

**Taxonomy and ecology of *Ecdyonurus ujhelyii* sp. n.  
(Ephemeroptera, Heptageniidae) from the tributaries  
of Lake Balaton**

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**Abstract** — The paper describes the winged stages (except for female sub-imago), nymphs, and eggs of a new species *Ecdyonurus ujhelyii* sp. n., commonly occurring in the tributaries of Lake Balaton in Hungary. The new species belongs to the *lateralis* (Curt.) group and differs from the species known so far by body coloration, shape of penis (winged forms), shape of gills and mouthparts (nymphs), and shape of attachment structures (eggs). Probably the species develops one generation in the year, with adults appearing in late spring and in summer.

**Key words:** mayflies, taxonomy, life cycles, heptageniids.

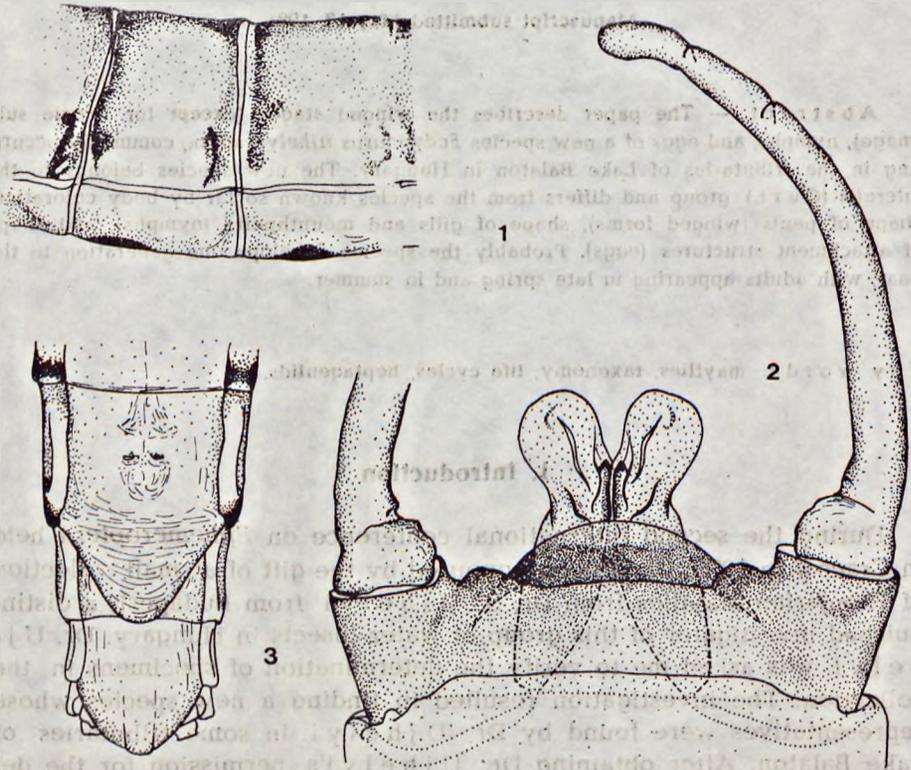
### 1. Introduction

During the second international conference on *Ephemeroptera* held in Cracow in 1975, I had been honoured by the gift of a small collection of Hungarian mayflies from Dr. S. Ujhelyi from Budapest, a distinguished investigator of this group of water insects in Hungary. Dr. Ujhelyi was asked me to verify the determination of specimens in the collection. The investigation resulted in finding a new species whose representatives were found by Dr. Ujhelyi in some tributaries of Lake Balaton. After obtaining Dr. Ujhelyi's permission for the description of the species, I propose that it be named after its first discoverer.

2. Description of *Ecdyonurus ujhelyii* sp.n. (alcohol 75%)  
 = *Ecdyonurus subalpinus*: Ujhelyi 1966, p. 205

Male imago:

Dimensions: body 9—11 mm, fore wings 9—10.5 mm and tails 23—25 mm in length. Compound eyes dark grey with the lower part darker. The distance between them is equal to the width of the lateral ocellus and from the side view they are slightly higher than their width. The back and bottom of thorax are brown with distinctly lighter, dark yellowish sides. The sides of mesothorax, behind the coxa, with slight violet pigmentations. The fore leg is brown: the tibia and the distal part of the femur are dark brown. The first article of the tarsus is about 1.5-times shorter than the second one. The other legs are light, yellow grey, their femurs sometimes showing traces of darker band near the middle of their length. The first article of the tarsus is slightly longer than the second one. Wings transparent with distinct dark brown venation. Cross-veins well visible, straight or slightly bent in the milky pterostigma



Figs 1—3. *Ecdyonurus ujhelyii* sp. n., imago male (1—2) and imago female (3). 1 — fragment of abdomen (segments 3—6); 2 — genitalia; 3 — terminal part of abdomen

field. Abdomen not transparent, light, with dark, contrasting, violet-rusty spots on the sides of segments 2—8 (fig. 1). Segments 2—6 slightly transparent in some places. Nervous ganglia show violet pigmentation. Cerci brown, lighter at the ends.

