



Fast wood decay in a mountain Mediterranean area having *Fagus sylvatica* forests

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Deadwood and litter act as important linkages between recent productivity and current community, and ecosystem processes. The increasing interest in the quantity and properties of coarse woody debris (CWD) and litter is relevant both to maintaining biodiversity and to global C dynamics. Mountain and Mediterranean areas, furthermore, are considered to be especially sensitive to changing environmental conditions. Consequently, a need exists to understand more in detail the interplay between soils, forests, deadwood and climate in general and in particular in mountain Mediterranean areas such as the Apennine. Due to the fact that linkages between climate, coarse woody decay and soils in mountain Mediterranean areas are only poorly understood, we aimed at investigating the decay mechanism of *Fagus sylvatica* as a function of altitude and exposure. Furthermore, the effects of exposure on the decay dynamics of dead wood and soils were compared along a altitudinal sequence in an Apennine mountain forest (Majella Mountain). Ten sites, five of which having north and the other 5 having south exposure, were investigated, ranging from 1000 m to 1650 m asl. All sites have a *Fagus sylvatica* forest. In addition to this, experimental plots were installed at each site. In May 2014 standardised wood blocks (5 x 5 x 2 cm) of local *Fagus sylvatica* were placed at each site inside PVC tubes ('mesocosms') that was filled with undisturbed soil material. The sampling design foresees that three replicates of such mesocosms per site will be sampled after 8, 16, 52 and 104 weeks. After 8 weeks three tubes were removed from the sites (sampled soil and dead wood blocks) and the wood blocks analysed for cellulose, lignin and density. At each site, three cores were taken to analyse soil properties. The soil cores were subdivided in 0 – 5, 5 – 10 and 10 – 15 cm depth and measured for organic carbon, carbonates and pH. In addition, the humus forms at each site were determined. Already after 8 weeks, the lignin content of the dead wood increased compared to the fresh wood. The cellulose analysis, however, showed a slight decreasing trend (not always statistically significant), both at the north and the south exposure. Especially at the highest altitudes this decreasing trend was best expressed. The highest sites are the coolest and also have enough moisture of during the dry summer months. Together with the relatively warm conditions, decay processes seem to be enhanced there. The humus forms nicely represented the climatic conditions with predominately Mull at higher sites and particularly at north-facing sites and Amphi at lower and warmer sites. Consequently, a fast wood decay also correlates with the humus form Mull.