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Redescription of the type of *Siphlonurus davidi* (Navás, 1932) (Ephemeroptera: Siphlonuridae)

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Abstract

The type specimen of *Siphlonurus davidi* (Navás, 1932, sub. nom. *Siphluriscus ? davidi*), a male subimago deposited in the Paris Museum, is redescribed. Based on the entire male styliger plate, a hind wing shorter than ½ the length of the forewing, and the distal position of vein MA of the hind wing, the present placement in *Siphlonurus* is considered valid pending discovery of other stages. *Siphlonurus davidi* will key to *S. palearcticus* and *S. binotatus* in recent keys from which it is distinguished by the greater width of the hind wing and the absence of prolonged projections on terga 8 and 9.

Key words: Ephemeroptera, Siphlonuridae, *Siphlonurus davidi*, redescription

Introduction

The species *Siphluriscus ? davidi* Navás, 1932 was described from a single male subimago collected from China in 1875. Based on generalities of wing venation and locality information for what is considered a weak description, Zhou and Peters (2003) provisionally transferred the species to *Siphlonurus davidi* pending its redescription. The male subimago is deposited in the Muséum National d'Histoire Naturelle (Paris) and, through the kindness of Dr Jean Legrand, we were able to study the specimen.

It is a male subimago in rather good condition. However, when shipped from Paris to Lausanne, the already delicate left wing broke at the point where the left foreleg was glued to the wing. The apical part was unfortunately lost, but thanks to the curator's wisdom and foresight, we have an excellent photograph of the wing which he made before sending the specimen (Fig. 6).

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Moreover, the male genitalia were obscured and had to be cleaned. For that purpose, the abdominal tip was cut and rehydrated for 24 hours in a solution of trisodic phosphate 0.25%, then transferred to 80% ethanol and gently cleaned using a brush to remove dust and fungi. After observation the genitalia were placed in a microvial with glycerin and pinned under the specimen.

A redescription of the specimen follows.

***Siphlonurus davidi* (Navás, 1932)**
(Figures 1–7)

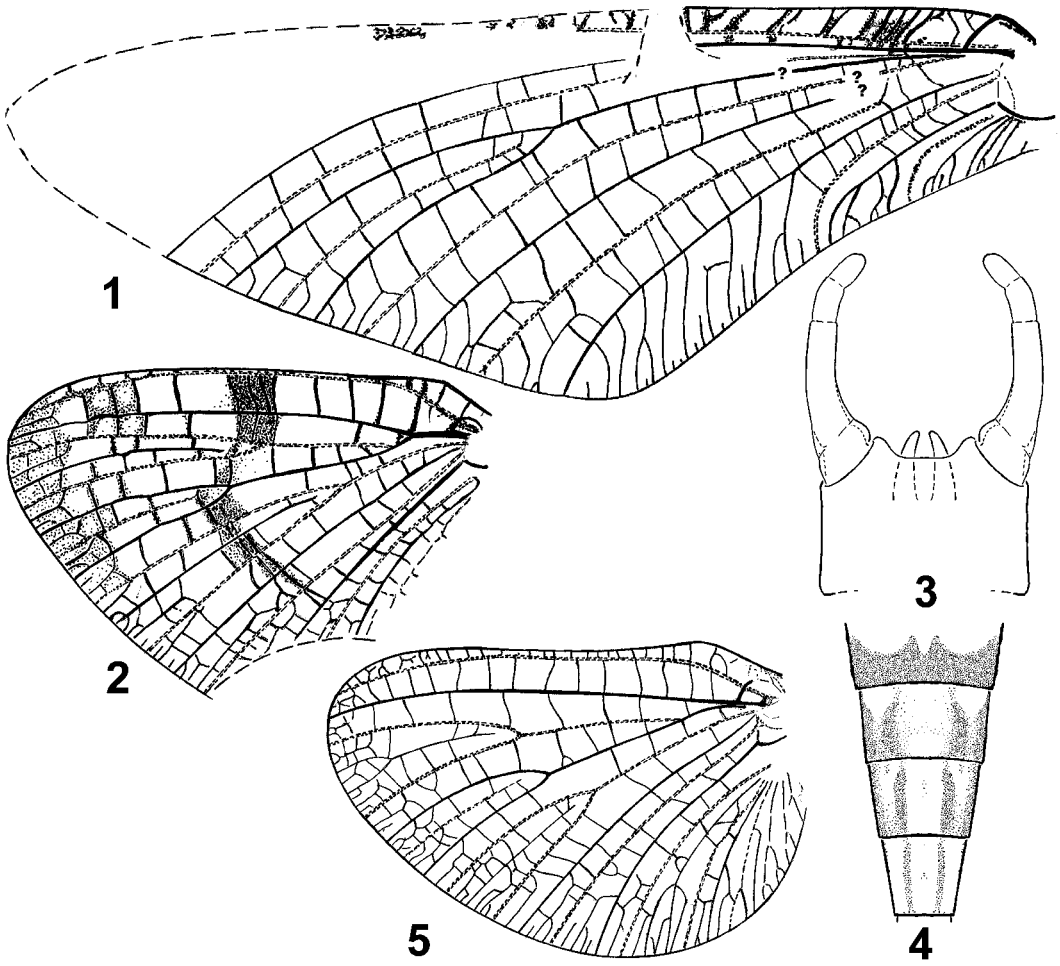
Siphluriscus ? *davidi* Navás, 1932: 929.
Siphlonurus davidi; Zhou & Peters, 2003: 346.

