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Pachygaster hymenaea sp. nov. and *P. antiqua* James, 1971 (Diptera: Stratiomyidae) in Neotropical ambers

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Abstract

We describe *Pachygaster hymenaea* sp. nov. from Dominican amber from a female specimen and compare it with the only other amber pachygastrine, *P. antiqua* James, 1971 from Mexican amber. The two species differ by the shape of the ocellar tubercle and the width of the frons. Comments about differences between the holotype of *P. antiqua* and the original description are given.

Key words: Dominican amber, Mexican amber, Pachygastrinae

Introduction

Evenhuis (1994) listed 24 species of fossil Stratiomyidae of which only one, *Pachygaster antiqua* James, 1971, belongs in the subfamily Pachygastrinae. This species was described from Mexican amber. We describe a second fossil species of *Pachygaster* Meigen from Dominican amber, which we compare with *P. antiqua* and correct some inaccuracies in the description of latter.

Dominican amber originates from the Dominican Republic, Hispaniola, Greater Antilles. The deposits of this fossil resin are of early to middle Miocene (15–20 Mya) age (Iturralde-Vinent & MacPhee 1996, Iturralde-Vinent 2001). The fossil flora and fauna trapped in the amber indicates that the resin-producing tree was part of a moist tropical forest (Poinar & Poinar 1999).

Mexican amber occurs in the region of Chiapas, Mexico. Until now Mexican amber was considered to be of upper Oligocene to lowest Miocene age (Poinar 1992). This means an absolute age of 22.5–26 million years according to Berggren & Van Couvering (1974).

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But recent biostratigraphic reinvestigations indicate that Mexican and Dominican amber correlate stratigraphically and both are of early to middle Miocene age (Rust J., Institute for Palaeontology, Bonn, pers. comm.). Both Neotropical fossil resins have been produced by leguminous trees of the genus *Hymenaea* L. (Poinar & Brown 2002, Poinar 1991).

There are 54 genera of Pachygastrinae with nearly 240 described species known in the Neotropical Region today (Woodley 2001). But because pachygastrine species are rarely collected and many are only known from the type specimens, it is likely that the true diversity of these flies is much higher. No Pachygastrinae have been described from Hispaniola so far. Many of the genera are monotypic and there has never been a phylogenetic analysis to test the monophyly of this subfamily or that of the genera respectively. Therefore placing the fossil into a genus is difficult. The new species fits within the limits of the Palearctic genus *Pachygaster,* even if it is not very likely that the fossil and the Palaearctic species of *Pachygaster* are closely related.

As noted by James (1971), the larvae of most Pachygastrinae breed under the bark of trees (dead or dying trees according to Woodley 2001), and therefore it is not astonishing to find an adult in fossil resin.

***Pachygaster hymenaea*, sp. nov.**

Etymology

Named after the tree genus *Hymenaea*, which is the source of the fossil resin. The tree genus was named for Hymen, the god of marriage in Greek mythology.

Material

P. hymenaea, sp. nov.: Female (holotype); in the collection of Staatliches Museum für Naturkunde Stuttgart (SMNS), Germany, label: Do-3495-M.

The size of the amber piece is about 5x4x3 mm, of irregular shape, but the plane and polished surfaces allow good view of the fossil (Fig. 1). The fossil is complete and very well preserved, with wings and legs spread. The matrix is highly transparent, with few internal cracks and only some air bubbles. The colour is clear yellow.

P. antiqua: Female (holotype); in the collection of University of California Museum of Paleontology (UCMP), Berkeley, California, label: locno B-7041-19 specno 13501.
The size of the amber piece is about 8x5x4 mm. The amber matrix is quite dark and intense light is needed for examination of the inclusion. The dorsal parts of thorax and abdomen, the right eye and most of the wings are lacking.

Diagnosis

Pachygaster hymenaea sp. nov. is a very typical pachygastrine and very similar to the previously described *Pachygaster antiqua* James. The new species can be separated by its clearly elevated ocellar area (Fig. 3a) in which the ocelli are situated less than one ocellus

diameter apart. In contrast *P. antiqua* has a nearly flat ocellar area, and the ocelli are separated from each other at least one ocellus diameter (Fig. 3b). The width of the frons across the frontal ocellus is about 0.25 mm, which is much broader than in *P. antiqua* (0.17 mm).

