

**NOMENCLATORIAL NOTES ON THE GENUS *ZENITHOPTERA*
BATES *IN SELYS*, 1869 AND ON *Z. FASCIATA* (L., 1758)
VERSUS *Z. AMERICANA* (L., 1758)
(ANISOPTERA: LIBELLULIDAE)***

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The controversial authorship of the generic name is discussed, and *Z. americana* is proposed a senior synonym of *Z. fasciata*.

INTRODUCTION

The synonymy of the two Linnaean species presently under the genus *Zenithoptera*, and the authorship of this name, were discussed by many authors. Historical Interpretations (RIS, 1910; CALVERT, 1948; JURZITZA, 1982), nomenclatorial opinions (RIS, 1910; CALVERT, 1948; JURZITZA, 1982; DE MARMELS, 1985) and morphological studies (JURZITZA, 1982) have also been published.

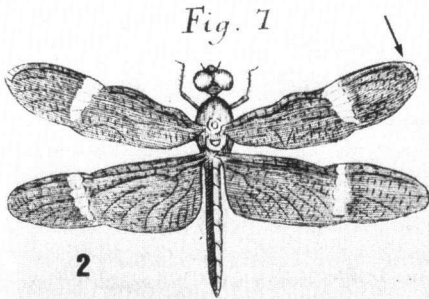
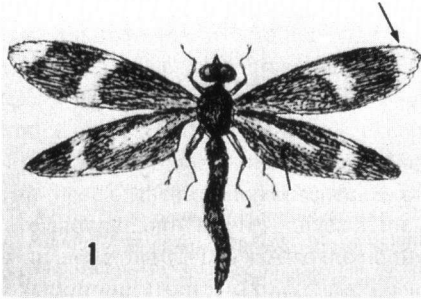
In order to illustrate the different points of view of different authors who dealt with the genus, the principal historical facts are here summarized.

HISTORICAL REVIEW

LINNAEUS (1758, p. 545) described, among others, two species in the genus *Libellula*, viz. *L. fasciata* and *L. americana*, based on wing colour pattern: "*fasciata* 12. *L. alis planis fuscis: fascia alba lineari*. Edw. av. 174. t. 174. Habitat in India. De Geer" and "*americana*. 16. *L. alis purpurascensibus: fascia alba, primoribus apice albis; posticis linea baseos alba*. Edw. av. 174. t. 174. Habitat in America. Corpus viride. Alae fusco-purpurascens ...".

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He referred both species to the same figure drawn by EDWARDS (1751, pl. 174), who asserted: "The fly engraved on this plate has the head and body of a dull green; the wings are of a dirty purplish brown; with some transparent spots in them. I drew it from nature, but forgot to note from whence it was brought; but I think it was from the West-Indies". (cf. Fig. 1). The wings show hyaline stripes, in fore wings there is an apical hyaline spot and in hind wings a basal hyaline stripe (CALVERT, 1948).



Figs 1-2. Historical depictions of *Zenithoptera*: (1) *Z. americana* (L.): reproduction of EDWARD's figure (1751, pl. 174), as given by CALVERT (1948, pl. 2, fig. 42); arrows indicate the hyaline apical spot in f.w. and the hyaline basal stripe in h.w.; - (2) *Z. violacea* (DE GEER, 1773, pl. 3, fig. 7); note the minute apical hyaline spot in f.w., indicated by arrow.

DE GEER (1773, p. 559) described his *Libellula violacea* with reference to *L. fasciata* Linnaeus, 1758, but in his description, he used the characteristics of the Linnaean *L. americana*: "Cette petite Demoiselle à tête ronde [pl. 26, fig. 7], que je crois originaire des Indes, a le corps d'un brun obscur. Toutes les quatre ailes sont entièrement d'un brun foncé, avec une teinte de pourpre ou de violet, sur tout endessous; mais chaque aile est travérlée, environ au milieu d'une bande blanche sale peu large, & au bout des ailes supérieures il se trouve une petite tache ou raye transparent & blancheâtre." (cf. Fig. 2). The wings present hyaline stripes and in fore wings there are short apical hyaline spots.

RAMBUR (1842, pp. 134-135) included *L. fasciata* in his new genus, *Palpopleura*, describing the wing colour pattern as: "[...] ayant en outre une bande transverse, une tache apicale aux supérieures, et une bande presque effacée à la base des inférieures, transparentes ou blanchâtres, la tache apicale et la bande basilaire peuvent disparaître [...]", and consid-

ered *L. fasciata* as a valid name: "[...] Quoique j'ai adopté le nom de *Fasciata*, les deux seuls individus que j'ai vus se rapportent à l'*Americana*, mais je pense qu'ils ne sont que des variétés."

