

## *Choroterpes (Choroterpes) prati* n.sp., a new species of mayfly from North-East of Spain (Ephemeroptera : Leptophlebiidae)

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Keywords : Ephemeroptera, *Choroterpes* s.s., Spain.

The nymph, subimago and egg of *Choroterpes (Ch.) prati* n.sp. from the Matarranya river (Ebro basin, Spain) are described. The relationships between this new species and the North-African and European members of the genus *Choroterpes* s.s. Eaton 1881 are illustrated.

*Choroterpes (Choroterpes) prati* n.sp., Ephéméroptère nouveau du Nord-Est de l'Espagne (Ephemeroptera : Leptophlebiidae)

Mots clés : Ephemeroptera, *Choroterpes* s.s., Espagne.

Description des nymphes, des subimagos et de l'œuf de *Choroterpes (Ch.) prati* n.sp. de la rivière Matarranya (Espagne). Les différences morphologiques avec les espèces nord-africaines et européennes du genre *Choroterpes* s.s. Eaton sont illustrées.

### 1. Introduction

To date, two species of *Choroterpes* s.s. Eaton 1881 have been described in Europe: *Ch. (Ch.) picteti* (Eaton 1871) and *Ch. (Ch.) borbonica* Belfiore 1988. Two other species have been described from North Africa: *Ch. (Ch.) atlas* Soldan and Thomas 1983 and *Ch. (Ch.) volubilis* Thomas and Vitte 1988.

We describe the female and male nymphs, subimago and egg a new species of *Choroterpes* s.s. from North-East Spain.

### 2. *Choroterpes (Ch.) prati* n.sp.

*Derivatio nominis*: The species is dedicated to Prof. Narcis Prat in recognition of his continued research in limnology.

*Short diagnosis*: Compared to *Ch. (Ch.) picteti* and *borbonica* the nymphs have splintery spines on the

dorsal surface and dorsal margin of fore femora; while compared with *Ch. (Ch.) atlas* and *volubilis* the nymphs present poorly developed tracheal net. Unlike all the other the female nymph has the ninth sternite entire and rounded, and the female subimago entire and straight.

#### Female nymph (with dark wing pads)

##### HEAD

Brown head with black shading between compound eyes and ocelli, light spots over each ocellus.

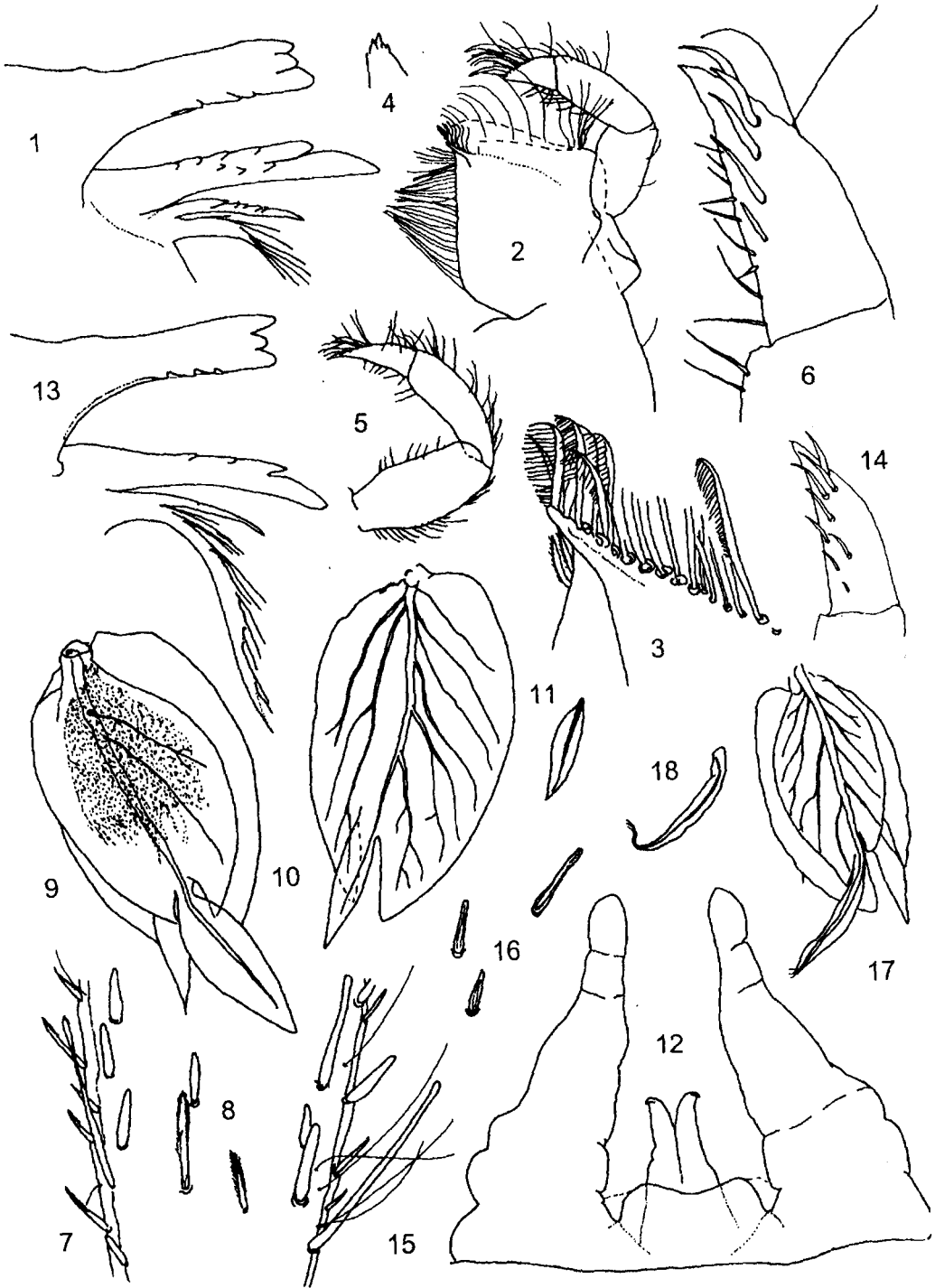
— Antennae chestnut and shorter than the maximum width of the head.

