

## *Orthemis sibylla*, a junior synonym of *O. ambirufa* (Odonata: Libellulidae)

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### ABSTRACT

*Orthemis sibylla* is shown to be a junior synonym of *O. ambirufa*, based on a comparison of the holotype male of *O. ambirufa* with voucher specimens in the UMMZ identified as *O. sibylla* by Ris and specimens of this species from French Guiana and Venezuela in the RWG collection. Diagnostic characters of the male holotype of *O. ambirufa* are illustrated, and compared with those of *O. levis*.

### INTRODUCTION

The New World genus *Orthemis* comprises 17 species. The names assigned to specimens of the *Orthemis ferruginea* (Fabricius, 1775) complex have been particularly difficult to associate with species (De Marmels 1988; Donnelly 1995; Paulson 1998, 2001), mainly due to a lack of comparison with type material. Here, we examine the status of two names, *O. ambirufa* Calvert, 1909 and *O. sibylla* Ris, 1919, and conclude that both represent the same species.

The original description of *O. ambirufa*, based on a single male from Chapada, Brazil (Calvert 1909), was largely comparative with *O. levis* Calvert, 1906, and lacked illustrations. Calvert stated that the "Genitalia of the second abd. seg. [were] apparently not different [from *O. levis*]". In his monograph of the Libellulinae, Ris (1910) did not examine this species, and only stated before transcribing Calvert's original description [here translated]: "I have not included it in the diagnostic key because I haven't found any specimens that completely agree with this short description...".

Under *O. aequilibris* Calvert, 1909, Ris (1910) included one male from Surinam and three females from Amazonas, Venezuela, and Bolivia, respectively. Later (1919), Ris described *O. sibylla* from the same male from Surinam which he had earlier (1910) mistakenly placed under *O. aequilibris*. Thus, his illustrations of the hamules (Ris 1910: fig. 162) are of the holotype male of *O. sibylla*. In his description of *O. sibylla* (here translated), Ris (1919) stated:

"The description was checked again against the specimen and was found to be exact. I haven't seen any other specimen of *Orthemis* that could be associated with this male. It corresponds very closely in general with the description of *O. ambirufa* Calvert (p. 290); but it is clearly stated there that the genitalia of *ambirufa*

look the same as those of *levis*. Since in our specimen the hamulus is apparently smaller and slightly differently shaped than that of *levis*, I think it is safer to give that one a new name instead of including it, maybe wrongly again, under the unknown *ambirufa*.”

Rácenis (1954) collected a pair of *Orthemis* in Guárico State, Venezuela, and concluded – based on a comparison with Ris’ (1919) description – that this pair represented *O. sibylla*. He also commented that the three females included by Ris (1910) as *O. aequilibris* more likely represent the female sex of *O. sibylla*. He did not mention *O. ambirufa*, and its identity has remained a mystery since its description.

### SPECIMENS STUDIED

Through the kindness of Robert Davidson, we were able to borrow the holotype of *Orthemis ambirufa* from the Carnegie Museum of Natural History (CMNH) and compare it with the following specimens:

*O. sibylla*, 7 ♂ — French Guiana: 3 ♂, small canal 17 km S of Tonate, 18 ii 1988. — Venezuela: 1 ♂, Bolivar State, Canaima at Rio Carrao, 12-14 viii 1990; 2 ♂, Amazonas State, 2 km E San Carlos de Río Negro, 5-11 iii 1984, leg. O.S. Flint, Jr. and J. Louton, det. J. De Marmels; all in coll. R.W. Garrison. — Brazil: 1 ♂, “Santarem-Amaz., XII-1920” in the University of Michigan, Museum of Zoology Collection (UMMZ), det. F. Ris.

*O. levis*, 10 ♂ — Mexico: 2 ♂, Jalisco State, Arroyo Chamela, 26-27 vii 1994, leg. E. González, R. Mendoza, and A. Godinez. — Honduras: 1 ♂, Punta Gorda, vi 1933, leg. J.J. White. — Costa Rica: 3 ♂, Guanacaste Prov., Hacienda Taboga, 06 vii 1966, 03 v 1967. — Venezuela: 1 ♂, Carabobo State, San Esteban, 03 ii 1920, and 3 ♂, Zulia State, El Guayabo, 20 iv 1920, leg. W.H. Ditzler, J.H. and E.B. Williamson; all in coll. R.W. Garrison.

