

***FEROSETA PRISCUS* (NEUROPTERA: MANTISPIDAE), A NEW GENUS
AND SPECIES OF MANTIDFLIES IN DOMINICAN AMBER**

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Abstract.—*Ferosecta priscus* (Neuroptera: Mantispidae), a **new genus** and **new species** of mantidflies, is described from Dominican amber. Diagnostic characters of the new genus are: 1, The cubitus of the hindwing is parallel to the first anal vein and does not touch it; 2, the absence of a pterostigma in all wings; 3, the shape and pedicellated nature of the flagellomeres; 4, the extended tip of the terminal flagellomere; 5, the structure of the thorax; and 6, the elongated male ectoprocts.

Key Words: *Ferosecta priscus*, new genus, new species, Mantispidae, Dominican amber, mantidfly, Tertiary

Mantidflies of the family Mantispidae (Neuroptera) are a cosmopolitan group of lacewings with a poor fossil record. The family is divided into four or five subfamilies depending on whether the South African Rhachiberothidae is included with the more traditional groups (Redborg 1998). The Neotropical mantispids fall into four subfamilies, the Calomantispinae, Symphrasinae, Drepanicinae, and the Mantispinae. These can be separated by the structure of the forelegs, with members of the former three subfamilies having two claws and an arolem on the foretarsi, and the Mantispinae with only a single claw and no arolem on the fore tarsi (Penny 1982a, b; Hoffman 2002).

A recently discovered male mantidfly in Dominican amber could not be placed in any of the extant genera and is described below in a new genus in the subfamily Mantispinae.

MATERIALS AND METHODS

The amber piece was repolished to obtain a better view of the diagnostic characters.

The final amber piece weighs 4.9 g, is 32 mm in greatest length, 21 mm in greatest width, and 13 mm in greatest depth. The specimen was obtained from the La Toca mine in the Cordillera Septentrional of the Dominican Republic. Dating of Dominican amber is still controversial with the latest purposed age of 20–15 mya based on foraminifera (Iturralde-Vinent and MacPhee 1996) and the earliest as 45–30 mya based on coccoliths (C  pek in Schlee 1999). Dominican amber is secondarily deposited in sedimentary rocks, which makes a definite age determination difficult (Poinar and Mastalerz 2000). A range of ages for Dominican amber may be likely since the amber is associated with turbiditic sandstones of the Upper Eocene to Lower Miocene Mamey Group (Draper et al. 1994). Dominican amber was produced by the leguminous tree, *Hymenaea protera* Poinar (1991). A reconstruction of the Dominican amber forest based on amber fossils indicated that the environment was similar to that of a present day tropical moist forest (Poinar and Poinar 1999). Terminology is

based on the works of Penny (1982a, b) and Lambkin (1986a, b).

Observations, drawings, and photographs were made with a Nikon SMZ-10 R stereoscopic microscope and Nikon Optiphot compound microscope with magnifications up to 600X.

Family Mantispidae Leach, 1815

Subfamily Mantispinae Leach, 1815

The presence of only a single claw and absence of an arolem in the foreleg place the fossil in the subfamily Mantispinae (Penny 1982a, b; Lambkin 1982a, b). The fossil is well preserved and complete except for the absence of the foretarsus of the right leg.

Feroseta Poinar, new genus

Type species.—*Feroseta priscus* Poinar.

Description.—Body medium size; with a single claw without arolem on foretarsus; antennal flagellomeres pedicellated; terminal flagellomere with extended tip; pronotum with few scattered setae in prozonal region, mesoscutal furrow inconspicuous; cubitus of hind wing runs parallel to anal vein without touching it; pterostigma not sclerotized in all wings, replaced by bristles; ectoprocts elongated and narrow, with well-developed median lobes; mediuncus with extended terminus.

Diagnosis.—The combination of the above characters separates *Feroseta* from all other genera in this subfamily, including those recently described from Costa Rica (Hoffman 2002).

Etymology.—“*Feroseta*” is from the Latin “fero” for to bear or carry, and “seta” for bristle in regards the bristles in the area of the pterostigma. The gender is feminine.

