

SPIXIANA	24	2	141–146	München, 01. Juli 2001	ISSN 0341–8391
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The larva of *Hydropsyche urgorrii* González & Malicky, 1980

(Insecta, Trichoptera, Hydropsychidae)

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Vieira-Lanero, R., M. A. González & F. Cobo (2001): The larva of *Hydropsyche urgorrii* González & Malicky, 1980 (Insecta, Trichoptera, Hydropsychidae). – *Spixiana* 24/2: 141–146

The larva of the hitherto unknown Iberian endemic species *H. urgorrii* González & Malicky, 1980 is described for the first time and compared with other known similar Iberian species. The most important features are illustrated and some zoogeographical and ecological notes are included.

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Introduction

According to González et al. (1992) the genus *Hydropsyche* is represented in the Iberian Peninsula by 17 species. Subsequently, Botosaneanu (1999) described *H. lagranja* Botosaneanu, 1999, from Segovia (Centre of Spain) and González & Malicky (1999) described *H. iberomaroccana* (previously cited as *H. cf. punica*: see González et al. 1992) from several localities of southern Spain. Moreover, Malicky (1999) carried out a review of the European species of the *pellucidula*-group (with a wide representation of specimens from Spain) concluding that the Iberian specimens traditionally identified as *H. pellucidula* (Curtis, 1834) belongs, in all probability, to *H. incognita* Pitsch, 1993.

Therefore, 18 *Hydropsyche* species are known at this moment from the Iberian Peninsula: *H. acinoxas* Malicky, 1981; *H. ambigua* Schmid, 1952; *H. brevis* Mosely, 1930; *H. bulbifera* McLachlan, 1878; *H. contubernalis* McLachlan, 1865; *H. dinarica* Marinkovic, 1979; *H. exocellata* Dufour, 1841; *H. iberomaroccana* González & Malicky, 1999; *H. incognita* Pitsch, 1993; *H. infernalis* Schmid, 1952; *H. instabilis* (Curtis, 1834); *H. lagranja* Botosaneanu, 1999; *H. lobata* McLachlan, 1884; *H. modesta* Navás, 1925; *H. pictetorum* Botosaneanu & Schmid, 1973; *H. siltalai* Döhler, 1963; *H. teruela* Malicky, 1980; *H. tibialis* McLachlan, 1884; and *H. urgorrii* González & Malicky, 1980.

In the last years, several papers have been published about the larval taxonomy of the European species of this genus (see discussion), and some of these were exclusively devoted to the larvae of some Iberian species (Millet 1983, García de Jalón 1981, 1983, Zamora-Muñoz et al. 1995). So, at this moment it is possible to identify almost all the larvae of the Iberian *Hydropsyche* species, and only the larvae of three Iberian species are unknown: *H. acinoxas*, *H. lagranja* and *H. urgorrii*. These three species are endemic and belong to the *pellucidula*-group. The last instar larva of *H. urgorrii* is described in this paper for the first time.

Material examined and methods

A great number of specimens (346 larvae) of *H. urogorii* have been collected from several sample sites of Galicia (NW Spain). For the specific determination of the aquatic stages, 6 larval exuviae collected from mature pupae with distinct genitalia were examined thereby ensuring the association between larval and adult specimens.

We have adopted in this paper the terminology of the larval characters used by Bournaud et al. (1982), Boon (1978) and De Pietro (1999).

Description of the final instar larva

Mean body length 17 mm (range 16-20 mm, N=22).

