

## STUDIES ON NEOTROPICAL PROTONEURIDAE. 4. NOTES ON SOME SELYSIAN TYPES OF *PROTONEURA* (ZYGOPTERA)

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Some general remarks are made on the types of the spp. brought by Selys under his sub-genus *Protoneura*, emphasizing the difficulty in identifying most of these spp. with the data available. The types of the Selysian spp. *exigua*, *tenuissima* and *capilliformis* were examined and lectotypes designated for the first 2 of these. *Protoneura exigua* was shown to be conspecific with *Phasmoneura olmyra* Willmsn, 1916 and thus becomes the type species of the genus *Phasmoneura* Williamson. The position of *tenuissima* as a true *Psaironeura* was confirmed and *Psaironeura cerasina* Willmsn, 1915 was made a synonym of *E. capilliformis* (Sel., 1886). Remarks were made on the morphology of the three species with the aim of correcting mistakes found in the literature and facilitating their identification.

### INTRODUCTION

In his "*Revision du Synopsis des Agrionines*" SELYS (1886) brought under his sub-genus *Protoneura* the following species: *P. ephippigera* Selys, *P. humeralis* Selys, *P. tenuis* Selys, *P. capilliformis* Selys, *P. capillaris* Rambur, *P. aurantiaca* Selys, *P. paucinervis* Selys, *P. exigua* Selys, *P. tenuissima* Selys and *P. sancta* Selys.

Thanks to the contributions of WILLIAMSON (1915), COWLEY & GLOYD (1938) and WESTFALL (1964), *P. aurantiaca*, *P. tenuis* and *P. capillaris* can now be identified with certainty. The same is not true for the other species whose diagnoses are very laconic and lack illustrations. Even the generic position of some of these species has been in dispute since WILLIAMSON (1915, 1916) splitted the Selysian sub-genus *Protoneura* into five genera. In 1981, I visited Selys' collection in Brussels with the special aim of examining the Selysian types

of *Protoneura*. Thanks to the courtesy of Prof. G. Desmoulin most of these types were brought on loan to Belo Horizonte for detailed analysis and redescription. The holotype of *humeralis* has been recently redescribed under *Epipleoneura* (MACHADO, 1984) and a redescription of the types of *ephippigera* will appear soon (MACHADO, 1985). The type of *sancta* was not found in Selys' collection; it is presumably in Hagen's collection. The identification of this species, even to genus, remains problematic. The types of *paucinervis* could not be examined during my stay in Brussels. They were badly damaged during mail transportation as reported by GLOYD (1980). Thanks to Mrs L.K. Gloyd I could examine a couple of *paucinervis* identified by direct comparison with the types. It is a *Protoneura* (s. str.) with long inferior appendages, close to *P. corculum* Calvert.

I report now the results of my studies on the types of *exigua*, *tenuissima* and *capilliformis* in the course of which their synonymy with species described by WILLIAMSON (1915, 1916) was established.

## THE TYPES OF *EXIGUA*

### THE TYPE SERIES

Pinned in the "boite" 29 under a green label of *Protonevra exigua* Bates ms I found 7 specimens whose characteristics and labels are described below:

Specimen 1: male, complete, abdomen broken and glued between segments 2 and 3 as well as in the junction with the thorax. Labels: "Turuty" (ink, green label). "Batesi S" (ink, green label). No. "16" (in red pencil, two white labels). "Fig." (in red pencil, white label). "Fig. compl. aile" (ink, white triangular label).

Specimen 2: female lacking the left forewing, labelled like no. 1, except for the number in red pencil, which is 17.

Specimen 3: female lacking abdominal segments 3-10. Labels: "Turuty" (ink, green label). "Batesi S" (ink, green label). "exigua" (ink, white label). "Bei Forster" (ink, with no. "102" in red pencil, white label). "Coll. Selys" (ink, with no. "102" in red pencil, white label).

Specimen 4: female, perfect. Labels: "Turuty" (ink, green label). "*Protonevra exigua* Bates Selys Turuty" (ink, green label).

Specimen 5: female lacking abdominal segments 4-10. Labels: "Obidos" (ink, green label). "Batesi S." (ink, green label).

Specimen 6: female without head. Labels: "Batesi S." (ink, green label). "Bates" (ink, green label). "134" (ink, white label). "*Prot. exigua* Bates mss. 134" followed by a word not decipherable. (ink, green label).

Specimen 7: female, perfect. Labels: "Para. Schulz" (ink, green label). "31" (ink, white label). "*Protonevra exigua* Selys" (ink, green label).

