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What is *Amphipteryx agrioides* Selys 1853 (Odonata: Amphipterygidae)?

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The family Amphipterygidae comprises a group of moderately large, robust species of pan-tropical damselflies. It was first recognized by Selys (1853) as his "6^{me} legion" based on the description of a unique female which he named "*Amphipteryx agrioïdes*." Its provenance ("Colombie. [Collect. Selys.]") has remained a mystery as no specimens of this genus had subsequently been collected from South America. Selys (1854a: 241, 243) expanded on the distribution of the specimen noting (page 241) that it had been collected "dans la province de Cumana (Amérique méridionale équatoriale)" and (page 243) "d'après un exemplaire recueilli par M. Funck, et qui se trouvait avec l' *Hetaerina majuscula* et l' *Agrion (Hyponevra) Funcki*…." De Marmels (1990) dismissed the record of *A. agrioides* from "Cumaná [Venezuela]" as unlikely and suggested deletion of the species from that country.

The single holotype female was apparently never re-examined, except by the late B.E. Montgomery who never published his observations, until recently (von Ellenrieder & Garrison 2007). Calvert (1901) in his Biologia Centrali-Americana assigned this name to specimens from Mexico and Guatemala. He described the male for the first time and gave a description of the female comparing it with the original description and noting that "The hind prothoracic lobe also possesses two dorsal lamellate processes (not mentioned by Selys)…." González (1991) described *A. longicaudatus* (should be *A. longicaudata*; Novelo 1995) from Oaxaca, Mexico and distinguished this species from *A. agrioides* based only on Calvert's (1901) description and illustrations.

Several years ago, Rosser W. Garrison was sent digital images of the holotype female of *A. agrioides* by Jérôme Constant of the IRSNB, and observed that the pronotal armature differed from specimens given this name by Calvert (1901) and González (1991) (Garrison *pers. comm.*).

Since *Amphipteryx* is the type genus of the family Amphipterygidae, it is imperative that its type species, *A. agrioides*, be correctly assigned to specimens.

The purpose of this paper is to determine the correct identity of *A. agrioides*, provide diagnostic illustrations of the same, and discuss the location of its type locality.

Methodology

The holotype of *Amphipteryx agrioides* in the IRSNB was illustrated by R.W. Garrison (von Ellenrieder & Garrison 2007) and additionally Calvert's material of *Amphipteryx* from the BMNH collections was critically examined (Garrison *pers. comm.*), along with material from CNIN. Illustrations of diagnostic characters are reproduced here. Acronyms used for collections are as follows: BMNH: The Natural History Museum, London, Great Britain; CNIN: Colección Nacional de Insectos, Instituto de Biología, UNAM; IRSNB: Royal Belgian Institute of Natural Sciences, Brussels, Belgium.

Results

Correct application of the name *Amphipteryx agrioides*

Examination and illustrations of the holotype female of *A. agrioides* in IRSNB (Figs. 4b, 5b) as well as examination of three males and two females in BMNH by R.W. Garrison indicate that Calvert was incorrect in assigning the Guatemalan

