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A new remarkable Xestomyzinae (Insecta, Diptera, Therevidae) genus from Mexican Amber

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Abstract

Peratrimera mexicana **n. gen., n. sp.** is described from Mexican Amber. The fossil is placed in the Therevidae subfamily Xestomyzinae and its close relationship to the recent genus *Henicomyia* Coquillett is discussed. This is the first fossil of a Xestomyzinae from the New World and the first Therevidae from Mexican Amber.

Key words: Diptera, Therevidae, Mexican Amber, *Peratrimera mexicana* **n. gen., n. sp.**

Introduction

The Therevidae represents a family of lower brachyceran Diptera. The flies occur most abundantly in dry and sandy habitats and are found on all continents except Antarctica. The elongate larvae are subterranean predators that live within loose soil and leaf litter. The diurnal adults of most species imbibe water, and a few species are known to feed on nectar and honey dew. Over 1000 extant species of this family are currently described with an additional 1000 or more known but not yet described. The family is divided into four subfamilies. The Xestomyzinae (Lyneborg 1972), consists of ten described genera, nine of which are restricted to the southern parts of Africa (Botswana, Madagascar, Namibia, South Africa, Tanzania, Zambia, and Zimbabwe) and only one genus, *Henicomyia* Coquillett is found in the New World. The genus *Henicomyia* was revised by Lyneborg (1972), who described five new species, increasing the total number of valid species to six. Only one species has been described since this revision (Irwin & Webb

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1992), but at least six more undescribed species are on hand. Species of *Henicomyia* are known from Argentina, Paraguay, Brazil, Peru, Panama, Costa Rica, Guatemala, Mexico and the United States.

The fossil we are describing here is closely related to the genus *Henicomyia* and is critical for reconstructing the historical biogeography of therevid flies. The fossil is from Oligocene–Miocene (20 million years old) amber from Chiapas, Mexico (Grimaldi 1996).

Material and Methods

Photographs of the fossils were captured with a Nikon CoolPix® 4500 digital camera through a Leica® MZ12 dissecting microscope and enhanced using Adobe Photoshop® software. Line drawings were made by the first author using Adobe Illustrator® software from the digital images. The specimen was assigned an individual 6-digit THEREVIDAE/M.E. IRWIN/SPECIMEN number (MEI#) on a yellow label. This unique identifier together with all label information was incorporated into Mandala, a database designed to log and track individual therevid specimens (Kampmeier et al. 2004), for which most data are available on the Internet (http://www.inhs.uiuc.edu/cee/therevid/dbtop.html).

Terminology follows Irwin and Lyneborg (1981) and McAlpine (1981).

Taxonomy

Peratrimera n. gen. (Figs. 1, 2)

Diagnosis. The genus is characterized by the long first flagellomere and three flagellomeres (Fig. 2B); the two notopleural macrosetae on the thorax (Fig. 1B); the closed wing cell m_3; the setae on R_1 and R_{4+5} (Fig. 2B); the vein C ending at M_2; the absence of a lateral macrosetae on the hind coxa; the short setae on the abdomen, the elongate shape of the abdomen; and the up-curved setae on the 8th abdominal sternite of the female (Fig. 1B).

Type species. *Peratrimera mexicana* **n. sp.,** by present designation.

Etymology. *Peras* (Gr.) = extremity, *tri* (Gr.) = three, *meros* (Gr.) = part, division, referring to the three flagellomeres of the antenna.

Peratrimera mexicana n. sp. (Figs. 1A–B; 2A–B)

Diagnosis. Same as the genus. The important species specific characters (i. e., pubescence on the frons, pleuron and mesonotum, as well as the color pattern of the hind leg) are not discernable.

Etymology. Named after Mexico, the country where the fossil was found.

Description of the female holotype (MEI # 164794):

The holotype specimen is deposited in The Natural History Museum London (In. 2158(1)).