Feroseta priscus Poinar, new species

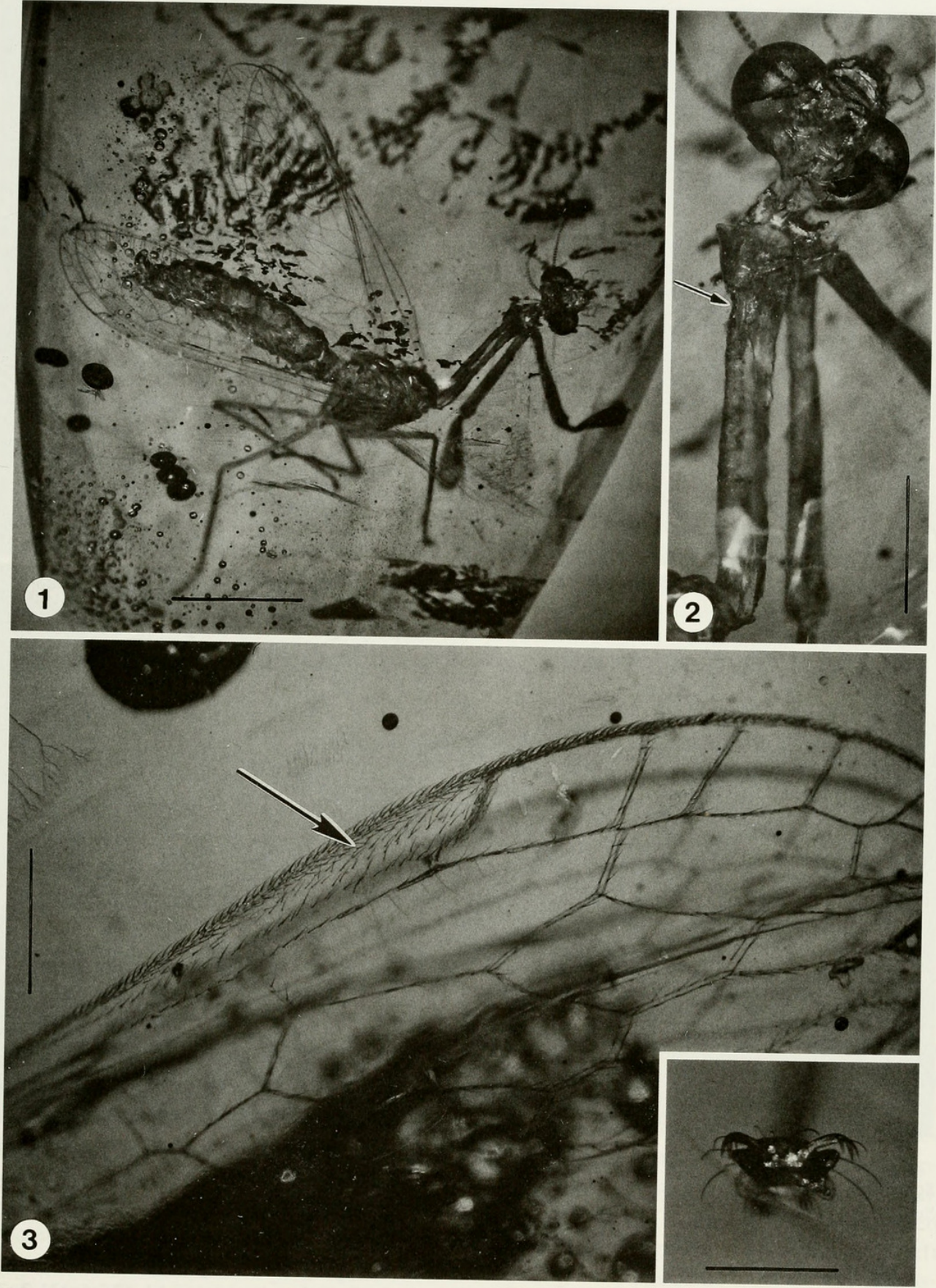
(Figs. 1–10)

