

The influence of biofertilizers on activity and biodiversity of soil microorganisms (BIO-FERTIL – BIOSTRATEG project)

The study on the use of microbially enriched mineral fertilizers is part of one of the main trends of scientific work for sustainable development and environmental protection. Soil microorganisms playing a fundamental role in the circulation of elements in terrestrial ecosystems are one of the most important factors shaping the availability of nutrients for plants. The study on microbial communities is very important for soil health, especially in identification of potentially phytopathogenic species and beneficial microorganisms. The variety and activity of soil microorganisms is important to ensure good soil quality and high productivity. The enzymatic activity of soil is relatively easy to change as a result of processes occurring in the environment, therefore it is considered as one of the most sensitive indicators of ecosystem functioning.

The proposed subject of the doctoral thesis concerns the impact of biofertilizers on the soil microbial communities. The aim of the proposed research is to determine the effect of biofertilizers on selected microbiological parameters of degraded soils. The research will include analysis of genetic and functional diversity of soil microorganisms. The following methods and techniques will be used to conduct the research: metagenomic analysis - next generation sequencing (NGS), analysis of terminal restriction fragment lengths polymorphism (t-RFLP), analysis of community level physiological profiles (CLPP), soil enzymatic activity.

Scientific supervisor: prof. dr hab. Magdalena Frąć, assistant supervisor: dr Agata Gryta

Candidate profile:

- master's degree in biology, environmental protection, biotechnology or other Life Sciences
- very good command in English, including specialist terminology
- knowledge of molecular biology methods and microbiological and biochemical techniques used in environmental research
- proven record of research activities (e.g. extracurricular research training period, research internships, participation in scientific conferences),
- ability to use bioinformatics and statistical software to elaborate results
- teamwork skills, motivation, creativity, independence