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IMPACT OF WINDTHROWS DISTURBANCE ON CHEMICAL AND BIOLOGICAL PROPERTIES OF THE FOREST SOILS FROM ROMANIA

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Abstract

The present study investigates the influence of windthrows on the chemical and biological characteristics and respiration processes of forest soils from Romania. Three pure Norway spruce, common beech, and sessile oak stands were chosen together with control plots where the forest and soils were not affected by windthrows. Soil samples were taken from two soil layers: 0–10 cm and 10–20 cm. Soil carbon dioxide fluxes or soil respiration was monitored at 20 randomly selected points for each sample surface. Soil temperature and soil water content were also measured at these points. Furthermore, the total number of heterotrophic bacteria and the total number of fungi were also measured. We found that abiotic factors lead to the modification of the chemical and biological properties of forest soils: soil pH was higher in the areas affected by windthrows, while humus and nitrogen quantities were lower in these areas. However, these changes were observed only in the first 10 cm of the soil profile. Underground microclimatic conditions were found to influence soil respiration, with higher respiration values observed in the surfaces affected by windthrows. In the Norway spruce and common beech stands, aerobe heterotroph bacteria and fungus were more abundant in soils that were not affected by windthrows because the uprooted trees remove top horizons of soils and the creation of leaf litter, roots and fungal hyphae, stops. In this situation, organic matter, in the soil, begins to decay.

Keywords: aerobe heterotroph bacteria, fungi, forest soils, soil properties, soil respiration, windthrows

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