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**Litter Mass Loss Rates in Deciduous and Coniferous Trees in Artvin, Northeast  
Turkey: Relationships with Litter Quality, Microclimate, and Soil  
Characteristics**

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**Abstract:** Plant litter decomposition is controlled by both biotic and abiotic factors. It has been widely hypothesized that litter quality and climatic and soil conditions regulate decomposition. The present study examined the decomposition of native forest tree litter on 2 aspects (the north and the south) and at 3 altitudes (top, middle, and bottom) on each aspect in Artvin province to determine the influence of litter quality, microclimate, and soil characteristics on the rate of decomposition. A litter-bag experiment was performed using beech, oak, fir, and pine litter. The litter bags were placed on the north- and south-facing sites and at 3 altitudes on each aspect and were sampled every 6 months for 2 years. The dominant rate-regulating factor on the litter mass loss rates was found to be the lignin concentration of the litter. The litter from oak and pine contained relatively low lignin levels, and these litter types exhibited significantly faster rates of decay than the highly lignified beech and fir litter. The litter placed on the north-facing site decomposed much faster compared to the south-facing site, and the litter placed at the top altitude on each aspect showed the lowest decay rates compared to either the bottom or middle position throughout the study period. The microclimate and soil characteristics also helped to explain the variation in the litter mass losses, but their effects were less and also showed variations according to the aspects. On the north-facing sites, behind the initial lignin concentration, the litter decomposition was limited by actual evapotranspiration (AET), whereas on the south-facing sites the limiting factor on litter decomposition was soil temperature. However, when the 2 aspects were considered together, lignin concentrations and soil respiration rates were found to be better predictors of the mass loss rates in these forest ecosystems.

**Key Words:** Litter decomposition, litter quality, topography, microclimate, soil factors

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