus, mesocoxal cavity nonclosed. Elytron with puncture grooves and narrow epipleuron, separated along their entire length by nonpuncture groove. Abdomen with five movable ventrites. All ventrites homonomous or ventrite 1 twice as long as ventrite 2, while other ventrites homonomous.

**Generic composition.** Five new genera from the Middle–Upper Jurassic and Lower Cretaceous of Asia.

**Comparison and remarks.** The basally attached antenna, procoxae occupying a very large

part of the ventral surface of the prothorax, and the robust body indicate that the new subfamily is close to Carinae and, thus, belongs to the family Ithycteridae. The new subfamily is distinguished from all other subfamilies of this family in the externally open mesocoxal cavity.

Key to genera of the subfamily Mongolocarinae

- (1) Rostrum with two tubercles near eyes.....*Praecar*  
 – Head and rostrum of ordinary structure.....2  
 (2) Larger: body without rostrum 5.8 mm long. Abdominal ventrites almost homonomous; ventrite 1 only slightly longer than ventrite 2. Precoxal part of prothorax narrow, but distinct.....*Mongolocar*  
 – Smaller: body without rostrum 2.2–3.5 mm long. Ventrite 1 longer than succeeding homonomous ventrites. Procoxa almost as long as prothorax ventrally.....3  
 (3) Femora not dilated. Antenna attached far from eye.....*Karacar*  
 – Femora dilated along entire length. Antenna attached close to eye.....4  
 (4) Smaller (2.2–2.3 mm). Antenna attached close to eye. Eye large, its diameter greater than diameter of rostrum. All segments of flagellum, including segment 1, short.....*Palaeocar*  
 – Larger (3.5 mm). Antenna attached at distal margin of basal third of rostrum. Eye relatively small, smaller in diameter than rostrum. Antennomeres 1 and 2 identical, elongate, and several times as long as succeeding segments of flagellum.....*Baissacar*

1 **Genus *Mongolocar* Gratshev et Legalov, gen. nov.**

**E t y m o l o g y.** From Mongolia and the generic name *Car*.

**T y p e s p e c i e s.** *M. orcinus* sp. nov.

**D i a g n o s i s.** Medium-sized, robust, weakly convex, and weakly chitinized beetle. Rostrum not in lower position, moderately long. Mandibles relatively small, anteriorly protruding. Head capsule large, wider than long. Eye flat, circular, medium-sized, greater in diameter than rostrum. Frons sloping, weakly convex, separated from rostrum by weak depression. Antenna attached near eye, at base of rostrum. Pronotum with distinct lateral rib; pronotal disc slightly convex longitudinally. Elytra with narrow but distinct puncture grooves, weakly longitudinally convex. Prothorax narrow. Procoxa spherical, occupying large part of ventral surface of prothorax. Abdominal ventrites homonomous.

**S p e c i e s c o m p o s i t i o n.** Type species.

1 ***Mongolocar orcinus* Gratshev et Legalov, sp. nov.**

**E t y m o l o g y.** From the Latin *orcinus* (posthumous; belonging to Orcus, god of the underworld).

**H o l o t y p e.** PIN, no. 4271/289, part and counterpart of adult beetle; Mongolia, Bayankhongor Aimag, southeastern slope of Ikh Bogd Uul, southwest of Tsagan Ovoo, 33 km north of Bayanlig Somon, Shar Tologoi locality; Lower Cretaceous, Bon Tsagan Group, Shar Tologoi sequence.

**D e s c r i p t i o n** (Fig. 2a). The body is light brown. The rostrum is slightly longer than the pronotum, gently and very weakly curved, not narrowing towards the apex, with thin carinae. The head capsule is imbedded in the pronotum almost up to the eyes. The antenna is short, not longer than the rostrum. The pronotum is weakly dorsally convex, covered with relatively small, but dense punctures on disc, and with umbilical punctures. The elytron is 2.6 times as long as the pronotum, with an epipleural border. The distance between the puncture lines is subequal to the diameter of the punctures. The femora are somewhat dilated along the entire length. The tibiae are straight.

