



Decomposition of leaf litter of *Phillyrea angustifolia* L. and mixed aboveground litter of herbaceous species from a mediterranean maquis.

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The Mediterranean shrubland is a mosaic of vegetation types mainly related to fire disturbance. The mosaic of shrub and clearings may show different pattern of decomposition due to different litter chemical composition as well as to different microclimatic and edaphic conditions.

In the low maquis of Castel Volturno Nature Reserve (Southern Italy) *Phillyrea angustifolia* L. is one of the most abundant shrub species while the clearings are covered by annual herbs (*Phleum subulatum*, *Medicago minima*, *M. litoralis*, *Melilotus neapolitana*, *Aetheoriza bulbosa*, *Petrorragia saxifraga*, *P. velutina*, *Briza maxima*, *Dactylis hispanica*). In this study, decomposition of leaf litter of *Phillyrea angustifolia* L., and of mixed aboveground litter of herbaceous species from the clearings was determined as weight loss, during 215 days of incubation. In order to highlight the influence of litter quality the study was performed in laboratory microcosms at 25°C under not limiting moisture condition, for. Brown leaves of *Phillyrea angustifolia* were sampled at abscission from the shrubs (between May and July) by shaking the branches; in the clearings aboveground plant material was collected at the end of the vegetative period (July), in randomized quadrates of 20x20 cm. Microcosms (glass pots, Ø: 12cm; volume: 550 ml) were filled with 5 cm of soil sampled under shrubs of *Phillyrea* and under herbaceous plants, respectively; about 10 g of litter were placed on the soil in each microcosm. Clearings-soil showed values of fungal and microbial biomass lower as compared to shrub-soil. Soil respiration, metabolic quotient (qCO_2) and coefficient

of endogenous mineralization (CEM) were significantly higher in clearings-soil as compared to shrub-soil. Clearings-soil was also poorer in Fe, Zn, Cu, Cr, Ni and Pb as compared to shrub-soil. Herbaceous litter was richer in lignin, cellulose, K, Fe, Mn, Cu, Pb, Cr, Ni and Cd as compared to leaf litter of *Phillyrea*. Comparing the pattern of decomposition, it was evident that litter of clearings decomposed more rapidly than litter of *Phillyrea*. At the end of the study period accumulated mass loss reached 58.4% and 32.5 % of the initial mass, respectively in herbaceous and shrub litter. At any decomposition stage, water holding capacity of herbaceous litter was significantly higher as compared to the litter of *Phillyrea*, and a significant positive correlation was found between water holding capacity and accumulated litter mass loss. In the herbaceous litter, the absolute amount of lignin decreased since the beginning of the decomposition and a significant negative correlation was found between absolute amount of lignin and accumulated litter mass loss. In the litter of *Phillyrea angustifolia*, an increase of the absolute amount of lignin occurred during decomposition. Mn, Cu, Fe, K, Cr, Ni and Pb were accumulated during decomposition in litter of *Phillyrea*, while cellulose and Mg were released. In herbaceous litter, cellulose and Mg were accumulated while the other elements were released.

The data suggest that in the late stage of decomposition, the two types of litter, leaf litter of *Phillyrea angustifolia* and aboveground litter of herbaceous species, are characterized by a different degree of recalcitrancy. In particular the litter of *Phillyrea* is richer of recalcitrant organic matter (lignin) as compared to herbaceous litter. This is consistent with the higher metabolic activity measured in the clearing-soil as compared to shrub-soil.