



## **Effects of tree diversity and environmental factors on the soil microbial community in three soil depth in a Central European beech forest**

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We investigated the link between aboveground and belowground diversity in forest ecosystems. Therefore, we determined the effect of tree composition on amount and composition of the soil microbial community using phospholipid fatty acid profiles in the Hainich National Park in Thuringia, a deciduous mixed forest on loess over limestone in Central Germany. On the one hand we investigated the composition of the microbial community in dependence of leaf litter composition, hypothesizing that distinct leaf litter compositions activated signature PLFA's. On the other hand we determined if environmental factor like clay content or nutrient status influence the microbial community in deeper soil horizons. Consequently soil was sampled from depth intervals of 0-5 cm, 5-10 cm and 10-20 cm. Plots with highest diversity of leaf litter had highest total amounts of fatty acids in the upper 5 cm. Mainly PLFA 16:1 $\omega$ 5 was activated in autumn, being a common marker for mycorrhizal fungi. In soil depth below 5 cm the environmental factors like clay and soil nutrients like phosphorus and carbon, explained most of the soil microbial variability. On pure beech sites the total phosphorus content of soil influenced soil microbial diversity, but on sites with higher tree diversity no single factor varying the microbial community could be identified. Tree diversity and environmental factors together effect soil microbial community and are closely related to the link between aboveground and belowground diversity.