

## **New Records and Redescription of *Baetis nubecularis* Eaton, 1898 from the Swiss Jura (Ephemeroptera, Baetidae)**

by

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*Baetis nubecularis* Eaton has been rediscovered at the type locality, in the Swiss Jura. The ♂ imago is redescribed, the ♀ imago, ♂ and ♀ subimagines and the nymphs are described for the first time. *B. nubecularis* is a member of the *alpinus*-group of *Baetis* and is compared to its other members, *B. alpinus* and *B. melanonyx*.

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Within the framework of a general study of Ephemeroptera from West Switzerland, collecting of many larvae related to *Baetis alpinus* Pict., as well as rearing of a type-locality population in the Swiss Jura led to the rediscovery of *B. nubecularis* Etn. Before, only the type specimen had been available, and the species was so poorly known that Müller-Liebenau (1969) could not assign it to a species group with certainty. A redescription of the ♂ imago is given. The last instar larvae (nymph) as well as the ♀ imago, the ♂ and ♀ subimagines are described for the first time.

Müller Liebenau (1969) assumed that *B. nubecularis* was a member of the *alpinus*-group and this is now confirmed. The description below compares *B. nubecularis* to its two close relatives, *B. alpinus* (Pictet) and *B. melanonyx* (Pictet).

### ***Baetis nubecularis* Eaton, 1898**

Eaton, A. E. (1898): *Ent. mon. Mag.* 34: 265-266

Kimmins, D. E. (1960): *Bull. British Mus. Nat. Hist.* 9 (4): 287-289

Müller-Liebenau, I. (1969): *Gewäss. Abwäss.* 48/49: 57-58

#### **Nymph**

Size: Body length: 6.0-7.0 mm, cerci: 5.5-6.1 mm, terminal filament: 2.0-2.6 mm.

(1) This paper is part of a Ph. D. thesis

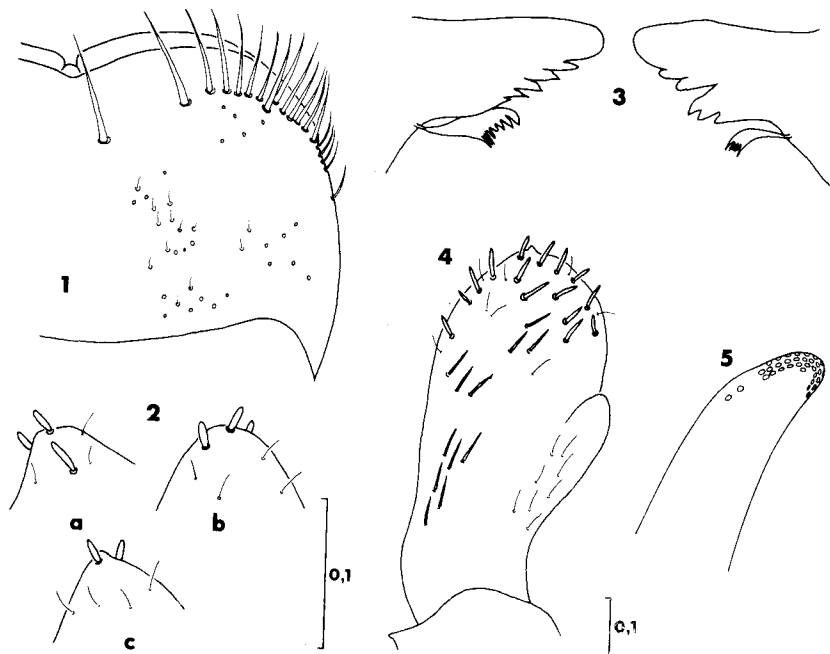
Antennae: Scape and pedicel without any particular ornamentation, except fine bristles.

Labrum: (Fig. 1) shape close to *B. alpinus*, width/length ratio between 1.4 and 1.6. On the front margin, 1 + 12 (- 16) long bristles, flattened at the base like in *B. nicolae* (Thomas et Gazagnes, 1984), with a basal diameter of 4.5  $\mu\text{m}$ . Bristles' length similar to those of *B. alpinus* and *B. melanonyx* Pict., and usually arranged in one row. Few fine bristles on the lateral edges. Short and fine bristles on the proximal part.