— Mouthparts: Labrum with antero-median margin deeply incised; a row of short thin setae present along the anterior margin and longer setae across the middle of labrum where they are disposed to form a central row and two or three rows laterally.

— Mandibles: Incisors of right mandible tridentate apically. Left mandible with outer incisor tridentate apically, with few denticles in the posterior border; inner incisor bidentate apically and with denticles distributed along its dorsal surface (Fig. 1); protheca forked into sharp spine with sawed dorsal margin and a brush of fine setae.

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— Maxillae: Palpus three-segmented. Right maxilla (Fig. 2) with a row of 17-18 pectinate setae below the crown and a tooth-like projection from the subapical margin (Fig. 3). Distal segment of palp triangular, with a double pointed apex (Fig. 4).

— Labium: Distal segment of palp 2.3 times longer than width at base (Fig. 5), with one row of 5 setae (Fig. 6). Segment 2 of palp with 2 long setae on the ventral border and 16-17 on the dorsal one.

#### THORAX

— Pronotum, meso- and metanotum light brown, wing pads parallel and narrowly separated.

— Legs: Whitish yellow, without distinct darker spots. Tibia and tarsus pale. Anterior femora with splintery spines on both dorsal surface (Fig. 7) and dorsal margin (Fig. 8). This type of spines borders the internal margin of tibia too. Claws apically hooked. Hind claws with 8 denticles and several smaller serrations between the apex and the first large denticle.

#### ABDOMEN

— Tergites blackish brown with triangular whitish spots in the middle, distributed as in *Ch. (Ch.) picteti*; ventral side of body light; cerci chestnut.

— Tergites: Posterior margin decorated with long triangular spines and two inner rows of short ones (Fig. 19). The surface shows complex scale-like bristles with fringed appearance. These gather together along the posterior tergal margin. Ninth sternum with a posterior entire and round margin (Fig. 21).

— Gills: Gill 1 lacking. The others present a poorly developed tracheal net in the dorsal lamellae. They are darker in the area close to the tergal joint. Gill 4 with the central process of the dorsal lamella broad and lan-

ceolated, whereas the two lateral processes are very short (Figs 9, 10).

Size of the last instar. Length: body = 8.7 mm; cerci = 9.3 mm.

#### Male nymph (with dark wing pads)

Differs from the above description of female by the presence of gill 1, which is broad and short (Fig. 11); and by the shape of the ninth sternum, with two posterior lobes separated by a clear cut.

Size of the last instar. Length: body = 7.2 mm; cerci = 7.8 mm.

#### Male subimago

Genitalia. Forceps with a round-shaped apex. Penis lobes become slender gradually towards the apex, where they diverge slightly and bend ventrally (Fig. 12). The border of the subgenital plate shows a deep depression in its middle region.