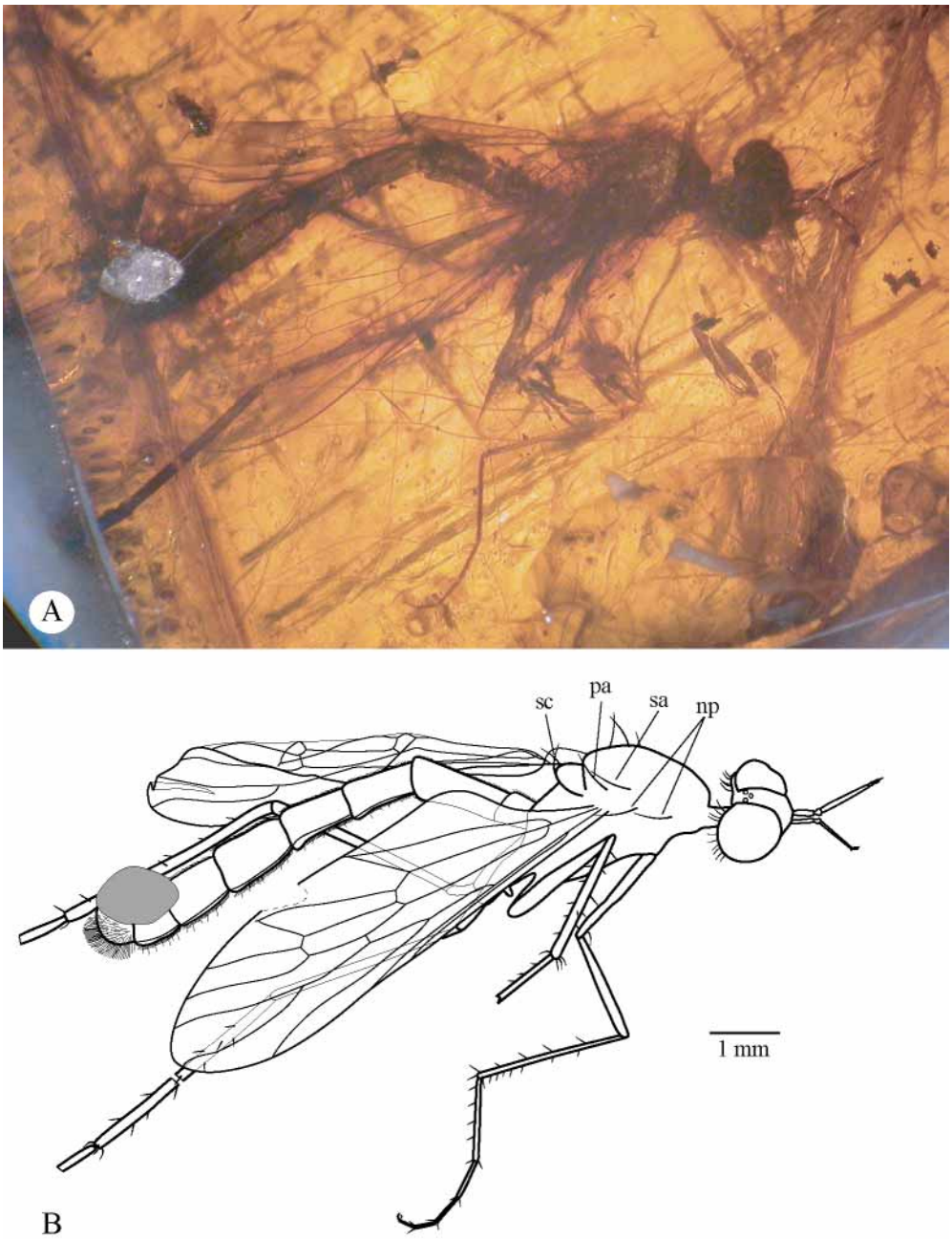
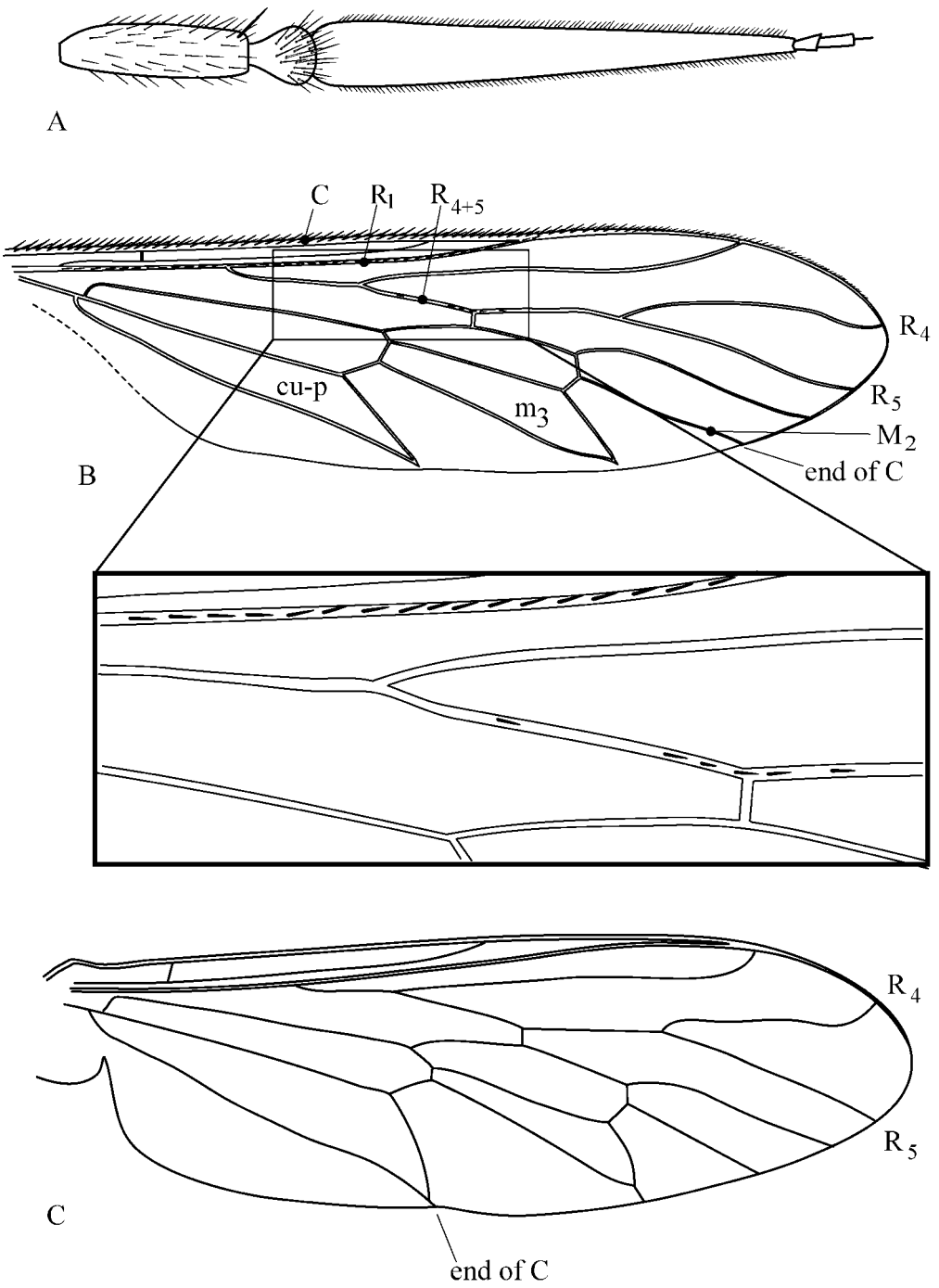


