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Original article

A new fossil bee from the Oligo-Miocene Dominican amber (Hymenoptera:Halictidae)

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Summary — A new species of fossil bee, *Oligochlora grimaldii* n.sp, is described and figured. The specimen is preserved in Oligo-Miocene amber from the Dominican Republic. The genus *Oligochlora* is not represented among the modern fauna and was originally based on two species, also from Dominican amber inclusions. *O grimaldii* generally agrees with the original generic definition except in the structure of the pronotal lateral angle which is slightly acute. A revised diagnosis for the genus is given in order to accommodate this specimen and a key is presented to its included species.

Augochlorini / bee fossil / Halictinae / paleontology / systematics

INTRODUCTION

The bee fauna of the Dominican amber has recently received increased attention (Poinar, 1994; Engel, 1995, 1996; Michener and Poinar, 1996; Rozen, 1996). There are currently seven bee species described from Dominican amber inclusions and of these, four are from the subfamily Halictinae. The halictines were unknown from amber inclusions until 3 years ago (Poinar, 1994), aside from one dubious Baltic amber specimen listed by Bachofen-Echt (1949) as belonging to the genus *Halictus*.

Herein I present the description of a fifth halictine species recently discovered by Grimaldi, of the American Museum of Natural History. The specimen is a representative of the genus *Oligochlora* Engel, an extinct member of the tribe Augochlorini. The genus was originally proposed on the basis of two species, *Oligochlora eickworti* Engel and *O micheneri* Engel. The species presented herein, while being representative of this genus, has one feature slightly incongruent with the generic diagnosis as it was originally formulated. In light of the new information this species provides, the genus is newly diagnosed with this character, the pronotal lateral angle, revised. The age of the Dominican amber deposits is discussed by Grimaldi (1995) while the apoid fauna of these deposits is reviewed by Michener and Poinar (1996).

MATERIALS AND METHODS

Measurements were made using an ocular micrometer on a WILD-M5a microscope and should be considered approximate since the optimal angle for measuring was not always achievable through the amber. The following abbreviations are used in the descriptions for morphological structures: F, flagellomere; S, sternum; T, tergum. A brief generic diagnosis is given incorporating new information and relevant characters for the recognition of the genus from other amber halictine genera. A more thorough description can be found in Engel (1996). Format for the specific description follows that of Engel (1995), while morphological terminology follows that of Michener (1944) and Eickwort (1969).

SYSTEMATICS

Genus Oligochlora Engel

Oligochlora Engel, 1996, *J Kans Entomol Soc, suppl* 69 (1997), 336.

Type species: *Oligochlora eickworti* Engel, 1996 (original designation).

Brief Diagnosis

Female (male unknown), epistomal sulcus forming obtuse angle. Preoccipital ridge rounded. Compound eyes bare. Mouthparts not greatly elongated or narrowed. Hypostomal ridge carinate, anterior angle rounded, carina slightly protruding beyond posterior border of head. Pronotal lateral angle variable (obtuse to acute), not strongly produced anteriorly; dorsal ridge carinate; lateral ridge variable (carinate to rounded). Mesoscutum broadly rounded anteriorly. Marginal cell apex truncated and feebly appendiculate. Anterior basitarsal brush present. Inner hind tibial spur pectinate. Basitibial plate small, sub-triangular, anterior border not well defined. Penicillus present and set forth on a short distal process extending just beyond juncture between basitarsus and following tarsomere.

Key to the species of *Oligochlora*

1. Pronotal lateral angle obtuse; propodeal triangle glabrous and shining, without striae.

eickworti Engel

— Pronotal lateral angle acute to orthogonal; propodeal triangle granular, not shining, with or without weak basal striae.

