Abstract

This diploma thesis deals with the decomposition of fungal necromass in the Arctic tundra (Svalbard archipelago) under the factor of climate change (simulated by an increased temperature inside the Open Top Chamber). The dynamics of fungal necromass decomposition of two selected fungi, which differ in the level of melanin content and in C:N ratio – *Laccaria laccata* (hyaline, lower C:N ratio) and *Phialocephala fortinii* (melanized, higher C:N ratio), was compared. The aim of the work was to evaluate the influence of melanization level of fungal necromass and elevated temperature on the dynamics of fungal necromass decomposition and on the community composition of the decomposers (fungi, bacteria). The experiment focused on monitoring the dynamics of fungal necromass decomposition, changes in enzyme activity, changes in melanin content and C:N ratio during decomposition, as well as on the analysis of the microbial community composition on decomposing mycelium.

Throughout the whole incubation, the necromass of *P. fortinii* decomposed more slowly than the necromass of *L. laccata*. The differences in the dynamics of decomposition were mainly due to the biochemical composition of the fungal necromass (C:N ratio and melanin content). The melanin content increased in both types of mycelium during decomposition. The C:N ratio in the necromass of *L. laccata* increased during decomposition, while in the necromass of *P. fortinii* remained unchanged.

The decomposition of the fungal necromass was mainly influenced by fungi from the division *Mucoromycota* and *Ascomycota*. The initial phase of the decomposition was driven mainly by molds, while in the later phase saprotrophic fungi predominated. Fungal necromass decomposition involved mainly bacteria from the phylum *Proteobacteria*, *Bacteroidetes* and *Actinobacteria*. The length of incubation was the main explanatory factor for differences in the composition of microbial communities.

The effect of elevated temperature on the dynamics of fungal necromass decomposition and on the composition of the microbial community was not detected during the entire incubation (eight weeks).

Key words: decomposition, fungi, bacteria, arctic tundra, climate change