

## Isotopic composition of chlorophylls as a new indicator of energy flow in stream ecosystems

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In most freshwater (e.g., stream) ecosystems, periphytic algae attached to a substrate (periphyton) play an important role as benthic primary producer. However, the energy flow, which is transferred from periphyton to animal consumers through trophic pathways, has not yet been adequately assessed because few studies have traced algal signatures from periphyton matrix to food webs. Here we present a new application of the isotopic composition of chlorophylls in periphyton to the tracer of *in situ* primary production. Chlorophylls can be used as a biomarker of photosynthetic autotrophs, including periphytic algae. We purified chlorophylls from periphyton matrix using a high performance liquid chromatograph (HPLC), and measured carbon and nitrogen stable isotope ratios of chlorophylls, pheophytins, the bulk of periphyton, and algal grazing specialists (e.g., *Epeorus latifolium*: mayfly larva) using an elemental analyzer coupled with an isotope ratio mass spectrometer (EA/IRMS). We will compare the results with traditional isotope maps, and discuss the potential of the isotopic composition of chlorophylls in aquatic food web studies.

Keywords: periphyton, photosynthetic pigments, biomarker, HPLC, stable isotopes