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Journal of Forest Science

**Changes in Austrian pine forest floor properties in relation with
altitude in mountainous areas**

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Altitudinal studies has become of interest to ecologists concentrated on functional alterations aiming to clarify the effects of limiting factors. Nutrient element release from forest floor (FF) decomposition is suppressed by those factors such as low temperature, shortened vegetation period concluding FF accumulation at high elevation fields. To draw out a response to the FF decomposition issue, FF layers as leaf + fermentation (L + F) and humus (H) were collected from 37 representative sample plots along an altitudinal gradient (from 1,400 m to 1,710 m) on Kaz (Balikesir-Turkey) mountain. Mass, pH, organic matter (OM) and total nitrogen (Nt) contents of FF were investigated to explain the relation between decomposition and altitudinal effects. The results revealed that total FF mass and (L + F), (H) sub-fraction masses through elevation show an insignificant relation with the altitude. No significant difference was found between the altitudinal groups in the OM content of L + F. Besides there are significant negative correlations

between OM contents (%) of L + F and H layers and altitude with the coefficient values 0.342 ($P < 0.05$) and 0.597 ($P < 0.01$), respectively. The Nt content of L + F layer also increases through the elevation revealing a medium correlation with altitude (0.368; $P < 0.05$). The increasing Nt and decreasing OM contents show better decomposition rates at higher sites regardless of the altitude induced climatic changes. We assume that the forest floor accumulation under tree canopies provides a better decomposition relying on the microclimatic environment mediated by tree canopies, in spite of the altitude.

Keywords:

altitude; *Pinus nigra*; forest floor; decomposition; organic matter; humus

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