Maxillae: Maxillary palpus shorter and thicker than in *B. alpinus*, with a distinct convexity on the whole outer margin (subcylindrical in *B. alpinus* and *B. melanonyx*). 1 to 5 stout bristles at the apex of the maxillary palpus (Fig. 2 a, b, c) which character is close to *B. punicus* (Thomas et al., in press).

Mandibles: (Fig. 3) Outer group of canini sharper than the one of *B. alpinus*, but not fused as in *B. melanonyx*. Prosthema on both mandibles distinctly asymmetrical, as in *B. alpinus*.

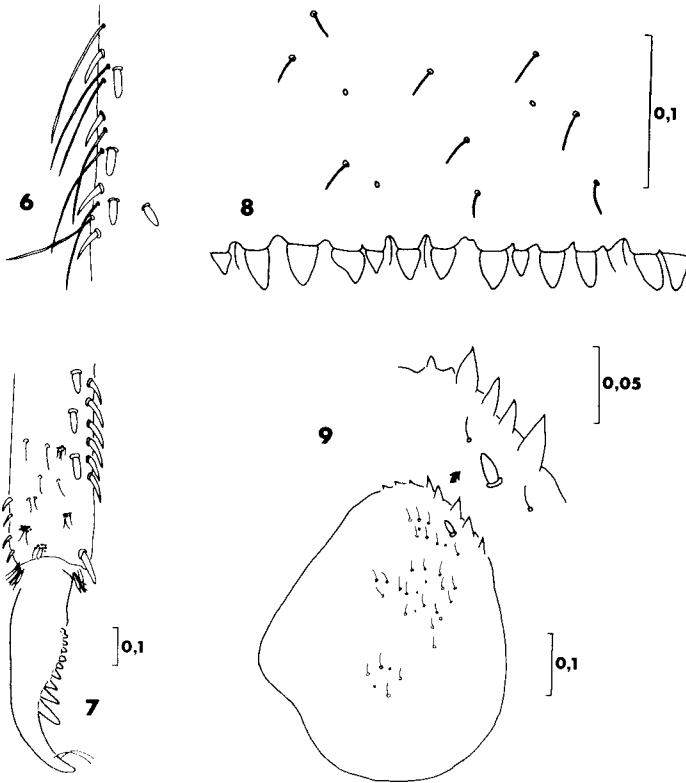
Labium: Apex of the labial palpus with fine, stout bristles arranged like those of *B. alpinus* (Fig. 4). Third segment longer, the last two more slender than in *B. alpinus* (length/width ratio ca. 2.1 for 1.9). Paraglossa close to *B. alpinus* generally, with two rows of fine bristles (Fig. 5).



Figs. 1-5: Nymph of *B. nubecularis*. 1. labrum; 2. apex of the maxillary palpus of three different specimens; 3. mandibles; 4. labial palpus; 5. paraglossa. Figs. 3-5 are to same scale.

Legs: Outer margin of femora with: one row of fringed spines; one or two rows of fine bristles which are less numerous and shorter than in *B. alpinus*. Shape rather similar to that of *B. melanonyx*; one or two rows of stout bristles, shorter and thicker than those of *B. alpinus* (Fig. 6). Outer margin of tibiae and tarsi with one row of spines. Apex of the tarsi with two tufts of fine bristles close to the insertion of the claw and only a few scales on the outer margin (Fig. 7). Claw with two fine bristles near the apex and 10 (sometimes 9 or 11) denticles on the inner margin.

Abdomen: Uniformly coloured, except for a darker mark on either side of the middle line of each abdominal tergum, like those found in most *B. alpinus*. Broad denticles with sometimes blunt apex, and also fine marginal intercalary bristles along the posterior margin of terga. Surface of terga also with fine bristles. *B. nubecularis* can easily be distinguished by the total lack of scales and scale bases on terga, in opposition to *B. alpinus* and also *B. nicolae* (Fig. 8).



