



New techniques yield new insights on the basic biology of living microgastropods

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Abstract

Light traps, undisturbed sediment cores and emergence traps were used to pursue new knowledge of the biology of poorly-known microgastropods. These tools were used specifically to explore novel habitats, behavior and function. The most interesting discoveries include significant interstitial populations of species previously considered rare, including epipsammic browsers and taxa that emerge from the sediment at night. Diel activity patterns include movement between sediment and water column, movement between sediment and marine plants, vertical migrations on marine plants, and movement between plants and plant epiphytes. Unsuspected behavioral correlates include active swimming and mass spawning aggregations and drifting and floating using mucus threads to launch into the water column from marine plants or the sides of aquaria. Ciliary locomotion is a convergent theme in microgastropods, with new examples from vetigastropod and neritopsine species that also use mucus threads in drifting. At the sediment-water interface, upside-down ciliary locomotion in the surface tension may be combined with feeding on the rich microbial ecosystem concentrated at the air-water interface.

Key Words: light traps, emergence traps, infauna, interstitial fauna, stygofauna, rafting, drifting, diel vertical migrations, epipsammic browsing, ciliary locomotion

Introduction

“Prosobranch” gastropod diversity is concentrated at small shell and body sizes (< 5 mm) among the so-called microgastropods. Malacological studies have concentrated on conspicuous, large-shelled species that are easily collected. There is a gap in our knowledge of minute and cryptic species, especially those that are invisible in the field and require special collection and recovery techniques. Microgastropods are known primarily from empty shells recovered from beach sand and “shell grit” by collectors who have specialized in the activities of “sorting” and “picking” through bulk samples. In museum collections it is common to find the microgastropods sorted to higher taxonomic levels and placed in drawers at the end of a series of well-curated and well-identified large-shelled species. There is growing recognition that a major component of marine biodiversity is small (< 5 mm). Estimates of species richness have increased dramatically in studies that have made a special effort to sample micromolluscan diversity (Bouchet *et al.* 2002). New methods for collecting and sorting in heterogeneous habitats will continue to yield new micromollusc taxa and increase understanding of species richness.

Resurgence of interest in obtaining live micromolluscs is driven primarily by systematists working to recover phylogenetic relationships from molecular data or from comparative anatomical data that