Root-Parasitic Nematodes Impact Microbial Biomass and Nitrogen Mineralization in Six Soils. (S03-tu143507-Oral)

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Abstract:

Obligate root-parasitic nematodes can impact soil microbes positively by enhancing C and nutrient leakage from roots but negatively by restricting root growth. However, it is unclear how nematode-induced changes in C supply to microbes impact soil microbial activities and N cycling. The effects of root-parasitic nematodes (Rotylenchulus reniformis) on soil microbial biomass and activities were examined in six different soils in a microplot experiment. Nematodes were introduced at 600 per 500 cm3 soil in May 2000 prior to seeding cotton. In 2001, soil samples were collected in May before seeding cotton and in November after final harvest. Extractable C and N were consistently higher in the R. reniformis plots than in the non-nematodes controls across six soils. Nematodes tended to reduce microbial biomass C, but significantly increased microbial biomass N, leading to marked decreases in microbial C:N ratios. Microbial respiration and net N mineralization were significantly higher in the nematode treatment than in the control. These results indicate that nematode infection of plants may enhance microbial activities and the turnover of soil microbial biomass, facilitating N cycling.

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