

**CONFIRMATION OF VALIDITY OF THE GENUS NAMES
BOEOSIMULIUM RUBZOV & YANKOVSKY, 1982 AND
TAENIOPTERNA ENDERLEIN, 1925, AND SPECIES “CONTENT” OF
THESE GENERA**

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ABSTRACT – The independent status of the genus *Boreosimulium* Rubzov & Yankovsky, 1982 is confirmed with a list of species of the genus. The genus name *Taeniopterna* Enderlein, 1925 is argued to be a valid one, and a list of species of the genus is presented.

KEYWORDS: Simuliidae, blackflies, taxonomy, *Boreosimulium*, *Taeniopterna*

The genus name *Boreosimulium* Rubzov & Yankovsky, 1982 for a long time after the original description was considered as a junior synonym of the genus (subgenus) name *Hellichiella* Rivosecchi & Cardinali, 1975. The genus *Boreosimulium* was originally described only on the basis of morphological characteristics. The separate status of this group has recently been confirmed by morphological and cytotaxonomical investigations of several species from the Nearctic (including new species) (ADLER ET AL., 2004). CROSSKEY & HOWARD (1997) divided the genus *Hellichiella* into two groups: *annulus* and *subexcisum*.

These certainly related groups differ from each other in the following characters (all in drawings are only generalized schemes, not the depiction of any concrete species):

In the male: 1) The presence of a unique structure consisting of one (rarely) or of two sclerotized thorns on the gonopleurites of parameres in *Boreosimulium*, while in *Hellichiella* this structure is absent; and 2) the flattened shape of the ventral plate in *Boreosimulium*, while in *Hellichiella* there is a distinguishable keel.

In the female: Claws are with a very small basal tooth or without it in *Boreosimulium*, while in *Hellichiella* the basal tooth of claws is very large.

In the larva: 1) The anterior margin of the hypostomium in *Boreosimulium* is approximately even, while in *Hellichiella* the medial tooth and lateral teeth are noticeably larger than the others; and 2) the mandibular serration in *Boreosimulium* consists of two teeth, while in *Hellichiella* there are 7-10 or more teeth in the mandibular serration.

In the pupa: 1) The respiratory gills consist of 3-4 filaments, as a rule swollen in the basal part in *Boreosimulium*, while in *Hellichiella* the respiratory organ consists of four, six or 12 filaments not swollen basally; and 2) the cocoon lacks an anterior medial corn in *Boreosimulium* (excluding *B. baffinense*), while in *Hellichiella* the cocoon has an anterior medial corn.

Based on recent data, our opinion is that the species content of the genus *Boreosimulium* is very similar to the list of ADLER ET AL. (2004) and includes *B. annuliforme* (PAL), *B. annulus* (= *euryadminiculum*) (PAL, NEA), *B. arctium* (PAL), *B. baffinense* (PAL, NEA), *B. balteatum* (NEA), *B. canonicolum* (NEA), *B. clarkei* (NEA), *B. emarginatum* (NEA), *B. jocular* (NEA), *B. johannseni* (= *duplex*) (NEA), *B. parmatum* (NEA), *B. quadratum* (NEA), *B. rothfelsi* (NEA) and *B. zephyrus* (NEA). However, we assume that the species *B. acutum* (Patrusheva, 1971) (PAL) and *B. crassum* (Rubzov, 1956) (PAL) should also be included (PAL – Palaearctic, NEA – Nearctic) here.

The genera *Boreosimulium* and *Hellichiella* in the accepted system belong to the tribe Nevemannini of the subfamily Simuliinae. In regard to certain characters, *Boreosimulium* and *Hellichiella* occupy an intermediate position between the subfamilies Prosimuliinae (tribe Prosimuliini in Crosskey's system) and Simuliinae (tribe Simuliini in Crosskey's system) in some ways, but between the tribe Stegopternini (of the subfamily Prosimuliinae) and the subfamily Simuliinae in more concrete ways (reduced calcipala and pedisulcus, dark legs with a cylindrical basitarsus of the fore leg in the imago, strong caudal spines and forked hooks on the abdomen of the pupa, as in Stegopternini and Ectemniini of the subfamily Prosimuliinae. On the other hand, by the important characters of the katepisternum and mesepisternal ridge these genera belong to the subfamily Simuliinae. In addition, the hypostomal tooth in larvae of these genera does not exhibit various patterns (as in Prosimuliinae), but only the common pattern of Simuliinae.

