

Abstract

Primary succession is the process of ecosystem development that takes place in sites that were not suitable for colonization by plants and organisms dependent on them. These sites arise either naturally, for example after a volcanic eruption or glacial retreat, or anthropogenically, for example by strip mining. During primary succession, plants colonise the bare substrate and gradually modify its abiotic and biotic conditions. During primary succession, interactions between plants and the soil microbiome, especially with fungi and bacteria, occur. Plants and soil microorganisms influence each other's growth and development through various interactions. Plants, or rather their roots, form a specific niche for a wide range of soil microbial communities. Through their roots, plants provide a wide range of substances, organic acids, sugars, amino acids and other often carbon-rich compounds that can serve as a substrate for microorganisms. Plants are able to do this by producing litter, root exudates, and translocation of sugars for symbiotic fungi and bacteria. Soil microorganisms contribute to the release of nutrients and the decomposition of organic materials that would otherwise be unavailable to plants. Many soil microorganisms can form a symbiotic relationship with the plant; this relationship may be mutualistic in the case of mycorrhizal fungi or some bacteria, or pathogenic in the case of some groups of bacteria or fungi. These interactions are an important factor during ecosystem succession and in the formation of plant communities. Plants have the ability to modify soil properties, which in turn shape the structure of the microbial and plant community. The shape of the soil microbiome is shaped during succession by earlier arriving plant species and can cause different feedbacks to subsequent colonization by both conspecific and heterospecific plants.

Overall, the interaction between plants and the soil microbiome during primary succession is complex and dynamic, with each component influencing the development of the other. The soil microbiome can influence plant growth and health, while plants can alter soil conditions and shape the structure of the soil microbial community.

Key words: primary succession, fungi, arbuscular mycorrhiza, bacteria, soil ecology.