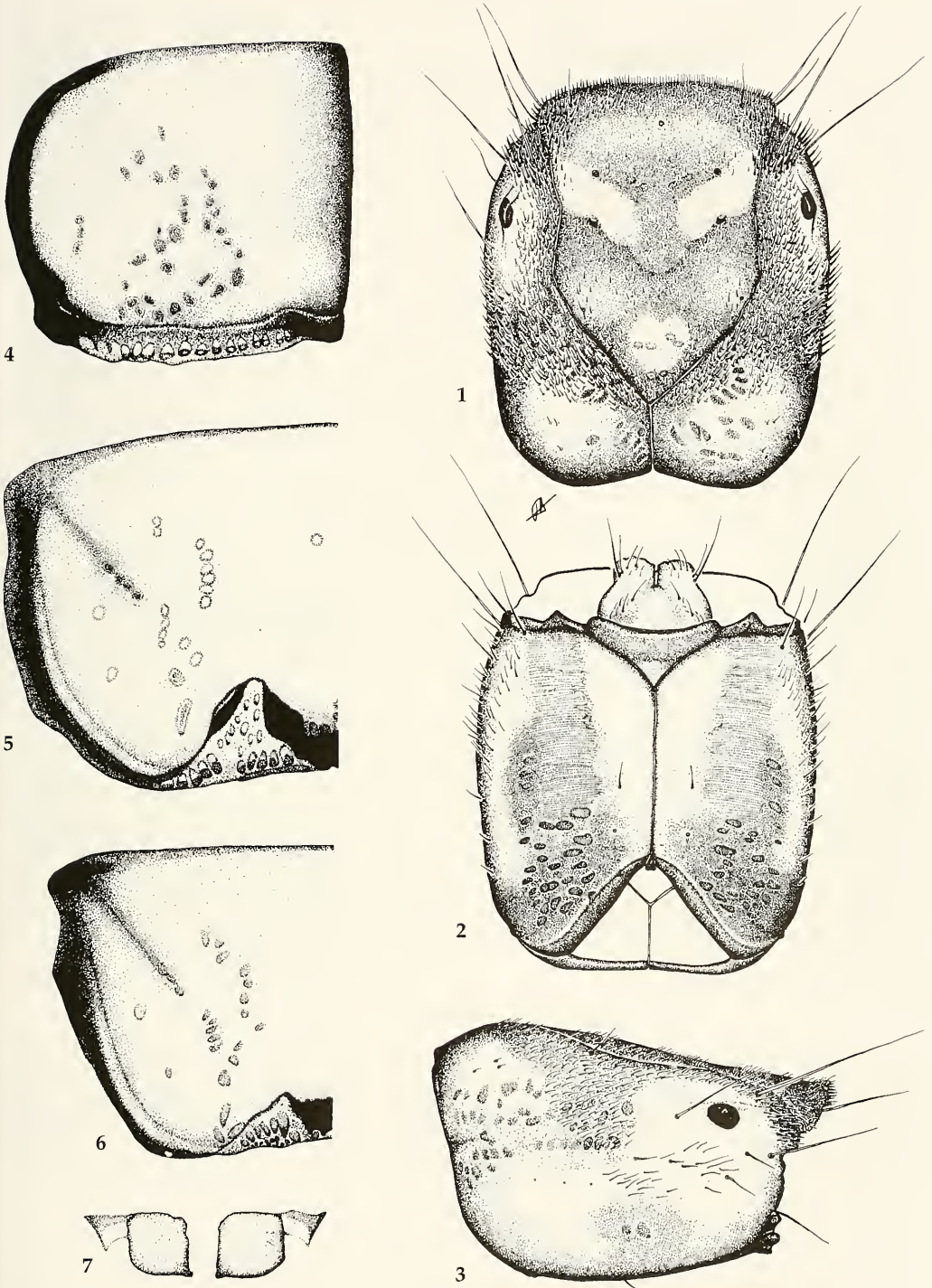
Head capsule (Figs 1-3). Almost square in dorsal view, slightly wider at eye level. Mean head length 2.1 mm (range 1.9-2.4 mm, N=22); mean head width 1.8 mm (range 1.6-2.1 mm, N=22).

The colour pattern (Fig. 1) is quite distinctive: ground colour of the head dorsum dark brown, with light spots on the frontoclypeal apotome, and a posterior, light oval area on each parietal and around the eyes. Lateral view with a light, longitudinal band, as in Fig. 3. Head pale brown in ventral view (Fig. 2), with a dark brown stridulatory band on each gena reaching the oral margin of the head. Muscle attachment spots ill-defined. Frontoclypeal apotome (Figs 1, 12) roughly pentagonal in shape. Anterior edge straight, slightly crenulate and similar in width to the posterior third. Lateral margins slightly narrower, posterior margins concave and the posterior tip pointed. Epistomal sulcus ill-defined but tentorial pits distinct; often with four muscle attachment spots on the surface, ahead of tentorial pits, and over 6 lighter spots on the posterior, rounded area. There is a characteristic light, rounded area, near the posterior tip (the "median portion aboral light spot"), and two light bands just under epistomal sulcus (the "lateral light spots"); sometimes two ill-contrasted lateral areas can also be distinguished on the epistomal sulcus (the "lateral portion aboral light spot"). A light transverse ill-defined oral area (more noticeable when the apotome is isolated) joins the bands below epistomal sulcus in some specimens (the "oral light spot"). Lateral arms of submentum (Fig. 13) long, narrow, enlarged slightly at apex. Anterior margin black brown; posterior apex lighter.