**M e a s u r e m e n t s,** mm. Body length without rostrum, 5.8.

**M a t e r i a l.** Holotype.

**Genus *Palaeocar* Gratshev et Legalov, gen. nov.** 1

**E t y m o l o g y.** From the Greek *palaios* (ancient) and the generic name *Car*.

**T y p e s p e c i e s** *P. princeps*, sp. nov.

**D i a g n o s i s.** Small, robust, convex, not flattened dorsoventrally, weakly chitinized beetle. Rostrum not in lower position, moderately long, weakly and gently curved. Mandibles not large, protruding anteriorly. Head capsule large, wider than long. Eye medium-sized, flat, and circular, exceeding rostrum in diameter. Frons weakly convex, sloping. Antenna attached at base of rostrum. Pronotum with distinct lateral rib. Elytra convex longitudinally, with narrow but distinct puncture grooves. Prothorax narrow. Procoxa occupying almost entire ventral surface of prothorax. Abdominal ventrite 1 twice as long as ventrite 2.

**S p e c i e s c o m p o s i t i o n.** Type species.

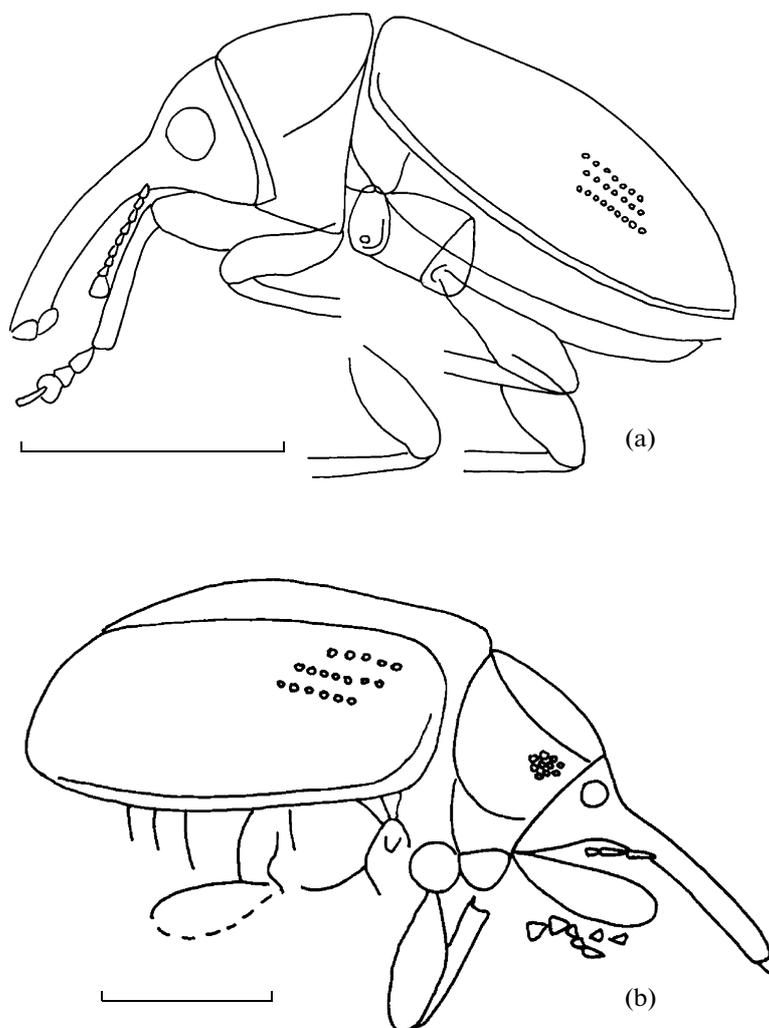
**C o m p a r i s o n.** The new genus differs from the genus *Mongolocar* in the considerably smaller size and elongate abdominal ventrite 1.

