

**A DESCRIPTION OF THE LARVA OF *HELOCOMBUS BIFIDUS*
(COLEOPTERA: HYDROPHILIDAE)**

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Helocombus Horn is one of the few Nearctic genera of aquatic hydrophilids for which the larval stage is not yet described. The species of this monotypic genus, *H. bifidus* (LeConte), inhabits eastern North America, ranging from Labrador south to Florida and west to Minnesota. This woodland pond species is one of the more infrequently collected hydrophilids in spite of having a large geographical distribution. Larvae described herein were reared from adults collected by Spangler from a woodland pond in Seth State Forest, Talbot County, Maryland.

First-instar larva (Figs. 1-7).—Total length 3.6 mm; width of prothoracic segment 0.5 mm. Color creamy yellow with sclerotized areas light yellowish brown. Integument of abdomen covered with short, dense hairs.

Head quadrangular (Figs. 2, 3), 0.54 mm wide, 0.38 mm from labroclypeus to occipital foramen. Frontoclypeal suture absent. Stem of ecdysial cleavage lines very short, frontal branches delimiting U-shaped frons. Head capsule with setae as illustrated (Figs. 2, 3).

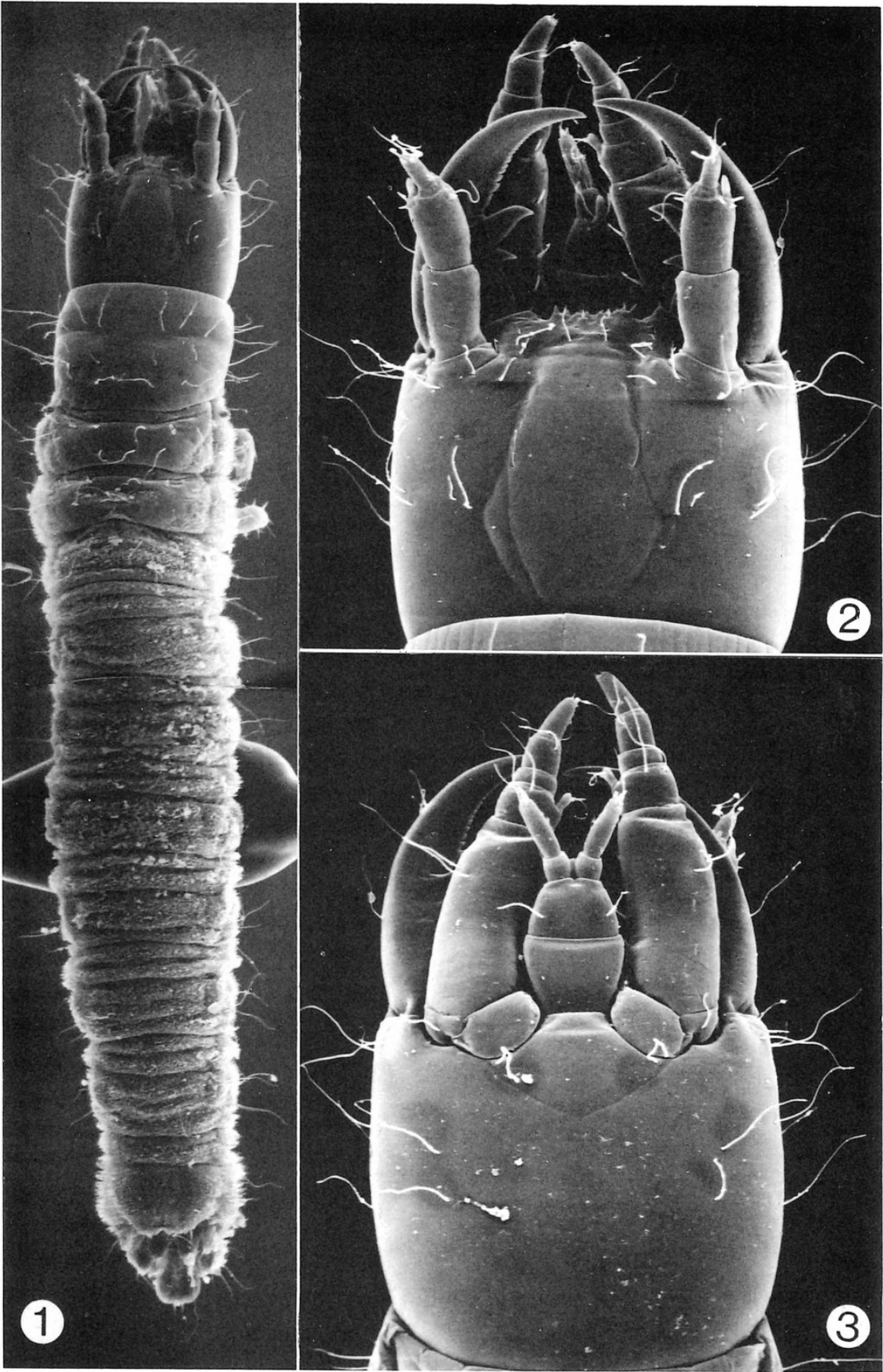
Labroclypeus (Figs. 4, 5) asymmetrical, a pair of prominent teeth on right and on left side, midregion with numerous, small, irregular teeth; tooth on left side as large as tooth on right side, or nearly so.

