

A New Genus and Species of the Cockroach Family Blattulidae from Lebanese Amber (Dictyoptera, Blattina)

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Abstract—A new genus and species of the cockroach family Blattulidae, *Ocelloblattula ponomarenkoi* gen. et sp. nov., are described from the Early Cretaceous Lebanese amber. In the wing venation, the new genus is extremely similar to the Jurassic genus *Blattula* Handlirsch, differing from the latter in a number of characters in its body structure. This find reveals much about the body structure of the extinct family Blattulidae, which is related to ancestors of the suborders Mantina and Blattina.

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INTRODUCTION

The specimen discussed below comes from the rich Early Cretaceous amber locality Hammana/Mdeyrij, Lebanon (Azar et al., 2003). The material is temporarily housed at the Muséum National d'Histoire Naturelle, Paris (D. Azar collection).

SYSTEMATIC PALEONTOLOGY

Suborder Blattina

Infraorder Raphidiomimidea

Superfamily Blattuloidea Vishniakova, 1982

Family Blattulidae Vishniakova, 1982

Genus *Ocelloblattula* Anisyutkin et Gorochoy, gen. nov.

Etymology. From the Latin *ocellus* (ocellus) and the genus *Blattula*.

Type species. *O. ponomarenkoi* sp. nov.

Diagnosis. Head (Figs. 1a, 1b) rather broad (no less than two-thirds of pronotum), subtriangular (slightly wider than long), anteriorly projecting from beneath pronotum; eyes large, rounded, strongly convex; all three ocelli (median and two lateral) developed; subantennal suture conspicuous. Antennae very thin, about as long as body; antennomeres small (unlike most modern forms), of nearly uniform size (proximal segments not discernible); maxillary palps about as long as head, labial palps somewhat shorter; all palps thin, with apical segments weakly widened distally. Pronotum short, but with large angulate posterior lobe; anterior and lateral margins of pronotum arched, the latter more strongly so (Fig. 1a). Elytra with markedly curved M and CuA and weakly curved CuP; hindwings with conspicuous pterostigma of thickened distal RA branches and slightly sclerotized membranes between them (Figs. 1c, 1d). Legs slender, covered with very

long setae (Figs. 1e, 1f). Genital plate (Figs. 1g, 1h) large, posteriorly narrowed, forming an elongate, troughlike lobe; longitudinal folds lateral to the fold, each bearing a small rounded depression at base; dorsal to the lobe, a pair of long, thin processes (probably ovipositor valves) projecting from genital cavity. Cerci without visible spherical structures.

Species composition. Type species.

Comparison. Wing venation virtually indistinguishable from the Jurassic genus *Blattula* Handlirsch, 1906 (Handlirsch, 1906–1908; Vishniakova, 1982; Vršanský, 2004; Vršanský and Ansoerge, 2007), but clearly distinct from the latter in the larger head, shortened pronotum with a large angulate posterior lobe, and much longer leg setae, and also probably in the presence of median ocellus and peculiar apical lobe of female genital plate. The new genus differs from the other genera of the family in the elytra with markedly curved M and CuA and/or weakly curved CuP.

Remarks. In the head structure (presence of median ocellus, shape of eyes and antennae) the genus *Ocelloblattula* gen. nov. resembles mantises (Mantina) rather than modern cockroaches (Blattidea). A certain similarity is revealed also in the structure of female abdomen: the long ovipositor characteristic of Mylacridina is reduced, but its apical parts are not hidden inside the genital cavity. Therefore, females of the new genus were unable to oviposit deep into the substrate and had not yet acquired the ootheca formed inside the genital cavity, characteristic of modern cockroaches and primitive termites, but were apparently able to lay the eggs onto some surface using their troughlike genital plate, or to form an external ootheca of the mantis type. All these peculiarities may indicate some relationship of Blattulidae to ancestors of the extant suborders Mantina and Blattina, and also an exposed mode of life (maybe

