

**A FOSSIL *EMPICORIS* WOLFF
(REDUVIIDAE: HETEROPTERA) FROM MEXICAN AMBER
WITH REMARKS ON THE PHYLOGENETIC STATUS OF
THE FOSSIL GENUS *ALUMEDA* POPOV**

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Abstract.—A fossil emesine reduviid (Heteroptera) is described from the Oligo-Miocene amber from the Simojovel formation of Chiapas, Mexico. The single specimen is described as a new species, *Empicoris electricus*. The characteristics of the fossil genus *Alumeda* are found to link the extant genera *Empicoris* and *Ctydinna*.

Fossil Emesine reduviids are known from both European and New World deposits. A specimen assigned to the genus *Ploiaria* Scopoli is reported from rock at Aix, France (Scudder, 1890). Bachofen-Echt (1949) illustrated an emesine nymph which was not assigned to genus, from the Baltic amber, and Schlee (1980) published a photograph of an emesine embedded in Dominican amber. Wygodzinsky (1966) mentions having seen a specimen of *Empicoris* Wolff in the Chiapas amber but offered no further elaboration. The most comprehensive reports on fossil emesines are those of Popov (1987a, b, 1989) who studied material from the Dominican amber. These included one species of *Malacopus* Stål, three species of an extinct genus *Alumeda* Popov, and a species of *Empicoris* in subfossil Dominican copal.

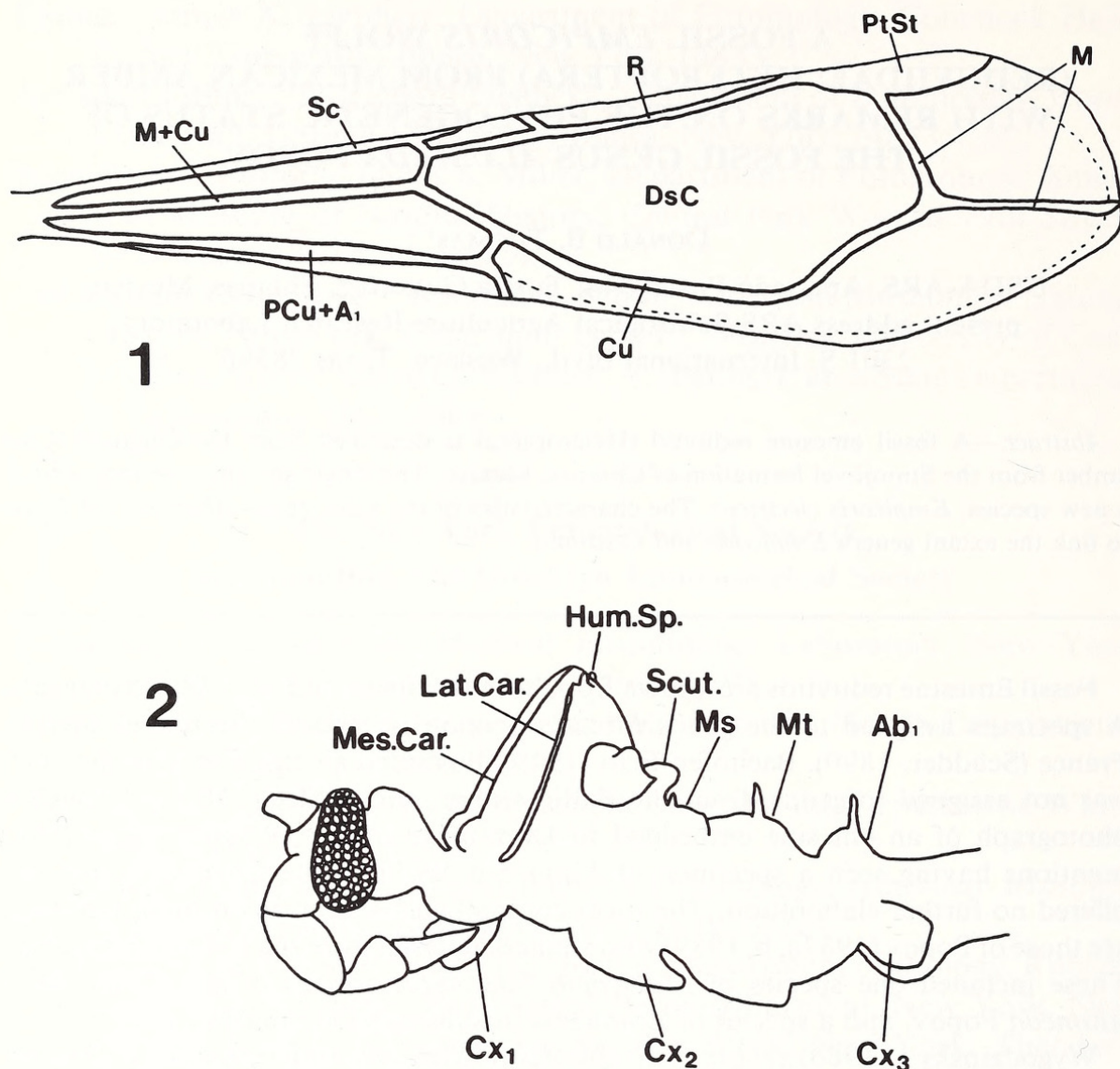
Wygodzinsky's (1966) report of *Empicoris* in Mexican amber is now confirmed, although his specimen was not available to me. The following description is based on a specimen purchased in Tuxtla Gutierrez, Chiapas, with a stated provenance of Simojovel, Chiapas, Mexico. The Simojovel formation, from which amber is mined, straddles the Oligo-Miocene boundary (Frost and Langenheim, 1974) giving an age of ca. 23 million years.