Size. Length: body = 7.1 mm; fore wing = 8.1 mm.

#### Female subimago

Genitalia. Subgenital plate with the posterior margin entire and straight.

Size. Length: body = 7 - 7.5 mm; fore wing = 8.2 - 9.1 mm.

#### Eggs

One pole is more slender than the opposite pole and its ornamentation differs from the rest of the egg surface (Fig. 23). The chorion pattern consists of ribs which converge regularly to form uplifted discs, each surrounding a central button (Fig. 24). At the more slender pole the ribs are wider, less uplifted and almost at the same level as the central button.

#### Figs. 1-18.

Figs. 1-10. Female mature nymph (last instar) of *Choroterpes (Ch.) prati* n.sp. 1 : incisors and prostheda of left mandible. 2 : right maxilla. 3 : tusk on inner apical angle of galea-lacinia. 4 : apical segment of maxillary palp. 5 : labial palp. 6 : segment 3 of labial palp. 7 : short spines on border of fore femora. 8 : fore femora surface spines. 9 : gill 4. 10 : ventral lamella of gill 4.

Fig. 11. Male nymph (last instar) of *Choroterpes (Ch.) prati* n.sp., gill 1.

Fig. 12. Genitalia of male subimago of *Choroterpes (Ch.) prati* n.sp.

Figs. 13-18. Female nymph of *Ch. (Ch.) picteti*. 13 : incisors and prostheda of left mandible. 14 : segment 3 of labial palp. 15 : short spines on border of fore femora. 16 : fore femora surface spines. 17 : gill 4. 18 : gill 1.

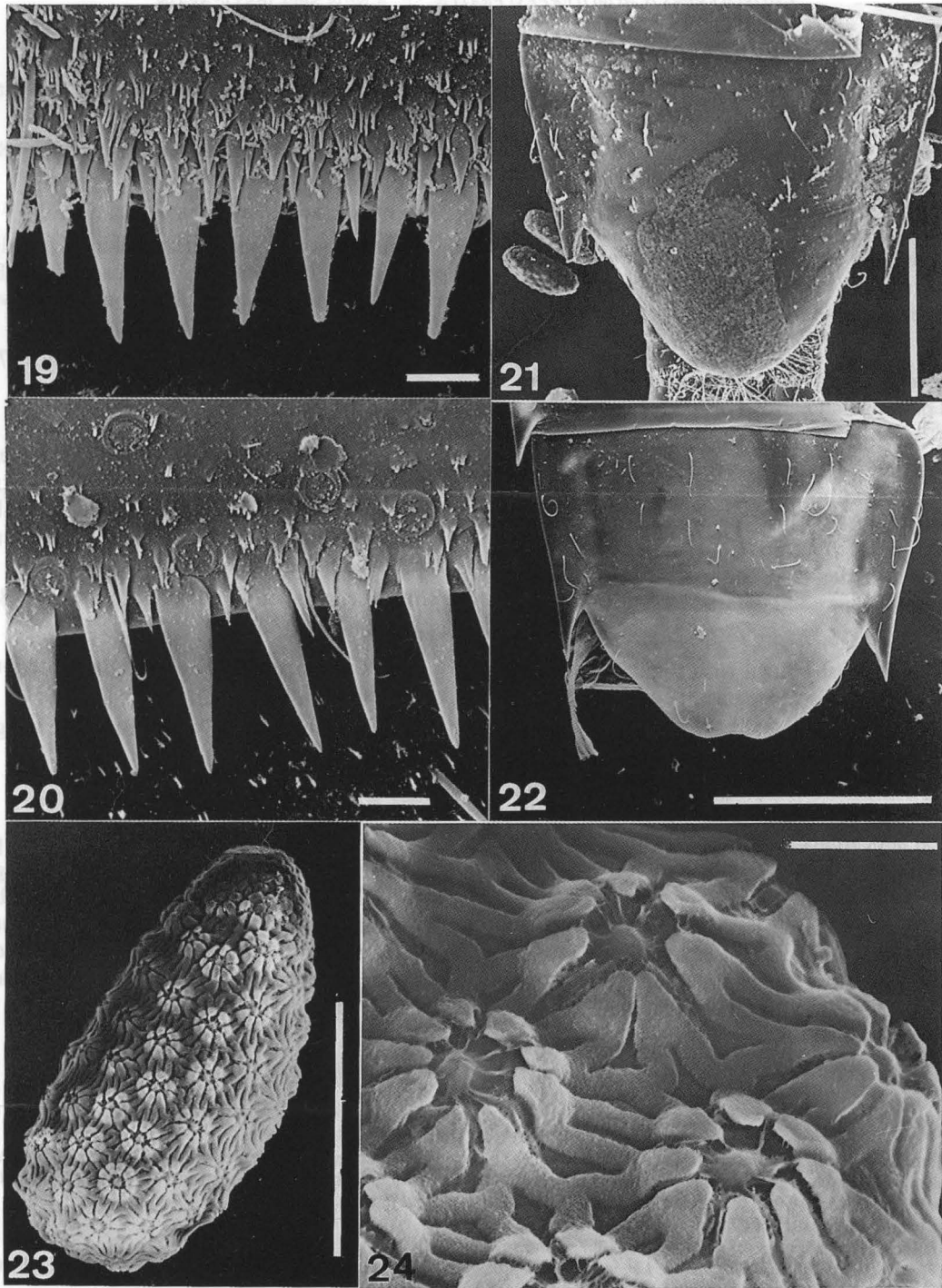
#### Figs. 1-18.

