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The larvae of *Polycentropus corniger* McLachlan, 1884 and *Polycentropus intricatus* Morton, 1910

(Insecta, Trichoptera, Polycentropodidae, Polycentropodinae)

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The fifth instar larvae of *Polycentropus corniger* McLachlan, 1884, and *P. intricatus* Morton, 1910 are described for the first time and the main taxonomic characters are figured. These larvae are easily distinguished from those of the remainder Iberian species of the genus by some differences in the head colour pattern, protarsal length, and angle of the anal claws. Additionally, some notes on distribution and ecological preferences are included.

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Introduction

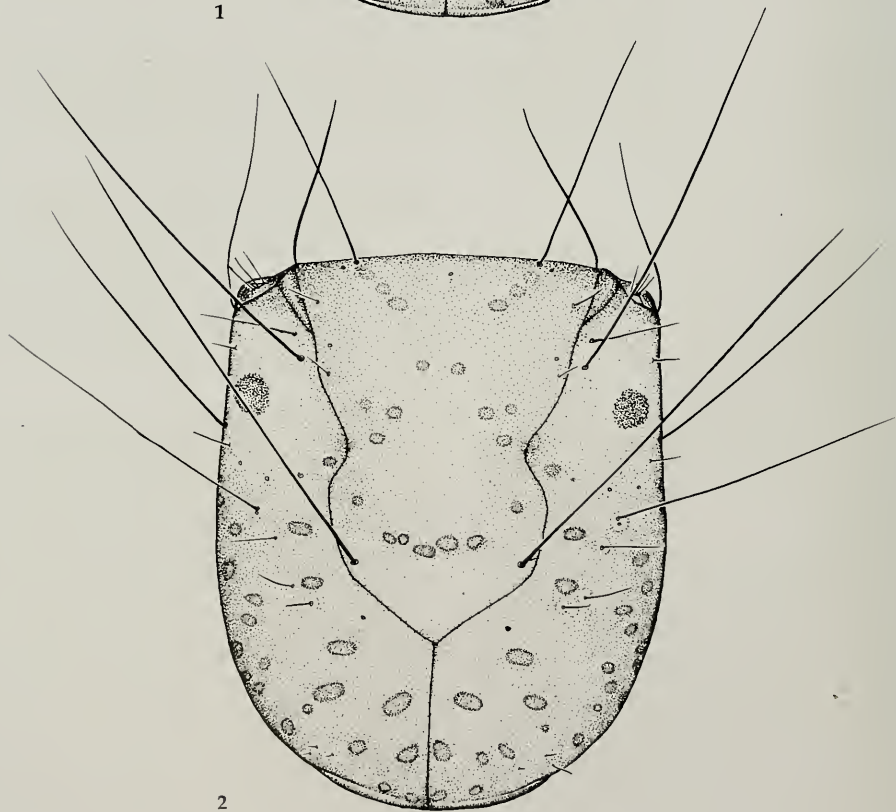
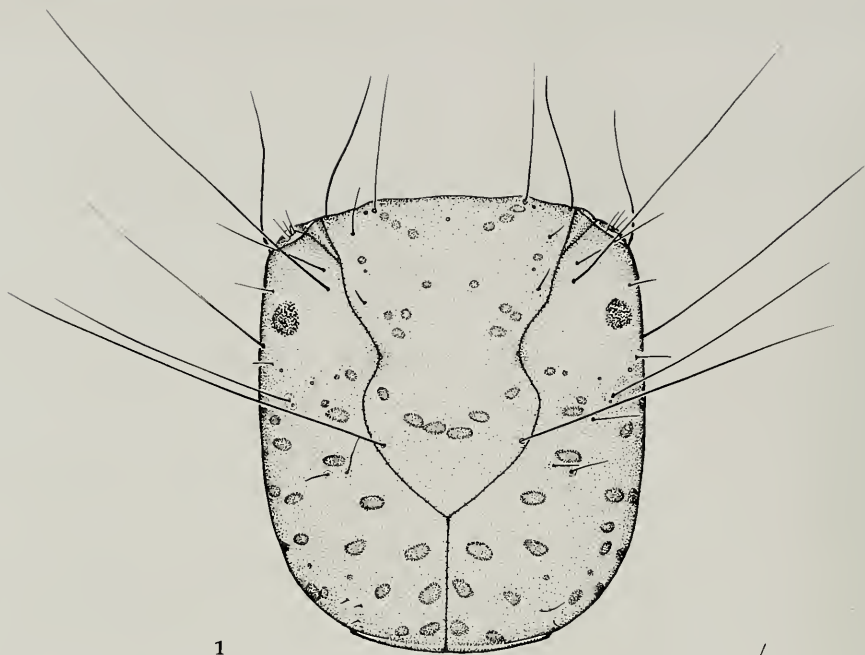
According to González et al. (1992) and Terra (1994), the Polycentropodidae are represented in the Iberian Peninsula by four genera: *Cyrnus* Stephens, 1836, *Plectrocnemia* Stephens, 1836, *Polycentropus* Curtis, 1835, and *Pseudoneureclipsis* Ulmer, 1913. Nevertheless, it should be noted that, in a recent paper, Tachet et al. (2001) noted difficulties placing *Pseudoneureclipsis* in Polycentropodidae, and Li et al. (2001) concluded that *Pseudoneureclipsis* should be removed from Polycentropodidae and placed in Dipseudopsidae.