2. Pronotal lateral angle acute, lateral ridge carinate; propodeal triangle without basal striae; Sc+R heavily sclerotized and black, remainder of wing veins brown; postgena punctate.

grimaldii new species

— Pronotal lateral angle orthogonal, lateral ridge rounded; propodeal triangle with basal striae; Sc+R sclerotized and colored as other wing veins; postgena impunctate and granular.

micheneri Engel

Oligochlora grimaldii Engel, new species (fig 1)

Description

Female (male unknown), total body length approximately 7.2 mm; approximate fore wing length 4.3 mm. Head length 1.7 mm; length of compound eye 1.4 mm; maximum width of compound eye 0.5 mm; distance from compound eye to lateral ocellus 0.26 mm; maximum width of gena 0.45 mm. Scape length 0.82 mm, reaching back beyond lateral ocellus; pedicel about as long as wide, as long as F1; F1 as long as wide and slightly longer than F2; following flagellomeres each about as wide as long, each slightly longer than preceding flagellomeres; F10 longer than wide. Maxillary palpi extending posteriorly to just over half of premental length. Median and parapsidal lines of mesoscutum strongly impressed. Scutellum longer than individual lengths of metanotum and propodeal triangle; propodeal triangle longer than metanotum.

Fig 1. *Oligochlora grimaldii* new species, holotype.

Basal vein distad of cu-a crossvein by two times vein width; Sc+R heavily sclerotized and black, remainder of wing veins brown; second submarginal cell not narrowed anteriorly; wings hyaline. Strigular concavity of antenna cleaner shallow; malus as long as velum, with a series of minute teeth on inner surface. Inner hind tibial spur with at least three visible teeth, not including the apex as a tooth.

Mandible brown. Head metallic green. Clypeal and supraclypeal surfaces not clearly visible, apparently imbricate with scattered weak punctures; clypeal apex apparently black and not metallic, basal half and supraclypeal area colored as rest of head. Face strongly granular and shining; vertex weakly granular. Gena imbricate with a few widely scattered, minute, weak punctures, integument shining. Postgena with strong punctures separated by a puncture width or less, integument otherwise smooth and weakly shining. Mesosoma metallic-green and shining, except at pronotal lobe where it is light brown with a patch of metallic green highlights. Pronotum weakly granular. Mesoscutum strongly granular with shallow punctures on borders, becoming weaker and disappearing by central disc. Tegula brown and smooth. Scutellum with minute punctures separated by a puncture width or less; integument otherwise imbricate and shining. Metanotum granular, integument shining. Pre-episternum granular with scattered shallow punctures. Hypoepimeron with minute punctures separated by less than a puncture width, integument between granular. Mesepisternum

anteriorly with shallow punctures and granular as on pre-episternum; posteriorly turning into minute punctures as on hypoepimeron; ventrally both giving way to granular integument without punctures. Metepisternum dorsally with a few weak transverse striae, medially and ventrally granular. Legs brown with scattered, strong metallic green highlights on outer surfaces, except for tarsi which lack any such highlights. Propodeal triangle strongly granular, without striae, integument not shining; dorsal and lateral ridges rounded; propodeal lateral surface strongly granular; posterior surface apparently the same only weaker (not easily visible). Terga and sterna imbricate and brown; terga with strong metallic green highlights at least on lateral surfaces (dorsally not visible).

Face with scattered simple hairs, hairs longer on clypeus and lower half of face than those above. Similar hairs on vertex and gena. Postgena with sparse long simple hairs, those on posterior border of head with a few short branches. Pronotal lateral surface with extremely short, suberect, simple hairs, not obscuring the surface. Mesoscutum with scattered simple short hairs, becoming more sparse posteriorly. Scutellum with long simple hairs. Metanotum with long hairs each with a few short branches. Propodeal triangle without hairs. Pleura with scattered simple hairs, becoming longer ventrally and those posteriorly with a few branches. Anterior basitarsal brush strong, extending along distal third of basitarsus. Hairs of legs generally simple, except for those comprising the scopa on the hind legs and for those on the inner surface of the mesotrochanter which are long and branched. Dense setal pad present on inner basal surface of mesofemur (fig 1). Propodeal lateral and posterior surfaces with long hairs, most with short branches. T1 with long simple hairs on lateral surfaces and bordering central disc of anterior surface; T2 with long simple hairs, more widely scattered than on T1, those of disc not visible. Sterna with scattered long simple hairs (visible on S1-3).

