

A NEW SPECIES OF *HYDROPTILA*  
(TRICHOPTERA: HYDROPTILIDAE)  
FROM NORTH CAROLINA

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*Abstract.*—Adult specimens of a previously unknown member of the *tineodes* species group of *Hydroptila*, were reared from pupae collected from a high elevation catchment located in western North Carolina. The male, female and terminal instar larva of *Hydroptila coweetensis* n. sp. are described and available biological information is given.

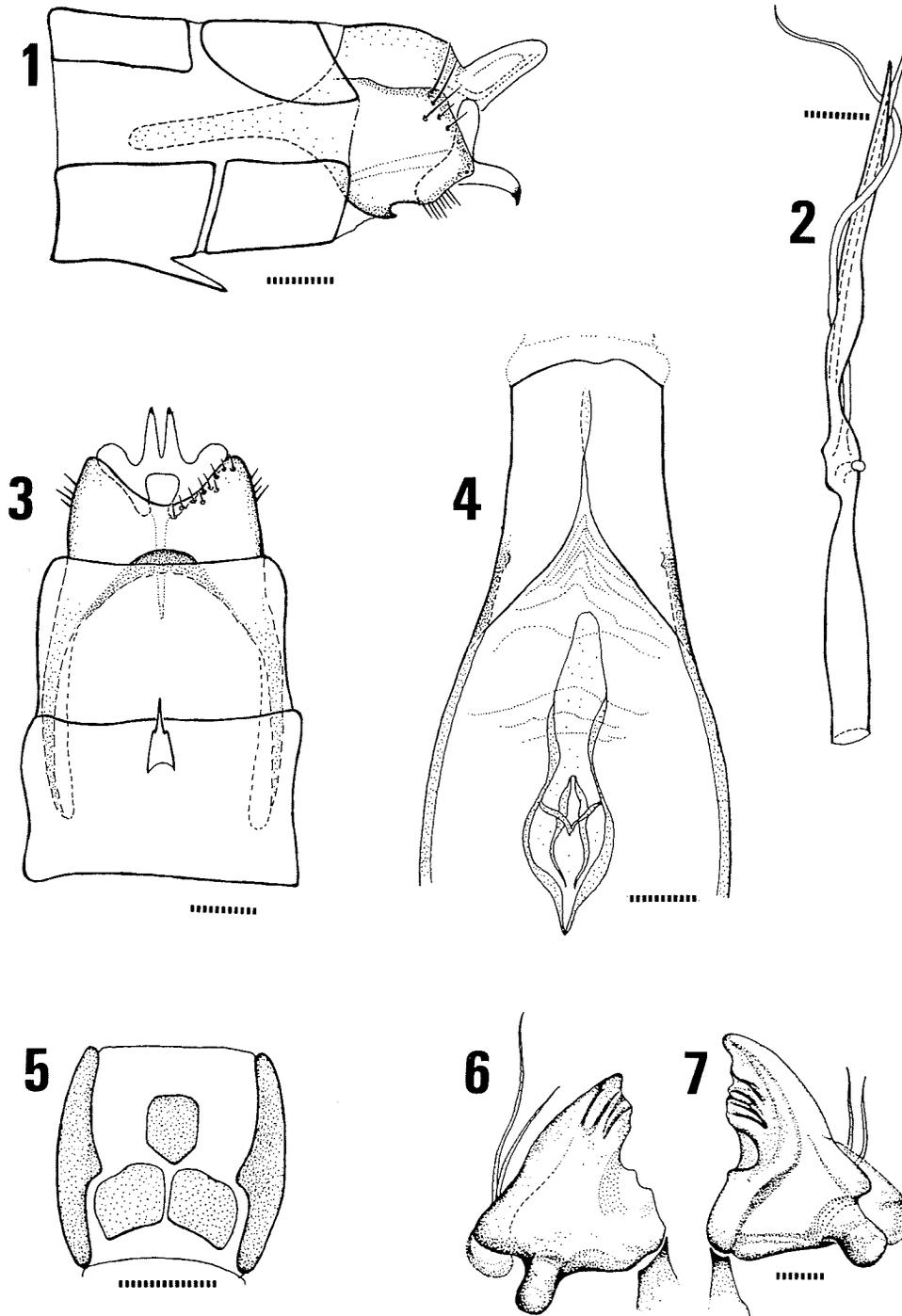
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Collections of Trichoptera from a mountain catchment located in the Coweeta Hydrologic Laboratory (Macon County, North Carolina) have resulted in the discovery of a previously undescribed species of *Hydroptila*. Adult specimens were reared from pupae collected from a madicolous granite outcrop. In this paper the male, female and terminal instar larva of *Hydroptila coweetensis* n. sp. are described and available biological information is given.

