

TAXONOMY OF *ECDYONURUS CORSICUS*
ESBEN-PETERSEN, 1912, WITH SOME REMARKS
ON DIAGNOSTIC FEATURES OF THE NYMPHS
OF THE GENUS *ECDYONURUS*
(Ephemeroptera, Heptageniidae) (*)

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The genus *Ecdyonurus*, recently restricted to the species with pronotal projections (Zurwerra and Tomka, 1985), is very common and widespread in running waters of whole Europe, but the taxonomic status of many species is still very uncertain. This is mainly due to the great variability of imaginal characters from different populations. Our present knowledge about this genus is most founded on winged stages. Also in recent descriptions and revisions, nymphs are poorly described, and only few presumed diagnostic features are discussed. Nevertheless the nymphs, compared with winged stages, share a lot of available characters, some of which seem to be constant within a species. For this reason I believe that future revisions of the genus must mainly rely upon nymphal morphology analysis and that more detailed descriptions of nymphs are strongly needed.

A first examination of abundant material, most of which from Italy and neighbouring countries, let me state the value of some till now neglected features of *Ecdyonurus* nymphs: pilosity of maxilla, hypopharynx, legs; shape of labrum, palps, leg bristles, gills, etc... These characters if examined in detail, show important specific differences.

Recent collections from Corsica and Sardinia let me examine winged stages and nymphs of *E. corsicus* Esben-Petersen, 1912, a species synonymized by Ulmer (1921) with *E. bellieri* (Hagen, 1860). The nymphs of both species were unknown. The synonymy was stated on the basis of material from the Selys collection, a female imago (type n. 73) from Sicily and two male imagines (n. 102,

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Figs. 1-2 — *E. corsicus*: left maxilla (1); bristles on dorsal side of hind tibia (2).

labelled by Hagen *Heptagenia bellieri*) from Corsica. I don't know any lectotype designation, but the female from Sicily has to be considered the lectotype: only it was described by Hagen in 1860. Moreover, also at present status of knowledge it is very hard to state the conspecificity of two sets of specimens on the basis of only females comparison. Finally, I have collected many *Ecdyonurus* (males and nymphs) from Sicily, without finding species close to *E. corsicus*. I think, therefore, that *E. corsicus* shall be considered species propria.

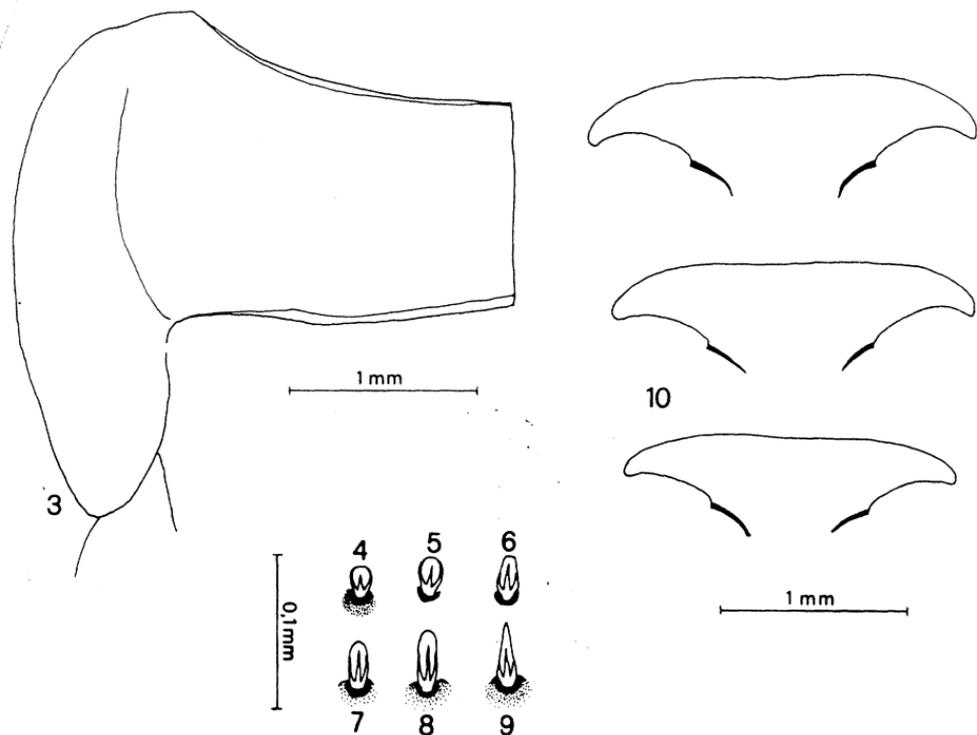
I give here a description of the nymph of *E. corsicus*, previously unknown. Conspecificity between males and nymphs of *E. corsicus* collected in Corsica was stated by rearing.