FIGURE. 1. *Peratrimera mexicana* **n. gen., n. sp.** (**A**) Photograph of the holotype. (**B**) Habitus drawing of the holotype (np = notopleural macrosetae, pa = postalar macrosetae, sa = supraalar macrosetae, sc = scutellar macrosetae).



FIGURES 2A, B. *Peratrimera mexicana* **n. gen., n. sp.** (**A**) Reconstructive drawing of antenna. (**B**) Reconstructive drawing of wing; **FIGURE 2C**. *Ataenogera* sp. Drawing of the wing (C = costa, cu-p = posterior cupital cell, m = medial cell, M = media, R = radius).

Body length: 10 mm, wing length: 7 mm.

The specimen is not in perfect condition. It decomposed somewhat after being engulfed by the resin. The body is translucent and slightly laterally compressed (Fig. 1A), therefore no pubescence is visible. Also the matrix above the tip of the abdomen is damaged so some structures of the last segments are not discernable. Both hind tarsi and the left middle tarsus are missing; the left middle leg and the left front leg are not discernable.

HEAD: The antennae are slightly longer than the head. The scape is more than four times as long as wide (because of the slightly decomposed condition of the insect and the distortion of the amber, the measurements are not as precise as they would be in a fresh specimen) and is covered with short, semi-appressed setae (Fig. 2A). A strong, dark, dorso-apical setae exists on the left scape. The first flagellomere is nearly nine times as long as wide and covered with many small, appressed setae. The second flagellomere is twice as long as wide; the third flagellomere is nearly three times as long as wide and possesses a long style. Eyes separated by the width of the ocellar triangle. Some short setae are visible on the frons along the inner margins of the eyes down to the base of the antenna. THORAX: The mesonotum is covered with short, semi-appressed setae. Two notopleural setae (np), one supraalar seta (sa), one postalar seta (pa), no dorsocentral setae and a pair of scutellar setae (sc) are discernable (Fig. 1B). The legs are long and slender; hind coxa with hind coxal knob. Lateral macrosetae on hind coxa absent. Wing cells m_3 and cu-p are closed and neither of them reaches the wing margin. The veins M_1 and M_2 are parallel and reach the wing margin (Fig. 2B). The coastal vein ends at M_2. The length of the wing vein R_1 is covered with setae, and a few setae are discernable on R_{4+5} (inset of Fig. 2B). ABDOMEN: The abdomen is long, slender, and covered with very short setae. The 8th sternite has many long setae which are slightly up-curved (Fig. 1B). Amongst the mainly thin setae are some thicker ones of the same length.