The protarsi and anal claws are used by Edington (1964) to separate the last instar larvae of *Polycentropus* from those of other British Polycentropodidae. *Cyrnus* larvae have always four blunt teeth on the inside margin of the anal claw which are absent in *Polycentropus* larvae. Besides this, protarsi are about the same length as the tibiae in *Plectrocnemia* larvae while they are less than half the length of the tibiae in the last instar larvae of almost all *Polycentropus* species (about two thirds of the tibial length in *P. corniger*). Moreover, the cephalic capsule is narrower (in relation to its length) in *Polycentropus*

than in *Plectrocnemia* larvae.

According to González et al. (1992) and Terra (1994), seven *Polycentropus* species were noted from the Iberian Peninsula: *P. corniger* McLachlan, 1884, *P. flavomaculatus* (Pictet, 1834), *P. intricatus* Morton, 1910, *P. irroratus* Curtis, 1835, *P. kingi* McLachlan, 1881, *P. telifer* McLachlan, 1884, and *P. terrai* Malicky, 1980.

The main larval diagnostic characters of *P. flavomaculatus* were presented (among other authors) by Lestage (1921), Bournaud et al. (1964), Lepneva (1964), Hickin (1967), Steinmann (1970), Moretti (1983), Sedláč (1985), Pitsch (1993), Edington & Hildrew (1995), and Waringer & Graf (1997). Larval characters of *P. irroratus* (previously described as *P. multiguttatus* Curtis, 1835) are available in the papers of Bournaud et al. (1964), Edington (1964), Hickin (1967), Moretti (1983), Sedláč (1985), Pitsch (1993), Edington & Hildrew (1995), and Waringer & Graf (1997). Wallace & Wallace (1983) include also some notes on this species. Finally, the main larval diagnostic characters of *P. kingi* were described or illustrated in the papers of Moretti (1983), Edington (1964), Hickin (1967), Pitsch (1993), Edington & Hildrew (1995), and Waringer & Graf (1997).



Figs 1-2. Head capsule, dorsal view (last instar larva). 1. *P. corniger* McLachlan. 2. *P. intricatus* Morton.



Figs 3-6. Prothoracic leg (tibia, tarsus and tarsal claw) and anal claw of the last instar larva. 3-4. *P. corniger* McLachlan. 5-6. *P. intricatus* Morton.

The immature stages of the remaining four species are unknown. In this paper we describe the last instar larvae of *P. corniger* and *P. intricatus*.

Material and methods

Material studied: 22 larvae and one mature pupa of *P. corniger*; 68 larvae and 8 mature pupae of *P. intricatus*, all from several localities of Galicia (NW Spain).

Field collected pupae were used for the specific determination of the aquatic stages, larval exuviae from mature pupae with distinct genitalia were examined thereby ensuring the association between larval and adult specimens.

The main diagnostic characters used to distinguish the *Polycentropus* species larvae (cf. Wallace & Wallace, 1983) are related to the cephalic pigmentation, the pro-tarsi/protibiae length ratio, and the angle of the anal claws.

For the description of the larval characters, we have adopted the terminology used by Williams & Wiggins (1981) and Edington & Hildrew (1995).

Results

Polycentropus corniger McLachlan, 1884 Figs 1, 3, 4

Description of the last instar larva

Larval length up to 14-15 mm (N=7).

Head (Fig. 1). Mean length: 1.70 mm; mean width: 1.51 mm (N=7). Head light brown, with a uniform colour (without dark bands nor marked discontinuities of pigment); area around the eyes and ventral side of the head even lighter. Muscle attachment spots of dark colour and clearly defined on dorsum, lateral areas and posterior area of genae. The posterior muscle attachment spots of the frontoclypeal apotome lie ahead of the posterior setal alveoli (seta 6). The setae 6, 9 and 14 are the longest of the head capsule.

Labrum concolorous with head dorsum and without median dark spot in the posterior margin. Mandibles with a sharp apical tooth and with 3 teeth in both dorsal and ventral blades. Left mandible with a group of indented setae in the concavity.

Thorax. Pronotum concolorous with head, anterior third lighter than the posterior two thirds. Meso- and metadorsum with one seta in sa1, three in sa2

and two setae in sa3. The prothoracic tarsi (Fig. 3) are about two thirds of tibial length. Lower distal end of the tarsus with well developed and numerous pectinate setae.

Abdomen. Typical of the genus. Lateral line in segment I composed by two long, dark setae and one small, transparent seta. Segments II-VIII with a lateral line of long dark setae, mainly inserted in the anterior and posterior thirds of the segment.

Dorsum of segment IX with two very small sclerites in posterior position, each with two tiny setae and a long, black seta inserted posteriorly. The anal claw (Fig. 4) is right-angled.

