Earthworms, Microbial Biomass and Nitrogen Cycling in Temperate Forest Soils. (S03-groffman052016-Oral)

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Abstract:

Invasion of forest soils by exotic earthworms could alter soil microbial biomass and activity over large areas of North America. We measured the distribution and activity of microbial biomass in forest stands invaded by earthworms and in adjacent stands lacking earthworms in sugar maple dominated forests in two locations in New York, USA. One site had a history of agricultural cultivation and a thin forest floor and the other had no history of cultivation and a thick (3 - 5 cm) forest floor. Earthworm invasion reduced pools of microbial biomass in the forest floor and increased pools in the mineral soil at the site with thick forest floors. There was a net increase in total soil profile microbial biomass in the invaded plots at this site. There was an increase in respiration in the mineral stotal soil profile microbial biomass in the invaded plots at this site. There was an increase in respiration in the mineral soil at both sites, however, N cycle processes (mineralization and nitrification) did not increase, likely due to earthworm movement of C into the mineral soil stimulating microbial uptake of N, preventing an increase in mineralization and nitrification. Earthworm invasion can alter the distribution and activity of microbial biomass in forests, but the effects vary with site history.

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