Oral pieces (Figs 8, 10, 11). Labrum (Fig. 10) elliptical in dorsal view; the dark colour of the anterior half extends to the posterior edge as a narrow central band. Labrum surface covered with numerous short setae, with small bristles between them and with well-developed lateral brushes. Six primary setae can be recognised. Mandibles (Fig. 8) roughly triangular, dark brown in colour. Left mandible with an apical and subapical tooth on dorsal blade, ventral blade with an apical and four subapical teeth, the basal subapical tooth short, rounded triangular, with a brush of long, spiny setae in the concavity, above basal tooth. Right mandible with a single tooth on dorsal blade and a obliquely row of small setae dorsally, on the tooth; ventral blade with an apical and three subapical teeth; the basal subapical tooth very short and rounded triangular. Laterally, on each mandible, there is a deep ridge with 18-24 hyaline setae and some shorter setae inserted between them. Mentum as in Fig. 11; chestnut brown in colour, setae grouped on each apical lobe and in an oblique line on each posterolateral corner; the anterior margin of each apical lobe is rounded and the median channel is straight-sided.

Thorax (Figs 4-7). Pro-, meso- and metanotum (Figs 4-6) lighter than head. Meso- and metanotum lighter than pronotum. Sclerites with a dense covering of short and strong setae ("scale-like" setae) and even shorter pointed setae between them. Anterior margin with numerous fine setae. Pronotum with a rather wide dark dorsal longitudinal band. Each hemipronotum (Fig. 4) subquadrangular in shape. Meso- and metanotum of uniform colour. The medial regions of the posterior prosternites (Fig. 7) are strongly pigmented and irregularly squarish; lateral regions lighter in colour, less distinct than the medial regions and fused with them. Protochantin (Fig. 9) with numerous setae along ventral portion, dorsal portion downturned apically.

Abdomen. Abdominal segments I-VII with ventral gills.



Figs 1-7. *H. ugorrii* (last instar larva). 1. Head capsule, dorsal view. 2. Head capsule, ventral view. 3. Head capsule, lateral view. 4. Hemipronotum, left half. 5. Mesonotum, left half. 6. Metanotum, left half. 7. Prosteronites.

Discussion

We can use several larval keys for the specific identification of the European species of the genus *Hydropsyche* (e.g. Lepneva 1964, Hickin 1967, Sedlák 1971, Hildrew & Morgan 1974, Szczesny 1974, Statzner 1976, Verneaux & Faessel 1976, Boon 1978, Wiberg-Larsen 1980, Edington & Hildrew 1981, Bournaud et al. 1982, Moretti 1983, Bongard 1990, Pitsch 1993, Waringer & Graf 1997, De Pietro 1999), and for the North African species (e.g. Dakki & Tachet 1987). However, some of them may be only partially valid and serious mistakes might result from using these keys in the Iberian Peninsula.

Regarding the Iberian species of *Hydropsyche*, the larval keys of García de Jalón (1981) and Millet (1983) include only some of the Iberian species but an updated key has been recently reported by Zamora-Muñoz et al. (1995), including the first larval description of five endemic species. Thus it is possible to use this key as a starting point for this work. When using the key of Zamora-Muñoz et al. (1995), larvae of *H. urgorrii* will key out under couplet 15: the characteristics of the frontoclypeal apotome disagree with those of *H. dinarica* and *H. lobata*. The width of anterior edge of the frontoclypeal apotome of *H. dinarica* is roughly similar to the width of the posterior third (cf. García de Jalón 1983, Klima 1989, Waringer & Graf 1997, De Pietro 1999); the posterior margins are not concave, the epistomal sulcus is not distinct and the lateral light spots under it are rounded, and some specimens have an ill-defined median portion aboral light spot similar to that of *H. urgorrii* but fainter. Moreover, larval size of *H. dinarica* is greater than that of *H. urgorrii*.

The frontoclypeal apotome of *H. lobata* is very much alike to that of *H. urgorrii* but the former has a rounded posterior tip and a distinct curved edge – very conspicuous in lateral view – across the cibarian muscle attachment spots (cf. García de Jalón 1983) that is lacking in *H. urgorrii*. Moreover, the lateral portion aboral light spots of *H. lobata* are ill-defined and the colour of the posterior prosternites is also different (cf. fig. 2b in Dakki & Tachet 1987): the lateral regions are lighter than the medial ones in *H. urgorrii* but concolorous with them in *H. lobata*.

The frontoclypeal apotome of some specimens of *H. urgorrii* is very similar in colour to that of *H. brevis* (see fig. 3 in Zamora-Muñoz et al. 1995), but the posterior tip is not rounded and the lateral margins are narrower in *H. urgorrii*; moreover, the coloration of the ventral part of the head and thoracic sclerites is also different.

