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Description of a new species of *Wormaldia* (Trichoptera, Philopotamidae) from Italy

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With 1 figure

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A new species of the Genus *Wormaldia* (Trichoptera, Philopotamidae) is described. *Wormaldia cianficconiae* sp. n. is an endemic of the Abruzzo Apennines in central Italy. It differs significantly from other related species, especially through the shape of segment X and the characteristic spines on the aedeagus.

1 Introduction

The Mediterranean area is a flora and fauna biodiversity hot-spot with a high number of invertebrate endemics (Vitecek et al. 2015).

In Europe, there are currently 54 known species in the genus *Wormaldia*. Most are widely distributed but several apparently highly endemic species have also been described (Graf et al. 2008, Martínez-Menéndez and González 2011, Vitecek et al. 2015). Aquatic stages of the genus, with few exceptions, prefer crenal and rhithral sections of alpine to lowland streams. The larvae are caseless and behave as passive filter feeders using characteristic nets (Graf et al. 2008). Species in the genus exhibit characteristic male genitalia but also comparatively high variability, particularly of the phallic structures (Malicky 2004, Martínez-Menéndez and González 2011, Neu 2015), resulting in the description of several subspecies. In this paper, a new species of *Wormaldia* is described.

2 Material and methods

As part of my research on *Wormaldia occipitalis* Pictet, 1834, Dr Omar Lodovici sent me 51 samples of *Wormaldia* from the collections of the Museo di Scienze Naturali di Bergamo. All these specimens had been determined as *Wormaldia occipitalis* Pictet, 1834. During my examination of this material, I found 15 males and 3 females (in 5 samples) which could not be assigned to any previously described species of *Wormaldia*. All had been collected in the years 1991 and 1992 by P. Capoccia and were labelled with the locality as "Italy, Lazio-Rieti, Cittareale, Sorg. Velino loc. Cupello".

The specimens were stored in ethanol and some males were examined after being cleared in KOH. Illustrations were prepared using a digital camera (Canon EOS 600D) on a binocular (Nikon SMZ 1000). The structures of the aedeagus were examined with a microscope at 100x magnification. Layer shots were taken, which were combined with the software Helicon Focus into a sharp image. The structures were then drawn in Corel Draw.

3 Taxonomy

Wormaldia cianficconiae sp. n.

Material examined. Holotype male: Italy, Lazio-Rieti, Cittareale, Sorg. Velino loc. Cupello; 42.6190N, 13.1530E; 980 m a.s.l.; 25.10.1992; leg. P. Capoccia; paratypes: 3 males, same date and same place. The specimens are currently in coll. P. J. Neu; all will be returned to the Museo di Scienze Naturali di Bergamo.

Type locality. Italy, Abruzzo Apennines.

Diagnosis. Morphology of the male terminalia suggests placement of the new species in Wormaldia. The species is unique in the European Trichoptera fauna and is differentiated from Wormaldia occipitalis Pictet, 1834 and Wormaldia subterranea Radovanovic, 1932 by the combination of the following characters: (1) in lateral view, a distinct hump in the middle of segment X before the saddle-shaped depression in the distal half, (2) aedeagus without long, needle-like spines, but with a diffuse group of about 25 short spines, two groups of 4-8 long spines and three or four strong thorns.

Description of males

Habitus yellowish-brown, head light brown, thoracic segments light brown, sclerites and tergites yellow to yellowish brown; abdominal segments yellowish-brown, outer edge of the tergites dark brown; legs yellowish brown. Forewing length 6.5 mm; wing membrane yellowish, clear and transparent, occasionally in the area of the pterostigma yellowish-turbid. Since all the investigated animals had been stored in ethanol for more than 25 years, fresh specimens may be a bit darker.

Male maxillary palp 5-segmented. Spur formula 2–4–4 in males.

Male genitalia (Fig. 1A–G). Dorso-distal end of tergite VIII rounded in lateral view, extended only slightly distally (Fig. 1A, B); twice as wide as long in dorsal view, with a weak excision at the distal end (Fig. 1B). Dorso-distal end of segment IX rounded in lateral view or cut off obliquely (Fig. 1C); segment IX in ventral view with a triangular excision at the distal end (Fig. 1D). Superior appendages in lateral view rounded at the distal end (Fig. 1E). Segment X in lateral view with a distinct dorsal hump in the middle (Fig. 1F). Coxopodite subovate in lateral view (Fig. 1G). Harpago slight in lateral view, half as high and not quite as long as the coxopodite (Fig. 1G).

Invaginated phallus without needle-shaped spikes between the phallic tip (Fig. 1a) and the first group of short thick spines (Fig. 1c), as found in Wormaldia occipitalis or W. subterranea (Neu 2015). The first group consists of 20 - 25 unordered thorns (Fig. 1c), followed by a paired group of 3 - 6 longer spines each (Fig. 1 d). Then, there are 3 - 4 strong and long spines (Fig. 1 e), which occur later in the evaginated aedeagus in its basal part.