Ecdyonurus corsicus Esben-Petersen, 1912

E. bellieri: Ulmer, 1921;

E. bellieri: Auct. seq.

MATERIAL. (N = nymphs; E = exuviae; (R) = reared material; following material C. Belfiore leg.). SARDINIA - Rio Aratu, Strada Provinciale N. 7 (NU), km 21.5, 31.V.1985, 23 N; Rio Badule Spano, Strada Provinciale N. 7, km 25.7, 31.V.1985, 3 N; Desulo (NU), right tributary of Flumendosa R., 2.VI.1985, 44 N; Rio Calaresu, Strada Statale N. 389, km 157.4 (NU), 3.VI.1985, 16 N. CORSICA - Albertacce (Calacuccia), Golo R., 840 m, 7.VI.1986, 58 N; Cristinacce (Evisa), Tavulella R., 765 m, 7.VI.1986, 34 N, 2 E, 2 male imag. (R), 1 female imag. (R); Col de Vergio, right tributary Golo R., 1000 m, 7.VI.1986, 2 N; Corte, Restonica R., 800 m, 8.VI.1986, 14 N, 1 male imago (R); Vizzavona, right trib. Vecchio R., Tattone, 9.VI.1986, 10 N; Bocognano, Gravona R., 9.VI.1986, 10 N; Zipitoli (Bastelica), left trib. Prunelli R., 10.VI.1986, 14 N; Bastelica,

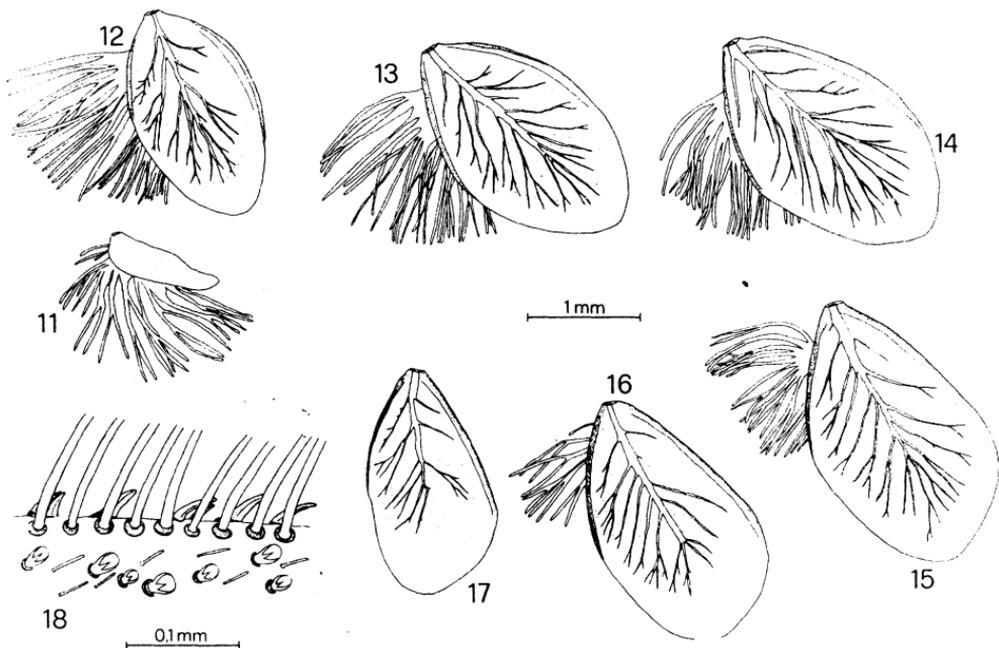


Figs. 3-10 — *E. corsicus*: left half of prothorax (3); bristles on dorsal side of fore femur, central part (4-5), fore part (6), proximal part (7-8); bristles on dorsal side of hind femur (9); labrum of three individuals (10).