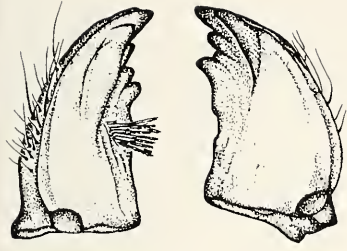
Among the eight *Hydropsyche* species with an overlapped distribution area with *H. urgorrii* (*H. ambigua*, *H. dinarica*, *H. exocellata*, *H. instabilis*, *H. lobata*, *H. incognita*, *H. siltalai* and *H. tibialis*) only the frontoclypeal apotome of *H. ambigua*, *H. dinarica* and *H. lobata* can be confused with that of *H. urgorrii*. We have already discussed the differences regarding *H. dinarica* and *H. lobata*; the larva of *H. ambigua* has been described by Zamora-Muñoz et al. (1995) and can be clearly distinguished from that of *H. urgorrii* by the shape of the frontoclypeal apotome (the lateral margins are more or less straight up to the epistomal sulcus, the posterior margins are roughly convexe and the posterior third is similar in width, or even wider, than the anterior margin), the colour pattern of this sclerite (with two rounded lateral light spots only and with a central, ill-defined, central spot, above them) and the triangular shape of the submentum (the lateral arms are short and broad).

Habitat and distribution

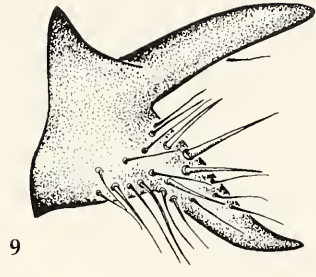
H. urgorrii is an endemic species of the Iberian Peninsula, where it is confined to the north-western quarter. In this area, some adults of this species have been recorded from many localities of Galicia and the north and centre of Portugal (González 1988, González et al. 1992, Terra 1994) from 15 to 500 m a.s.l. The typical habitat of this species consists of small and medium waterbeds where the larvae were found in rapidly flowing stream areas with pebbles and small rocks. In Galicia, *H. urgorrii* larvae in instars IV were present from late October to March and adults were recorded from late March to May.

Acknowledgements

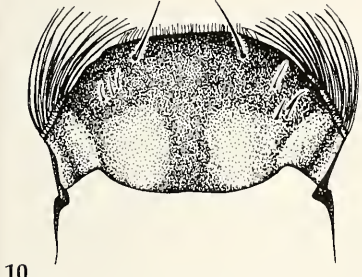
We wish to thank Dr. J. Waringer who kindly provided us with specimens of *H. incognita* from central Europe. This research was supported by XUGA 20005B98 of Xunta de Galicia.



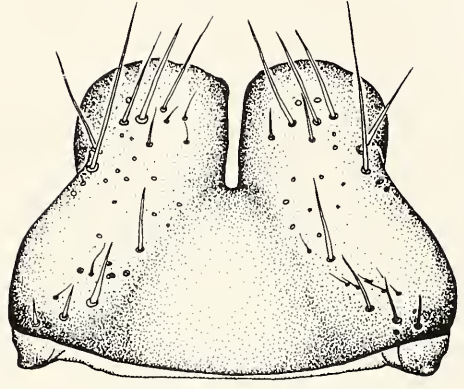
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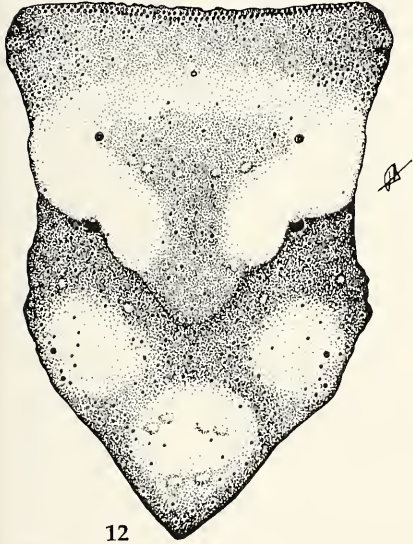
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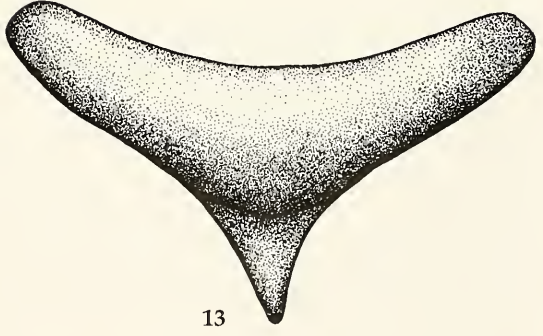
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Figs 8-13. *H. urgorrii* (last instar larva). 8. Mandibles, dorsal view. 9. Right protochantin, external view. 10. Labrum, dorsal view. 11. Mentum. 12. Frontoclypeal apotome, dorsal view. 13. Submentum.

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Zeitschrift/Journal: [Spixiana, Zeitschrift für Zoologie](#)

Jahr/Year: 2001

Band/Volume: [024](#)

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Artikel/Article: [The larva of *Hydropsyche urgorrii* Gonzalez & Malicky, 1980 \(Insecta, Trichoptera, Hydropsychidae\) 141-146](#)