***Palaeocar princeps* Gratshev et Legalov, sp. nov.** 1

**E t y m o l o g y.** From the Latin *princeps* (first).

**H o l o t y p e.** PIN, no. 4271/287, part and counterpart of adult beetle; Mongolia, Bayankhongor Aimag, southeastern slope of Ikh Bogd Uul, southwestern Tsagan Ovoo, 33 km north of Bayanlig Somon, Shar Tologoi locality; Lower Cretaceous, Bon Tsagan Group, Shar Tologoi sequence.

**D e s c r i p t i o n** (Fig. 1a). The body is dark brown. The rostrum is 1.3 times as long as the pronotum, not narrowing towards the apex. The head capsule is imbedded in the pronotum almost up to the eyes. The antenna is short, not longer than the rostrum. The



**Fig. 1.** Members of the subfamily Mongolocarinae: (a) *Palaeocar princeps* sp. nov., holotype PIN, no. 4271/287, lateral view; (b) *Baissacar passarius* sp. nov., holotype PIN, no. 4210/726, lateral view. Scale bar, 1 mm.

antennal club is three times as wide as the flagellum, not long. The pronotum is virtually flat dorsally, 1.5 times longer than wide, with the maximum width medially, narrowing very weakly basally and smoothly but more strongly anteriorly, 0.62 times as wide at the base. The disc is covered with large and dense dual punctures. The elytra are 2.8 times as long as the pronotum and 1.5 times longer than the width at the middle, with an epipleural border. The distance between the puncture lines is subequal to the diameter of the punctures. The femora are somewhat dilated. The tibiae are straight. The protibia is somewhat shorter than the profemur. Tarsomere 1 is twice as long as wide, 1.5 times as long as tarsomere 2. Tarsomere 2 is as long as wide, with incised anterior margin, equal in width to tarsomere 2. Tarsomere 3 is bilobed, slightly longer and somewhat wider than tarsomere 2.

**Measurements**, mm. Body length without rostrum, 2.2–2.3.

**Material.** Holotype.

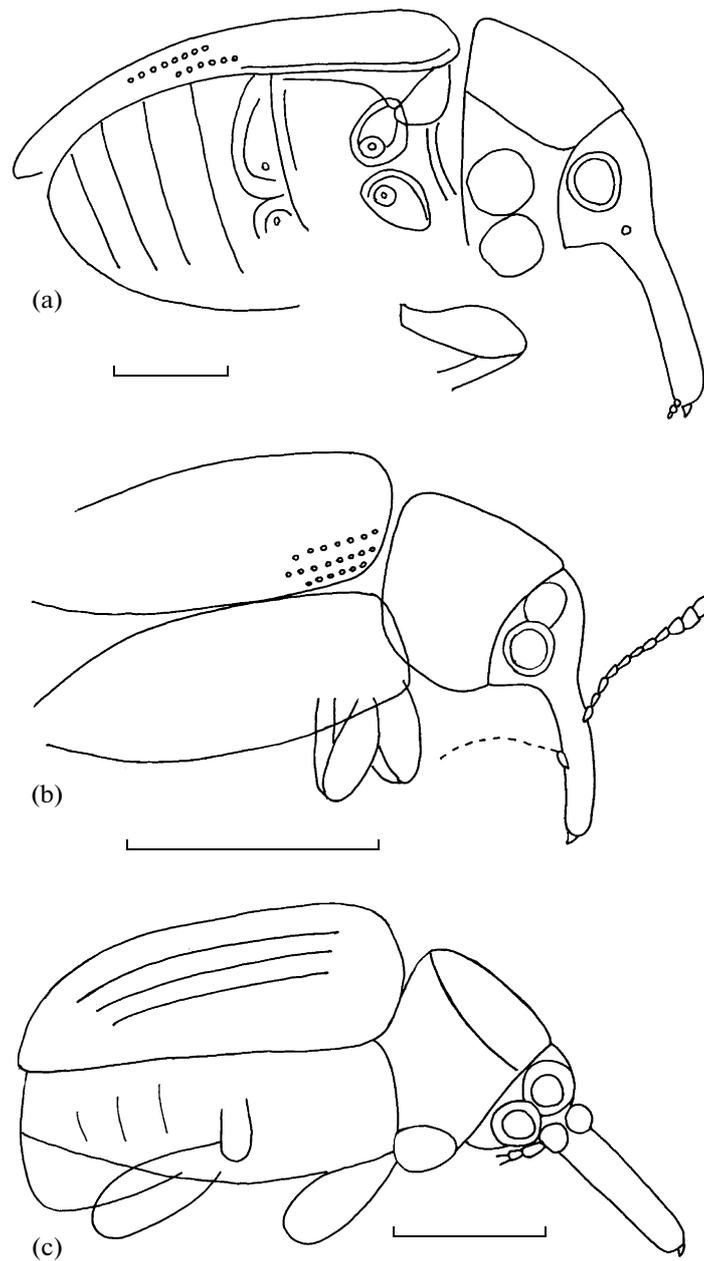
#### **Genus *Praecar* Gratshev et Legalov, gen. nov.**