Antennae (Fig. 4) 3-segmented, slightly longer than stipes. First antennal segment slightly longer than second, without setae. Penultimate antennal segment with a large sensillum and numerous smaller sensilla at apex. Ultimate antennal segment small, cylindrical, terminating in flagelliform setae and sensilla.

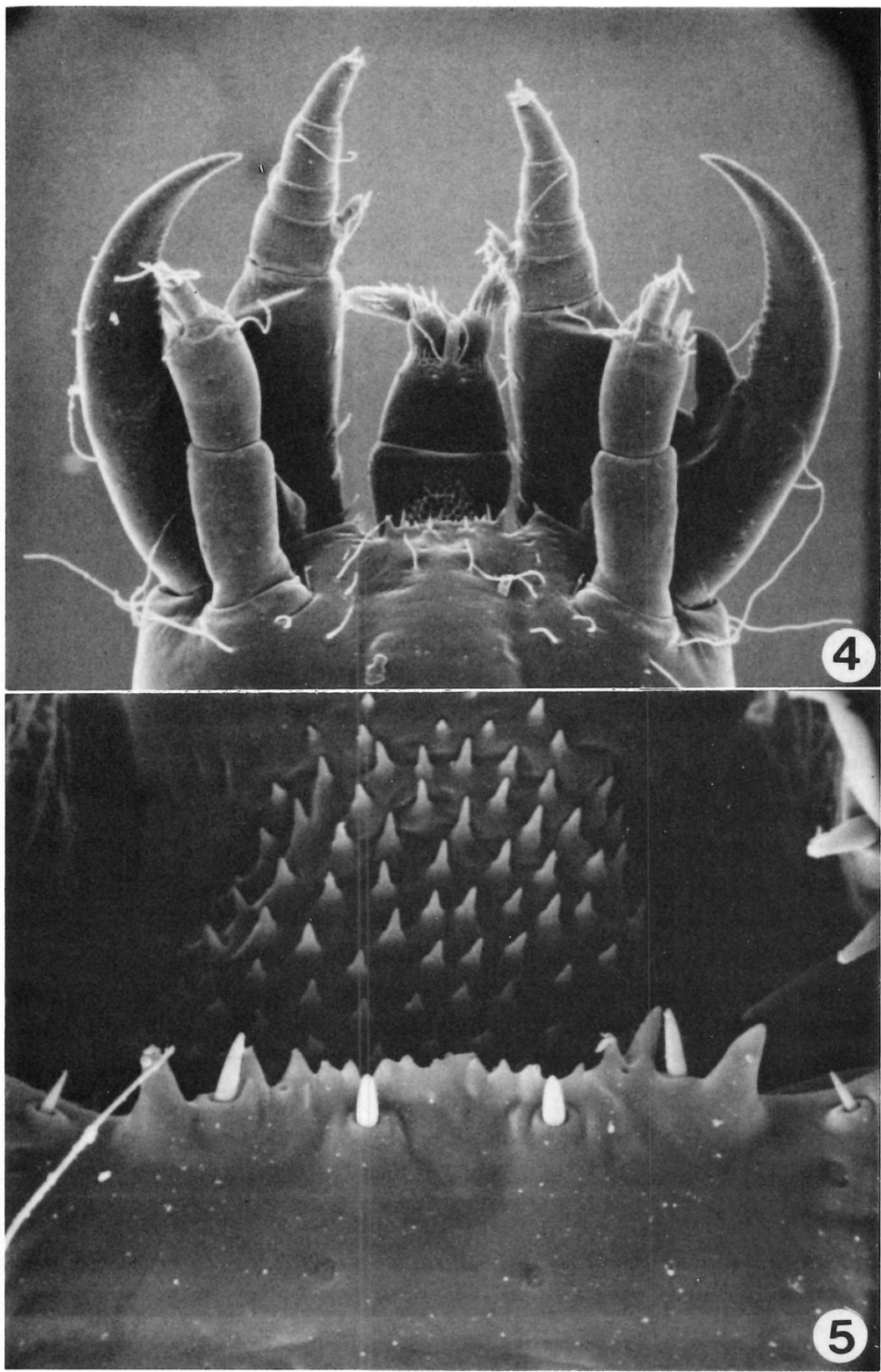
Mandibles (Fig. 2) symmetrical, prominent, sharply pointed apically; inner margin with two teeth, distal larger than proximal; inner margin serrate from apex of mandible to distal tooth; inner margin between proximal tooth and base of mandible with sparse, short spicules.