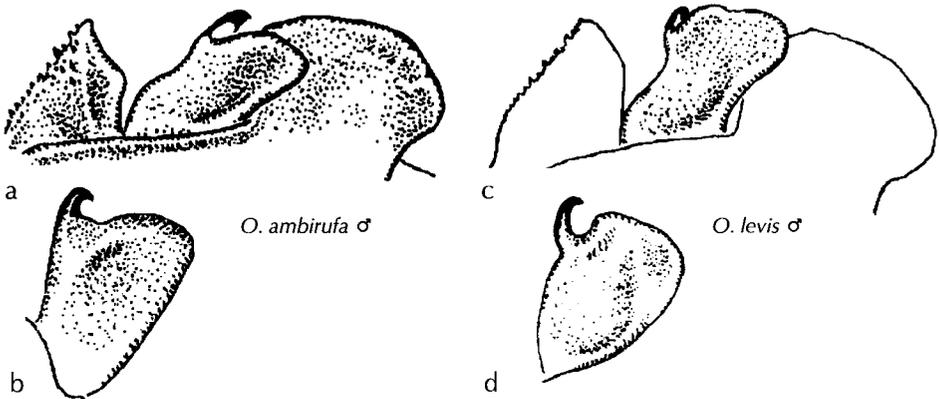


Figure 1: Structural comparison of male *Orthemis ambirufa* (left) with *O. levis* (right) — (a, c) genital fossa, lateral view; (b, d) right posterior hamule, frontal (anterior) view. *O. ambirufa* is represented by the holotype, *O. levis* by a male from Costa Rica, Guanacaste Province, Hda. Taboga, leg. 6 July 1966, collection D.R. Paulson.

## ARGUMENTS FOR SYNONYMIZATION

We illustrate the genital fossa with the right hamule (Figs 1a, 1b), caudal appendages (Fig. 2a), and thoracic pattern (Fig. 2b) of the holotype of *Orthemis ambirufa*. These structures agree well with those of specimens that we identified as *O. sibylla* based on its original description and comparison with voucher specimens at the UMMZ determined by Ris. The thoracic design is consistent with that of *O. sibylla* illustrated by Rácenis (1954). The lateral view of the hamule of the holotype of *O. sibylla* illustrated by Ris (1910: fig. 162; as *O. aequilibris*) shows the hamule's outer branch more strongly pointed than what we illustrate here for the holotype of *O. ambirufa*, but in both instances they are roundly pointed. Although the hamule is similar to that of *O. levis* (Figs 1c, 1d) as Calvert stated (1909), the outer branch of the hamule in that species is evenly rounded, not roundly pointed as in *O. ambirufa*. This condition is best seen when the hamule is viewed in frontal view (Figs 1b, 1d).

Based on the examination of the holotype of *O. ambirufa*, and on comparison with voucher material identified as *O. sibylla* by Ris and with the original descriptions of both species, we recommend that *O. sibylla* be considered a junior subjective synonym of *O. ambirufa* as follows:

*Orthemis ambirufa* Calvert, 1909: 246 [type: Chapada, Brazil, in CMNH].

*Orthemis aequilibris* Calvert, 1909. Ris (1910): 287, fig. 162 (in part, misidentified).

*Orthemis sibylla* Ris, 1919: 1104 [type: Surinam, in coll. Selys, Brussels]. — Rácenis (1954). — New synonymy.