The likelihood that *Hellichiella* and *Boreosimulium* are plesiomorphic groups is suggested by the presence in Baltic amber (Eocene/Oligocene) of only one species of the subfamily Simuliinae – *Boreosimulium oligocenicum* (all other specimens known belong to the subfamily Prosimuliinae). Of course, the stated opinion depends on the system of the family, but this does not alter the principal tendency.

The genus name *Taeniopterna* was proposed by Enderlein in 1925, with the type species *Melusina macropyga* Lundström, 1911. This small group in the genus *Prosimulium* can then be viewed as a species group (as, for example, in RUBZOV, 1956). Even Dr. Crosskey, who ever has a tendency to unite and consolidate the groups of blackflies, never has any doubt as to the separate status of this group (species group *macropyga* in the subgenus *Prosimulium* of the genus *Prosimulium*). Certain characters in this group of species differ from those in all other genera on the level of the tribe Prosimuliini (or on the level of subgenera of the genus *Prosimulium*) and are no less marked than the ones which exist between *Distosimulium*, *Helodon*, *Parahelodon*, and *Prosimulium* s. str.

In the male: 1) Between the eyes, a narrow but clearly distinguishable frons exists, while in all other genera of Prosimuliini that structure is absent; 2) the antennae and proboscis are shortened, while in all other genera of Prosimuliini these characters are of the “usual” pattern; 3) the ventral plate bears a long medial keel, whereas in *Prosimulium* this keel is much shorter, while in *Helodon*, *Parahelodon*, *Urosimulium* and *Distosimulium* the ventral plate is flattened, without a keel.

In the female: 1) Serration on the laciniae of maxillae and on the mandibles is absent, while in other Prosimuliini these sclerites are serrated; 2) the spermatheca is very small, about 1/3-1/5 as long as the stem of the genital fork, whereas the spermatheca in *Prosimulium*, *Helodon*, and *Parahelodon* is about as long as the stem of genital fork, while in *Distosimulium* the spermatheca is equal to the whole of the genital fork in length; and 3) the hypogynal valves are very long and not sclerotized medially, whereas in *Prosimulium* they are of the same shape and very sclerotized medially, while in other genera of Prosimuliini the hypogynal valves are much shorter and without sclerotization.

In the larva: The lateral hypostomal teeth are much longer than the median tooth (a similar pattern in the Prosimuliini can be seen only in *Parahelodon* from the Nearctic Region, while other genera exhibit another pattern of hypostomal teeth).

Very important is the triploidy of chromosomes, which connects this group with some *Gymnopaia* (WOOD, 1978; ADLER ET AL., 2004).

The distribution of the genus encompasses Northern Europe (as far as the Polar Urals).

We propose that the *macropyga* species group be considered as the genus (or subgenus) *Taeniopterna* Enderlein, 1925 (with the type species *Melusina macropyga* Lundström, 1911) in the tribe Prosimuliini of the subfamily Prosimuliinae, the indicated genus including the following species: *T. arctica* (Rubzov & Carlsson, 1965) (PAL), *T. erythronota* (Rubzov, 1956) (PAL), *T. kolymensis* (Patrusheva, 1975) (PAL), *T. korshunovi* (Patrusheva, 1975) (PAL), *T. macropyga* (Lundström, 1911) [= *latifrons* (Enderlein, 1925), = *ventosum* (Rubzov, 1956)] (PAL), *T. neo-macropyga* (Peterson, 1970) [= *jeanninae* (Peterson, 1989), = *wui* (Peterson & Kondratieff, 1995)] (NEA), *T. tredecimfistulata* (Rubzov, 1956) (PAL), *T. ursuna* (Edwards, 1935) [= *browni* (Twinn, 1936)] (PAL, NEA), and *T. zaitzevi* (Rubzov, 1956) (PAL) (PAL – Palaearctic, NEA – Nearctic).

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