Genitalia. Styliiger plate (fig. 2) relatively short. Its hind margin is strongly protruding to the back and slightly upwards. It is poorly chitinized at the end. Two lateral lobes are usually large, triangular (fig. 2). From the ventral side, the basal segment of the style (fig. 2) is distinctly bulging at the end. The lobes of the penis are rounded and slightly opened to sides (fig. 2). From the dorsal side, a few spines are irregularly scattered at the base of each lobe. The shape and position of penis lobes are fairly variable.

Male subimago. Dimensions and general coloration similar to those of male imago. Wings uniformly light grey. Penis lobes rounded at the end, and close to each other.

Female imago. The body is 12 mm, and the fore wing 13 mm long; cerci damaged. Coloration similar to male imago except for the lighter thorax. Compound eyes uniformly dark grey. The coloration of abdominal tergites similar to that of male imago, with a reddish hue. The venation of wings the same as in male imago. The subgenital plate slightly longer than the hind margin of sternite VIII. The middle part of sternite IX is swelling at the end. The undulated part is darker (fig. 3). Female subimago — unknown.

Egg.

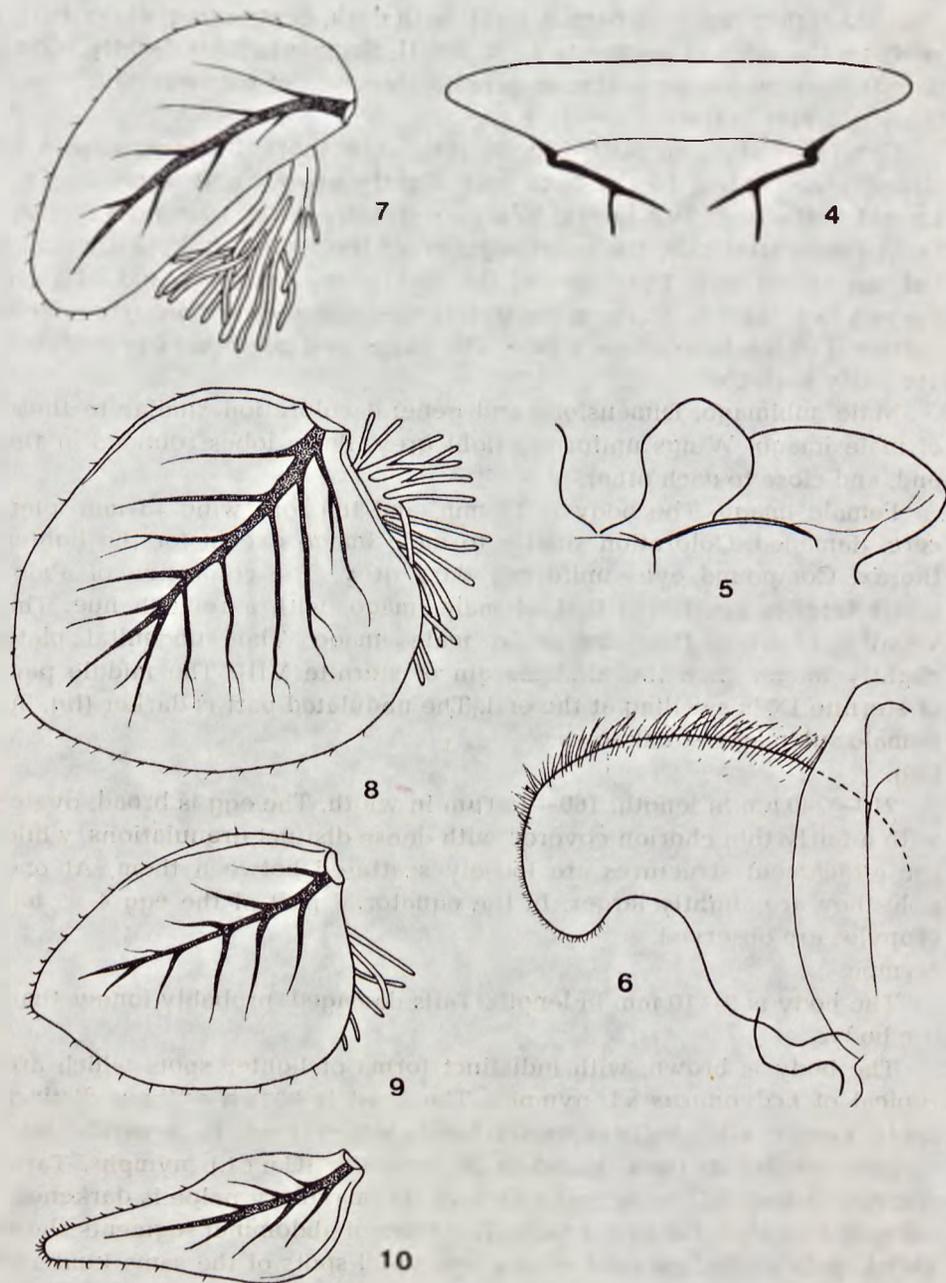
210—240  $\mu\text{m}$  in length, 160—180  $\mu\text{m}$  in width. The egg is broad, ovate, with a fairly thin chorion covered with dense distinct granulations, while the attachment structures are loosely scattered between them. At one pole they are slightly larger. In the equatorial part of the egg 4—5 micropyles are observed.

