

ABSTRACT

The role of litter composition and quality on the nutrient release was studied in four months laboratory experiments and *in-situ* experiment. Spruce needles and leaves of four species dominant in understorey vegetation of the Norway spruce forest were collected in early autumn and incubated at 5 °C, 10 °C and 15 °C. The litter bag test for *in-situ* research was prepared on four experiment plots in the catchments of Čertovo lake and Plešné lake. C mineralization was measured every two weeks, concentration of NH_4^+ , NO_3^- , dissolved organic N, dissolved organic C and oxalate extractable P at the beginning and at the end of incubation. Also decay rate and nutrient release were calculated in the laboratory experiment. Samples from *in-situ* experiment were collected for four times in spring and in autumn and were measured for concentration of NH_4^+ , NO_3^- , dissolved organic N, dissolved organic C and oxalate extractable P.

Freshly senescent leaves contained less N and P indicating nutrient reallocation. Effect of temperature on a decay rate and nutrient transformation was not significant while the effect of litter quality expressed by C/N ratio was significant at the end of incubation. The decay rate was the fastest for the fern (*Athyrium alpestre*) and decreased in order: *Calamagrostis villosa* > *Vaccinium myrtillus* > *Avenella flexuosa* > spruce needles. The results from *in-situ* experiment did not confirm the slowest decay rate of spruce needles in laboratory experiment.

The critical C/N ratio below which mineral N was released in high amount was around a value of 32. The results indicate that an increase of coverage of understorey vegetation with low level of C/N ratio as is for example *Calamagrostis villosa* or *Avenella flexuosa* can increase a risk of nutrient release.