

# ASSESSMENT OF LEAF LITTER DECOMPOSITION IN A PINE AND BEECH MIXED FOREST: CASE STUDY IN NORTHERN SPAIN

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The promotion of mixed forests represents an adaptation strategy in forest management to cope with climate change. The mixing of tree species with complementary ecological traits may modify forest functioning regarding productivity, stability, or resilience against disturbances. Litter decomposition is an important process for global carbon and nutrient cycles in terrestrial ecosystems, also affecting the functionality and sustainability of forests. Decomposition of mixed leaf litters has become an active research area because it mimics the natural state of leaf litters in most forests. Thus, it is important to understand the factors controlling decomposition rates and nutrient cycles in mixed stands. In this study, we conducted a litter decomposition experiment in a Scots pine and European beech mixed forest in the province of Navarre (north of Spain). The effects of forest management (i.e. different thinning intensities), leaf litter types and tree canopy on mass loss and chemical composition in such decomposing litter were analysed over a period of three years. Higher decomposition rates were observed in leaf litter mixtures, suggesting the existence of positive synergies between both pine and beech litter types. Moreover, decomposition process was favoured under mixed tree canopy patches. Regarding thinning treatments significant differences on decomposition rates disappeared at the end of the study period. Time influenced the nutrient concentration after the leaf litter incubation, with significant differences in the chemical composition between the different types of leaf litter. Higher Ca and Mg concentrations were found in beech litter types than in pine ones. It was observed an increase of certain nutrients throughout the decomposition process, due to immobilization by microorganisms (e.g. Mg in all leaf litter types, K only in beech leaves, P in thinned plots and under mixed canopy). Evaluating the overall response in mixed leaf litters and the contribution of single species is necessary for understanding the litter decomposition and nutrient processes in mixed forest ecosystems.

**Keywords:** mixed forest; litter decomposition; microbial ecology.