Volta R., 771 m, 10.VI.1986, 1 E; Val d'Ese (Bastelica), Ese R., 1600 m, 10.VI.1986, 3 N; Palneca, Taravo R., 800 m, 11.VI.1986, 37 N, 1 E; Col de Verde, Taravo R., 1200 m, 11.VI.1986, 5 N; Ghisoni, Fium'Orbo, 11.VI.1986, 30 N, 3 E. (Following material P.A. Audisio leg.) SARDINIA - Rio Aratu, Strada Provinciale n. 7 (NU), 1.V.1983, 9 N; Monte Arbo, 3.V.1983, 2 N; Orgosolo, Cedrino R., 4.V.1983, 2 N; Gadoni, Rio Tistigliosi, 3.V.1983, 3 N.

DESCRIPTION OF THE NYMPH. Body length (mature nymphs): female 16 mm, male 14 mm.

Shape of lateral lobes of labrum variable (fig. 10): in most individuals lobes moderately bent backwards. Maxillae (fig. 1): from 23 to 34 large bristles, most of which comb-shaped, on fore margin (Number of examined individuals = 55; mean = 28.9; variance = 4.5); fine bristles on dorsal side of outer angle present; some (0-12) fine bristles on outer margin and on ventral side, just before the joint with the maxillary palp (N = 55; mean = 5.9; var. = 7.1); fore margin of maxillary palp without or with few long and thin bristles;

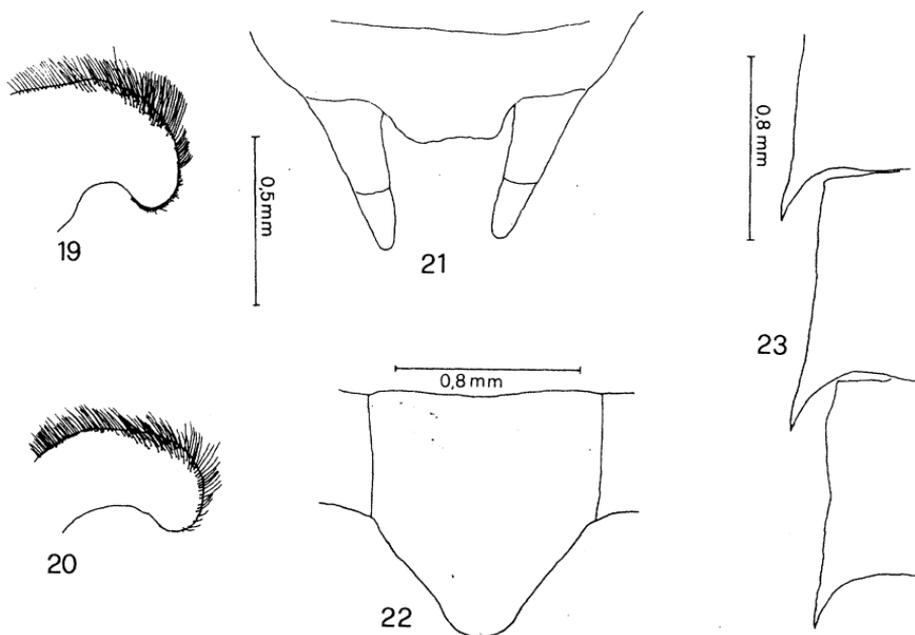


Figs. 11-18 — *E. corsicus*: gills I-VII (11-17); distal part of dorsal hind margin of fore femur (18).

last segment of maxillary palp long. Hypopharynx (fig. 19,20) with long bristles on fore margin of lateral lobes which are not beyond the apex of lobes.

Pronotal projections (fig. 3) somewhat pointed, long and straight: the apex may be very slightly bent outwards. Most bristles on dorsal side of femora with darkened basis. Distal half of all femora with a row of bluntly pointed bristles on ventral side, just behind the long hairs on hind margin (fig. 18). On dorsal side of fore femur, near the hind margin, there is a row of rounded bristles, most of which with diverging sides (fig. 18). Dorsal side of fore femur with short and rounded bristles on the central band, bluntly pointed ones near fore margin (fig. 4-9). Dorsal side of middle and hind femur with more or less pointed spines. Fore and middle tibia dorsally with a row of short and rounded bristles, near the outer margin. Hind tibia with pointed bristles in a dorsal row near the outer margin (fig. 2). Tarsus darkened at apex. Claws with 2 denticles, sometimes 3 or 4.