SELYS LONGCHAMPS (1869, p. 16) included the two Linnaean species in the then new genus *Zenithoptera*, which, ipsissima verba, reads: "[...] Quant aux deux

Palpopleura de l'Amérique méridionale à peine distinctes l'une de l'autre: *P. americana* L. et *fasciata* F. (*violacea* De Geer) elles ont un faciès tout différent, leur abdomen est grêle et selon M. Bates elles portent comme les *Agrion* les ailes relevées dans le repos. Il convient d'adopter pour elles le genre *Zenithoptera*, propose pour elles par le célèbre voyageur dans les notes manuscrites qu'il m'a gracieusement adressés, lorsqu'il m'a cédé sa riche collection d'Odonates de l'Amazonie."

HAGEN (1875, p. 95) added some information on the synonymy of the American *Palpopleura* species, and considered DE GEER's (1773) *L. violacea* as a synonym of *Palpopleura americana*.

SELYS LONGCHAMPS (1881, p. 667) gave full credit to Bates as the author of the generic name: "[...] *Palpopleura*, Ramb. – Presque exclusivement africain; une seule espèce aberrante *P. sexmaculata* Fab. est asiatique. *L. Americana* a forme le *G. Zenithoptera*, Bates [...]"

KIRBY (1889, p. 272) described the new genus *Potamothemis*, and included *Libellula fasciata* L., 1758 as the type species, ignoring the earlier named *Zenithoptera* (cf. SELYS LONGCHAMPS, 1869).

RIS (1910, p. 313) knew the "fragile" SELYS LONGCHAMPS's (1869) information, but according to the *Code* in force at the time (*International Rules*, Art. 25a), which prescribed that a generic name must be published with its characterization, recognized the name *Zenithoptera* Selys, 1869 instead of *Potamothemis* Kirby, 1889. He considered *Z. americana* as a valid name (pp. 314-315), since it agreed better to the original Linnaean description than *L. fasciata*, and emphasized the similarity between the latter and *Neurothemis tullia* (Drury, 1773), based on geographical distribution ["India"]. Later this statement was to be criticized by CALVERT (1948).

SJÖSTEDT (1918, p. 40) studied the type of *L. violacea* De Geer and noted: "De Geer's *Lib. violacea* (Men. Ins. III, p. 559, no. 06, T. 26, fig. 7, 1773) deren Typus vorliegt ist mit *americana* L. (Ris, o.c.), nicht mit *viola* Ris identisch" (cf. Fig. 2).

CALVERT (1948, pp. 74-75) agreed, in part, with RIS (1910), although adopting "*Zenithoptera* Bates in Selys, 1869", studied the Linnaean's "types" of the genus *Zenithoptera*, and suggested that Linnaeus could have seen, "[...] in 1758 or earlier, the specimen which his compatriot, De Geer, later described and figured in 1773 [...]" DE GEER's (1773) specimen was described as *L. violacea* from "Indes" and Linnaeus could have added this information to the original description of *L. fasciata*. Calvert suggested, the difference between these two species is due to geographical distribution, while the descriptions of both species were based on the same figure of EDWARDS (1751). Consequently, he synonymized these names according to "page priority": *L. fasciata* was considered a senior synonym of *L. americana* and *L. violacea*.

JURZITZA (1982, pp. 331-332) agreed, in part, with CALVERT's (1948) opinion, and (1) confirmed that the Linnaean diagnosis of *L. americana* fits better the figure of EDWARDS (1751) than that of *L. fasciata* does (as suggested earlier by

RIS, 1910); – (2) pointed out that *L. fasciata* could have been described from DE GEER's (1773) "type" of *L. violacea* (in Jurzitza's opinion this interpretation is more acceptable than Calvert's argument); – (3) questioned the synonymy of *Z. americana* as such: "Die Gattung *Zenithoptera* Selys, 1868 [sic!], umfaßt drei Arten *Z. fasciata* (Linnaeus, 1758) = (?) *Z. americana* (Linnaeus, 1758) [...]", – and presented data on penis morphology, variation in wing colour pattern, etc., in *Zenithoptera*.

DE MARMELS (1985, p. 87) considered *Z. americana* as a senior synonym of *Z. fasciata* and *Z. violacea*, based on RIS (1910), the first reviser of the group. DAVIES & TOBIN (1985, p. 134) apparently ignored DE MARMELS's (1985) statement and agreed with JURZITZA's (1982) opinion.

CONCLUSION

In accordance with Article 12 (b) number 5 (ICZN, 1985), and in consonance with SELYS LONGCHAMPS's (1869) statement, the authorship, "*Zenithoptera* Bates in Selys Longchamps, 1869", is herewith confirmed.

