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Upper Eocene robber flies of the genus *Ommatius* (Diptera: Asilidae) in Dominican Amber

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Abstract

Ommatius fimbriatus and *O. subtus* are based upon four specimens embedded in Dominican amber from the El Mamey Formation in the Dominican Republic. The amber is from the Lower Oligocene - Upper Eocene, originating between 25 and 40 million years ago. The specimens are the first reported fossils of *Ommatius*. Both species are described and compared with modern species. Significant characters are illustrated and/or photographed.

Introduction

This is a report of two species of asilids from pieces of amber found in northern Dominican Republic. The amber dates from the Lower Oligocene - Upper Eocene. Three of the asilids (#'s 7-71, 7-77 & 7-78) have plumose antennae, a chitinous metacoxal bridge and wing venation similar to that found in members of the genus *Ommatius* Wiedemann. Specific characters common to these specimens indicate that they belong to a single species. The antenna and parts of the head and thorax of a fourth specimen (# 7-66) are largely obscured by cloudy amber. Because other discernible characters are almost identical to those of the above three specimens, and the wing venation, especially the shape of cell m_1, is similar to that of several New World species of *Ommatius*, this specimen is also assigned to *Ommatius*. However, unique characters of this specimen indicate it is another undescribed species of *Ommatius*. Though similar in general characters to modern species of this genus, neither of the undescribed species is known from Hispaniola or other parts of the New World (Martin & Wilcox 1965; Martin & Papavero 1970; Scarbrough 1984a, 1984b, 1985a, 1985b, 1988, 1990; Bullington & Lavigne 1984). To facilitate other studies in progress, descriptions of the two new amber species, with illustrations and photographs of significant structures are presented below.

This is the first report of a fossil species of *Ommatius*. The specimens originated from mines in the Altimira facies of the El Mamey formation. The mines are located in the Cordillera Septentrional, between Santiago and Puerto Plata, in the northern portion of the Dominican Republic. This formation is shale-sandstone interspersed with a conglomerate of well rounded pebbles (Eberle et al., 1980). The amber originated from neotropical leguminous trees of the genus *Hymenaea*, especially *H. protera* Poinar (Poinar 1991), approximately 25 to 40 million years ago (Lambert *et al.*, 1985). A wide range of arthropods, as well as molluscs, plants, and vertebrates, occur in the amber deposits (Poinar 1992). Extant *Ommatius* species are predators that feed on a wide range of insects. Adults typically search for prey and perch along the margins of forests, streams, roads and footpaths, and patches of scrubby woody plants in secondary growth fields.

Ommatius fimbriatus Scarbrough & Poinar new species

Type material. Holotype male, # 7-71; paratype females #'s 7-77, 7-78. Poinar collection of Dominican amber, University of California, Berkeley.

Figure 1. *Ommatius fimbriatus*, n. sp., male # 7-71, left ventrolateral view showing head and fore legs. Scale: 2.0 mm.

Etymology. From Latin, *fimbriatus*, adjective meaning "fringed", refers to the thin, wavy setae on the side of the fore tibia.

Preservation. The fossil asilids are well preserved but are missing the terminal parts of the abdomens, some leg parts and wing tips or entire wings absent. The genitalia and other structures were probably lost through cutting and polishing of the amber. Although specimen # 7-71 (Fig. 1) lacks most of the abdomen, the nature of the vestiture of the face, legs and the shape of the m_1 cell, clearly distinguish it as a male. Otherwise it is essentially identical to female specimens # 7-77 and # 7-78.

Description (male # 7-71, Figs. 1-4): Head dark brown to black. Face narrow, width at base of antennae about 1/5 greatest width of compound eye; face with three pairs of long, thin, brown bristles, arranged in two vertical rows; mystax with several shorter and thicker, yellow bristles. Palpus yellow with sparse yellow setae. Proboscis slender, length about 3/4 height of compound eye, largely black but with a broad yellow band basally, vestiture entirely yellow. Ocellar tubercle with sparse, dark brown setae, two of which are thicker and longer than remaining setae. Antenna largely yellow with dark brown vestiture; flagellum brown to yellow brown, subovate, slightly longer than wide, greatest width about 2/3 its length; stylus with seven setae of which basal 2-3 are between 1/2 and 1/3 length of apical setae. Occiput with four or more thin, dark brown postocular bristles, apical 1/3 or more of two bristles curved forward.

