

Review of the PhD thesis submitted by Ing. Daria Rapoport

Title: Bacterial interactions and secondary metabolites in plant and soil environment

Referee: RNDr. Vendula Brabcová, PhD.

The thesis submitted by Daria Rapoport presents a set of studies and listed results addressing the occurrence, physiology and function of Actinobacteria in soil, namely assessing relationships between secondary metabolites and interactions of actinobacteria in plant and soil environments. The thesis is divided into two parts. The first describes the role of selected isolated actinobacteria in interaction with other cultivable bacteria from acidic waterlogged soil. The already published results are complemented with other important results and widely discussed pointing to the effect of the selected actinobacteria strains on bacterial community structure and secondary metabolite production. The second part focuses on the characterization of phytopathogenic and biocontrol actinobacteria from the tuberosphere potatoes addressing the very important question for agriculture - the control of widely spread common potato scrub. The rather diverse scope of individual studies mirrors the immense ecological diversification of Actinobacteria world.

The thesis consists of introduction parts clearly defining the aims of the work and the background of studied topic. Both detailed parts include introductory informations, methods, results and discussion and are well written. The already published results in respected peer-reviewed journals are framed with other results and the discussion gives the coherent impression.

Four papers are listed as a part of the thesis. However, two other manuscripts were submitted to support Darja's expertise and 6 other publications are listed in her CV.

In conclusions, the thesis brought a number of new interesting results in the Actinobacteria world and also the promise in application of the results in agriculture. The thesis fully meets the requirements for doctoral theses and the candidate proved to have the full expertise and competence for scientific work. I therefore recommend it for the defence.

V Praze, 9.11.2022

Vendula Brabcová

Questions:

The Trebon Clade actinobacteria dominate the studied waterlogged acidic soil. Could this group be indicative for this type of environment or they are also highly abundant in other soils/ forest environments/ habitats?

Only Acidobacteria abundance was negatively affected in interaction experiment. Can you hypothesize why?

It seems, that *Trebonia* isn't a strong competitor, but potential wide spectra secondary metabolite producer. The effect towards other bacteria is only mild. Could be the complex metabolite production aimed against the fungal community? Would this bacterium be able to compete for the nutritional resources with saprotrophic fungi or these do not dominate this type of environment?

In paper IV, you describe the biologically very active fast growing isolate 09ZI22. Are there any future plans with this strain in terms of possible biological control agents?