The "Principle of the First Reviser" (Art. 24 of the 1985 ICZN) enforces DE MARMELS's (1985) statement, therefore *Z. americana* must be considered as a valid name (ichnotaxon of EDWARDS, 1751, pl. 174). This conclusion is also supported by the fact that the diagnosis of LINNAEUS (1758; 1767) perfectly fits the figure of EDWARDS (1751: 174). The consistence with the proposition of RIS (1910) is maintained. Consequently, the following nomenclatural reorganization is proposed:

ZENITHOPTERA Bates, in SELYS LONGCHAMPS, 1869

Libellula LINNAEUS, 1758 (pars)

Palpopleura RAMBUR, 1842 (pars)

Zenithoptera Bates, in SELYS LONGCHAMPS, 1869

Potamothemis KIRBY, 1889

Type-species: *Libellula americana* Linnaeus, 1758: 545, based on ichnotaxon of EDWARDS (1751), by present designation.

E t y m o l o g y. – *Zenith*, from Arabian *samt* (erroneously reading "senit"): way, direction, position of the sun at mid-day, – referring to position of wings at rest.

LIST OF SYNONYMY

ZENITHOPTERA AMERICANA (LINNAEUS, 1758)

Libellula americana LINNAEUS, 1758: 545; – SEBA, 1765: 78; – LINNAEUS, 1767: 904; – FABRICIUS, 1775: 423; – 1781: 523; – 1793: 380; – LINNAEUS, 1790: 2623; – PERTY, 1833: 124; – BURMEISTER, 1839: 854; – CALVERT, 1898: 71; – 1948: 74; – JURZITZA, 1982: 333; – DAVIES & TOBIN, 1985: 134

Libellula fasciata LINNAEUS, 1758: 545; – SEBA, 1765: 68; – LINNAEUS, 1767: 903; – FABRICIUS, 1775: 422; – 1781: 522; – 1793: 378; – LINNAEUS, 1790: 2622; – HAGEN, 1845: 156; – CALVERT, 1948: 74; – JURZITZA, 1982: 333-334; – DAVIES & TOBIN, 1985: 134

- Libellula violacea* DE GEER, 1773: 559; – CALVERT, 1948: 74; – JURZITZA, 1982: 334; – DAVIES & TOBIN, 1985: 134
- Palpopleura americana* – RAMBUR, 1842: 134-135; – HAGEN, 1861: 320; – BRAUER, 1868: 716; – SELYS LONGCHAMPS, 1869: 16; – HAGEN, 1875: 95; – KARSCH, 1890: 355
- Palpopleura fasciata* – RAMBUR, 1842: 134-135; – HAGEN, 1861: 320; – BRAUER, 1868: 716; – SELYS LONGCHAMPS, 1869: 16; – HAGEN, 1875: 95; – KARSCH, 1890: 355
- Palpopleura violacea* – RAMBUR, 1842: 134; – SELYS LONGCHAMPS, 1869: 16; – KARSCH, 1890: 355
- Diastatops fasciata* – ERICHSON, 1848: 584
- Potamothemis americana* – KIRBY, 1890: 155
- Potamothemis fasciata* – KIRBY, 1889: 272; – KARSCH, 1890: 355; – KIRBY, 1890: 155
- Zenithoptera americana* – Bates in SELYS LONGCHAMPS, 1869: 16; – SELYS LONGCHAMPS, 1881: 667; – KARSCH, 1890: 355; – KIRBY, 1897: 602; – CALVERT, 1909: 216; – RIS, 1910: 314; – SJÖSTEDT, 1918: 40; – RIS, 1916: 1110; – LONGFIELD, 1929: 128; – GEIJSKES, 1932: 105-106; – SCHMIDT, 1952: 241; – FRASER, 1946: 468; – SOUKUP, 1954: 19; – PAULSON, 1982: 259; – JURZITZA, 1982: 331-338; – DAVIES & TOBIN, 1985: 134; – DE MARMELS, 1985: 134; – 1990: 341
- Zenithoptera fasciata* – Bates in SELYS LONGCHAMPS, 1869: 16; – KIRBY, 1897: 602; – RIS, 1910: 314; – RACENIS, 1953; – 1959: 516; – CALVERT, 1948: 73; – JURZITZA, 1982: 331-338; – DAVIES & TOBIN, 1985: 134

ZENITHOPTERA VIOLA RIS, 1910

- Zenithoptera viola* – RIS, 1910: 314, 316; – 1916: 1111 (pars: figs 632 & 633, lower); – LONGFIELD, 1929: 128; – SANTOS, 1950: 38; – JURZITZA, 1982: 333-337; – DE MARMELS, 1985: 87; – PAULSON, 1977: 177; – DAVIES & TOBIN, 1985: 134; – DE MARMELS, 1990: 341

ZENITHOPTERA LANEI SANTOS, 1941

- Zenithoptera lanei* – SANTOS, 1941: 207-213; – JURZITZA, 1982: 333-337; – DAVIES & TOBIN, 1985: 134; – DE MARMELS, 1985: 134; – 1990: 341
- Zenithoptera viola* – RIS, 1916: 1111 (pars: figs 632 & 633, upper)

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