1

**Etymology.** From the Latin *prae-* (before) and the generic name *Car*.

**Type species** *P. stolidus*, sp. nov.

**Diagnosis.** Robust, weakly convex, strongly chitinized beetle. Rostrum not in lower position, moderately long, very weakly and smoothly curved, with two contiguous tubercles at antennal bases. Mandibles not large, anteriorly protruding. Head capsule moderately large. Eye flat, circular, medium-sized. Frons sloping, weakly convex, separated from rostrum by weak depression. Pronotum with distinct lateral rib; pronotal disc convex slightly longitudinally. Elytra convex weakly longitudinally, with puncture grooves. Prothorax narrow. Procoxa occupying almost entire ventral surface of prothorax.



**Fig. 2.** Members of the subfamily Mongolocarinae: (a) *Mongolocar orcinus* sp. nov., holotype PIN, no. 4271/289, ventral view; (b) *Karacar contractus* sp. nov., holotype PIN, no. 2384/528, dorsal view; (c) *Praecar stolidus*, sp. nov., holotype PIN, no. 2239/1558, lateral view. Scale bar, 1 mm.

**Species composition.** Type species.

**Comparison.** The new genus differs from all other genera of the subfamily in the large tubercles at the base of the rostrum near the eyes, where the antennae are attached.

**Remarks.** Although it is impossible to examine the structure of the mesothorax and abdomen, the genus is assigned to the subfamily Mongolocarinae because of the basal position of the antennae and more or less cylindrical rostrum, which is not in the lower position.

*Praecar stolidus* Gratshev et Legalov, sp. nov.

1

**Etymology.** From the Latin *stolidus* (unmovable, dull, stolid).

**Holotype.** PIN, no. 2239/1558, positive impression of adult beetle; Kazakhstan, South Kazakhstan Region, Baidibekskii District, spurs of the Karatau Range near the village of Mikhailovka (Aulie); Middle–Upper Jurassic, Karabastau Formation.

**Description** (Fig. 2c). The body is robust, dark brown. The rostrum is slightly longer than the pronotum, not narrowing towards the apex. The head cap-

sule is imbedded in the pronotum almost up to the eyes. The eye is subequal in diameter to the rostrum. The antenna is thick, attached in front of the eyes on tubercles. The pronotum is weakly dorsally convex. The elytron is 2.4 times as long as the pronotum. The distance between the puncture lines is distinctly larger than their width. The femora are evenly dilated in the apical portion.

**Measurements**, mm. Body length without rostrum, 3.7.

**Material**. Holotype.

1 **Genus *Karacar* Gratshev et Legalov, gen. nov.**

**Etymology**. From the Karatau locality and the generic name *Car*.

**Type species** *K. contractus* sp. nov.

**Diagnosis**. Robust, weakly convex, strongly chitinized beetle. Rostrum not in lower position, moderately long, very weakly and smoothly curved. Mandibles not large, protruding anteriorly. Head capsule large. Eye flat, circular, medium-sized. Frons sloping, weakly convex, separated from rostrum by weak depression. Antenna attached at middle or basal to middle of rostrum. Pronotum long, with weakly longitudinally convex disc. Elytra with puncture grooves. Femora not dilated.

