

Deadwood as microbial hotspots in mountains forest soils

Deadwood is an essential component of properly functioning forest ecosystems which impacts physical, chemical and biochemical properties of soil. Mountain forests are specific ecosystems due to diverse geomorphological conditions and often extreme climate characteristics. Maintaining the stability of mountain forest ecosystems is a requirement for soil protection against erosion, water runoff or loss of biodiversity. Managing deadwood resources can help maintain the favourable conditions in mountain forests. Deadwood decomposition processes are microbially mediated. Microorganisms are the primary agent of decomposition. Many microorganisms tend to form colonies and to aggregate, while creating microbial hotspots. We suppose that decaying wood is a hotspot because it may enhance changes in soil properties, especially the biological properties of soil. Most of the hotspots study have focused on the rhizosphere and detritosphere. There are no results concerning on the microbial activity in other hotspots. Our research supplements this gap. The purpose of our study is to determine the role of deadwood in shaping the microbiological activity of mountain forest soils. For this purpose a climosequence approach comparing north (N) and south (S) exposure along an altitudinal gradient will be set up. Thus by comparing the properties of decomposing deadwood and that in the soil located directly beneath the decaying wood it is possible to draw conclusions about the role of deadwood as hotspots for the abundance and diversity of microbes. Through the deadwood and its decomposition products, the amount and diversity of soil biota can be shaped, which in consequence may result in greater stability of mountain forest soils. By managing the amount of deadwood we can influence the creation of hotspots in mountain forest ecosystems. Knowledge of the dynamics in the release of components from decaying wood is a prerequisite for understanding microbial mechanisms and for modeling of biogeochemical cycles in mountain soils. The proposed research will expand knowledge of soil science, ecology and especially soil microbiology.