Description.—With characters listed under generic description. Total length 14.2 mm (as positioned in the amber) but 15.9

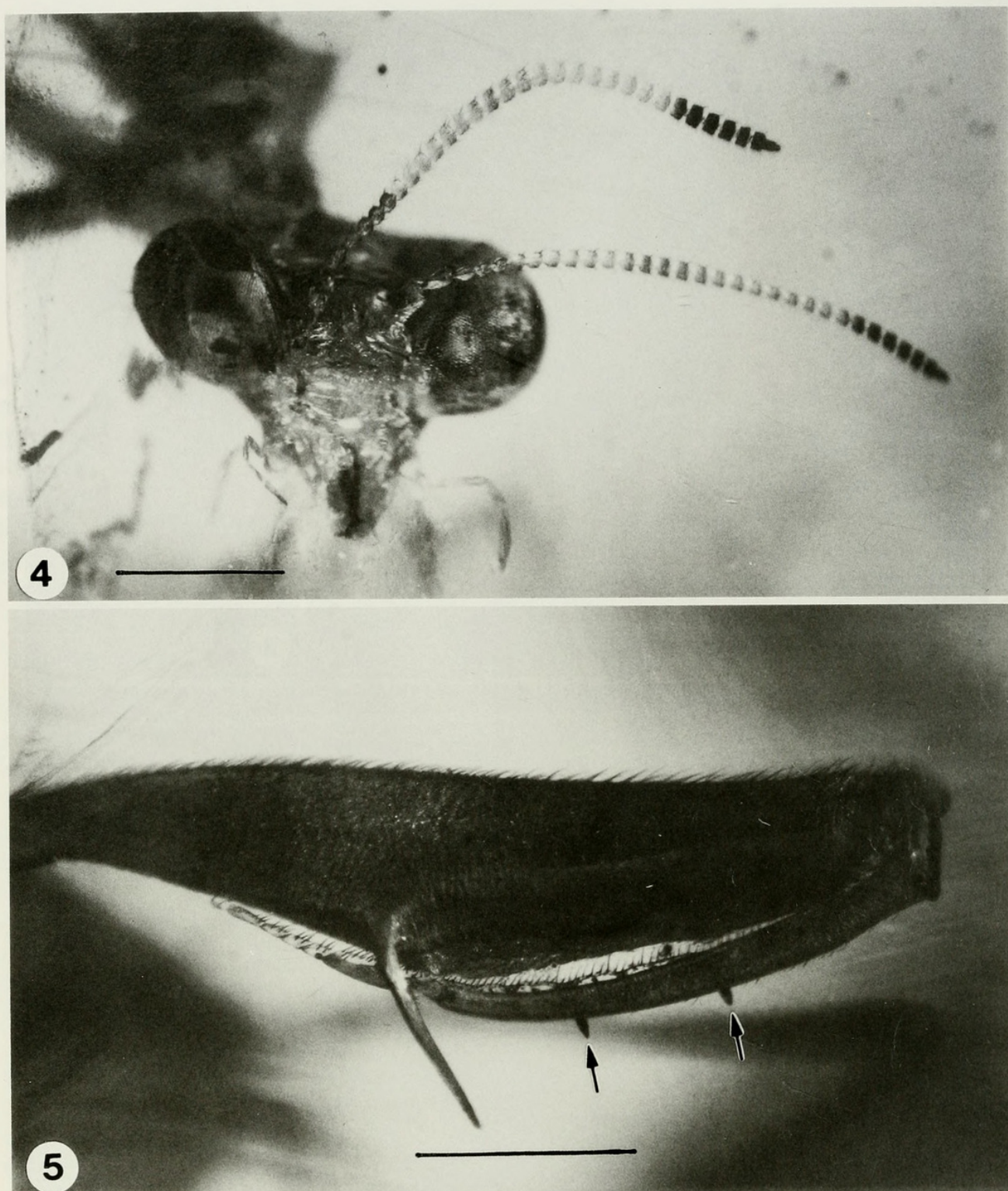
mm when body divisions measured separately.