These data are in good agreement with those contained in the description where one reads: "Patrie: Forêts de l'Iruse (province de Santarem) par M. Bates. Obydos, Turaty, Pebas. Coll. Selys". Specimen no. 6 is probably the one from Santarem, the material from Pebas was not found and specimen no. 7 apparently does not belong to the type series. Specimen no. 1 was designated lectotype and labeled as such: All the other specimens (except no. 7) were labeled as

paralectotypes. All specimens received a label of *Phasmoneura exigua* (Selys, 1886) n. comb.

#### TAXONOMIC DISCUSSION

The generic status of *exigua* as a *Protoneura* (s. str.) has never been questioned (WILLIAMSON, 1915; SCHMIDT, 1942; RACENIS, 1959; DAVIES & TOBIN, 1984). However, upon examining the types of *exigua* in Brussels it became clear that they corresponded to what SANTOS (1968) and myself had been calling *Phasmoneura olmyra* WILLIAMSON, 1916, a species regarded by WILLIAMSON (1916) as the type of his new genus *Phasmoneura*. Specimens from my collection identified by comparison side by side with the lectotype of *exigua* were sent to Mrs Gloyd who confirmed that they were conspecific with *P. olmyra*, by comparison with the holotype in Williamson's collection. Thus *olmyra* falls as synonym of *exigua*.

The male of *Phasmoneura exigua* has been described by SELYS (1886), WILLIAMSON (1916) and SANTOS (1968) who described also the female. Santos pointed out that the superior appendages are provided with a vertical process directed ventrally, not readily visible in profile view as it is concealed by the distal border of the 10th segment. Although not mentioned or figured by Williamson, the presence of this process in the holotype of *P. olmyra* was confirmed by Mrs Gloyd (in litt.) and it is very distinct in the lectotype of *P. exigua*. In Selys' description this process is wrongly regarded as the inferior appendages which, in fact, are rudimentary in this species. The appendages of *P. exigua* were illustrated by WILLIAMSON (1916), whose figure conforms well with the lectotype. The examination of large series of *exigua* in my collection revealed considerable age-dependent variations in the color of the pterothorax with all transitions between orange-brown (as in the lectotype) and dark, as in the specimens described by WILLIAMSON (1916). SANTOS (1968) studied the venation characters of *exigua* based on the examination of 35 males and found them to be more variable than supposed in previous studies, based on a limited number of specimens.

#### THE TYPES OF *TENUISSIMA*

##### THE TYPE SERIES

Pinned in the "boîte" 29 under a green label of "Protonevra tenuissima Bates mss", I found 6 specimens whose characteristics and labels are described below:

Specimen 1: Male, lacking the legs and the right forewing; the abdomen, broken during the study, was put in a small envelope pinned under the insect. It is glued in two points. Labels: "Peba" above, "Teffe" below (ink, green label). "Tenuissima B" (ink, green label).

Specimen 2: Male lacking the 4 last abdominal segments. Labels: "Peba" above, "Teffe" below

(ink, green label). "Tenuissima B" (ink, green label). "Protonevra" (pencil, white label). "Bei Förster" (ink with no. 51 in red pencil). "Coll. Selys" (ink with no. 51 in red pencil).

Specimen 3: Female, complete. Labels: "Prot. tenuissima Bates mss. 167", word not decipherable, "an pr. Sancta? Hay." (ink, green label). "Bates" (ink, green label). "Pr. tenuissima Bates" (ink, green label). "167" (ink, white label).

Specimen 4: Female lacking the right wings. Labels: "S. Paulo" (ink, green label). "Tenuissima B" (ink, green label).

Specimen 5: Female lacking part of the right wings and abdominal segments 7-10. Labels: "S. Paulo" (ink, green label). "Tenuissima B" (ink, green label).

Specimen 6: male with abdominal segments 5-10 kept in an envelope pinned under the insect. Labels: "S. Paulo" (ink, green label). "Tenuissima" (ink, green label). "Bei Förster" (pencil with no. "103" in red pencil; white label). "Coll. Selys" (pencil with no. "103" in red pencil).

Specimen 3 is probably the female referred by Selys as "Type de M. Bates". Specimen 1 was designated lectotype and labeled as such. Specimens 2-3 were labeled paralectotypes. Specimens 4-6 cannot be ascribed with certainty to the type series. All specimens were labeled *Psaironeura tenuissima* (Selys, 1886) n. comb.

The type locality of *tenuissima* deserves some consideration. In the description Selys states: "Patrie: Pebas, Teffé (Amazone)". Pebas is a town in Peru and Teffé in Brazil, both along the Amazon river. Since more than one specimen were referred to this species by SELYS (1886) one could assume that some specimens were collected in Pebas and some in Teffé, which would mean that the species belongs to both the Brazilian and the Peruvian fauna. However both words are on the same label which actually read Peba (not Pebas). Peba is a Tupi word (meaning flat) that has been used for some Brazilian villages and rivers. However after consulting most of the existing maps, gazetteers and postal guides I found no Peba in the region of Teffé. Another possibility is that the word in the label is a misspelling of Pebas and the specimens were collected on a river trip from Pebas to Teffé. In conclusion, the type locality of *P. tenuissima* cannot be precisely located (not even for the country) although it is certainly in the upper Amazon region.

