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EFFECTS OF TEMPERATURE ON THE PROPERTIES OF PINE AND MAPLE LEAF LITTER ASH. A LABORATORY STUDY

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Abstract

The dominant litter samples *Pinus sylvestris* L. needle litter and *Acer platanoides* L. leaf litter were collected in the coniferous mixed forest located at 54°43' N 25°19' E (Vilnius, Lithuania) in April 2010. Different heating temperatures (150, 250, 350, 450 and 550°C) and 2 hour heating duration were used to produce ashes. The selected heating temperatures affected mass loss, colour, pH, electrical conductivity (EC), C/N ratio, nutrient concentrations of the ash. The darkness of Munsell chroma values was visible at 250°C and 350°C in both types of litter and additionally at 450°C in the needle litter ash. In contrast, the chroma values increased in brightness mainly between 450 and 550°C. The general tendency of pH ($p=0.01$) increase was ranging at the 150–550°C interval and the results did not include acid and extremely alkaline features but over the temperature of 350°C were alkaline. Values of EC ($p=0.01$) showed similar differences in the same litters. EC reached the maximum value at 450°C in *Acer platanoides* L. leaf litter. Likewise, heating temperatures affected litter ash nutrient composition. K, S, and P concentrations particularly depended on heating temperature and litter type. Nutrient concentrations were in the order Ca>K>Na>S>Mg>P>Zn>Fe for needle litter and Ca>K>S>Mg>P>Na>Fe>Zn for leaf litter samples. Significant differences in C/N ratio between the litters were observed as temperatures increased.

In conclusion, this study provides significant information on how different heating temperatures affect ash properties of *Pinus sylvestris* L. needle litter and *Acer platanoides* L. leaf litter of the coniferous mixed forest in Lithuania.

Key words: *Acer platanoides* L., C/N ratio, *Pinus sylvestris* L., temperature, nutrient

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