Annls Limnol. 20 (1-2) 1984 : 21-24

On some Plecoptera from southern Spain

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Two new taxa from the Province of Córdoba, *Brachyptera vera cordubensis* nov. ssp. and *Capnioneura gelesae* nov. sp., are described and illustrated. The phyletic relationships of *Leuctra andalusiaca* Aubert are discussed.

Sur quelques Plécoptères du Sud de l'Espagne

Les auteurs décrivent et figurent deux taxons nouveaux de la Province de Córdoba, *Brachyptera vera cordubensis* nov. ssp. et *Capnioneura gelesae* nov. sp., et ils discutent des relations phylétiques de *Leuctra andalusiaca* Aubert.

The stoneflies of the Province of Córdoba have been studied by Aubert (1963 a, b) and more recently by Puig & Ferreras (1983). The material collected in this province by one of us (M.B.R.) includes two new taxa and an Iberian endemic species of *Leuctra*, *L. andalusiaca*, whose phyletic relationships are discussed below.

Brachyptera vera Berthélemy & Gonzalez del Tánago, 1983 **cordubensis** nov. ssp.

Segments of the antennal flagellum longer than in *B. vera vera* (Length/width of the segments 3 to 5 : 1.3 - 1.5). As in the nominal subspecies, each segment is not parallel-sided but widens toward its apex.

Male fully winged (forewing, 9 mm), not brachypterous as in *B. v. vera*. Terminal plate of the prong of the male epiproct Y-shaped (Fig. 9) ; this plate is U-shaped in *B. v. vera* (Fig. 10). In one female, the ninth sternite is distinctly longer than in any known specimen of *B. v. vera*. The two subspecies differ probably from each other in this respect but more abundant samples of both are necessary for a statistical study of this character.

The terminal plate of the prong of *B. v. cordubensis* shows that *B. vera* is closer to *B. algirica* Aubert (Fig. 11) than previously thought. The concavity of the posterior margin of the male ninth sternite may be a synapomorphy uniting the two species.

One male holotype and two female paratypes collected near the Rio Guadalbarbo at Espiel (UTM 30SUH258336), 640 m a.s.l., 25.1.1983. The Rio Guadalbarbo is a temporary stream with a moderate current in winter. Width 0.3-1.2 m ; depth 5-70 cm ; granitic pebbles and sand ; *Ranunculus* and *Eleocharis* in the stream bed ; *Securinega tinctoria*, *Rosa* and *Nerium oleander* on the banks.

Capnioneura gelesae[3] nov. sp.

Body length : male, 5-6 mm ; female, 6-7.8 mm. All specimens macropterous. Length of fore wing : male, 6.5-7.2 mm ; female, 8-9.2 mm.

Colouration similar to that of *Capnioneura libera* (Navás), less contrasted than in *C. mitis* Despax (see Berthélemy & Terra 1980).

Male.

The sternal areas covered with long hairs are less distinct than in *C. mitis*. Membranous part of the 10 th tergum large (Fig. 1). Epiproct rounded at apex, with a strong anterior subapical tooth (Figs. 2

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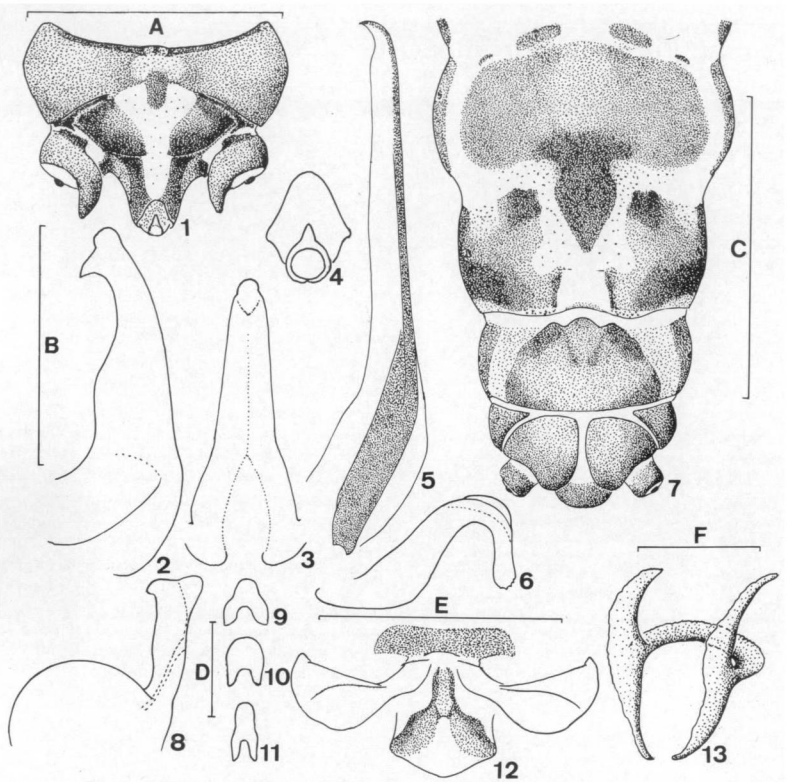