Figs. 1-10. *Choroterpes (Ch.) prati* n.sp., larve femelle au dernier stade. 1 : incisives et prostheda de la mandibule gauche. 2 : maxille droite. 3 : saillie de l'angle apical interne de la galea-lacinia. 4 : segment apical du palpe maxillaire. 5 : palpe labial. 6 : troisième segment du palpe labial. 7 : soies de la marge du fémur antérieur. 8 : soies de la surface dorsale du fémur antérieur. 9 : branchie 4. 10 : lamelle ventrale de la branchie 4.

Fig. 11. *Choroterpes (Ch.) prati* n.sp., branchie 1 de larve mâle au dernier stade.

Fig. 12. Genitalia du subimago mâle du *Choroterpes (Ch.) prati* n.sp.

Figs. 13-18. *Choroterpes (Ch.) picteti*, larve femelle au dernier stade. 13 : incisives et prostheda de la mandibule gauche. 14 : troisième segment du palpe labial. 15 : soies de la marge du fémur antérieur. 16 : soies de la surface dorsale du fémur antérieur. 17 : branchie 4. 18 : branchie 1.



Figs 19-24.

Figs. 19, 21. Female mature nymph of *Choroterpes (Ch.) prati* n.sp. 19: tergite 6, posterior margin (bar = 15 µm). 21: sternite 9 (bar = 0.5 mm).  
 Figs. 20, 22. Female nymph of *Ch. (Ch.) picteti*. 20: tergite 6, posterior margin (bar = 15 µm). 22: sternite 9 (bar = 0.5 mm). Figs. 23, 24. Egg  
 of *Choroterpes (Ch.) prati* n.sp. 23: egg (bar : 100 µm). 24: ornamentation of chorion (bar = 10 µm).

Figs 19-24.

Figs. 19, 21. *Choroterpes (Ch.) prati* n.sp., larve femelle au dernier stade. 19: tergite 6, bord posterior échelle = 15 µm). 21: sternite 9 échelle = 0.5 mm). Figs. 20, 22. *Choroterpes (Ch.) picteti*, larve femelle. 20: tergite 6, bord postérieur échelle = 15 µm). 22: sternite 9 échelle = 0.5 mm). Figs. 23, 24. œuf de *Choroterpes (Ch.) prati* sp.n. 23: œuf échelle : 100 µm). 24: détail de la surface du chorion échelle = 10 µm).

Size: length = 180  $\mu\text{m}$ ; wide = 85  $\mu\text{m}$ .

### 3. Material examined

*Choroterpes (Choroterpes) prati* n.sp.

Spain: Teruel, Ebro basin (M.A. Puig col.). River Matarranya 220 m a.s.l., near Nonaspe (0° 10'W, 41° O'N), 25.VII.1984: 1 nymph female (holotype); 1 nymph female and 1 male (paratypes); 1 subimago male and 1 subimago female, 13 nymphs. The holotype and paratypes are deposited in the collection of the Centre d'Estudis Avançats de Blanes, Spain.

*Choroterpes (Choroterpes) picteti* (Eaton, 1871)

Italy: Piémont (E. Gaino col.). Stream Erro 170 m a.s.l., near Arzello, 15.VII.1974: 29 nymphs and 2 subimagos female.

### 4. Ecology

Nymphs of *Ch. (Ch.) prati* inhabit temporary streams between February and July. The last instar is present in large pools. The dominant substrata are

stones. Temperature ranging from 7° C to 29° C. Emergence takes place in June and July, associated with the beginning of the dry period each year.

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