Scutum largely brown, sides and posterior margin narrowly yellowish to yellow brown; vestiture black with four long, thick, bristles and at least seven dorsocentral bristles on each side, posterior 2-3 pairs of dorsocentral bristles thick and long with remaining pairs bristles or setae contrastingly thinner and shorter. Scutellum with two long, marginal bristles and 2-3 shorter, thinner setae. Pleuron largely brown or blackish with yellowish vestiture. Anepimeral bristle probably present (presumably because of the dark pleuron, the base of a bristle or its socket was not detected; but because a related undescribed extant Dominincan species has a thin anepimeral bristle, we suspect this species has a similar bristle). Halter yellow. Wing as in Fig 2.

All coxae yellow, slender, with thin, yellow vestiture; fore coxa about 2/3 length of fore femur. Fore and mid femur largely yellow with slight sooty or brownish tint dorsally; at least apical 1/3 of hind femur brownish, grading to yellow basally. Anterobasal 1/5 of fore femur with one short, black bristle; fore femur dorsoapically with a row of 9-10 long, thin, brown setae (Fig. 1); ventrally with a row of 5-6 long, thin, yellow setae. Mid femur (Fig. 3) with 4-5 unusually long, brown bristles anteriorly, longest about 1/4-1/3 length of mid femur; setae of anteroventral row, short and thin, apical 4-5 setae brown, remaining basal setae yellow; setae of posteroventral row all yellow, thin, and as long as, or longer than, those in anteroventral row; a long, yellow, preapical, posterodorsal bristle present. Hind femur largely brown with a narrow yellow base and subapical band, and a yellow and brown bristle anteriorly; anteroventral row of 4-5 thin to coarse, brown bristles present, each bristle widely spaced with middle three bristles thickest and longest; posteroventral row with numerous, thin, brown setae, closely spaced, somewhat comblike, and two unusually long, yellow bristles on basal 1/4. Fore