Head: Length, 1.6 mm, width, 2.1 mm; occiput only slightly raised above level of compound eyes; distance between eyes, 2.1 mm; upper portion of head (vertex and frons) dark, lower portion (clypeus and mouthparts) light; antennal length, 2.8 mm; antenna with 30 segments; distance between antennal bases, 440 μ m; flagellomeres ranging from as wide as long to twice as wide as long; segments appearing glabrous, but with few, fine, short setae; flagellomeres pedicellated (with pedicel or extension at base); terminal 6 flagellomeres darker than remainder, terminal flagellomere with extended tip; head region between eyes brown, lower portion of head light, without inverted V-shaped marking or vertical or horizontal stripes above or beneath antennae.

Thorax: Brown; length prothorax, 4.1 mm; length mesothorax, 1.3 mm; length metathorax, 1.3 mm; prothorax glabrous except for some scattered hairs in prozonal region; dorsal surface of pronotum bearing flattened transverse rugae; apical portion of pronotum just posterior to prozonal region with dorsal constriction; prozonal region of pronotum saddle-shaped; mesoscutal furrow inconspicuous; wings clear, no infuscated area at apex; trichosores absent; setae on all wing veins; lacking subcosta crossveins; pterostigma absent in all wings, replaced by macrosetae; forewing length, 12.0 mm; greatest width, 3.5 mm; second anal vein not forked; with strongly recurved humeral crossvein; two radial cells originating from first radial cell (r_1), three radial cells originating from second radial cell (r_2); two radial cells originating from third radial cell (r_3); hindwing length, 10.4 mm; greatest width, 3.2 mm; 3 radial cells originating from first radial cell (r_1), two radial cells originating from second radial cell (r_2) (in one wing, second radial cell divided by a separate vein) (Fig. 7), two radial cells originating from third radial cell (r_3); 7–8 graduate crossveins; legs mostly light in



Figs. 1–3. *Feroseta priscus* in Dominican amber. 1, Holotype male. Scale bar = 3.9 mm. 2, Head and prothorax. Note dorsal pronotal constriction (arrow). Scale bar = 1.3 mm. 3, Tip of forewing showing macrotrichia (arrow) in place of pterostigma. Scale bar = 850 μ m. Insert shows claws on left hind leg. The smallest claw does not show on this photo. Scale bar = 512 μ m.



Figs. 4–5. *Feroseta priscus* in Dominican amber. 4, Head showing darkened 6 terminal antennal segments. Scale bar = 550 μm . 5, Femur, tibia and tarsus of foreleg showing major and 2 of 3 minor spines (arrows). Scale bar = 440 μm .

color; forecoxa divided into 2 parts; fore-femur dark, length, 4.0 mm; bearing one large central spine (major spine of Lambkin 1986a) (length, 718 μm), 3 minor spines and 7–8 small spines; foretarsus with 5 seg-

ments, length segments, 1, 435 μm ; 2, 86 μm ; 3, 97 μm ; 4, 97 μm ; 5, 183 μm ; length foreleg claw, 69 μm ; arolium absent; length mid- and hind leg claws, 154 μm ; claws on mid- and hind legs 4 cleft.

Abdomen: Coloration uniformly light, without mottling; ectoprocts elongate, narrow, bearing long setae, with well-developed median lobes bearing short, thick setae on inner surfaces; length of narrow terminal portion of ectoproct, 324 μm ; width of narrow terminal portion of ectoproct, 94 μm ; mediuncus with extended terminus.

Material examined.—Holotype male in Dominican amber, deposited in the Poinar amber collection maintained at Oregon State University (accession # N-4-16).

Etymology.—"Priscus" is Latin for ancient, of former times.

Diagnosis.—The flattened transverse rugae and the constriction on the pronotum are characteristics of several mantispid genera, including the genus *Entanoneura* Enderlein 1910. However, in *Entanoneura* the pterostigma is chitinized and darkened, there are numerous branches of the radius in both wings and the cubitus bends down and either touches or is fused for a short distance with the anal vein (Enderlein 1910).

