



# Posters Chapter

Pinus nigra

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**P3-08 Organic matter dynamics in the soil under *Pinus pinea* in a monoculture and in a mixed wood on Mount Vesuvius**

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Plant cover influences chemical, physical and biological properties of soil. In particular, the quality of the produced litter affects decomposition and the cycle of nutrients as well as soil organic matter dynamics and the carbon sequestration in the soil.

The aim of this work was to evaluate the effects on soil chemical and biological properties of *Robinia pseudoacacia*, an alien species that has been used for afforestation of volcanic substrates on Mount Vesuvius (Naples, Italy) and has invaded chestnut, holm oak and pine forests in the area. Two coeval (around 40 years old) *Pinus pinea* forests in the Vesuvius National Park were selected, i.e. a monoculture (P) and a mixed wood (PR) created by the invasion of *R. pseudoacacia*. Soil was sampled from the 0-5 cm layer under the canopy of *Pinus pinea* in the monoculture and in the mixed wood and under the canopy of *Robinia pseudoacacia* in the mixed wood.

Soil organic matter (SOM), water holding capacity (WHC), pH, total N and C concentrations, soil basal respiration, microbial biomass ( $C_{mic}$ ), metabolic quotient ( $qCO_2$ ) and the coefficient of endogenous mineralization (CEM) were measured at the two sites.

PR soil, either sampled under *Robinia pseudoacacia* or under *Pinus pinea*, had higher pH, WHC, SOM and N content as compared to P soil. Microbial biomass was lower in PR soil than in P soil whilst CEM and  $qCO_2$  were higher. No difference in soil basal respiration between the two soils was found.

The data suggest that *Robinia pseudoacacia* affects *Pinus pinea* soil:

- 1) by increasing soil organic matter and N concentrations,
- 2) by inhibiting soil microbial biomass, and
- 3) by inducing stress conditions as indicated by the higher  $qCO_2$  and CEM in PR soil compared to P soil.

**Keywords:** alien species, *Robinia pseudoacacia*, microbial biomass and activity