Fig. 1-7 : *Capnioneura gelesae* nov. sp. 1, male terminalia, dorsal (scale bar A, 0.5 mm) ; 2, male epiproct, lateral (scale bar B, 0.2 mm) ; 3, id., from behind (B) ; 4, id., from above (B) ; 5, left paraproct (B) ; 6, specillum, left (B) ; 7, female terminalia, ventral (scale bar C, 1 mm). — Fig. 8-9 : *Brachyptera vera cordubensis* nov. ssp. 8, basal bulb and prong of the male epiproct, lateral (scale bar D, 0,2 mm) ; 9, terminal plate of the prong, from above (D). — Fig. 10 : id., *B. vera vera* (D). — Fig. 11 : id., *B. algirica* (D). — Fig. 12-13 : *Leuctra andalusiaca*. 12, male last tergite and epiproct, dorsal (scale bar E, 0,5 mm) ; 13, sclerotized ring of the spermatheca, oblique ventral view (scale bar F, 0,1 mm).

and 4). Shaft thinner than in *C. libera* and without the sudden narrowing seen in *C. mitis* (Fig. 3, compare with Fig. 33 in Berthélemy & Terra 1980 and with Fig. 31 in Berthélemy 1969). Cercal process thin, directed outwards. Specillum strongly down curved (Fig. 6). Paraprocts long, bent at the apex as in *C. petitpierrae* Aubert, outer membranous portion short (Fig. 5).

Female.

Accessory anterior sclerites generally fused to the abdominal sterna. Median extension of the 7 th sternum long, heavily pigmented, isolated from the sclerotized portions of the 8 th segment (Fig. 7). Eighth segment with two anterior dark spots and two longitudinal sclerotized and pigmented stripes. In contracted specimens, these two stripes constitute the lateral margins of a median depression. Anterior margin of the genital opening slightly sclerotized but not pigmented. Ninth sternum with a short and blunt median projection.

Larva.

The bristles of *Capnioneura gelesae* are distinctly longer than those of *C. mitis*. In the apical whorl of the cercal segments 5-8 of the full-grown larva, the length of the setae is 30-35 μm in *C. gelesae* and 18-23 μm in *C. mitis*. The same differences can also be seen elsewhere, for instance on the femora.

Discussion.

The male can be separated from all other *Capnioneura* species by the shape of his epiproct. The pigmentation of the female is rather similar to that of *C. caucasica* Zhiltzova but the vulvar sclerites, well defined in that species, are absent in *C. gelesae*.

One male holotype, 9 male and 17 female paratypes collected near the Rio Guadalbarbo at Espiel (see above, *B. v. cordubensis*), 25.1.1983. 17.3.1982, 1 ♀ ; 1.3.1983, 2 ♀.

Additional material.

Rio Cuzna at Alcaracejos (30SUH294427), 560 m. Temporary river with pools and rapids in winter. Width 3-7 m ; depth 10-160 cm ; schistous pebbles and stones ; sunny river bed with *Ranunculus ; Nerium oleander* and rushes on the banks. 25.1.1983, 3 ♂, 2 ♀.

Rio Matapuercas at Adamuz (30SUH640226), 460 m. Temporary river with slow current in winter. Width 3-8 m ; depth 8-70 cm ; large stones and granitic sand ; abundant aquatic vegetation, with *Ranunculus* and algae ; *Securinega tinctoria, Nerium oleander* and rushes on the banks. 25.1.1983, 5 ♂, 9 ♀, 4 exuviae, 8 larvae.

Along the road from Villanueva del Duque to Adamuz, km 30. Small temporary stream at Adamuz (30SUH654187), 480 m. Slow current in winter. Width 1 m ; depth 5-20 cm ; stones and pebbles ; abundant vegetation on the banks. 25.1.1983, 2 ♂, 3 ♀, 2 exuviae.

Arroyo de la Tolva at Villaviciosa de Córdoba (30SUH 285175), 440 m. Temporary stream with moderate current in winter. Width 0.7-4 m ; depth 10-100 cm ; granitic stones and sand ; *Ranunculus* and *Oenanthe* in the stream bed ; *Nerium oleander, Rubus* and *Fraxinus* on the banks. 26.1.1983, 2 ♂, 3 ♀.

Arroyo de Don Lucas at Córdoba (30SUH392031), 480 m. Small temporary stream with slow current in winter. Width 1 m ; depth 5-20 cm ; stones and pebbles ; very abundant vegetation on the banks, shading the stream bed. 26.1.1983, 2 ♀.

Capnioneura gelesae and C. mitis were collected together in the Rio Guadalbarbo, the Arroyo de la Tolva and the Arroyo de Don Lucas. Five species of *Capnioneura* — half of the total number for the whole genus — have now been found in the Iberian Peninsula, including the Pyrenees.

Leuctra andalusiaca Aubert, 1962.

The shape of the male epiproct (Fig. 12) shows that *L. andalusiaca* is related not only to the Corsican *L. fraterna* Morton and the Caucasian *L. delamellata* Zhiltzova but also to the *hippopus* sub-group (*L. hippopus* Kempny, *L. pseudohippopus* Rauser, *L. hippopoides* Kacanski & Zwick, *L. gallica* Aubert).

The processes of the 8 th tergite, which are united by a transverse bar in *L. andalusiaca, L. fraterna* and *L. delamellata*, are independant in the *hippopus* sub-group. Since some Caucasian and Central European *Leuctra* with united processes, such as *L. alpina* Kühtreiber, have a more primitive epiproct, the fusion of the processes represents the ancestral state and their separation the derived one. The *hippopus* sub-group arose from a lineage whose remnants (*L. andalusiaca, L. fraterna* and *L. delamellata*) have survived in Mediterranean and Caucasian refuges.

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