DISCUSSION

The American Mantispinae range from North America to Argentina, with some 119 species in 15 genera reported from South and Central America (Rehn 1939; Welch and Kondratieff 1991; Penny 1977, 1982b; Handschin 1960; Ohl 2004). Lambkin (1986a) stated, "the presence of apterostigma is one of the characteristic features of the family". Thus, the absence of a sclerotized pterostigma in *F. priscus* is surprising. Consideration was given to the possibility that the portion of the wing bearing the pterostigma had somehow cleared during the fossilization process. However, other mantispid fossils in amber (see below) possess well-developed pterostigmae and even if some clearing had occurred in the present fossil, one would expect that at least one wing would have had a partial pterostigma. However, all wings are equally devoid of both pigmentation and sclerotiza-

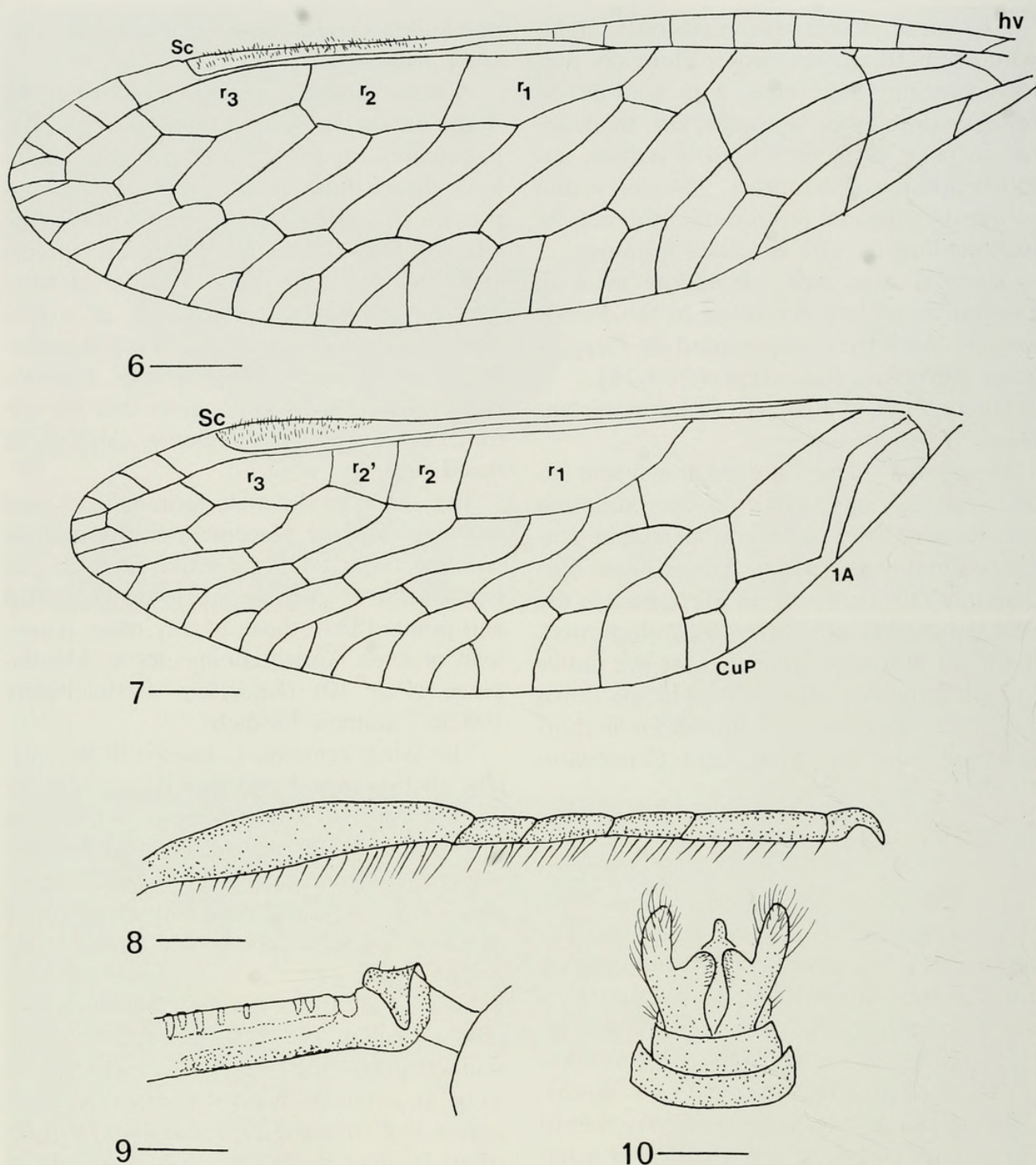
tion and the region of the pterostigmae contains macrosetae.

