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ANALYSIS OF THE INTERACTIONS OF MICROORGANISMS IN SOIL ENVIRONMENT

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Summary

Soil is a complex environment in which there occur numerous complicated and often closely overlapping processes. They stem mainly from the presence of an extensive and varied soil microbiota and interactions occurring with their participation. The most dynamic area of the soil, characterized by an increased intensity of interactions, is the zone directly adhering to plant roots, called a rhizosphere. A variety of interactions between microorganisms, which include both the negative and positive relationships, is observed in this area. Microorganisms may also interact with plants and thereby stimulate or inhibit their growth. A phenomenon necessary for the occurrence of these dependencies is allelopathy, that is exchange of signaling molecules produced by microorganisms (phytohormones, volatile organic compounds), and released also from plant root exudates. Because of the spaciousness and complexity of the soil environment, many of the underground processes are not yet known at all, others are neither fully clarified, nor understood; lack of such knowledge often prevents attainment of crop yields expected by farmers. A thorough analysis of interactions between microorganisms in the soil environment may contribute to the development of new technologies in agriculture, also those related to improvment of human health. Hence, there is a strong requirement of further studies on the soil interactions.