Georgia Journal of Science

Volume 67 *No. 2 Scholarly Contributions from the Membership and Others*

Article 7

2009

Variation in Stemmatal Morphology of Larvae of Liodessus noviaffinis Miller (Dytiscidae: Hydroporinae: Bidessini)

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VARIATION IN STEMMATAL MORPHOLOGY OF LARVAE OF *LIODESSUS NOVIAFFINIS* MILLER (DYTISCIDAE: HYDROPORINAE: BIDESSINI)

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ABSTRACT

Second and third instars tentatively identified as *Liodessus noviaffinis* Miller have six dorsolateral stemmata near the origin of each antenna. However, each stemma lacks a corneal (cuticular) lens on the surface exterior to its internal sensory pigmented components.

Key words: Dytiscidae, *Liodessus*, larva, stemmata, corneal lenses.

Bidessine larvae collected on 26 October 2007 from a small drainage ditch in Bibb County, Georgia, USA (N32°52.813'; W083° 45.425') were identified tentatively as *Liodessus noviaffinis* Miller. The identification was based on distribution records (1, 2) and co-occurrence of adults identified as *L. noviaffinis*. The morphology of third instars in this cohort also corresponded, in general, to that attributed to *Liodessus* (3, 4) with the exception of the stemmata. Larvae of most dytiscid species have six stemmata located on and in the cranium posterior to the origin of each antenna (1). The cuticle above each stemma usually forms a biconvex corneal (cuticular) lens exterior to the crystalline cone and the various stemmatal sensory components of the cranial interior (5, 6). Although complete stemmata were expected based on previous descriptions (3, 4), there were no indications of corneal lenses on exuviae of second instars in this cohort.

Our analysis of intact second and third instars that had been preserved and stored in 70% glycerated alcohol revealed six moderately pigmented

dorsolateral stemmata defining stemmatal regions posterior to the origin of each antenna. However, corneal lenses were not observed (Meiji, ML2000; 400x) on the cranial exteriors although the pigmented interior stemmatal components tended to obscure our observations. The absence of a corneal lens on each stemma was readily apparent when non-sclerotized internal material was removed with 15% KOH. Thus, on these second and third instar bidessine larvae corneal lenses are absent, but the internal stemmatal sensory components appear to be present defining a rather typical stemmatal region.

Assessments of stemmatal morphology included in many descriptive studies of dytiscid larvae may provide useful information for systematic evaluations. Areas of corneal lenses, volumes of cellular sacs (7) and orientation of individual stemma (8) may vary within stemmatal regions of individual taxa. Some species of Dytiscinae have a seventh stemmatal-like pair of structures on larvae in addition to the usual six (1). Stemmata are reportedly absent on the mature larva of the subterranean hydroporine genus *Haideoporus* Young and Longley (9) and on first and second instars of *Hydrocolus* Roughley and Larson (10, as *Hydroporus paugus* Fall). The absence of corneal lenses on these bidessine larvae presents systematists with an additional source of stemmatal variation that may be evaluated objectively with no more difficulty than assessments of cranial sensilla. However, pigmented internal sensory components may obscure the absence of the corneal lenses and the absence of lenses does not necessarily mean that stemmata are absent.

ACKNOWLEDGEMENTS

We appreciate the assistance and comments generously provided by Dr. M.C. Michat of the University of Buenos Aires, Argentina and the identification of adult material by Dr. G. William Wolfe of this University. This project was supported in part by Faculty Research Grants awarded by the Office of Research Services, Georgia College & State University. Aquatic Coleoptera Laboratory Contribution Number 76.

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