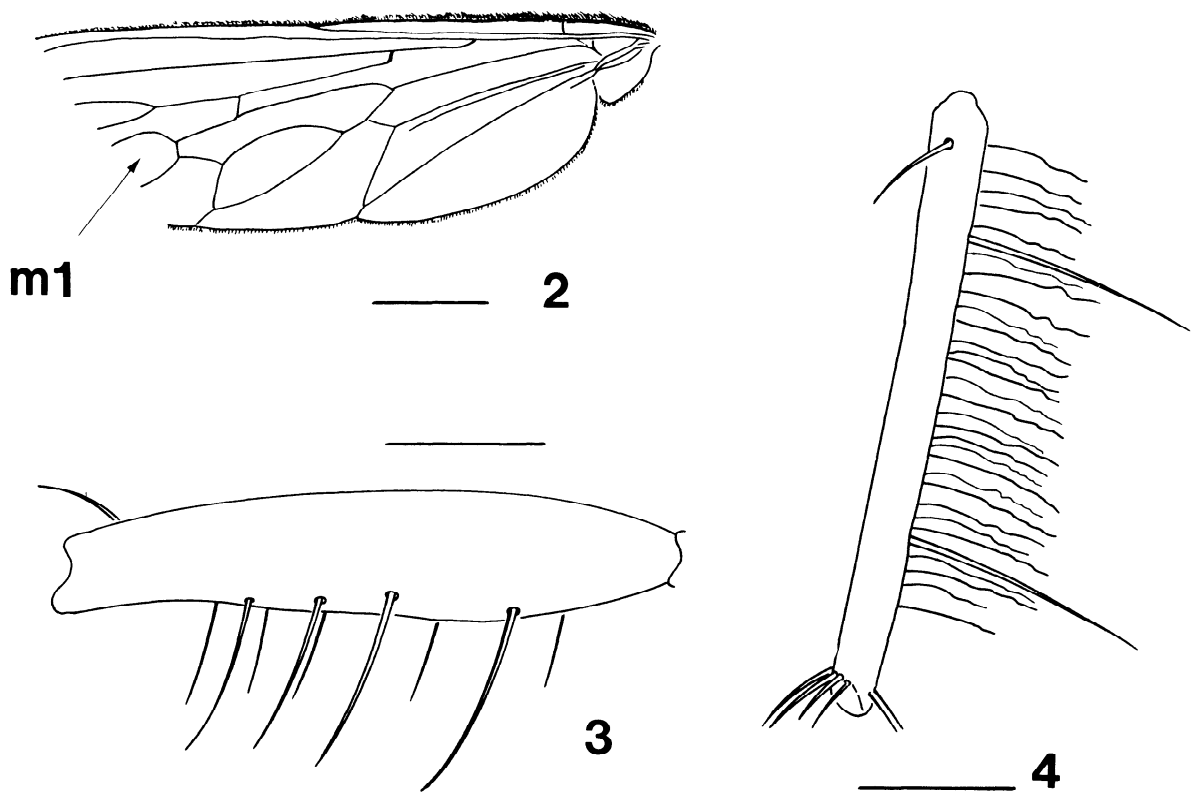

Figure 2-4. *Ommatius fimbriatus*, n. sp., male # 7-71. 2. left wing, 3. dorsal view right mid femur, 4. dorsolateral view of left fore tibia. Abbr.: M1 = 1st median cell. Scale: Fig. 2. = 2.0 mm; Figs. 3-4 = 0.5 mm.

and mid tibiae wholly yellow, hind tibia with apical 1/3 brown, yellow basally. Fore tibia (Figs. 1, 4) with numerous thin, wavy, brown setae and 2-3 yellow bristles laterally; all apical bristles brown. Mid and hind tibiae with all brown bristles. Fore and mid tarsi yellow; hind tarsi slightly brownish yellow; vestiture of tarsi dark brown except for one yellow bristle on fore tarsus. Abdomen (segments 1-4?) largely brown to blackish, with brown to blackish vestiture except for sparse yellow setae and bristles. Sternite 3 (and part of 4?) with several short, brown setae laterally. Genitalia absent.

Description (females #'s 7-77, 7-78): Females differ from male as follows: wing length (# 7-78) 10.9 mm; body length (# 7-78; head+thorax+abdominal segments 1-8?) 12.5 mm; 7-8 brown facial bristles or setae present, with two dorsal most setae being much weaker and shorter; female # 7-78 with proboscis entirely black. Vein M_1 slightly more angular subbasally than in male. Mid coxa, and sometimes hind coxa, with one brown bristle laterally. Fore femur without a posterodorsal row of thin, brown setae. Mid femur with only two long, brown bristles anteriorly and a shorter seta medially, 5-6 brown setae anteroventrally, and a brown, preapical, posterodorsal bristle. Hind femur with a large dark spot, basal 1/3 and apical 1/5 yellow; 4-5 brown bristles in anteroventral row, bristles in posteroventral row all yellow. Fore tibia without numerous thin, wavy, brown setae, and with only brown bristles. Apical 2/3 of hind tibia brown. Apical segments of fore and mid tarsi brownish yellow to brown with apical segment darkest. Fore tarsus with only brown bristles. Abdominal tergites with only brown vestiture; sternites 4 and 5 with a yellow coarse seta in each apical corner, sternites 6 and 7 with a few dark setae on each side. Sternite 8? with a short medioapical fissure. Genitalia absent.

Remarks. The male of *O. fimbriatus* differs from *O. subtus*, described below, by the vestiture of the femora, the yellow base of the proboscis, and the shape of cell m1. The male is also distinguished by a patch of brown setae