Maxilla (Figs. 2-4) with stipes longer than combined lengths of palpifer and palpus; stipes with four large, apically bifid setae on inner margin. Palpifer with a large seta on inner margin near base, two long setae on ventral surface (Fig. 3), and a sensory lobe at anteromedial angle. Palpus 3-segmented, with numerous sensilla at apex.

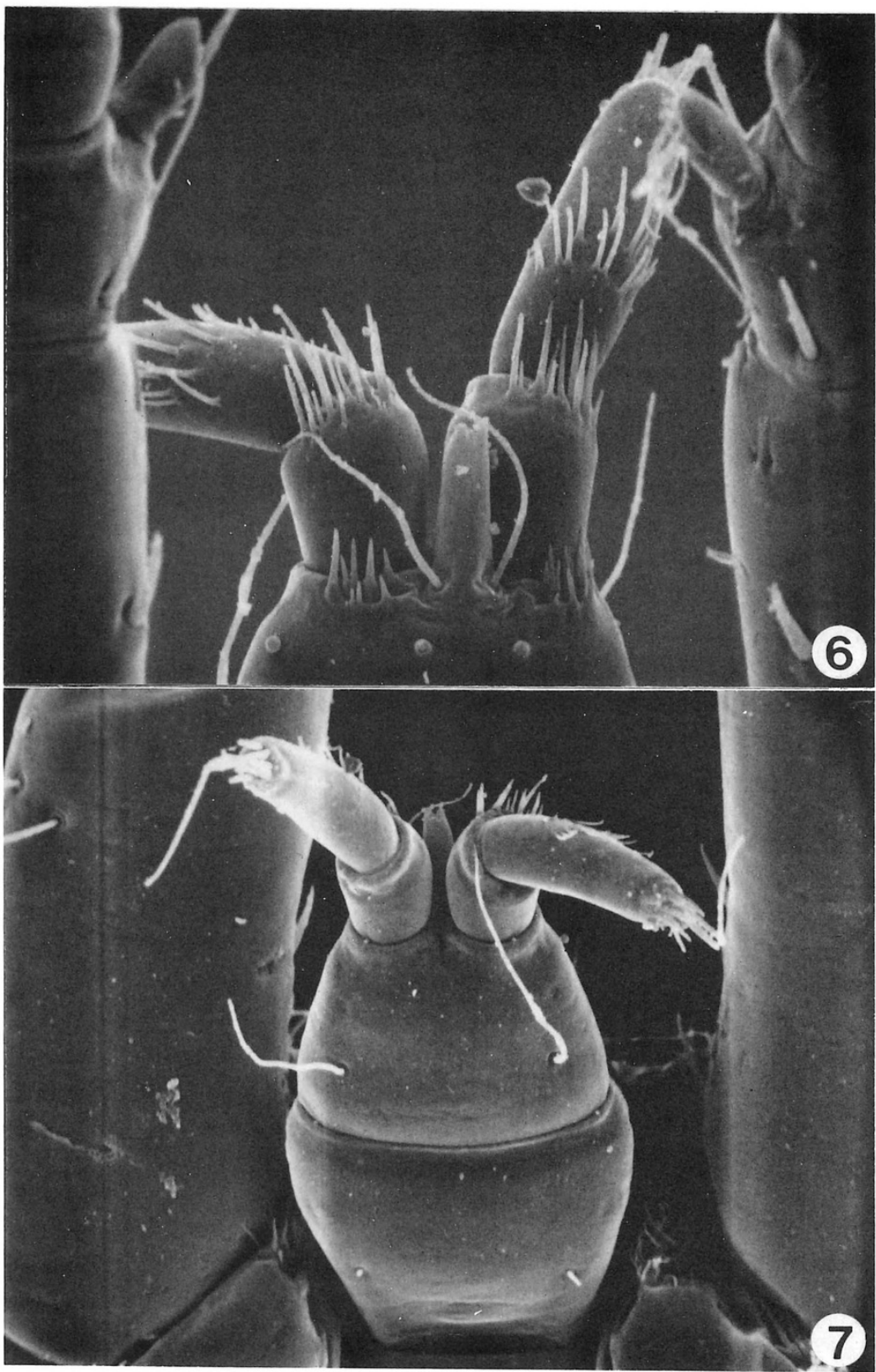
Labium (Figs. 4-7) extending as far forward as apex of stipes. Mentum