Material. Type of *Siphluriscus* ? *davidi* Navás in Paris Museum, with following 4 labels. 1) Museum Paris/ Se-Tchouen/A. David 1875; 2) 6/9 75 [not in handwriting of Navás, probably that of A. David and probably date of collection 6-IX-1875]; 3) *Siphluriscus* ? *Davidi* Nav. / Navas S. J. det [handwriting by Navás]; 4) TYPE [in red]. "Se-Tchouen" is an archaic spelling for Sichuan Province, China, according to Zhou (Zhou and Peters 2003).

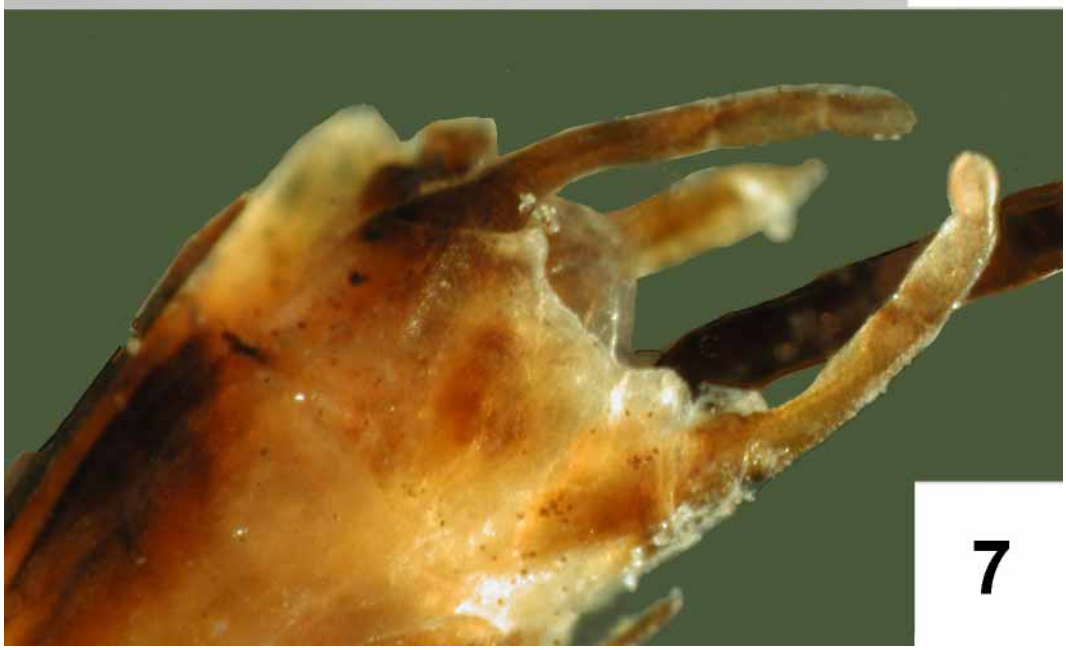
Measurements. Given by Navás 1932: body 17 mm, forewing 20 mm, hind wing 9.5 mm; hind wing width estimated from torn wing at 7.2 mm.