Placement of the genus. The elongate gestalt is typical for several genera of Xestomyzinae. The cell m_3 is closed, which is the case in all Phycinae and Xestomyzinae, but also many other Therevidae genera have this cell closed. The ending of the costal vein at M_2 is found in all Xestomyzinae, while all Agapophytinae and Therevinae have the costal vein completely around the wing. In the Phycinae, the vein stops in most genera at CuA_2 (Fig. 2C), but in some genera at M_1 or M_2. The up-curved setae on the 8th sternite of the female place this species clearly within the subfamily Xestomyzinae. The females of Agapophytinae and Therevinae have acanthophorites at the last tergites and no up-curved setae on 8th sternite. In the Phycinae the setae of the female are reduced, but the 8th sternite never has thick up-curved setae between filiform setae. The setae on R_1 and R_{4+5} are found in all species of *Henicomyia* (Lyneborg (2002: 104) stated that *Henicomyia* has no setae on these wing veins, but this is not the case. We examined all species known to Lyneborg and several undescribed species, and the setae were always present). These setae are always present in the Phycinae (exception: *Schlingeria* Irwin) and in very few Therevinae (e.g. *Protothereva* Malloch) but never in Xestomyzinae other than *Henicomyia*.

From all the Phycinae, the fossil resembles the South American genus *Ataenogera* Kröber the most. The three segmented, laterally compressed antenna of the fossil with its apical style is very similar to the antennae of present day species of *Ataenogera*. While the flagellum of *Henicomyia* is always two segmented, the first flagellomere is cylindrical, and the style is inserted inside an invagination of the second flagellomere, the flagellum of *Ataenogera* is three segmented with an apical style. Despite the *Ataenogera*-like antenna, there are several characters that place the fossil close to the genus *Henicomyia.* In *Henicomyia* and *Peratrimera,* R_4 and R_5 are only slightly divergent (Fig. 2B). In all *Ataenogera* R_4 and R_5 diverge strongly after half of their length (Fig. 2C). Another important characteristic is the costal vein, which ends in all Xestomyzinae, including *Henicomyia* and *Peratrimera* at M_2, while it ends at CuA_2 in *Ataenogera*. Also does the vein M_3 never reaches the wing margin in *Henicomyia* and *Peratrimera*, while in *Ataenogera* it always merges with C at the wing margin. The alula is much reduced in *Henicomyia*, while it is relatively broad in *Ataenogera*. This character is not clearly visible in *Peratrimera*, but it seems that the alula is reduced.

From all Xestomyzinae only *Henicomyia* and *Peratrimera* share the absence of a lateral macrosetae on the hind coxa. The three segmented flagellum separate *Peratrimera* from all the known recent (described and undescribed) species of *Henicomyia*, which possesses only a two segmented flagellum. The characteristics of the antenna are the main reason for justifying the new genus.

Remarks. This fossil indicates that more than 20 million years ago, members of the Xestomyzinae occurred on the North American continent. This raises doubts that the Xestomyzinae are, as was previously thought, of Gondwanan origin, which dispersed from South America to North America over the past 4 million years, once the Mesoamerican land bridge was formed.

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References

Grimaldi, D.A. (1996) *Amber, Window to the Past*. Harry N. Abrahams, Incorporated, New York, 216pp.

Irwin, M.E. & Lyneborg, L. (1981) The genera of Nearctic Therevidae. *Illinois Natural History Survey Bulletin*, 32 (3), 1–277.

Irwin, M.E. & Webb, D.W. (1992) Brasilian Therevidae (Diptera): A checklist and description of species. *Acta Amazonica*, 21, 85–121.

Kampmeier, G.E., Irwin M.E. & Algmin K. (2004) Mandala 5.3: a database system for systematics & biodiversity studies. *Diptera Data Dissemination Disk II*. (CD-ROM). North American Dipterists Society.

Lyneborg, L. (1972) A revision of the *Xestomyza*-group of Therevidae (Diptera). *Annals of the Natal Museum*, 21(2), 297–376.

Lyneborg, L. (2002) Two new species of *Ataenogera* Kröber from South America (Dipt., Therevidae). *Entomologist's Monthly Magazine*, 138, 103–107.

McAlpine, J.F. (1981) Morphology and terminology — Adults. *In*: McAlpine, J.F., Peterson, B.V., Shewell, G.E., Teskey, H.J., Vockeroth, J.R. & Wood, D.M. (coords.): *Manual of Nearctic Diptera Volume 1*, Research Branch, Agriculture Canada Monograph, Canada, pp. 9–63.