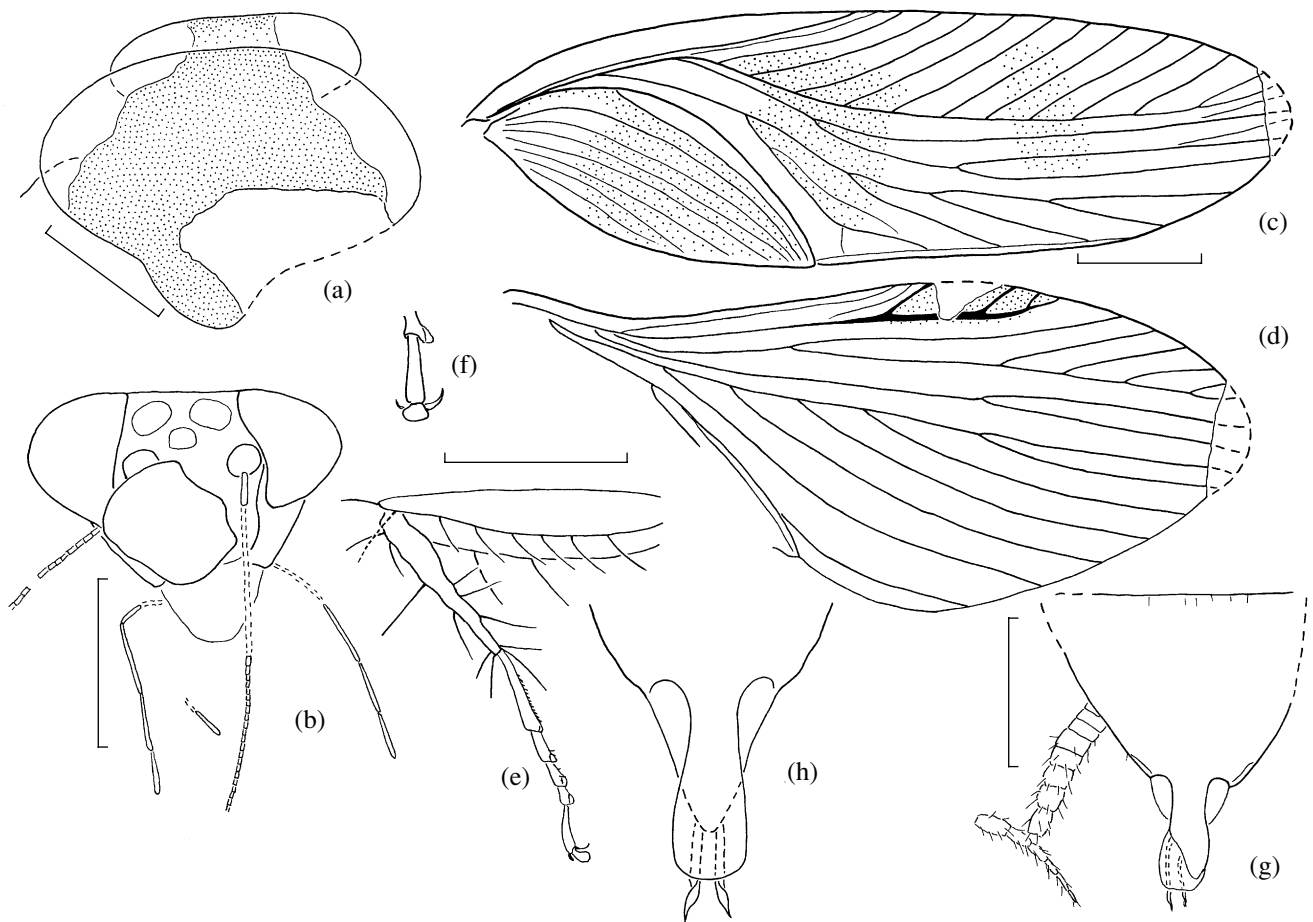


Fig. 1. *Ocelloblattula ponomarenkoi* gen. et sp. nov., holotype female, Lebanese amber, Early Cretaceous: (a) head and pronotum in dorsal view; (b) head in ventral (facial) view; (c) elytron; (d) hindwing; (e) fore leg in anterior (lateral) view, apical spine broken off; (f) distal part of mid tarsus in ventral view; (g) distal part of abdomen in ventral view; (h) reconstruction of genital plate and ovipositor in ventral view. Explanation: (An.) antennae; (P. mx.) maxillary palps; (P. lb.) labial palps; (G. sp.) genicular spine. Dark-colored areas dotted. Scale bar 1 mm.

on the leaves of trees) of the new genus and of supposed ancestors of these suborders. For the new genus this hypothesis is further supported by the characters of its leg structure: slender tibiae and long, thin, semierect spines.

Ocelloblattula ponomarenkoi Anisyutkin et Gorochov, sp. nov.

E t y m o l o g y. In honor of the outstanding Russian paleoentomologist A.G. Ponomarenko.

