



Uptake of dissolved organic matter (DOM) and its importance to metabolic requirements of the zebra mussel, *Dreissena polymorpha*

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ABSTRACT: We determined the rates at which *Dreissena polymorpha* assimilated radiolabeled acetate, monosaccharides, amino acids, and fatty acids at environmental concentration levels. The mussels incorporated all of the substances presented to them. Much of the ^{14}C -labeled substrate that was taken up was respired to $^{14}\text{CO}_2$, indicating that the substrates were used for metabolic purposes. Nonacidic amino acids and fatty acids were taken up fastest, with absorption efficiencies (AE, percentage of filtered substrate removed) of 13% and 85%, respectively. The AEs for monosaccharides (1.5%), acetate (0.2%), and the acidic amino acid glutamic acid (0.79%) were much lower. Among the nonacidic amino acids, nonpolar forms (AE = 19.5%) were preferred over basic and polar neutral forms (AE = 9.3%). On the basis of direct measurements of free amino acid concentrations and literature estimates of free sugars, acetate, and short-chain fatty acids in surface waters, we estimated that direct uptake of these monomers amounts to ~10-25% of the zebra mussel maintenance ration. Direct uptake of dissolved organic matter might be metabolically significant to zebra mussels.

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