*Hydroptila coweetensis*, NEW SPECIES

Figs. 1-7

Adult male.—Generally similar to other members of *Hydroptila*. Length of forewing 2.13 mm (n = 2). Setae of wings slate gray; sclerites of body brown. Antennae 23-segmented. Cephalic scent caps well developed, occupying entire dorsum of head. Genitalia (Figs. 1-3): Abdominal sternum VII with short, acuminate posteromesal process. Abdominal sterna VII and VIII with numerous long setae along posterior margin. Abdominal segment IX; anterolaterally, with internal paired processes extending anterad to midpoint of segment VII; posterolaterally, with heavily sclerotized flange-like structures, bearing numerous setae along margins; posteroventrally, with shallow, curved emargination bearing numerous fine setae along posterior margin; dorsally, abruptly truncated at point anterad of fusion with tergite X. Abdominal tergite X largely membranous with weakly sclerotized lateral bands internally; in dorsal aspect; tapered posterad, shallowly notched apically to form a slightly asymmetrical, bilobed posterior margin; in lateral aspect, convex along dorsal margin. Inferior appendages heavily sclerotized, trilobed; posterior lobe sparsely spinulose, extending directly posterad to form a hooked beak-like structure; dorsal lobe, slightly curved, blunt apically, extending dorso-laterad to a point about  $\frac{2}{3}$  the height of abdominal segment IX; ventral lobe tapered, extending ventromesally toward posteromesal margin of abdominal segment IX. Left and right inferior appendages apparently fused at base of posterior lobe. Phallus with proximal portion simple; apical portion tapering posterad,



Figs. 1-7. *Hydroptila coweetensis* n. sp. 1, Male terminalia, lateral. 2, Phallus. 3, Male abdominal segments VII-IX, ventral. 4, Female abdominal segment VII, ventral. 5, Larval prothorax, ventral. 6, Right mandible, ventral. 7, Left mandible, ventral. [Fig. 1-5, scale line = .05 mm; Fig. 7, scale line = .01 mm].

separating into 2 filaments near apex; basally, apical portion with small lobe, spiralling  $\frac{1}{2}$  revolution; titillator long, slender, tapered, spiralling 1 complete revolution.

Adult female.—Length of forewing 2.25 mm ( $n = 1$ ). Antennae 21-segmented. Genitalia (Fig. 4): Eighth sternum simple, no setation evident, lightly sclerotized with acute, membranous emargination extending posterad from anterior margin. Eighth tergite with u-shaped reticulated area, about  $\frac{1}{2}$  the length of the sclerite, extending posterad from anterior margin. Vaginal sclerites arranged as in Fig. 4.

Due to the paucity of larval descriptions and the historical lack of characters reliable for specific diagnoses (Ross, 1944), species level characterizations of *Hydroptila* larvae are of limited use. However, since associated larval material for *H. coweetensis* is available, I offer a brief description below.