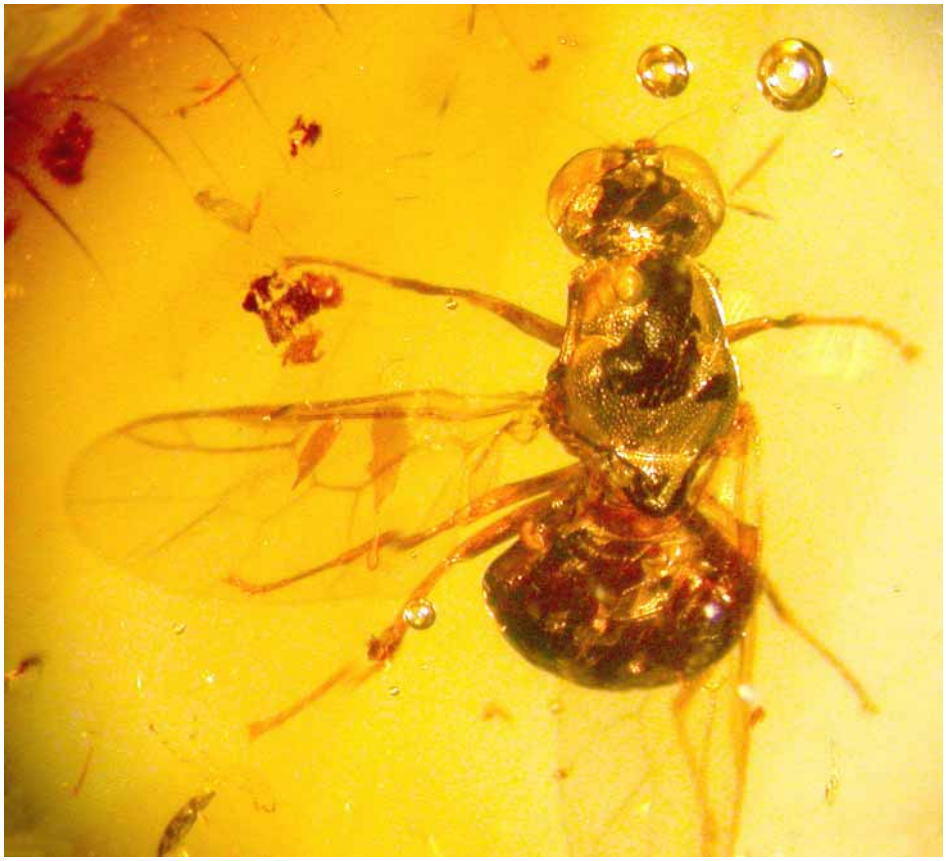

FIGURE 1: *P. hymenaea* sp. nov., habitus photo.

Description

The statements about the color of certain body parts must be viewed with caution because the true coloration of the insect was altered by the fossilization process and is also dependant on the light and angle of view.

Head: Antenna short oval, light brown; arista inserted slightly above middle of flagellar complex; arista three times as long as flagellar complex, with a few scattered setae (Fig. 2a). Ocellar triangle compact and raised distinctly. Distance between ocelli less than one ocellus diameter (Fig. 3a). Eyes broadly separated; frons spanning one-third of head diameter, sparsely covered with short setae, latter more abundant on dorsolateral part of frons. Frontal width across frontal ocellus about 0.25 mm. Head extended little beyond eyes, dorsal occipital area posterior to eyes narrow, approximately twice the width of an ocellus. Postocular area small, greatest width four ocellar diameters wide. In lateral view

no cheeks visible ventral of eye margin. Labella of proboscis spanning three-quarters of length of head, palpus very small and black.

