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SHORTER COMMUNICATION

MATURE LARVAE OF *HYDROPORUS SIGNATUS* SHARP (COLEOPTERA: DYTISCIDAE) AS SUBSTRATES FOR PERITRICHIDA

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ABSTRACT

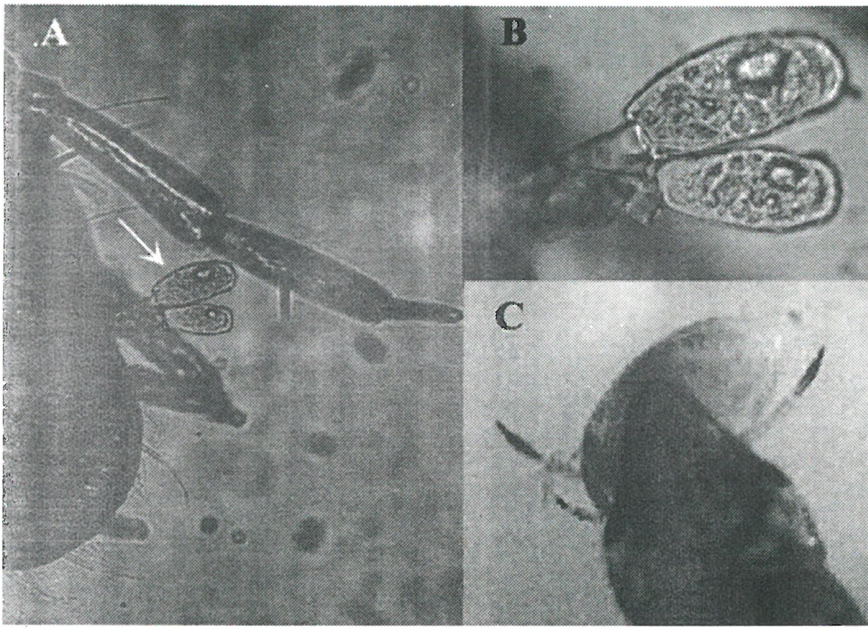
Mature larvae of *Hydroporus signatus* Sharp collected from a small eutrophic habitat served as substrates for Peritrichida (Ciliophora). The rate of infestation was 60% and there were indications of body site specificity for the colonies with most found attached to the cranium and/or mouthparts.

Key Words: Protozoa; Peritrichida, beetle larva; southeastern United States.

Dytiscid larvae identified by distribution (1) and available descriptions (2) as *Hydroporus signatus* Sharp were collected between 23 January and 19 March 2007 from a small eutrophic habitat in Baldwin County, central Georgia (USA). An examination of 10 mature larvae selected randomly from a laboratory cohort of 40 larvae revealed that 60 % of the larvae had protozoan colonies (Peritrichida, probably *Epistylis*) attached to sclerotized areas. Steffan's (3) review of ectosymbiosis of aquatic insects includes reports of Peritrichida infestations of Ephemeroptera, Odonata, Hemiptera, Diptera, Trichoptera, and Coleoptera. Reported coleopteran infestations include dytiscid species; however, dytiscid larvae are difficult to identify. The level of infestation of larvae of *H. signatus* is comparable to that reported by Evans et al. (4) for a crustacean, *Mysis* sp. (55-85%). Peritrich colonies (Fig. 1A & B) with a maximum of five or six branches were observed attached to the venter of the extended nasale (Fig. 1A), on the mouthparts, ventrally at the union of the cranium and prothorax, and on the seventh abdominal segment. A single larva had one colony on the dorsum of the seventh ab-

dominal segment. Epibiont colonies were observed on or near the cranium of the remaining infested larvae, suggesting a degree of body site specificity for successful colonization of the dytiscid larvae. Indications of site specificity have also been reported for epibionts on other arthropods (5, 6, 7).

Figure 1. (A) ventral view of the nasale of a larva of *Hydroporus signatus* Sharp with a small peritrich colony attached; (b) enlargement of colony; (c) mature larva feeding on an ostracod.



This peritrich-dytiscid interaction may be at least moderately detrimental to the dytiscid larvae, although the peritrichs may derive some advantages (5) from the association. The prey of *Hydroporus signatus* includes highly mobile ostracods (Fig. C) and other small invertebrates. Detection of potential prey (as well as predators) and their subsequent capture are probably due, at least in part, to sensory functions of the numerous sensilla that originate on the cranium and its appendages. The presence of detrital and/or biotic material, including peritrich colonies, on the cranium and its appendages may interfere with sensory functions of those sensilla, diminishing larval ability to detect suitable prey. Nilsson (8) described structural modifications of he protarsi of *Cybister* and *Coptotomus* and hypothesized that these modifications were employed to aid in removal of detrital and/or biotic material from the cranium and cranial appendages. A more complex "cleaning" system has also been described for *Hydaticus bimarginatus* (9). Although comparable "cleaning" structures and behaviors have not been observed for *H. signatus*, selection for structures dedicated to removal of extraneous materials in other

taxa provides indirect evidence of the importance to dytiscid larval survival of maintaining relatively pristine cranial and cranial appendage surfaces. Thus, it seems probable that the presence of peritrich colonies on the cranium of these hydroporine larvae will diminish sensory functions and possibly interfere with biomechanical efficiency, resulting in at least a limited reduction in predator effectiveness of infested larvae.

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