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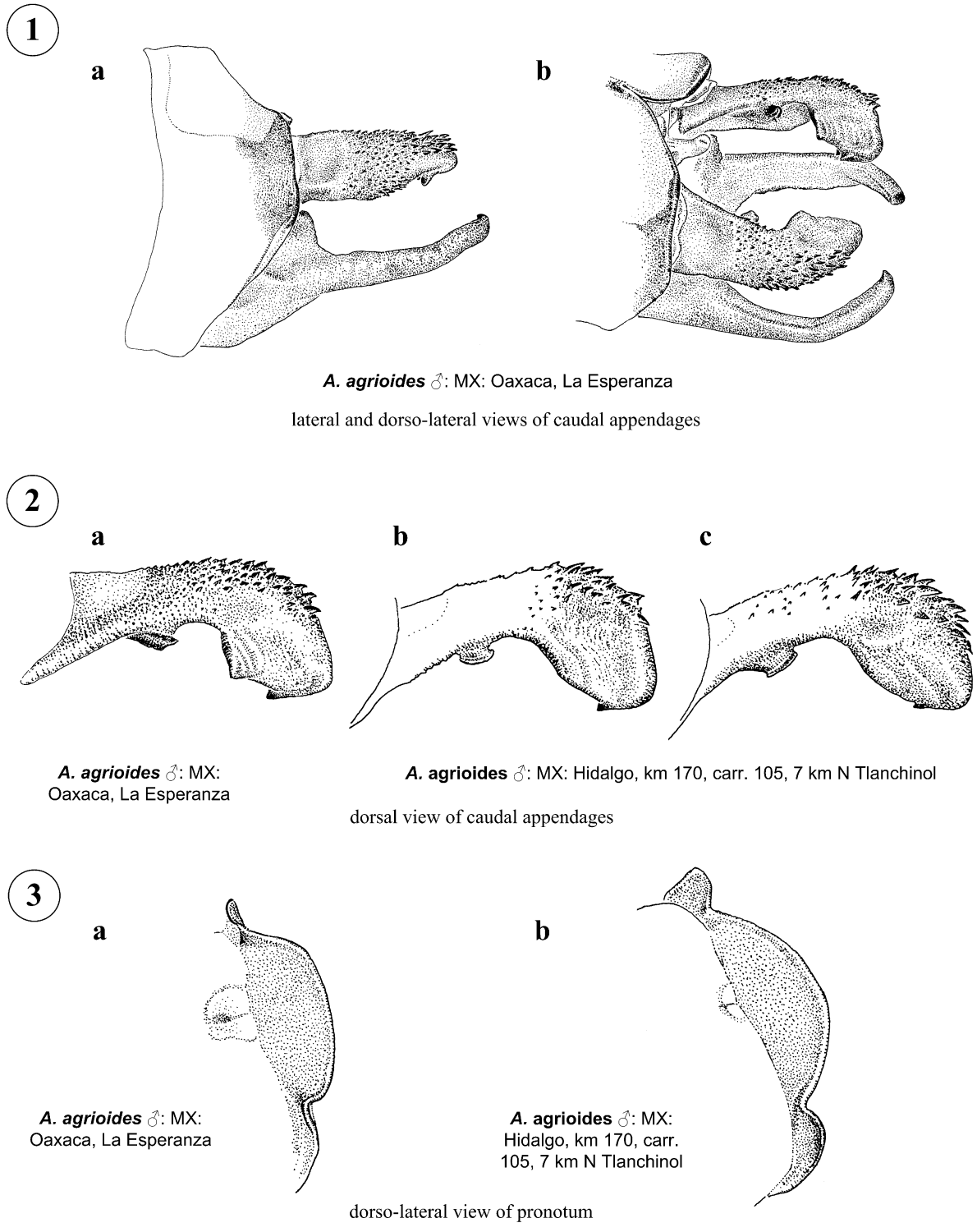
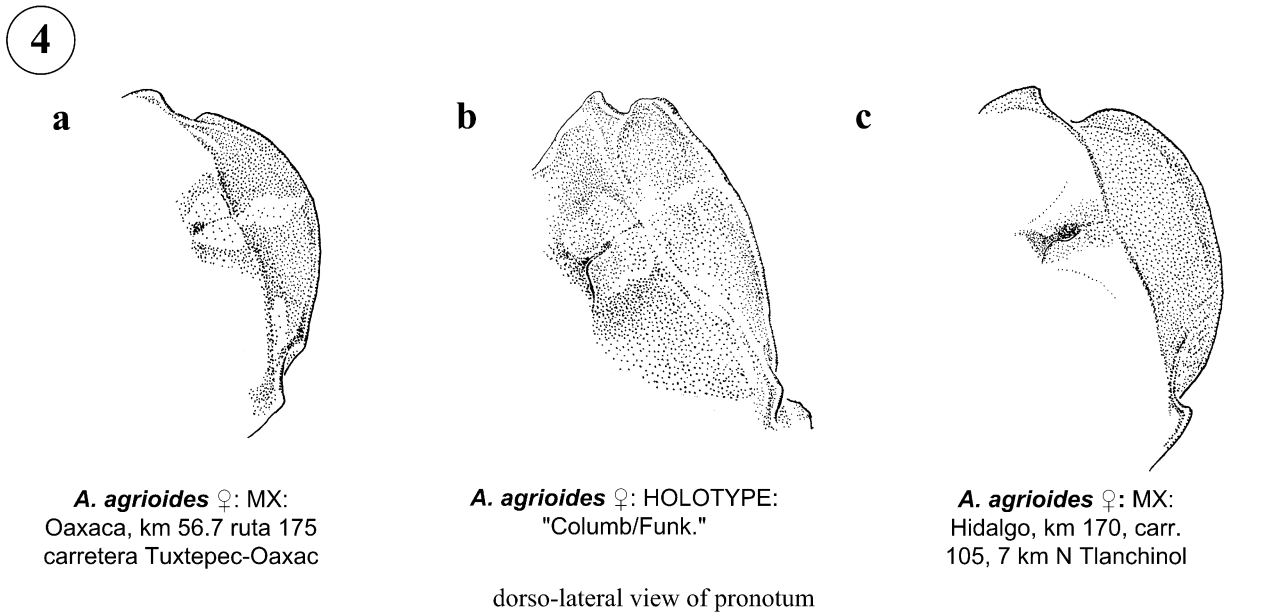
material to *A. agrioides*. The illustrations of the pronotal hind lobe of the prothorax of the holotype (Figs. 4b, 5b) show it to be relatively unmodified and similar to the same structure illustrated by González (1991) to represent the female of *A. longicaudata* (Figs. 4a, 5a). The female misidentified as *A. agrioides* by Calvert differs by its modified pronotum with a pair of dorso-lateral lamellate processes (Calvert 1901).



