Fire, Charcoal, and Nitrogen Cyling in Swedish Boreal Forests. (S07-deluca144523-Oral)

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Abstract:

Scots pine (Pinus sylvestris L.) forests of northern Sweden are considered to be N limited, a condition likely exacerbated by fire exclusion. A total of 34 forest stands with varied time since last fire were identified and characterized. Overstory and understory vegetative composition and depth of humus were analyzed in replicated plots at 34 sites. A subset of these stands were selected to study how time since last fire influences N mineralization, nitrification, and N-fixation. Ionic and non-ionic resin capsules were used to assess net N mineralization, nitrification, and free phenolic compounds. Calibrated acetylene-reduction was used to study N-fixation. Feathermoss and dwarf shrub cover increased logarithmically with time since fire. Nitrogen-fixation associated with the feather moss P. schreberi also increased with time. Nitrification and mineralization decreased with time since fire. Net ammonification was readily increased by the addition of a labile N source, but the increased NH4+ did not stimulate nitrification. In contrast to existing theory, we have found N-fixation to increase with late secondary succession in response to reduced N availability.

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