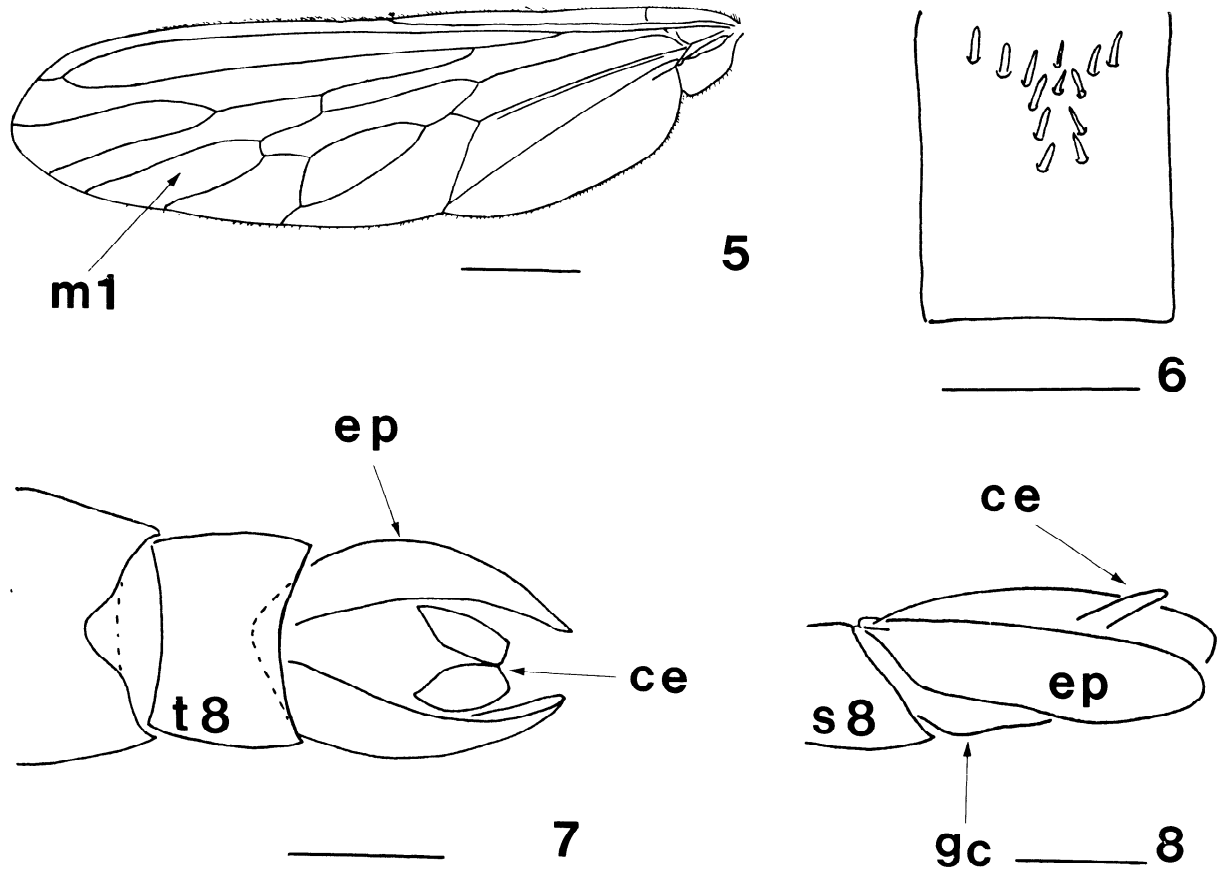

Figure 5-8. *Ommatius subtus*, n. sp., male # 7-66. 5. left wing (flattened), 6. sternite 5 with stubby bristles, 7. dorsal view of tergites 7-8 and genitalia, 8. lateral view of genitalia. Abbr.: m1 = 1st median cell; t8 = tergite 8; ep = epandrium; ce = cercus; gc = gonocoxite. Scale: Fig. 5 = 2.0 mm; Figs. 6-8 = 0.5 mm.

on each side of sternites 4 and 5, and the female by a bristly yellow seta in each apical corner of sternites 4 and 5. The male of *O. fimbriatus* resembles an undescribed species, from the Dominican Republic, in the presence of a row of posterodorsal setae on the fore femur and the short setae on the basal 1/2 of the stylus but differs in the yellow band on the base of the proboscis, the shape of the cell m1, and the color and vestiture of the legs. In addition, the female of *O. fimbriatus* is characterized by the presence of only yellow bristles in the posteroventral row of the mid femur.

Ommatius subtus Scarbrough & Poinar new species

Type material. Holotype male, # 7-66. Poinar collection of Dominican amber, University of California, Berkeley.

Etymology. From Latin *subtus*, adjective meaning "below" or "under", and refers to the site of the unusual vestiture on the underside of the abdomen, specifically the numerous stubby bristles on sternite 5.