Head. Brownish, mostly obscured by compound eyes that meet medially. **Thorax.** Pro- and mesothorax brown with distinct median transverse suture. Mesonotal suture turned backwards; posterior margin of meso- and metathorax carinated. **Wings** [left forewing damaged medially and posteriorly, right forewing broken; left hind wing mostly intact; right hind wing intact but folded]. Forewing length a little more than 1/3 width; MA fork distal to middle of wing and MP_2 attached basally to MP_1 at cross vein, but a small tear in this area and overlapping veins on both wings make exact vein connection difficult to interpret; CuA field with numerous intercalaries attaching vein to margin; CuP strongly curved; cross veins as in Figs. 1,6. Hind wing broad (width approximately ¾ length), with MA fork distal and MP fork basal to middle of wing, forks symmetrical; CuA, CuP, and visible anal veins straight, anal area expanded but details not visible (Figs. 2,6). Distinct, dark blackish clouds surrounding cross veins in costal and subcostal cells of forewing; a similar color pattern more extensive in hind wing irregularly extending onto membrane across middle of wing and distally (Figs. 1–2,6). **Legs**. Foreleg segments declining in length from femur (longest) to tibia, tarsal segment 1, tarsal segments 2–3 subequal, and tarsal segments 4–5 subequal (Fig. 6); foreclaws similar, hooked with small opposing hook. **Abdomen**. Base color of terga a pale brown; posterior half of terga 2–5 dark blackish brown, paler anteriorly; terga 6–8 with submedian blackish-brown lines (Figs. 4,6). **Genitalia.** Styliger plate shallowly concave; forceps with three visible segments and indi-

cation of a partially fused 4th basal segment within the subimaginal cuticle; penes short, without visible detail within subimaginal cuticle (Figs. 3,7). **Caudal filaments.** Right cercus present (left broken and missing), short, about equal to length of abdomen; a very short terminal filament present (length less than that of male forceps) (Figs. 6–7).



FIGURES 1–5, *Siphlonurus davidi*: 1, left forewing (reconstruction, interpretation based on both wings, tear in MA and MP marked by ?); 2, left hind wing; 3, ventral view of genitalia (line drawing reconstructed from photograph by Sartori); 4, terga 5–8 (approximate color pattern prepared from photograph by Legrand); 5, hind wing of *S. mirus*. Concave longitudinal veins stippled in Figs. 1–2,5.



FIGURES 6–7, *Siphlonurus davidi*, photographs: 6, pinned specimen (photographie J. Legrand, Entomologie, MNHN, Paris); 7, genitalia (cleared), ventral view (photograph by Sartori).

Discussion

It is clear that *Siphluriscus davidi* does not belong to the genus *Siphluriscus* based on the following characters: styliger plate undivided; MA of hind wing forked distal to middle of wing; and hind wing less than ½ length of forewing. The placement in *Siphlonurus* seems valid pending description of other stages. *Siphlonurus davidi* differs from all of the described species of *Siphlonurus* in the combination of the strong curvature of vein CuP in the forewing, the broad expansion of the hind wing, and the color pattern of the hind wing, but none of these characters differ enough from presently recognized species to suggest another genus. The North American species *S. mirus* (Eaton, 1885), for example, also has a relatively broad hind wing which has never been illustrated (perhaps because it is so easily recognized by its bright red color), and it is figured here (Fig. 5) for comparison and to show possible position of folded anal veins in *S. davidi*.

In existing keys, *Siphlonurus davidi* will key to *Siphlonurus palearcticus* (Tshernova, 1930, originally described in *Oniscigaster*) which it resembles in the markings of the wings, the shallowly concave styliger plate of the male, and the cubital venation (illustrated by Kluge 1982, Tshernova *et al.* 1986, Hwang and Bae 2001, and by Bajkova 1979 under the synonym *S. brodskyi* Bajkova). The Japanese species *S. binotatus* (Eaton, 1892) has similar wing coloration, and Hwang and Bae (2001) suggest that the two species need to be studied more closely. Eaton (1892) described pronounced posterolateral projections on tergum 9 of *S. binotatus* (illustrated by Gose 1979 Fig. 58 and by Matsumura 1931 under the synonym *Siphlonisca grandiosa* Matsumura). The prolongation of terga 8 and 9 was described for the holotype female of *Siphlonurus palearcticus* by Tshernova (1930). However, in the redescription of Korean males and females attributed to this species, the posterolateral spines of terga 8 and 9 are "poorly developed" (Hwang and Bae 2001).

The male subimago of *S. davidi* is distinguished from both *S. binotatus* and *S. palearcticus* by the greater width of the hind wing (at least ¾ length) and the absence of prolonged posterolateral tergal projections on terga 8 and 9.

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