Figs. 6-9: Nymph of *B. nubecularis*. 6: outer margin of femur; 7: tarsal claw; 8: posterior margin and surface of tergite; 9: paraproct. Fig. 6 is to same scale as main part of Fig. 9.

Seven pairs of less pigmented and clearly asymmetrical gills. Paraproct similar to that of *B. alpinus*, with one row of strong triangular spines on the outer margin and 1 to 3 broad spines on the distal area (Fig. 9).

Cerci pale brown, shorter than body length. Terminal filament significantly longer than in *B. alpinus*.

#### Male Imago

Size: Body length: 7.5-8.9 mm, cerci: 10.8-14.5 mm, fore wing: 7.6-8.5 mm.

Head: Antennae medium brown; ocelli light grey, surrounded by a dark grey to black ring. Turbinate eyes yellowish brown, faceted surface liver brown.

Thorax: Meso- and metanotum medium brown with black sutures and yellow-whitish pleurites. Foreleg with trochanter, femur, tibia medium brownish and tarsi light brown. Middle and hind legs uniformly light brown.

Fore wings hyaline, except the distal part and the pterostigmatic area which are brown-grey (Fig. 10). Note that the colour on the front wings often disappears within some months in alcohol. Hind wing hyaline, with a costal process and 3 simple longitudinal veins. Number of transversal veins 0 to 3, variable between specimens (Fig. 10).

Abdomen: Terga I-V generally light brown. Terga VI-IX darker. Forceps medium to dark brown, general shape close to that of *B. alpinus*. *B. nubecularis* can easily be distinguished from it by the following characters (Fig. 11-12):

- the shape of the first segment of the forceps. As mentioned by Müller-Liebenau (1969), the base is just a little bit wider than the apex, i.e., the general shape is not conical as in *B. alpinus*, but rather subcylindrical.
- second segment shorter than in *B. alpinus*. Second/first segment ratios included between 2.5 and 3.2 for *B. alpinus*, versus 2.0 and 2.3 for *B. nubecularis*.
- swelling near apex of inner margin of forceps base is faint in *B. nubecularis*, compared with *B. alpinus*.

Cerci light brown with darker joints.

#### Female Imago

Size: Body length 6.5-7.5 mm, cerci: 10.5-11.5 mm, fore wing: 7.9-8.3 mm.

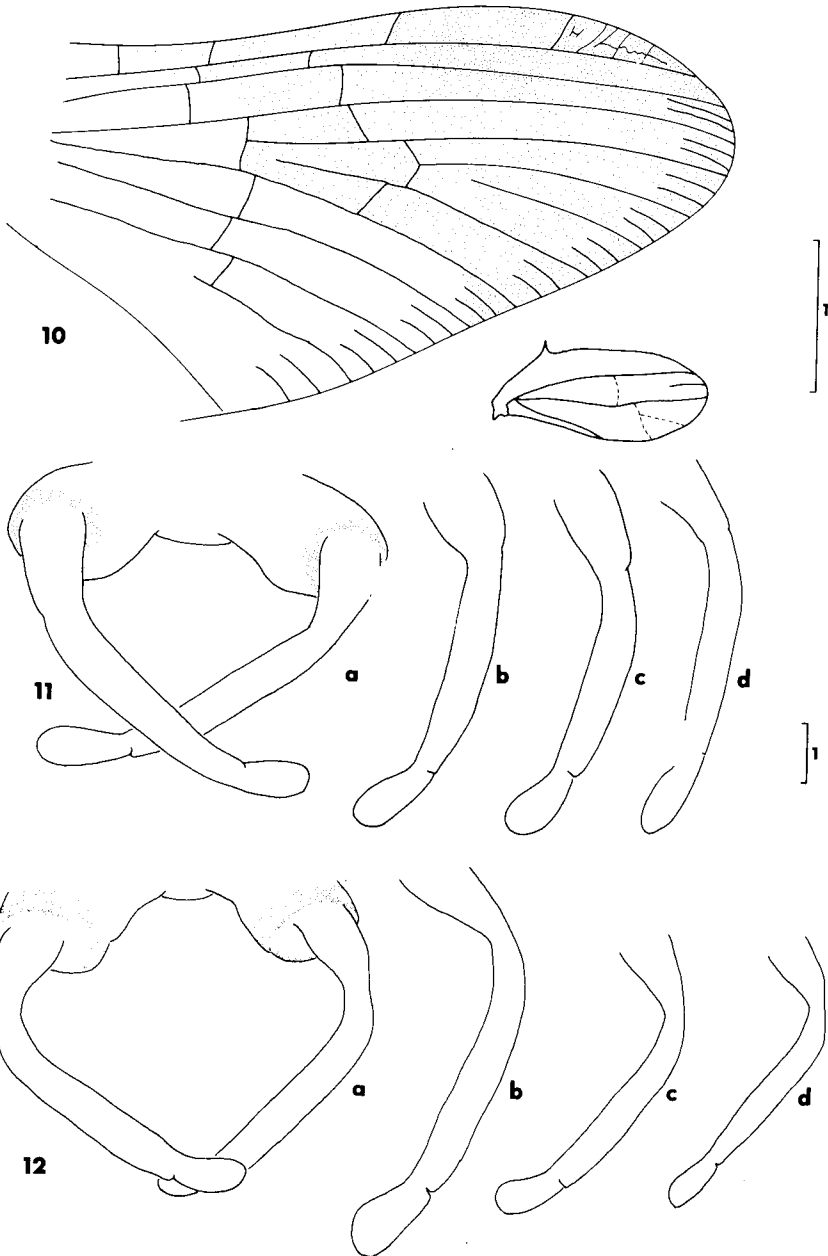
Head: Yellowish light grey. Eyes and edge of ocelli black, grey ocelli.