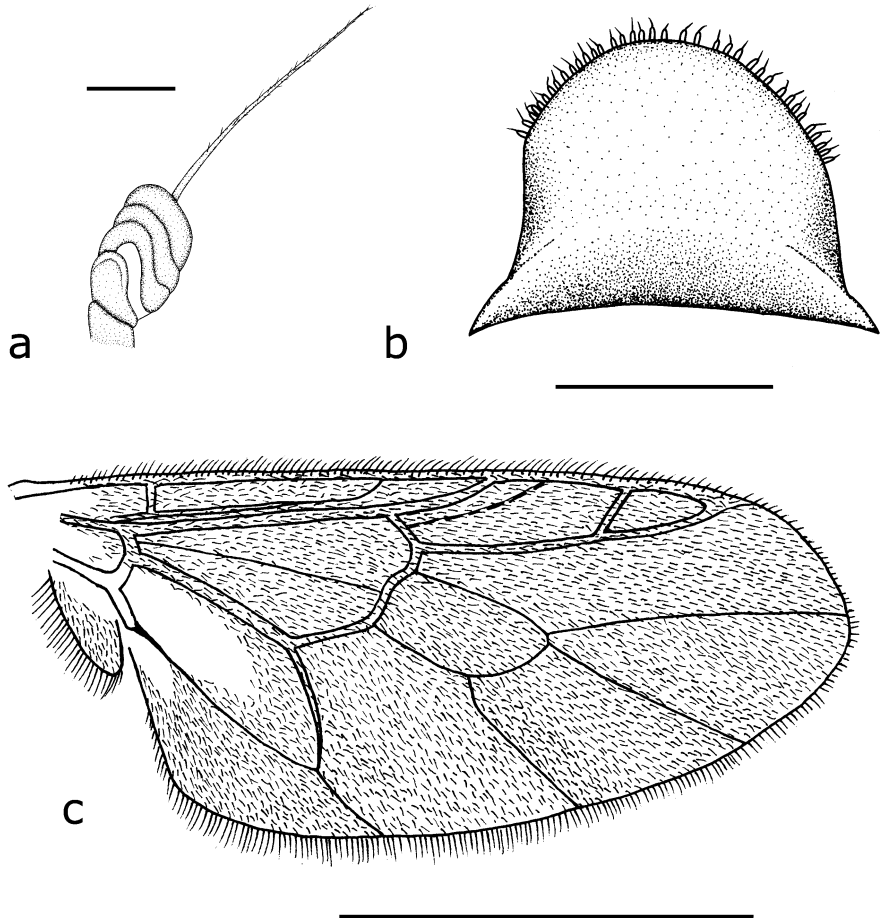

FIGURE 2: *P. hymenaea* sp. nov., a: antenna (ventral view) scale bar 0,1 mm; b: scutellum (dorsal view) scale bar 0,2 mm; c: wing, scale bar 1 mm.

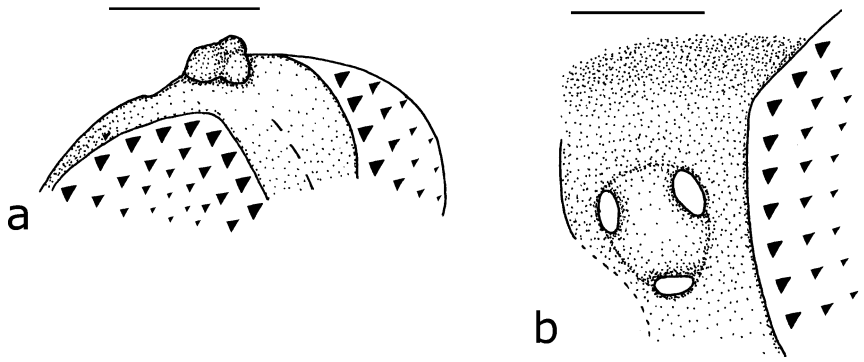

FIGURE 3: Ocellar area of a: *P. hymenaea* sp. nov. (angular frontal view) scale bar 0,2 mm; b: *P. antiqua* (dorsal view) scale bar 0,1 mm.

Thorax: Black with deep transverse suture, covered with short setae. Scutellum semicircular, convex, apical margin depressed in lateral view, with row of minute tubercles, each bearing a short seta (Fig. 2b). Legs brownish, mid and hind tibiae as well as tarsi light yellow. Perhaps femora and fore tibia black in living specimen. Wings covered mostly with microtrichia, absent on basal three-quarters of cell cu-p, most of intervenal area, and small basal part of anal cell (Fig. 2c). Halteres transparent yellowish white.

Abdomen of typical rounded shape of many Pachygastrinae.

Body length 2.3 mm; wing length 2.2 mm.

Comments on the description of *P. antiqua*

James (1971) described the tibia as half as long as the femur, with a body length of 2.5 mm. But as in *P. hymenaea*, the tibia and femur have nearly the same length and the body length is 2.3 mm.

James gave a frontal width across the hind ocelli of 0.14 mm and width of head as 0.75 mm. We measured 0.17 and 0.72 mm. The other length measurements given by James should also be considered with some scepticism.

The labella of *P. antiqua* appears as in the drawing of James, but its unusual shape is assumed to be an artefact of dehydration and alteration during fossil diagenesis.

Apart from the distinguishing characters described in the diagnosis above, *P. antiqua* and *P. hymenaea* are quite similar. This is not surprising because many Pachygastrine females are very similar and poorer in characters than males. Additional to the difficulties in separating female Pachygastrinae is the fact that the fossil specimen of *P. antiqua* is not complete and that in general, certain characters in fossils are not discernable.

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