FIGURES 1–3. *Amphipteryx agrioides* Selys, (1, 2) male appendages; (3) male pronotum [illustrations by R.W. Garrison].

From this we conclude that specimens determined as *A. agrioides* by Calvert (1901) and subsequent authors (González 1991; Novelo 1995) and illustrated as representing the male of *A. agrioides* by González (1991) correspond to an undescribed species, and *A. longicaudata* González 1991 becomes a junior synonym of *A. agrioides* Selys 1853.

True *A. agrioides* comprises scattered populations in Mexico whose specimens can differ slightly in male pronotal (Figs. 3a, b) and cercal (Figs. 2a-c) and in female pronotal (Figs. 4, 5) morphology. We believe these differences correspond to intraspecific morphological variation related to geography rather than represent specific characters of distinct species.



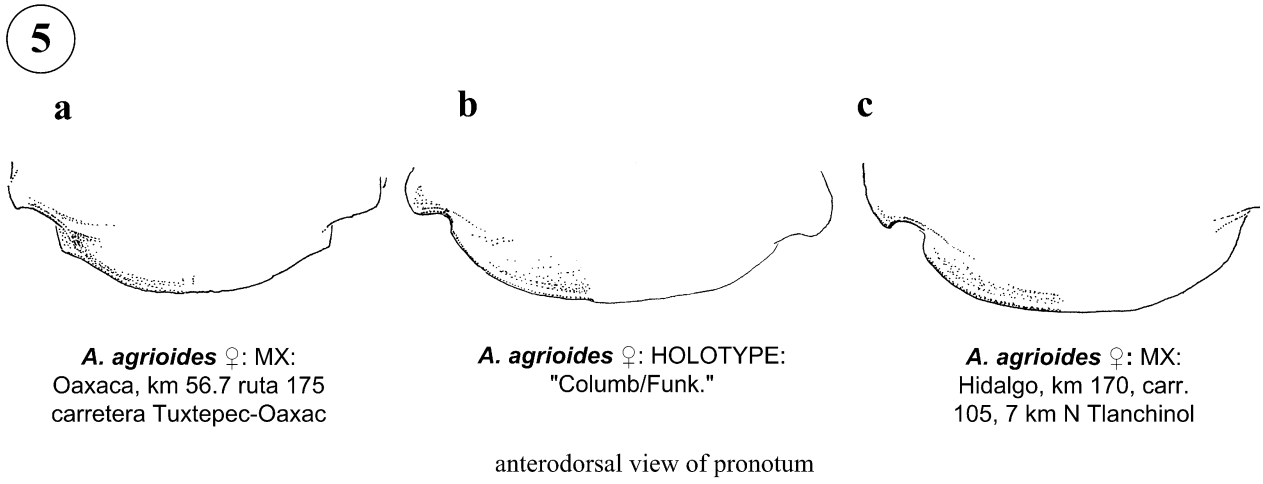


FIGURE 4, 5. *Amphipteryx agrioides* Selys, female pronotum [illustrations by R.W. Garrison].

The type locality of *Amphipteryx agrioides*

According to Selys (1854), Nicholas Funck was the collector of the type of *Amphipteryx agrioides*, as well as of the types of *Hetaerina majuscula* Selys and *Agrion funcki* Selys. Papavero and Ibáñez-Bernal (2001: 82-83) state that Nicholas Funck was an artist of an expedition accompanying August B. Ghiesbreght, the zoologist of a Belgian commission charged by the government to undertake a scientific exploration of Mexico and other tropical countries. The expedition "left in March 1838 for Mexico. There they visited the plateau of Anahuac, the volcanoes Popocatepetl and Iztaccihuatl, the peak of Orizaba, the Cofre de Perote, and all the eastern slope of the Cordillera. From Veracruz they sailed to Campeche, crossed Yucatan and then went by sea to visit the state of Tabasco and later Chiapas, entering also northern Guatemala."

Neither *Hetaerina majuscula* nor *Argia funcki* are known to occur in South America, and according to the above passage, Funck may have collected the female holotype of *A. agrioides* in Veracruz or Puebla States. The Oaxacan

population of *A. agrioides* (males with a slightly more angulated cercus as illustrated in González 1991 and in Fig. 2a) seem to be more isolated compared to those in more northerly states (males with a slightly less angulated cercus; Figs. 2b, c), and we believe it less likely that Funk would have discovered the small population near Valle Nacional, Oaxaca. In summary, the holotype of *A. agrioides* likely hailed from the southern region of Mexico which is consistent with the known distribution of this infrequently encountered species.

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