Figs. 1-3. *Helocombus bifidus* first-instar larva. Fig. 1, Habitus (60×). Fig. 2, Head, dorsal aspect (150×). Fig. 3, Head, ventral aspect (150×).



Figs. 4, 5. *Helocombus bifidus* first-instar larva. Fig. 4, Mouthparts and anterior margin of head, dorsal aspect (170 $\times$). Fig. 5, Labroclypeus and mentum (875 $\times$).



Figs. 6, 7. *Helocombus bifidus* first-instar larva. Fig. 6, Apex of labium, dorsal aspect (630 $\times$). Fig. 7, Labium, ventral aspect (410 $\times$).

with numerous spicules on dorsal surface (Fig. 5). Palpiger with apicodorsal spicules (Fig. 6). Ultimate segment of palpus twice length of penultimate; penultimate segment with long apicodorsal spines; ultimate segment with long spines near midlength, sensory structures apically.

Prothorax broader than long, with dorsal setae as illustrated (Fig. 1). Prosternal sclerite broader than long. Meso- and metathoracic sclerites equal in length, combined length subequal to length of prothorax.

Legs 4-segmented, subequal to length of mandibles; trochanter about half as long as coxa; femur slightly longer than tibiotarsus; tarsal claw single, half as long as tibiotarsus, with two basal setae.

Abdomen (Fig. 1) with 8 distinct segments, ninth and tenth segments reduced; segments 1–8 without tubercles or projections; eighth tergum represented by superior valve of stigmatic atrium, a large, oval sclerite with small apicomedian emargination. Ninth tergum trilobed, median lobe large, with two short and two long setae on caudal margin; lateral lobes indistinct, with four setae. Spiracles present. Mesocerci prominent, conical, with a large apical seta.

Comparative notes.—*Helocombus* first-instar larvae are most similar to those of *Cymbiodyta*, but differ in several respects, including: 1) shape of the labroclypeus, *Helocombus* having tooth on the left side as large as that on the right side (Fig. 5), whereas in *Cymbiodyta* the left tooth is smaller than the right; 2) setae on the medial surface of the stipes are bifid at their apices in *Helocombus*, non-bifid in *Cymbiodyta*; 3) mandibles of *Helocombus* have a patch of small spicules on medial surface between base and proximal tooth, *Cymbiodyta* lacks these spicules; and 4) *Helocombus* larvae have a prominent seta on the anterior margin of each side of the head, midway between the labroclypeus and mandibular articulation, *Cymbiodyta* larvae lack these setae.

Larvae of *Helocombus* will key to the genus *Cymbiodyta* at the second alternative of couplet 11 in Chandler's key (1956, pp. 339–341). The following couplet will separate the two genera:

1. Labroclypeus with tooth on left side smaller than tooth on right side *Cymbiodyta* Bedel
- Labroclypeus with tooth on left side equal in size to tooth on right side *Helocombus* Horn

Literature Cited

- Chandler, H. P. 1956. Aquatic Coleoptera. In: Usinger, Aquatic Insects of California with Keys to North American Genera and California Species. Berkeley and Los Angeles, ix + 508 pp.



Perkins, Philip D. and Spangler, P J. 1981. "A description of the larva of *Helocombus bifidus* (Coleoptera: Hydrophilidae)." *The Pan-Pacific entomologist* 57(1), 52-56.

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