Functional and Community Level Microbial Indicators of Nutrient Enrichment in Wetlands; a Mesocosm Scale Experiment. (S10-corstanje161652-Oral)

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Abstract:

Changes in the nutrient status of wetland soils may result in consequent shift microbial responses. The objective of this study is to determine changes in the functional composition of microbial communities as a result of an external input of nutrients. A controlled experiment was carried out at the mesocosm scale consisting of three 1 m by 13 m raceways; two containing organic substrate and one an inorganic substrate. The mesocosms were planted in 1994 in order to obtain a distinct Cladium community and a Typha community. One of the mesocosms containing organic substrate was loaded in 2001 with nutrients for over a year (2 g N/m2.yr and 1 g P/m2.yr), the other two systems serve as references. The study focus was the litter material and the bulk wetland soil. Microbial response measures consisted of (i) hydrolytic enzyme activity: Beta-Glucosidase, Acid Phosphatase; (ii) Microbial Biomass and (iii) Microbial Activities (anaerobic CH4 and CO2). Periodic sampling indicated a significant bacterial response in the litter component (alpha as acid phosphatase activities were suppressed, yet overall microbial activity increased. Microbial biomass, hydrolytic enzymatic activity and microbial activities were consistently higher in cattail litter across all treatments.

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Presentation Information:

Presentation Date: Wednesday, November 13, 2002
Presentation Time: 10:30 am

Keywords:

Wetlands, microbial indicators , nutrient enrichment , mesocosms