Are non snail macrophyte associated macroinvertebrates important grazers of periphyton?

Adrian E. Williams and Brian Moss

School of Biological Sciences, Jones Building, University of Liverpool, Liverpool, L69 3GS, UK. E mail: ae.williams@virgin.net

Abstract

Increases in periphyton have been associated with macrophyte decline owing to competition between them for light and CO_2 and the creation, by periphyton, of unfavourable O_2 and pH regimes. Macrophyte associated macroinvertebrates, in particular snails, are known to graze periphyton. However snails are not always the dominant macroinvertebrate in aquatic systems. It is thus important to gauge the grazing effect that other macroinvertebrates may have on periphyton so that macrophyte loss can be better understood and therefore managed. Carp (*Cyprinus carpio*) and roach (*Rutilus rutilus*) at two stocking densities 0 and 800 kg ha^{-1} and of different sizes were placed in mesocosms in Little Mere, a fertile, shallow lake in Cheshire, UK. Macrophyte associated macroinvertebrate populations, periphyton crop and water chemistry were investigated in relation to different fish treatments. The number of macrophyte associated macroinvertebrates was significantly higher in enclosures stocked with carp than roach. This may have been because roach removed macroinvertebrates from macrophytes with a greater efficiency than carp. Furthermore different sizes of fish had varying efficiencies of feeding on certain macroinvertebrate species. Non snail macrophyte associated macroinvertebrates did not have a significant grazing effect on periphyton and results suggested that as the food source (periphyton) increased so the number of grazers increased. A greater abundance of periphyton in some enclosures was apparently not due to a decrease in the number of macroinvertebrate grazers, from predation by fish, but was more likely related to an increase in nutrient availability in those enclosures.