



Influence of zooplankton stoichiometry on nutrient sedimentation in a lake system

Darchambeau, François, Isabelle Thys, Bruno Leporcq, Lucien Hoffmann, Jean-Pierre Descy

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ABSTRACT: We explored rates and stoichiometry (C:N: P ratios) of sinking particles in a temperate reservoir during a 2-yr period. Plankton was sampled weekly, and a sediment trap placed below the metalimnion collected sinking particles. There were no significant relationships between the stoichiometry of entrapped material and seston or zooplankton stoichiometry. However the differences in the entrapped C: P and N: P ratios between consecutive trap samplings were negatively correlated with the time variations of the zooplankton C: P and N: P ratios. Zooplankton C: P and N: P ratios were positively correlated with the percentage of copepod biomass in total zooplankton biomass >250 μm and negatively correlated with the percentage of cladocerans. Zooplankton biomass >250 μm reduced the fraction of N and P primary production lost to sinking (export ratio). The residuals of the N export ratio versus zooplankton biomass relationship were negatively correlated with the zooplankton N: P ratio, whereas there was a positive relationship with the residuals of the P export ratio relationship. These observations support the hypothesis that the regulation of elemental homeostasis in the herbivorous zooplankton consumers occurs at least partly at the assimilation/egestion level. Elements ingested in excess [P for the herbivorous copepods and N for many cladocerans] are concentrated into sinking feces, whereas the deficient elements are captured into biomass.

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