

### **(O-3) Microbial biomass increases with tree species diversity in European forest soils**

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Increasing tree species diversity in forests might contribute to ecosystem-service maintenance, as well as to the reconciliation of regulating, provisioning and supporting services within the frame of multifunctional and sustainable forestry. Individual tree species influence biogeochemical cycling through element deposition (throughfall, litterfall), and through microbial activities in the soil. Yet, the influence of mixing tree species on these ecosystem processes is unclear, in particular concerning the microbial diversity and activity in soils.

Here we synthesize results from the Exploratory Platform of the FunDivEUROPE project (<http://www.fundiveurope.eu/>). This network of 209 comparative plots covering a tree diversity gradient of 1 to 5 tree species was established in existing mature forests in 6 European regions. These six focal regions represent a gradient of major European forest types from boreal to Mediterranean forests. We analysed the impact of tree species diversity and the role of other controlling factors on the metabolic diversity of soil bacteria (BIOLOG Ecoplate), soil microbial biomass (fumigation-extraction) and potential nitrification (shaken soil slurry) in the forest floor and the upper organo-mineral soil horizon.

Mean values of microbial biomass carbon ranged from 3264 (Italy) to 8717 (Finland) mg kg<sup>-1</sup> in the forest floor. Statistical models predict microbial biomass to increase in both horizons by 7-8% with each step increase in tree diversity. Increased proportion of conifers was linked to a decrease in the metabolic diversity of soil bacteria. These tree diversity effects could be linked to soil drivers, such as pH, total and labile carbon and nitrogen.

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