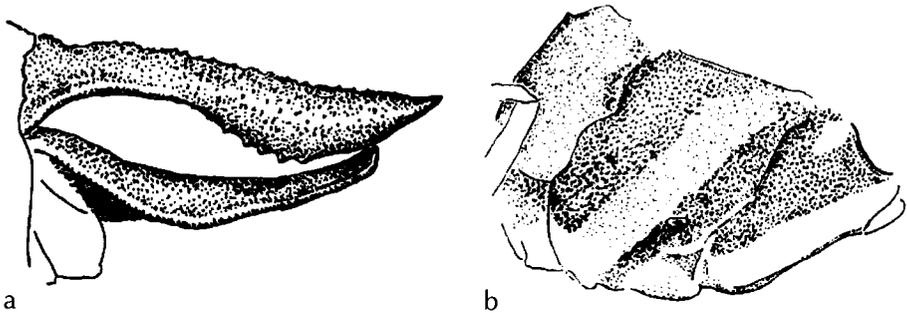


Figure 2: Holotype male of *Orthemis ambirufa* — (a) caudal appendages, lateral view; (b) pterothorax, lateral view.

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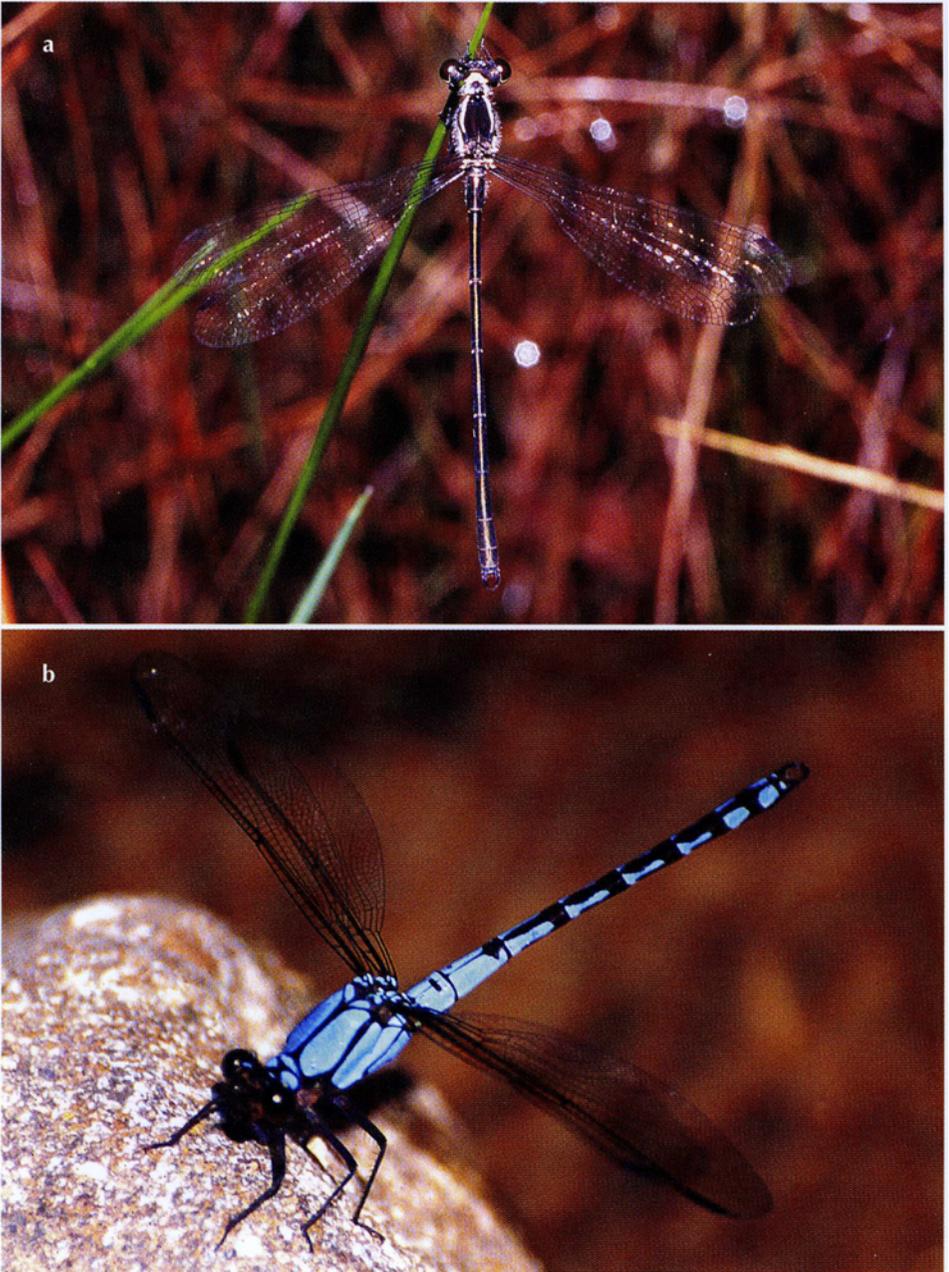
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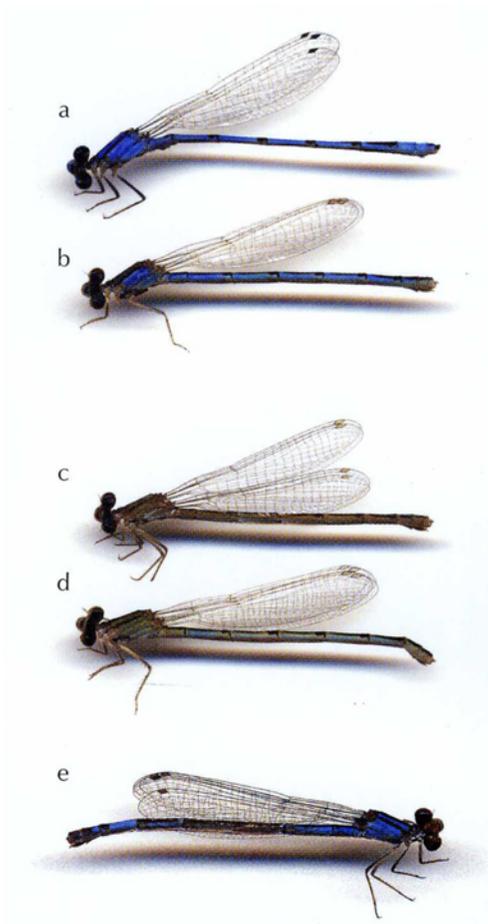
Colour plate I: *Somatochlora borisi* — (a) premature female from the Diavolorema River near Mikron Dherion, NE Greece, 6 May 2004; (b) mature female from the same locality, 1 June 2003. The abdominal pattern with extensive yellow is typical of this species. Photos by Jean-Pierre Boudot.