Type Material

Holotype: female, Oligo-Miocene Dominican amber, specimen number DR-14-839 (fig 1), deposited in the Department of Entomology, American Museum of Natural History, New York, NY, USA.

Preservation

The bee is in fairly good condition. The body is linearly extended with the head thrust forward, exposing its undersurface, and the metasoma only slightly angling downward. The right anterior end of the bee is not visible from the side as the combination of a fracture plane and *Schimmel* (a whitish mold) obscures this view. Likewise, portions of this same material and fracture obscure a direct anterior view of the head. The face, however, can be seen from above and in profile, with only the distal-most portions being obscured. The legs are held under the body and therefore do not interfere with views of the pleura, however, the distal portions of several of the legs are missing. The wings are folded over the dorsum. The right fore wing is partially damaged with the basal vein mostly missing as well as some distal portions of the wing. The metasoma is not clearly visible dorsally due to a fracture plane towards the posterior end of the bee and *Schimmel* running over this plane thereby obscuring much of the surface.

Etymology

The specific epithet honors friend and colleague Dr DA Grimaldi who has contributed significantly to insect paleontology and in particular to the study of amber.

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Résumé — Une nouvelle abeille fossile de l'ambre dominicaine de l'oligo-miocène (Hymenoptera : Halictidae). Une nouvelle espèce d'abeille de la famille des Halictidae, *Oligochlora grimaldii*, est décrite ici à partir d'inclusions dans l'ambre de la république Dominicaine, datées de l'oligocène inférieur ou du miocène supérieur. C'est le cinquième halictidé de l'ambre connu à ce jour et c'est un représentant de la tribu des Augochlorini. Le genre *Oligochlora* n'est pas représenté parmi la faune actuelle et n'est connu que par deux autres espèces, *O eickworti* et *O micheneri*, qui proviennent également de l'ambre dominicaine. L'espèce décrite ici diffère de la diagnose du genre par sa structure de l'angle latéral pronotal. La variabilité de ce caractère morphologique, désormais incorporée dans la définition du genre, va de l'angle aigu *(O grimaldii)* à l'angle obtus *(O eickworti)*. La nouvelle espèce diffère des espèces précédemment décrites par l'angle latéral pronotal aigu, la présence d'une carène sur la crête latérale pronotale, des postgènes fortes et densément perforées, une veine alaire Sc+R fortement sclérotinisée et l'absence de striations sur le triangle propodéal.

Halictinae / Augochlorini / abeille solitaire / fossile / systématique / république Dominicaine

Zusammenfassung — Eine neue fossile Biene in einem dominikanischen Bernstein aus dem Oligo-Miozän (Hymenoptera:Halictidae). Eine neue Schmalbienenart, *Oligochlora grimaldii* wird beschrieben, die aus einem Bernsteineinschluß der Dominikanischen Republik entstammt, dessen Alter dem unteren Oligozän oder dem oberen Miozän zugerechnet wird. Das ist die fünfte Halictusart, die bis jetzt aus Bernsteineinschlüssen bekannt ist. Sie gehört dem Tribus Augochlorini an. Die Gattung *Oligochlora* kommt in der heutigen Bienenfauna nicht mehr vor, ist aber durch die beiden anderen, auch aus dominikanischem Bernstein stammenden Arten, *O eickwortii* und *O micheneri* bekannt. Die hier beschriebene Art unterscheidet sich von der Diagnose der anderen Arten in der Struktur des pronotalen seitlichen Winkels. Die Variabilität dieses morphologischen Merkmals ist neuerdings in die generelle Definition von Arten aufgenommen worden, die vom Spitzwinkel *(O grimaldii)* bis zum stumpfen Winkel reicht *(O eickworti)*. Die neue Art unterscheidet sich von den zuvor beschriebenen durch den spitzen, pronotalen seitlichen Winkel, das Auftreten eines Kiels an der pronotalen seitlichen Kante, die starke und dicht gepunktete Postgena, stark sklerotisierte Sc+R Flügeladern und das Fehlen von Riefen auf dem propodealen Dreieck.

Augochlorini / fossile Biene / Halictinae / Paläontologie / Systematik

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