Geophysical Research Abstracts
Vol. 19, EGU2017-9070, 2017
EGU General Assembly 2017

The changes of soil microbial C: N: P stoichiometry and phosphatase activity along afforestation chronosequencese in oak, Norway spruce and beech

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Phosphorus is an essential nutrient for forest development, while is a scarce and nonrenewable resource. For forest to be sustainable, a better understanding of phosphorus cycling mechanism is needed. The challenge is to keep the production of forest but in the way that will contribute to phosphorus cycling, especially improve phosphorus use efficiency. We studied the change of phosphorus and phosphatase activity in soil-microbial continuum in forest site in Denmark. The site was afforested continuously on former cropland with same soil type, three tree species were chosen, oak, Norway spruce and beech, every tree species has five chronosequencese stands, and soil samples were divided according to layer, 0-5 cm, 5-15 cm and 15-25 cm. The objective of the research were to investigate the effect of forest stand years and tree species on soil properties, soil microbial biomass carbon, nitrogen and phosphorus stoichiometry, and phosphatase enzyme activity. We hypothesis that soil pH value decreased with afforestation chronosequences, the acidification in soil might be the reason that causes changes in phosphatase enzyme activity, and the change trends of enzyme activity along chronosequencese are different in different tree species. Soil microbial biomass stoichiometry was predicted to have differences along afforestation chronosequence and different tree species, which indicates the different mineralization states of phosphorus. However, the experiment and data analysis are still ongoing, so the hypothesis needed be investigated and proved.