***Empicoris electricus*, new species**

Description. Narrow, elongate, small; length 3.8 mm. Thorax appearing unusually bilaterally compressed. Wings present, membranous with pattern of spots. Antennae and legs with numerous dark annuli; protarsi two-segmented.

Head constricted behind eyes; posterior lobe slightly larger than anterior lobe; eyes and antennal tubercle large. Rostrum without spines or stiff setae; segment II appearing distinctly swollen. Antennal segmental ratios I-IV: 0.09:1.00:0.40:0.15.

Pronotum with complete lateral carinae as well as pair of mesial carinae on anterior dorsum. Humerus with small, spinous tooth at dorsal terminus of each lateral carina. Posterior dorsal border of pronotum without medial tubercle or projection. Scutellum with non-spinous projection; mesonotum with small, median tubercle; metanotum and first abdominal segment each with prominent erect spine (Fig. 2).



Figs. 1-2. *Empicoris electricus*, n. sp. 1. Hemelytron with venation: M+Cu = Medial+Cubital vein, Sc = Subcostal vein, R = Radial vein, M = Medial vein, PCu+A₁ = Postcubital+Anal vein one, Cu = Cubital vein, DsC = Discal Cell. 2. Head and thorax, lateral view (legs, wings and antennae not shown): Mes. Car. = mesial carinae (=dorsal carinae or submedial carinae), Lat. Car. = lateral carinae, Hum. Sp. = humeral spine, Scut. = scutellum, Ms = mesonotum, Mt = metanotum, Ab₁ = first abdominal tergite, Cx = coxae. All figures drawn with Camera Lucida.

Hemelytron with pterostigma far from apex: distance from insertion of M vein on pterostigma to tip of pterostigma about half distance from latter to apex of wing. M+Cu vein fused to form single stem emitting from base of discal cell. Discal cell without smaller closed cell at its base; basal angle truncate; separated from costal margin by intervening membrane. R vein connected to margin of wing by two veinlets (sc-r crossveins). Cu vein bent in apical portion oblique to wing axis. False or spurious submarginal vein present along posterior and apical portion of wing (Fig. 1).

Profemur with posteroventral series of minute spinules, longer proximally; longest ca. one-third diam. of femur. Tarsomere II ca. twice length of I.

Holotype. Male. Mexico, Chiapas, Simojovel Area. Cat. No. DT-055. Embedded in a cut and polished piece of fossil amber, flat, tear-shaped, measuring $26 \times 13 \times 6$ mm in dimension. Deposited American Museum Natural History, New York.

Remarks. *Empicoris* is a cosmopolitan genus of about 50 species of which five are reported to occur in Mexico (Maldonado-Capriles and Brailovsky, 1983). The fossil species *Empicoris electricus* is unique in having humeral spines, although *E. incredibilis* Wygodzinsky and *E. copal* Popov have flaps in the same position. Dorsal pronotal carinae (termed submedial carinae by Wygodzinsky [1966]) occur in *E. barberi* McAtee & Malloch and *E. mirabundus* Wygodzinsky. The carinae are more pronounced in the fossil species but this may be because the specimen is bilaterally compressed; possibly as a result of the heterogenous distortion common in amber fossilization. The thorax in *Empicoris* is typically dorso-ventrally compressed. The presence or absence of spines on the scutellum, mesonotum, metanotum and first abdominal tergite are important in species recognition. *Empicoris electricus* shares with *E. barberi* and *E. mirabundus* the absence of a scutellar spine commonly found in other species but has a metanotal spine that is absent in the latter two species. The new fossil species is also unusual in having the second rostral segment distinctly swollen. In the Emesinae the second rostral is at most slightly swollen (Wygodzinsky, 1966). A swollen second rostral segment is characteristic of the related subfamily Saicinae. However, in that subfamily the rostrum and venter of the head is bristled with spinous setae and the acetabulae of the procoxae are not directly forward (Blinn, 1990). In these regards the specimen is a typical emesine, and again the apparent condition may be an artifact of distortion in fossilization.