Abdominal pattern more or less contrasted. Generally I and II tergite medially light, with two brown narrow lateral stripes; III-VI



Figs. 19-23 — *E. corsicus*: right lobes of hypopharynx from two individuals (19-20); last sternite from male nymph (21) and from female nymph (22); sides of VI-VIII abdominal segments, from a female nymph (23).

with prevalence of brown pigmentation, VII, VIII and IX light, X dark. Ventral polygonal spots typical of winged stages visible in mature nymphs. Gills as in fig. 11-17. Lateral spines of abdominal segments large and sharp, outwards directed. Hind margin of last sternite subtrapezoidal in males (fig. 21), with an irregular medial emargination, subtriangular in females (fig. 22), with widely rounded apex.

DISCUSSION. The nymph of *Ecdyonurus corsicus* can be easily distinguished from the other congeneric species (at least within Italy), mainly for the shape of dorsal bristles near the fore margin of fore femur. However this species shows a peculiar complex of characters, which place it on an intermediate position between species of *helveticus* group and *venosus* (s.l.) group.

The *helveticus* group was recently reviewed by Jacob and Braasch (1984), who point out, as diagnostic features of the nymphs, the short and wide femora with spatulate bristles, the darkened basis of these bristles and the scarce pilosity on the first segment of maxillary palps. In most cases these characters are not sufficient for

a reliable determination, also at species group level. Further studies on nymphal morphology within this group in Europe are needed; for the moment I can assess some criteria for group determination which are valid for Italian species.

The nymphs of *helveticus* group share the following characters: a tuft of hairs is on ventral side of maxilla, between the outer fore angle and the joint with the palp; fore margin of first segment of maxillary palps with few long bristles, last segment long; long hairs on hypopharynx lobes end far from the apex of lobe; no bristles are on ventral side of femora, near fore margin (with the exception of one species, possibly *E. picteti* (Meyer-Dur)); bristles on dorsal side of hind tibia rounded, with diverging sides.

The nymphs of *venosus* group (including *E. aurantiacus* (Burmeister) and *E. insignis* (Eaton)) have only few or no hairs on ventral side of maxilla, near outer margin; first segment of maxillary palps with a dense tuft of hairs on fore margin, last segment short; long hairs on hypopharynx lobes get over the apex of lobes; from dorsal view a row of pointed bristles appears behind the long hair of femora, at least on distal half; bristles on dorsal side of hind tibia pointed.

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SUMMARY

The nymph of *E. corsicus* Esben-Petersen species propria, from Corsica and Sardinia, is described. The relevance of nymphal stages in *Ecdyonurus* species taxonomy is stressed. Some features for a characterization of species groups within the genus *Ecdyonurus* are also pointed out.

RIASSUNTO

L'A. rileva la necessità di riesaminare la tassonomia del genere *Ecdyonurus* alla luce dei caratteri delle ninfe, che permettono una migliore valutazione delle differenze tra le specie. Viene poi descritto lo stadio ninfale di *E. corsicus* Esben-Petersen, in precedenza ignoto; viene riconosciuta inoltre la validità di tale specie, per lungo tempo considerata sinonimo di *E. bellieri* Hagen. Infine vengono brevemente discussi alcuni caratteri utili per la diagnosi dei gruppi di specie nell'ambito del genere *Ecdyonurus*.

REFERENCES

ESBEN-PETERSEN, P., 1912. Addition to the knowledge of the Neuropterous insect fauna of Corsica. Ent. Medd., 1912 (4): 348-353.

- HAGEN, H. A., 1860. Examen des Nevroptères (non Odonates) Recueillis en Sicile par M. E. Bellier De La Chavignerie. Ann. Soc. Ent. Fr., 1860: 746-748.
- JACOB, U. & D. BRAASCH, 1984. Neue und statusrevidierte Taxa der *Ecdyonurus helveticus*-Grossgruppe (Ephemeroptera, Heptageniidae). Ent. Abh. Staat. Mus. Tierk. Dresden, 48 (6): 53-61.
- ULMER, G., 1921. Über einige Ephemeropteren-Typen alterer Autoren. Arch. Naturg., 87: 229-267.
- ZURWERRA, A. & I. TOMKA, 1985. *Electrogena* gen. nov., eine neue Gattung der Heptageniidae (Ephemeroptera). Ent. Ber. Luzern, 13: 99-104.