

SEFS 7 - Girona 2011

Effects of ethanol and phenanthrene on litter decomposition by aquatic fungal assemblages

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Fungi, particularly aquatic hyphomycetes, have been recognized as playing a dominant role in microbial decomposition of plant litter in streams. In this study, we used a microcosm experiment with monocultures and combinations of mixed cultures with up to five aquatic hyphomycete species (*Articulospora tetracladia*, *Tricladium splendens*, *Heliscus submersus*, *Tetrachaetum elegans* and *Flagellospora curta*) to assess the potential effect of ethanol, phenanthrene and fungal diversity (species number and identity) on three functional measures: litter decomposition, fungal biomass accrual and sporulation. Alder leaf disks were conditioned by fungi for 7 days and then were exposed to ethanol (0,07%) and/or phenanthrene (1 mg/L) for further 24 days. Exposure to ethanol or phenanthrene decreased both leaf mass loss and fungal sporulation, but increased fungal biomass. All aspects of fungal activity increased with increasing number of fungal species. Fungal activity in mixed cultures was generally higher than expected from the weighted performances of participating species in monoculture, suggesting complementarity between species. However, the activity of fungi in mixed cultures did not exceed the activity of the most productive species in the absence or presence of ethanol and/or phenanthrene.

Acknowledgment

The Portuguese Foundation for the Science and Technology supported this work (POCI/MAR/56964/2004)