Discussion. Among the Iberian *Polycentropus* species, *P. corniger* is differentiated by having a relatively long protarsus. Thus, the tarsus of *P. corniger* clearly exceeds half the length of the respective tibia (Fig. 3), attaining about $\frac{2}{3}$ of the tibial length. The protarsi of the remaining Iberian species of the genus (cf. Fig. 5) are, at most, twice the length of the tibiae. Nevertheless, it should be noted that, according with some drawings (see Pitsch 1993, p. 208, and Waringer & Graf 1997, p. 107, fig. 8), the protarsus of *P. irroratus* is almost as long as half the length of the tibia. Moreover, the cephalic capsule of *P. irroratus* (cf. Pitsch 1993, Edington & Hildrew 1995, Waringer & Graf 1997) and *P. corniger* are very similar in colour. However, the anal claw of *P. irroratus* is obtuse-angled (cf. Wallace & Wallace 1983, Waringer & Graf 1997), whereas it is right-angled in *P. corniger* (Fig. 4).

Polycentropus intricatus Morton, 1910

Figs 2, 5, 6

Description of the last instar larva

Larval length up to 18.2-19.5 mm (N=20).

Head (Fig. 2). Mean length: 2.07 mm; mean width: 1.77 mm (N=20). Square, slightly wider at the posterior part and with conspicuous muscle attachment spots. Ground colour of the head dorsum light brown, with pale areas around the eyes and setal alveoli. Posterior part of the frontoclypeal apotome (behind the muscle attachment spots) paler than the ground colour of the head, and frontal area with a pale Y-shape area. Ventral side of the head of light colour, with clearly visible spots in the posterior part of the genae, near the occipital foramen.

Labrum concolorous with head dorsum, with a median dark spot in the posterior margin. Mandibles with a sharp apical tooth and with 3 teeth in the ventral blades. The dorsal blade bears 3 teeth in the left mandible while only 2 in the right. Left mandi-

ble with a group of indented setae in the concavity.

Thorax. Pronotum lighter than head, with dark muscle attachment spots. Prothoracic tarsus (Fig. 5) less than half length of the tibia.

Abdomen. Lateral line with 22-30 setae per segment, except segment I, with only two setae in this position. Dorsum of the abdominal segment IX similar to that of *P. corniger*. The anal claw (Fig. 6) is obtuse-angled.

Discussion. The uniform background colour of the head capsule of *P. intricatus* is very similar to that of *P. corniger* and *P. irroratus*; by contrast, the head capsule of *P. kingi* and *P. flavomaculatus* are distinctly banded (cf. Pitsch 1993, Edington & Hildrew 1995, Waringer & Graf, 1997). The anal claw of *P. intricatus* (Fig. 6) is, as in *P. irroratus* and *P. kingi*, obtuse-angled. As remarked above, the head colour patterns of *P. kingi* and *P. intricatus* are very different, but some difficulties may be encountered in separating the larvae of *P. intricatus* from those of *P. irroratus*. The frontoclypeal apotome of *P. irroratus* is very uniformly pigmented whereas two lighter areas can be distinguished in the apotome of *P. intricatus*: an area behind the posterior muscle attachment spots and a median Y-shaped area (Fig. 1). Moreover, in *P. irroratus* larvae, the frontoclypeal arc of spots lie behind the posterior setal alveoli (cf. Wallace & Wallace 1983, Edington & Hildrew 1995) while in *P. intricatus* it lies ahead these setal alveoli (frontoclypeal seta 6). Finally, in *P. irroratus*, and according to the papers of Pitsch (1993) and Waringer & Graf (1997), and the drawings of Bournaud et al. (1964) and Edington & Hildrew (1995), the width of the third big muscle spot (on parietals, near frontoclypeal vertex), is similar to the distance from the spot to the nearest frontoclypeal suture. By contrast, in *P. intricatus*, this distance is twice the width of the spot.

Notes on biology, ecology and distribution

P. corniger has been reported mainly from the upper part of streams and mountain brooks (Terra 1981, Basaguren 1990). The species was always found in clean, oxygenated waters, being intolerant with organic pollution (Basaguren 1990). The larvae were reported from low altitude streams of Pyrenees, below 460 m a.s.l. (Décamps 1967); in Galicia, they were collected in fast flowing streams at 180-300 m a.s.l.

The larvae of *P. intricatus* live preferably in brooks and small mountain streams, from 500 to 2000 m a.s.l. (Décamps 1967, 1968). In Galicia they were reported mainly from the western montane

localities (160-1350 m a.s.l.) where its flight period extends, as in Pyrenees (Décamps 1967), from July to September (González 1988).

The flight period of *P. corniger* extends from June to September in Portugal (Terra 1981), from June to August in Biscay, N Spain (Basaguren 1990), from July to September in Pyrenees (Décamps 1967) and from July to August in Galicia (González 1988).

P. corniger has been reported from the Iberian Peninsula and Pyrenees (González et al. 1992, Terra 1994) and, according to some scattered references, also from central Europe (see Pitsch 1993). In the Iberian Peninsula it is widely distributed, but the species was cited mainly from the NW quarter.

P. intricatus is widely distributed throughout SW Europe and, in the Iberian Peninsula, it was only cited from the northern half (González et al. 1992, Terra 1994).

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