Thorax: Colouring like the head. Wings completely hyaline. Femora whitish; tibiae and tarsi brown-yellow.

Abdomen: Yellow-brown; cerci light grey.

#### Subimagines

General colour dark brown; legs uniformly light yellow; wings greyish without any maculations.



Figs. 10-11: Male imago of *B. nubecularis*. 10: front and hind wing (same scale); 11: forceps, with intraspecific variations.

Fig. 12: forceps of *B. alpinus*, with intraspecific variations.

Material examined: All was collected at the type-locality indicated by Eaton (1898), i.e., Sources de l'Orbe, Vallorbe, at an altitude of 840 m (not 1463 m, as mentioned by Müller-Liebenau, 1969).

Holotype (♂ imago), 2.VIII.1898, deposited in the British Museum of Natural History in London. Additional material (deposited at the Museum of Zoology in Lausanne): 1 ♂, 13.VII.1942; 3 ♂, 15.VII.1975; 1 ♂, 17.VII.1978; 2 ♂, 15.VIII.1980 (coll. J. Aubert). 2 larvae, 8.VII.1983. 14 larval exuviae and imagines reared between 18th and 21st July 1983 (coll. M. Sartori).

All imagines are preserved in 70% alcohol, larval exuviae mounted in Canada balsam.

Remarks: *B. nubecularis* has been compared to specimens of *B. alpinus* from Switzerland (Jura, Plateau, Prealps and Alps) and from France (Alps, Pyrenees, Massif Central), and to specimens of *B. melanonyx* (Switzerland, France). Although *B. nubecularis* has so far been found only in a single locality, it may possibly be found in other places of the Jura. The flight period begins in the middle of July and probably lasts until the end of August. *B. nubecularis* lives in a typical lotic stream. It is an inhabitant of running water and not a "lake or pond" species (Puthz, 1978).

#### RÉSUMÉ

Dans le cadre d'un travail approfondi sur les Epheméroptères de Suisse occidentale, la capture de plusieurs larves apparentées à *Baetis alpinus* Pict., ainsi que l'élevage d'une population provenant de la localité typique dans le Jura suisse, ont permis la redécouverte de *B. nubecularis* Etn. L'imago ♂ est redécrit, la larve au dernier stade ainsi que l'imago ♀, les subimagines ♂ et ♀ sont décrits pour la première fois.

#### ACKNOWLEDGEMENTS

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