



Bivalve diets in a midwestern U.S. stream: A stable isotope enrichment study

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ABSTRACT: This study examined a community of stream bivalves (unionids and fingernail clams) in a second-order woodland stream in southern Michigan using both the natural abundance of ^{15}N and a 6-week whole-stream ^{15}N enrichment experiment, as part of the Lotic Intersite Nitrogen eXperiment (LINX). Objectives included addressing what made up the diet of these bivalves and whether suspended algae consumed by bivalves were derived from pelagic phytoplankton imported from an upstream lake or attached algae sloughed from instream surfaces. Within the examination of bivalve diets, we considered whether suspension- and/or deposit-feeding modes were employed and whether bivalves selectively assimilated the algal and microbial portions of bulk material they ingested. All 12 unionid species reached a level of ^{15}N enrichment greater than the bulk suspended organic matter. *Sphaerium striatinum* (Sphaeriidae) were enriched to levels greater than all presumed food sources. Suspended algae were derived both from sloughed epilithon and pelagic phytoplankton originating from lentic waters upstream. A mixing model suggested that unionids were consuming 80% deposited and 20% suspended material. Alternatively, these bivalves were preferentially assimilating the highly enriched living component of suspended and/or benthic organic matter rather than assimilating the bulk material. These results advance our understanding of freshwater bivalve-feeding ecology, which is necessary if conservation efforts of these increasingly threatened organisms are to succeed.

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