



Toruń, 19.06.2023

Full name of doctoral student: Kalisa Bogati

Album no.: 503157

PESEL no.: 92120611280

DOCTORAL DISSERTATION ABSTRACT

Scientific discipline: biological sciences

Title of the doctoral dissertation: **"The impact of simulated drought on changes in microbial biodiversity and soil biological activity"**

Doctoral dissertation abstract:

The presented doctoral dissertation focusses on the effect of drought on soil biological activity such as microbial diversity, ecophysiology, and enzymatic activity, on agricultural soils. The findings acquired during the execution of the research enabled the following final conclusions to be reached:

- Prolonged drought of 8 weeks has a deleterious effect on the growth and activity of the soil microbial abundance and taxonomic diversity.
- The soil water regime strongly modified the activities of enzymes, leading to a slowing-down and /or affecting the nutrient cycles. Clay-rich soil was more resistant to suppression of soil enzymatic activity during soil water deficiency, whereas sandy soil resulted in significant soil enzyme inhibition.
- Drought induced substantial shifts in the metabolic potential of microbial communities in investigated soils. The use of most of the carbon substrates were strongly inhibited by water deficit conditions.



This research will give a practical and theoretical foundation for other researchers to investigate soil water deficit issues, as well as benefit water and soil resource management and protection. It will also advance the application of fractal theory in soil science, which will aid the advancement of soil science. Currently, there is an increasing emphasis in metagenomic research on determining specific taxa that are influenced by water stress circumstances. A deeper understanding of the changes in soil microbial community structure and functions will provide insights into nutrient cycling under climate change using this approach.

Kalisa Bogati

.....
doctoral student's signature