Abstract

Polymer materials have had a big impact on the industry in the 20th century and replaced a large amount of then used materials. Plastic waste, however, has subsequently become a big problem that needs a solution. One of the possible solutions is to produce biodegradable plastics, that should degrade in nature by themselves and therefore not increase the volume of plastic waste. Their degradation, however, is often only partial and the dynamics of polymer biodegradation in soil are not yet fully understood. In this thesis, we are investigating biodegradability of polyurethanes in field soil as it has high ecological relevance.

The text consists of two parts. The first part is literary research on mechanisms of biodegradation of polymer materials and methods which are commonly used for characterization of microbial communities. The second part is our own laboratory project that aims to evaluate the effect of biodegradation of polyurethane on soil microbial communities. We assume that mostly fungi and bacteria taxa will take part in the biodegradation and will use enzymatically catalyzed hydrolysis to degrade the polyurethane foam.

Key words: Biodegradation, polyurethane, soil, microbial communities, PLFA