Colour plate II: *Idomacromia jillianae* sp. nov. — (a) holotype female; (b) type locality at Ruhija in Uganda, Kabale District, Bwindi Impenetrable National Park (alt. 2,100 m) – view of Mubwindi Swamp and the Virunga Volcanoes, with the collecting site in the forest to the right of the swamp. Scan and photo by Klaas-Douwe Dijkstra.



Colour plate III: Two typical zygopteran openwing perchers — (a) *Griseargiolestes griseus* (Megapodagrionidae), Govett's Leap, Blue Mountains National Park, New South Wales, Australia, 11 December 1998; (b) *Diphlebia nymphoides* (Diphlebiidae), Megalong Creek at Old Ford Reserve, New South Wales, Australia, 11 December 1998. Photos by Dennis Paulson (a) and Netta Smith (b). See also cover photo.



Colour plate IV: Color variation of *Enallagma civile* and examples of heterospecific pairing — (a) male; (b) andromorphic female; (c) heteromorphic female; (d) intermediate type female; (e) the other study species in comparison: andromorph female of *E. aspersum*, a monomorphic species; (f) intrageneric mistake: male of *E. carunculatum* in tandem with female of *E. basidens*; (g) another intrageneric mistake: male of *Platycnemis pennipes* accompanying an ovipositing female of *P. acutipennis*; (h) intergeneric mistake: male of *Ischnura elegans* in tandem with female of *Erythromma lindenii*; (i) mistake between different families: male of *Coenagrion ornatum* in tandem with female of *Platycnemis pennipes*. Scans and photos by Tom Schultz (a-e), Dustin Huntington (f) Mathias Lohr (g) and Bernd Kunz (h, i).