



Impacts of land use intensity in mountain semi-dry meadows on earthworms, litter decomposition and plant diversity

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Farming has created different agricultural landscape types and shaped the rural areas. However, ongoing socio-economic changes are following two trends on mountain meadows: intensification of sites that are easily accessible and abandonment of those that are difficult to manage. Both trends are known to affect plant diversity directly, while influencing indirectly litter decomposition via changes in abiotic conditions, plant community and the quality of litter. Effects on plant diversity are additionally expected to affect the activity and diversity of earthworm communities. We investigated whether abandonment of extensively managed mountain meadows affects plant parameters, litter decomposition and earthworms. Four managed (mown once a year, no fertilization) and four abandoned (no mowing, no fertilization) semi dry meadows in a mountain biosphere reserve in Austria were surveyed in June and August 2016. Plant parameters (species richness, vegetation cover, plant traits, biomass structure), litter decomposition (tea bag index) and earthworm parameters (species richness, density, biomass) were assessed. Additionally, soil parameters (temperature, moisture, electric conductivity) were measured.

Results showed that plant species richness was significantly higher in managed than in abandoned meadows. Furthermore, management types resulted in different plant species assemblages. The structure of plant functional groups showed differences mainly in a higher necromass on abandoned sites. Litter decomposition rate was significantly higher in abandoned sites and correlated positively with higher necromass. Earthworm parameters showed marginal management effects, with marginally higher worm density on managed meadows. Moreover, the density of juvenile worms and endogeic worms was marginally higher on managed sites. Both management types showed similar earthworm species. We conclude that in order to sustain plant and earthworm biodiversity in this biosphere reserve both abandoned and extensively managed meadows matter.

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