#### TAXONOMIC DISCUSSION

Based on the Selysian description, WILLIAMSON (1915) placed *tenuissima* in his new genus *Psaironeura* and it has been quoted as such by SCHMIDT (1942), and DAVIES & TOBIN (1984). However, CALVERT (1909) and FRASER (1946), who claimed to have identified the species respectively from Brazil and Peru, referred it to *Protoneura* genus in which it was quoted by SOUKUP (1954) and RACENIS (1959). Examination of the type material left no doubt that it is a typical *Psaironeura*. It showed also that *tenuissima* is conspecific with an Amazonian species that both SANTOS (1968) and myself had identified as *Psaironeura cerasina* WILLIAMSON, 1915. Thanks to Mrs Gloyd specimens from my collection identified by comparison with the lectotype of *tenuissima*

were compared with the holotype of *P. cerasina* in Williamson's collection and shown to be conspecific. Thus *cerasina* falls as synonym of *tenuissima*.

In his diagnosis of *cerasina* WILLIAMSON (1915) who knew *tenuissima* only from Selys' description, stated that in coloration the two species were scarcely distinguishable. In his key the two species were separated as follows:

e<sup>1</sup> Superior appendages of the male subcylindrical, the inferiors terminated by a small, blunt, curved point ..... *tenuissima*

e<sup>2</sup> Superior appendages of the male forked, the inferior without a point .. *cerasina*

A careful examination of the lectotype of *tenuissima* revealed that Selys' description of the appendages (transcribed in Williamson's key) is not correct: the superior appendages of *tenuissima* are forked and the inferior have no curved point. Indeed the inferior appendages may be regarded as absent. It is possible that Selys mistook the lower branch of the superior appendages for a curved point of the inferiors. Selys' mistake misled Williamson, thus resulting in the synonym that we are now pointing out.

Williamson's description and illustrations of the male of this species are accurate and allow prompt identification. The female has been described by SELYS (1886), and SANTOS (1968) studied the venation based on the examination of 16 males.

#### THE TYPE OF *CAPILLIFORMIS*

Pinned in the "boîte" 27 under the label of *Protoneura capilliformis* I found a single male without head and legs, lacking the right two wings and the left forewing, one of the missing wings being kept in a small envelope pinned under the insect. It bears the following labels: "Bates" (ink, green label). "Pr. capilliformis B" (ink green label). "117" (ink, green label). "prot. capilliformis Bates mss. 117", word not decipherable, "an. p. tenuis Dale" (ink, green label). "Bei Förster" (ink, with no. "97" in red pencil; white label). "Coll. Selys" (ink, with no. "97" in red pencil, white label).

In the description of *capilliformis* Selys states: "Patrie: Forêts de l'rusa pres de Santarem (Para) par Mr. Bates. Un mâle unique. Coll. Selys". There is no doubt that this is the holotype of *capilliformis* and the specimen has been labeled as such adding also a label "*Epipleoneura capilliformis* (Selys, 1886) n. comb."

#### TAXONOMIC DISCUSSION

The generic status of *capilliformis* has been a matter of controversy. WILLIAMSON (1915), who knew the species only from Selys' description, suggested that it might be a *Protoneura* s. str. or more probably an *Epipleoneura*. CALVERT (1909), LONGFIELD (1929), FRASER (1946) and DAVIES & TOBIN (1984) quoted the species under *Protoneura* and RACENIS (1960) stated

that its position in *Epipleoneura* or *Protoneura* remained to be demonstrated. The study of the male holotype revealed that *capilliformis* is no doubt an *Epipleoneura* by its venation and structural characters, among which the presence of a typical supra-anal plate.

Thanks to the good offices of Mrs Gloyd we had on loan the holotype of Williamson's *Epipleoneura incusa* which could thus be compared with the holotype of *capilliformis*. In spite of small difference in the supra-anal plate they are conspecific. In consequence *incusa* falls as synonym of *capilliformis*. The appendages and the supra-anal plate of *E. capilliformis* have been illustrated by WILLIAMSON (1915) (under *incusa*). The distal border of the supra-anal plate has a small finger-like projection in the middle which proved to be variable when a large series from a single locality was examined (240 specimens from Obidos, Pará). In some specimens (like in the holotype of *capilliformis*) this projection stands out poorly from the main body of the plate whereas in other specimens (like in the holotype of *incusa*) it projects more and becomes very distinct. However, never, not even in the specimen that served as the holotype of *incusa* is the projection so prominent as shown in the figure 28 of WILLIAMSON (1915).

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