Nymph.

The body is 9—10 mm in length. Tails damaged, probably longer than the body.

The body is brown, with indistinct forms of lighter spots which are typical of *Ecdyonurus* s.l. nymphs. The head is brown without distinct spots. Femurs with indistinct dark bands which tend to separate into 4 spots, similar to those found in *E. lateralis* (Curt.) nymphs. Tarsi slightly darkened. The second article of the maxillary palpe is darkened; being darker than the first article. The sides of abdominal segments show violet spots of the imaginal coloration. Small spots of the same kind are also visible on the back part of mesothorax. Nervous ganglia show violet pigmentation.

The head is rounded with the broadest part at the level of compound eyes line. Labrum slightly bent backwards (fig. 4). Prosthema of mandibles composed of 4—6 sturdy medium high setae. The third article of ma-



Figs 4—10. *Ecdyonurus ujhelyii* sp. n., nymph. 4 — labrum; 5 — fragment of labium; 6 — fragment of hypopharynx; 7 — first gill; 8 — third gill; 9 — sixth gill; 10 — seventh gill

xillary palpe equals about  $\frac{1}{5}$  of the second article. The lateral lobe of the hypopharynx is haired as in fig. 6. Glossa of labium broad, almost rectangular (fig. 5). Hind margins of pronotum without backward projections.

The dorsal surface of femurs is covered with numerous spines. The fore margin of femurs with short hairs, which do not exceed the length of neighbouring spines. Ungues usually with 3—4 denticles of various height. Posterolateral projections on abdominal segments are short while those on segments V and VI reach to  $\frac{1}{8}$  of sternite length. The surface of tergites is covered with sharp splinters which are visible almost in their full length in the middle part of the tergites. The II—VI pairs of gills are distinctly asymmetrical. All pairs show distinct dark tracheation (figs 7—10). Tails without swimming hairs; posterior margins of articles are covered with fairly numerous medium slender spines which do not reach to the fore margin of the next article.

Material: holotype ♂ imago, stream near Aszófő, basin of Lake Balaton near the village of Tihany, Hungary, 1.07.1976; paratypes 4♂ im., 8 ♀ im., 7 nymphs, idem., 28. 08. 1957, 10. 08. 1958, 1. 07. 1976, 15. 06. 1975. Material in R. S o w a collection. According to Dr. S. U j h e l y i's information, the stream where nymphs of the new species were found is about 8 km in length; it flows down from lime hills and feeds Lake Balaton. The investigation station was appointed about 1—2 km from its mouth. Imagines were collected above the stream and larvae on the sandy bottom in weak current. Probably they also live in stony bottom and among higher aquatic vegetation. The species probably develops one generation in the year. According to Dr. U j h e l y i's opinion the species also occurs in some other streams in the Lake Balaton basin.

Diagnostic features.

The nearest relative of the new species is *Ecdyonurus gridellii* (G r a n d i). *Ecdyonurus ujhelyii* differs from it and from other European species of the *lateralis* (C u r t.) group by the following combination of diagnostic features: Imagines — the characteristic violet coloration of the body, particularly of the abdomen; the shape and microstructure of penis lobes (males) and of the subgenital plate and abdominal sternite IX (females), and also, in the case of nymphs, by the shape of mouthparts, gills, hairs on tails, and by the microsculpture of abdominal tergites.

### 3. Polish summary

**Taksonomia i ekologia *Ecdyonurus ujhelyii* sp. n. (Ephemeroptera, Heptageniidae) z dopływów jeziora Balaton**

Praca zawiera opis stadiów imaginalnych (ryc. 1—3), jaja i larw (ryc. 4—10) nowego gatunku jętki, *Ecdyonurus ujhelyii* sp. n. (Ephemeroptera, Heptageniidae) z do-

plywów jeziora Balaton na Węgrzech. Nowy gatunek należy do grupy *Ecdyonurus lateralis* (Curt.); od spokrewnionych z nim gatunków, szczególnie od *Ecdyonurus gridellii* (Grandi) odróżnia się następującą kombinacją cech: imagines — charakterystycznym ubarwieniem fioletowym ciała, szczególnie odwłoka, kształtem i mikrostrukturą płatów prącia (samce), kształtem płytki subgenitalnej i IX sternitu odwłoka (samice) oraz nimfy wyglądem narządów gębowych, skrzelotchawek, owłosieniem ogonów, mikroskulpturą tergitów odwłoka. Nowy gatunek zasiedla piaszczyste dno w miejscach o słabym prądzie i ma prawdopodobnie jedno pokolenie w roku. Dorosłe postacie pojawiają się późną wiosną i w lecie.

#### 4. Reference

- Ujhelyi S., 1966. The Mayflies of Hungary, with the description of a new species, *Baetis pentaplebedes* sp. n. (*Ephemeroptera*). Acta Zool. Acad. Sc. Hung., 12, 1—2, 203—210.