**Species composition**. Type species.

**Comparison**. The new genus is most similar to the genus *Palaeocar*, but differs from it in the nondilated femora, the more strongly elongate pronotum, and the more distal position of the antennal base.

**Remarks**. The structure of the mesothorax and abdomen is unknown. The new genus is assigned to Mongolocarinae based on the more or less basal attachment of short antennae, the position of the rostrum, which is not lower, and its more or less cylindrical shape.

1 ***Karacar contractus* Gratshev et Legalov, sp. nov.**

**Etymology**. From the Latin *contractus* (to draw together, collect).

**Holotype**. PIN, no. 2384/528, negative impression of adult beetle; Kazakhstan, South Kazakhstan Region, Baidibekskii District, spurs of the Karatau Range near the village of Mikhailovka (Aulie); Middle–Upper Jurassic, Karabastau Formation.

**Description** (Fig. 2b). The body is dark brown. The pronotum is 1.15 times as long as the rostrum; the rostrum does not taper towards the apex. The head capsule is imbedded in the pronotum almost up to the eyes. The eye is greater in diameter than the rostrum. The antenna is short, extends slightly beyond the anterior margin of the pronotum. Antennomere 1 is slightly wider than the succeeding antennomeres. The antennomeres of the flagellum are more or less equal, almost twice as long as wide. The antennal club is almost three times as long as wide and two times as

wide as the flagellum. The pronotum is smoothly and weakly dorsally convex. The elytron is 2.2 times as long as the pronotum. The distance between the puncture lines is somewhat greater than the puncture diameter. The femora are not dilated.

**Measurements**, mm. Body length without rostrum, 2.4.

**Material**. Holotype.

**Genus *Baissacar* Gratshev et Legalov, gen. nov.** 1

**Etymology**. From the Baisa (Baissa) locality and the generic name *Car*.

**Type species** *B. passarius*, sp. nov.

**Diagnosis**. Medium-sized, robust, not flattened dorsoventrally, strongly chitinized beetle. Rostrum not in lower position, moderately long, weakly and smoothly curved. Mandibles not large, protruding anteriorly. Head capsule large, wider than long. Eye flat, circular, medium-sized, somewhat smaller in diameter than rostrum. Frons sloping, weakly convex. Antenna short, attached proximal to basal third of rostrum. Pronotum with distinct lateral rib; pronotal disc evenly longitudinally convex. Elytra flattened longitudinally, with distinct deep puncture grooves. Prothorax narrow. Procoxa occupying almost entire ventral surface of prothorax. Abdominal ventrite 1 twice as long as ventrite 2.

**Species composition**. Type species.

**Comparison**. The new genus differs from the genera *Palaeocar* and *Mongolocar* in the denser cuticle, the smaller eyes, and the attachment of the antennae at some distance from the eyes; in addition, it differs from *Mongolocar* in the smaller size and long abdominal ventrite 1.

***Baissacar passarius* Gratshev et Legalov, sp. nov.** 1

**Etymology**. From the Latin *passarius* (dried).

**Holotype**. PIN, no. 4210/726, part and counterpart of adult beetle; Russia, Buryatia, Bauntovskii District, left bank of the Vitim River below the Baisa River mouth, Baisa locality; Lower Cretaceous, Zaza Formation, layer 31.

**Description** (Fig. 1b). The rostrum is 1.4 times as long as the pronotum, not narrowing towards the apex. The head capsule is imbedded in the pronotum almost up to the eyes. The eyes are relatively small. The antenna is short, not longer than the rostrum. Antennomeres 1 and 2 are elongate, and the other antennomeres are short. The antennal club is markedly wider than the flagellum. The pronotum is densely and evenly punctured, laterally with confluent punctures, forming wrinkles. The elytron is 2.8 times as long as the pronotum, with an epipleural border. The distance between the puncture lines is greater than the puncture diameter. The femora are somewhat dilated along their entire length. The tibiae are straight, as long as the femora.

Measurements, mm. Body length without rostrum, 3.5.

Material. Holotype.

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