Another unusual character on the fossil is the character and positioning of the flagellomeres. In most mantispids, the flagellomeres are quite pubescent and closely appressed to one another, however in the fossil, the flagellomeres are sparsely hirsute and separated (Fig. 4). Separation of adjacent flagellomeres is caused by an extension (pedicel) at the base of each flagellomere. The shape of the terminal flagellomere in each antenna suggests that the terminal and subterminal segments might have fused (Fig. 4).

The shape of the male terminalia is used in the systematic placement of the mantispids. As far as could be determined, the ectoprocts of *F. priscus* are more elongated and pointed than those of any other American or even Australian species of Mantispinae (Fig. 10) (Enderlein 1910; Penny 1982b; Lambkin 1986a,b).

The wing venation is known to be variable in this group and this is apparent by the presence of an extra radial cell in one of the hind wings, caused by a vein separating the second radial cell into two equal cells (Fig. 7). Also, in one forewing, the tip of the R1 vein is represented by a row of macrotrichia.

Fossil mantidflies are rare. *Whalfera ventrix* (Whalley 1983) of the subfamily Platymantispinae in British amber (quite likely to be an extended deposit of Eocene Baltic amber and roughly the same age) is fairly small (6 mm in length), lacks a recurrent humeral vein in the forewing, has forelegs with only 4 tarsal segments and possesses wing trichosors. All of these characters separate it from *F. priscus*. A second fossil, *Vectispa relict*a (Cockerell), was described from a wing fragment and a complete left forewing in Oligocene sedimentary deposits from the Isle of Wight (Cockerell 1921; Jarzembowski 1980). The presence of a distinct pterostigma separates this fossil, which was placed in the Mantispinae, from *F. priscus*. Another mantispid in Dominican



Figs. 6–10. *Feroseta priscus* in Dominican amber. 6, Forewing. Scale bar = 1 mm. 7, Hind wing. Note two r_2 radial cells. Scale bar = 1 mm. 8, Fore tarsus. Scale bar = 114 μm . 9, Anterior portion of prothorax. Scale bar = 512 μm . 10, Dorsal view of terminalia showing elongated lobed ectoprocts and terminal mediuncus. Scale bar = 432 μm . hv = humeral vein; r_1 = first radial cell; r_2 = second radial cell; r_3 = third radial cell; 1A = first anal vein; CuP = cubitus vein; Sc = subcostal vein.

amber, which was tentatively assigned to the genus *Mantispa*, was mentioned and figured in Poinar and Poinar (1999). This specimen, which is in a private collection in Europe, has a well defined pterostigma in both wings, which separates it from *F.*

priscus. *Prosagittalata oligocenica* Nel and *Climaciella henrotayi* Nel were described from Oligocene deposits in France. The presence of well-developed pterostigmae in both wings and the wing venation separate these fossils from *F. priscus*. Other fossil

mantispid listed by Ohl (2004) have wing features that are quite different from *F. priscus*.

As a family, mantispids develop on a wide range of insect larvae in the orders Hymenoptera, Lepidoptera, and Coleoptera. However as far as known, all members of the subfamily Mantispinae, which includes *F. priscus*, develop only on spider eggs (Redborg 1998). There would have been a wide host selection in the Dominican amber forest since presently some 152 species of spiders in 82 genera and 36 families are known from these deposits (Wunderlich 2004).

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