DISCUSSION

When Popov (1989) described the early Miocene fossil genus *Alumeda* he listed three characteristics by which it differed from all other ploarioline genera. These were (briefly): (1) the pterostigma shortened; (2) the base of the discal cell "shortly pointed"; and (3) the discal cell in broad contact with the wing margin. In fact these characters will not adequately separate *Alumeda* from all species of *Empicoris* including the fossil species described above. Popov reiterated these characters in a key to those emesine genera related to *Alumeda* and *Empicoris*, which have a single stem vein (M+Cu) emitting from the base of the discal cell. The key was modified from Wygodzinsky's (1966) key to genera of Ploiariolini to include only the five extant genera with the single stem vein and the fossil genus *Alumeda*. The couplet [10(7)] leading to *Alumeda* and separating *Empicoris* and *Ctydinna* states: "Distance from apex of pterostigma to tip of forewing no less than twice as long as distance from pterostigmal apex to insertion of M on same; base of discal cell shortly pointed, only a basal quarter or fifth of anterior border of cell separated from wing margin and connected to it by one cross vein." Actually, in some common species of *Empicoris*, such as *E. vagabundus* (L.) and *E. orthoneuron* McAtee & Malloch, the ratio in the length of the distal pterostigma to the length to the wing tip, is twice as in *Alumeda*. Also, in the fossil species *E. electricus*, which has venation very similar to that of *E. vagabundus*, this ratio is $2 \times$. With regard to the character of the discal cell relative to the wing margin; in most species of *Empicoris* the discal cell is separated from the wing margin by an intervening membrane and connected by two bridging cross-

veins. However, *E. orthoneuron* is like *Alumeda* spp. in having the discal cell in broad contact with the margin. Similarly, some Asian species, including the holarctic species *E. culiciformis*, have the discal cell in broad contact with the wing margin (Putshkov, 1989). Thus, most of the wing venation characters emphasized by Popov will not separate *Alumeda* from *Empicoris*. The only reliable venation character separating the genera is the presence of two sc-r crossveins in *Empicoris* and *Ctydinna* (only one in *Alumeda*). The presence of the proximal crossvein forms the angle which results in the discal cell base being truncate instead of pointed; Popov's second distinguishing characteristic for *Alumeda*.

Popov's (1989) and Wygodzinsky's (1966) key character separating *Empicoris* from *Ctydinna* will also separate *Alumeda*. *Empicoris* characteristically has lateral pronotal carinae that are lacking in *Alumeda* and *Ctydinna*. Bergroth (1909) proposed the separation of two genera *Ploiariodes* White and *Ploiariola* Reuter (synonyms of *Empicoris*) based on the presence or absence of the pronotal carinae. McAtee and Malloch (1925) noted that the carinae varied from complete to reduced to obsolete (particularly in unnamed specimens from the South Pacific) and therefore disregarded the value of the character, stating that it was worth at most subgeneric distinction. Subsequently, China (1930) proposed the subgenus *Dictynna* for a species from Samoa in which a salient feature was the lack of lateral pronotal carinae. In his monograph, Wygodzinsky (1966) elevated *Dictynna* to full genus, changing the name to the anagram *Ctydinna* Wygodzinsky; *Dictynna* being preoccupied in the Hymenoptera. *Ctydinna* is monotypic; its one species *nitidicollis* China, has wing venation similar to that of a typical *Empicoris*. When China proposed *Dictynna* as a subgenus of *Empicoris* he emphasized the lack of an emargination on the posterior border of the basal abdominal sternite. Wygodzinsky (1966) characterized the posterior border of this sternite as "faintly emarginated," and did not include this character in the generic key. Thus, Wygodzinsky elevated the monotypic *Dictynna* to genus level while dispensing with the character considered by China to be its defining character, and emphasizing the character (lateral pronotal carinae) considered by McAtee and Malloch (1925) to be worth at most subgeneric distinction. In *Empicoris rubromaculatus* McAtee & Malloch, for example, the lateral carinae, though present, are greatly reduced.

Thus, *Ctydinna* and *Empicoris* are closely related and distinguished only by a character whose discreteness and significance is questionable. The fossil genus *Alumeda* differs from *Ctydinna* in wing venation as described by Popov (1989), and from *Empicoris* by the lack of lateral pronotal carinae. Whether these differences deserve generic or only subgeneric distinction is clearly subjective. A reanalysis of the character-states exhibited by the fossil genus *Alumeda* and the extant genera, *Empicoris* and *Ctydinna* indicates a closer relationship among them than prior treatments would suggest.

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