Females cannot be distinguished from related species, larva are unknown.

Etymology. The species is named after our esteemed colleague Fernanda Cianficconi, Perugia, Italy, for her continued research on the Trichoptera, which has led to many new discoveries in the Italian caddisfly fauna.

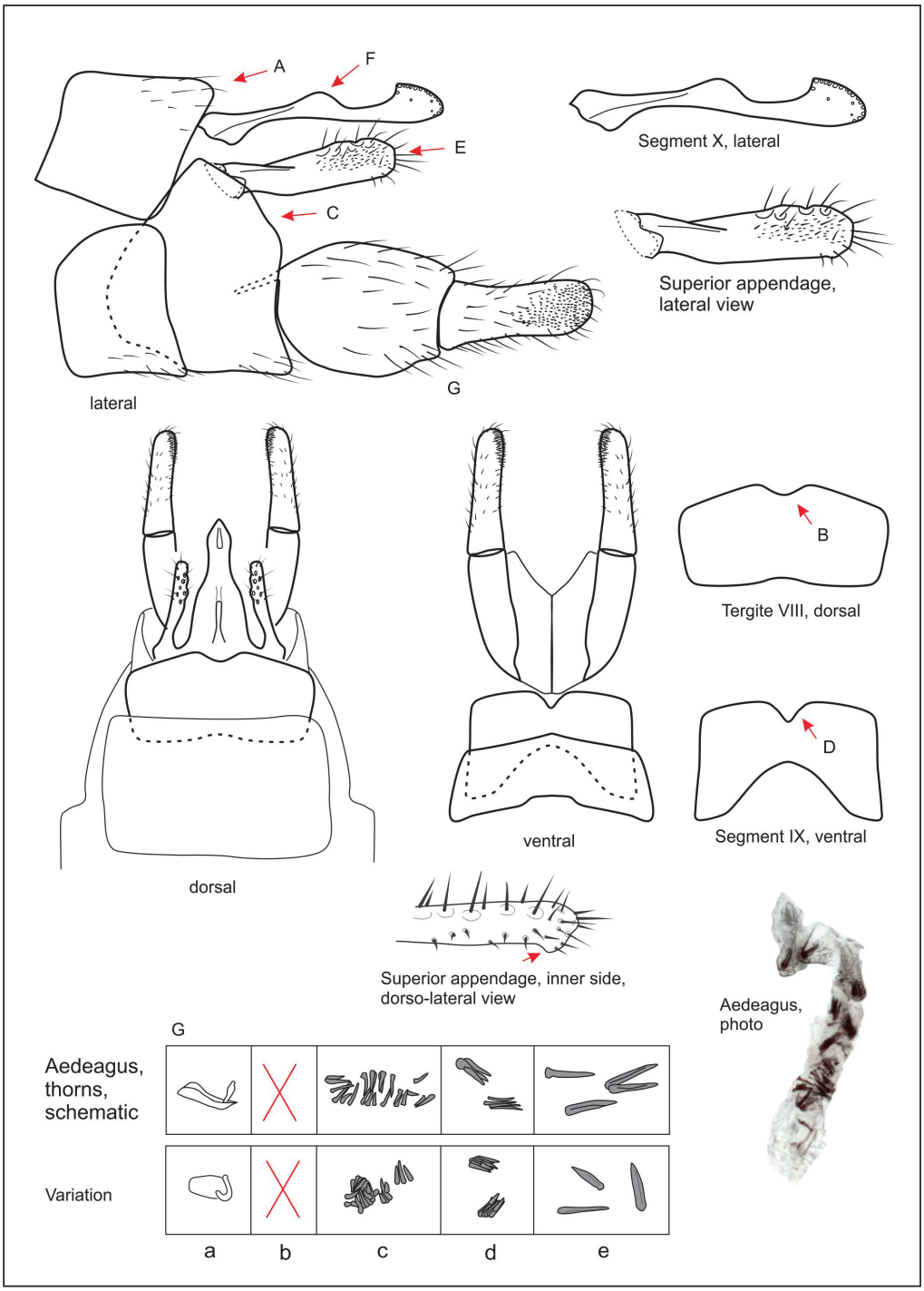

Fig. 1: *Wormaldia cianficconiae* sp. n. A = dorso-distal end of tergite VIII, lateral, B = dorso-distal end of tergite VIII, dorsal, C = dorso-distal end of segment IX, lateral, D = segment IX in ventral view, E = superior appendage in lateral view, F = segment X in lateral view
G: Aedeagus thorns, schematic. a = phallic tip, b = missing needle like spines, c = groups of short and thick thorns, d = paired group of short thorns, e = strong and long spines

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