



Use of size spectra and empirical models to evaluate trophic relationships in streams

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ABSTRACT: We measured the biomass size distributions of algae, protozoa, and invertebrates in several streams of Eastern Ontario and Western Quebec and related assemblage biomass to nutrient (nitrogen and phosphorus) concentrations in the water. Size spectra and measurement of periphytic chlorophyll were then combined with existing empirical models to estimate primary production, invertebrate production, and grazer removal, to examine herbivory in these natural assemblages. In general, biomass of organisms increased with nutrients but the response of invertebrates was stronger than that of algae and protozoans. Secondary production (range 1.7%-4.2%) and algal removal by grazers (range 62%-175%) were high relative to primary production. This suggests that grazers exert top-down control on algae in these streams and that increases in nutrient inputs to oligo- and mesotrophic streams may benefit consumers more than primary producers.

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