Larva.—General aspect nearly identical to the *Hydroptila* larva illustrated in Wiggins (1977, p. 133). Length 1.91–2.28 mm ( $n = 6$ ). Head; dark grey-brown with extensive pale regions surrounding eyes; mandibles (Figs. 6, 7), asymmetrical, overlapping, dentition interlocking, each mandible bearing 2 stout setae posterolaterally. The right mandible (Fig. 6), overlaps the left mandible ventrally and probably functions in scraping food particles from the substrate. This observation is supported by the extreme wear characteristic of the leading edge of the right mandibles of specimens examined ( $n = 3$ ). Thorax; notal sclerites and legs generally concolorous with head; curved transverse sulci of meso- and meta-nota, observed by Wiggins (1977) as occurring on some *Hydroptila* larva, not apparent; prothoracic sternites variable, generally sub-rectangular, collectively occupying a major portion of the venter of prothorax as indicated in Fig. 5. Abdomen; typical for terminal instar *Hydroptila*, cream colored, anal claws with 2 accessory teeth apparent. Case; typical silken purse-case (Wiggins, 1977), longest dimensions 2.46–3.08 mm ( $n = 6$ ), laterally compressed, usually covered with single layer of mica particles or, occasionally, diatom frustules.

Type material.—Holotype  $\delta$ : North Carolina, Macon County, Coweeta Hydrologic Laboratory, Experimental Watershed 27, collected as pupa 29 May 1984, emerged 13 July 1984, ADH, deposited in the United States National Museum of Natural History; Paratypes, 1  $\delta$ , 1  $\text{♀}$ , same data as holotype except emergence occurred 14 July, deposited in USNMNH ( $\text{♀}$ ) and in the collection at the University of Georgia ( $\delta$ ).

Additional material.—Same collection data as holotype, 2 pupae, 7 larvae, deposited in USNM (1 pupa, 3 larvae) and UGA (1 pupa, 3 larvae). Same locality as holotype: 23 October 1983 (1 larva); 21 November 1983 (1 larva); 19 May 1984 (1 larva).

Remarks.—Various structures of the male terminalia of *H. coweetensis*, notably the inferior appendages, abdominal segment IX and tergite X, indicate close affinity with members of the *tineodes* species group (Marshall, 1979). Among the members of this species group, *Hydroptila coweetensis* is most similar to *H. amoena* Ross, *H. metoeca* Blickle & Morse and *H. remita* Blickle & Morse. It can easily be distinguished from the latter taxa by the lack of a long, sinuous median process on abdominal sternite VII (e.g., Ross, 1944, fig. 513 E).

#### HABITAT AND BIOLOGY

Terminal instar larvae and pupae of *H. coweetensis* were collected 29 May 1984 from a bare granitic outcrop [elevation = 1184 m (3885 ft)] over which a thin

film (<0.5 cm) of water was flowing. Pupae placed in a laboratory incubator (11°C) yielded adults about 45 days later (13–14 July). In situ, pupal cases were laterally appressed to the rock surface with 3–4 corners of each case anchored to the substrate with silken bands.

Observations at the time of collection and subsequent scrapings of the rock surface from which larvae of *H. coweetensis* were collected, indicated that no filamentous green algae were present. However, the filamentous blue green alga, *Oscillatoria*, an unidentified unicellular colonial green alga, and diatoms were present. The apparent lack of any filamentous green algae in the larval habitat of *H. coweetensis* and the wear pattern of the leading edge of the right mandible (Fig. 6) indicated that this species feeds by scraping periphyton from rock surfaces. This observation was supported conclusively by gut analyses performed on field preserved specimens. Although the guts of two of the three specimens examined were empty, the gut of one specimen contained numerous diatoms. This finding is contrary to the typical belief that *Hydroptila* larvae feed by piercing and eating the contents of individual cells of filamentous green algae (e.g., Marshall, 1979). A similar finding was reported by Percival and Whitehead (1929) for a British *Hydroptila* species; however, the evidence for their conclusion was never clearly stated.

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