H o l o t y p e. Inclusion no. 845A in the amber piece no. 845A-E, almost complete female with wings slightly spread; Central Lebanon, Mouhafazit Jabal Loubnan, Caza Baabda, locality Hammana/Mdeyrij, Lebanese amber; Lower Cretaceous, Barremian–Lower Aptian.

Description (Figs. 1, 2). Body dark (almost black), with pale eyes and ocelli (Figs. 1a, 1b), translucent pronotal paranota (Fig. 1a) and wings, elytra with suffused anal area and three characteristic dark spots, hindwings with suffused pterostigmal area (Figs. 1c, 1d); tibiae, tarsi and cerci suffused. Integument smooth,

shining, only anal area of elytron punctate; short pubescence on antennae, palps, and along posterior margin of abdominal sternites; genital plate and cerci with sparse, long hairs.

Head (Fig. 1b) with median ocellus but slightly smaller than lateral ones; interocular distance subequal to eye width, and subocular distance (between eye and mandible) somewhat less than eye height; distance between antennal foveae almost twice the scape length. Shape and proportions of head and pronotum as in Figs. 1a and 1b.

Elytra elongate oval, weakly sclerotized, with distinct venation (Fig. 1c); Sc simple (vein along its posterior margin probably secondary), reaching about midlength of elytron, distinctly carinate on lower side; R stem reaching elytral apex, steeply curved proximally and arched medially, with 12 branches in almost regular comb; M originating from R stem, markedly curved, reaching elytral apex, forked nearly level with CuP apex (anterior branch simple, posterior forked); CuA with 5 distinctly curved branches and secondary (intercalary) veins between them; CuP shallowly arched,



Fig. 2. Female habitus of *Ocelloblattula ponomarenkoi* gen. et sp. nov., Early Cretaceous Lebanese amber. Scale bar 5 mm.

reaching about one-third of elytron; anal area weakly sclerotized, with 8 simple branches of A running parallel to CuP and reaching anal margin of elytron.

Hindwing elongate triangular (Fig. 1d), with costal margin distinctly concave proximally and weakly convex more distally, narrowly rounded apex, and preanal area broad and apparently distinctly longer than the anal area (i.e., anal lobe tucked under in repose, poorly visible in the specimen); Sc simple, nearly straight, reaching wing midlength; RA nearly straight, not reaching wing apex, distally with 4 or more (the inclusion damaged there) thickened branches (wing membrane in this area weakly sclerotized, forming pterostigma); RS separating from RA near base, forked in proximal wing half (its anterior branch simple, posterior with simple pecten of 5 branches, posteriormost of them reaching wing apex); M nearly straight and forked distally; CuA with regular pecten of 6 simple, gently curved branches, alternating with weaker intercalary veins.

Legs (Figs. 1e, 1f) relatively long. Fore legs: tibia shorter than femur; tarsus about as long as femur; femur with one genicular spine and 7 spines along anteroventral margin (including 1 apical, being much longer than others); tibia with 10 or more spines; basitarsus slightly shorter than other four tarsomeres combined, ventrally with row (or rows?) of spinules and apical pulvillus; 2nd tarsomere much shorter, 3rd still slightly shorter, 4th shortest (about as wide as long), 5th shorter than basitarsus but longer than 2nd, bearing large arolium and somewhat asymmetrical claws (2nd–3rd tarsomeres with spinules along ventral margin, 2nd–4th with large pulvilli). Mid legs similar to fore legs, but larger, femur with 4 spines along anteroventral margin (including apical one), tibia as long as femur, with 15 or more spines, tarsus shorter than tibia, with markedly asymmetrical claws (one more than twice as large as the other). Hind legs differ from mid legs in their even larger size, tibia longer than femur, 6 spines (including apical one) along anteroventral margin of femur, and 27 or more spines on tibia (tarsi not preserved).

Abdomen (only distal part visible from below) without conspicuous glands. Genital plate elongate; its posterior lobe rounded apically; tips of paired thin sclerotized processes (possible ovipositor valves) acuminate and extended caudad to the apex of posterior lobe of genital plate (Figs. 1g, 1h). Cerci with 14 segments, medially and distally almost moniliform, about as long as genital plate (Fig. 1g).

M e a s u r e m e n t s (mm): head: length, 1.5; width, 1.7; pronotum: length, 2; width, 2.8; elytron: length, 6.8; width, 2.2; femur length: fore, 1.5; mid, 1.7; hind, 2; tibia length: fore, 0.9; mid, 1.7; hind, 3.

M a t e r i a l. Holotype.

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