Preservation. Specimen # 7-66 is much smaller and more slender than the other three specimens. It is well preserved with the right fore femur and tibia, right mid femur and tarsus, hind legs, wings, abdomen, and genitalia clearly visible. However, the amber surrounding much of the head and thorax is cloudy, obscuring their details.

Description (male # 7-66, Figs. 5-10): Wing length 6.5 mm, body length 8.2 mm. Head with proboscis and palpus brown to dark brown, facial vestiture with six or more long, brown bristles.

Figure 9. *Ommatius subtus*, n. sp., male # 7-66. Photograph of male genitalia, dorsal view.

Thorax dark brown to black, postalar calli yellowish; scutellum with a pair of long, thin, brown bristles. Anepimeral bristle probably present (see discussion of the pleuron of *O. fimbriatus*). Wing as in Fig. 5.

All coxae slender, yellow, with yellow vestiture. Right fore femur and tibia yellow; fore femur anteriorly with a short, brown seta on basal 1/5 and ventrally with numerous long, thin, brown setae; fore tibia with a ventral and lateral row of thin, brown setae, setae of lateral row not unusually abundant, apical 1/3 of each seta slightly wavy. Right mid femur yellowish with a slight tint of brown, and bearing at least three thick, brown bristles anteriorly, thickest and longest present on basal 1/4, about 1/3 length of mid femur; anteroventral row of 3-4 setae present, all much thinner and shorter than anterior bristles; posteroventral row of 5-6 yellow setae, these mostly much longer than those in anteroventral row. Hind femur brownish with a brown and a yellow bristle anteriorly, basal most bristle significantly longer and thicker than preapical bristle; anteroventral row with only 4-5 widely spaced, yellow bristles, most slightly thicker and longer than those in posteroventral row; posteroventral row with numerous, closely spaced largely yellow bristles, only 3-4 brown bristles present apically, basal 1/3 of posteroventral row with two unusually long, yellow bristles, each about 1/3 length of hind femur. Apical 1/3 of hind tibia and hind tarsus largely brownish yellow with only brown bristles.

Abdomen slender, brown with mostly brown vestiture; vestiture of lateral callus of tergite 1, and apices of tergites 2-5 with at least one long bristle each, and vestiture of sternites 1-4 mostly yellow. Medioapical 1/2 of sternite 5 with a double row of 13 or more short, stubby, brown bristles, each row extended obliquely toward apical corner (Fig. 6). Medioapical margin of tergite 7 with a moderately deep sinus (Figs. 7, 9). Genitalia as in Figs. 7-10.

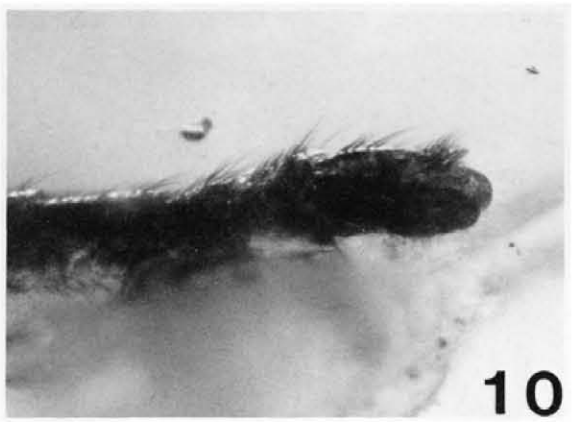

Figure 10. *Ommatius subtus*, n. sp., male # 7-66. Photograph of male genitalia, lateral view.

Remarks. *Ommatius subtus* is easily recognized by its small, slender body, narrow cell m_1, the stubby bristles of sternite 5, and the terminalia. The narrow cell m1 is similar to that of both *O. neotropicus* Curran and *O. norma* Curran. However, *O. subtus* differs in the slender hind femur and the two rows of ventral setae or bristles. The former two species have swollen hind femora and the ventral rows of bristles are absent or incomplete. A Cuban species, *O. lineolatus* Scarbrough (1988), and an undescribed Dominican species are also similar in their small size, short setae on the basal 1/2 of the antennal stylus, and slender body and legs. The latter undescribed extant species also has two unusually long, thin bristles below the hind femur. *Ommatius subtus* differs from both of these species by the shape of the epandrium and the presence of stubby bristles below sternite 5.

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