



Bachelor Thesis

Microorganism Functionality in maize crops in the driest area in the south of Ecuador



- Microorganisms, including mycorrhizae, provide various ecosystem services such as i) enlargement of the root system, ii) solubilization of minerals, making them assimilable by plants, and iii) the debatable enhancement of tolerance of plants to periods of drought. In this context mycorrhiza – Plant symbiosis is fundamental for its development and establishment in a dry ecosystem.
- Considering the critical role of microorganisms in the agroecosystems, here we propose to characterize the composition and functions of the microbial communities of the rhizosphere and soil in maize crops (*Zea mays*) and the contributions of mycorrhizal fungi in the flow of carbon and nutrients as well as its contribution to root growth in different phenological states and dry conditions.
- Through a laboratory experiment we want to create a baseline knowledge to understand the development of maize roots without any microorganisms, from 3 different hybrid maize seeds adapted to different altitude gradients and precipitation input to a gradient of dry conditions in their different phenological states.

The information generated will contribute to the specific knowledge, creating a baseline from which we will evaluate the contribution of different cultivable microorganisms in root development, nutrient acquisition, and drought tolerance. This will help us to evaluate the importance and prevalence of these microorganisms in the current agroecosystems and their potential use as an alternative to the indiscriminate use of agrochemicals and the effects of climate change.

The maize seeds are from different crop plots in the driest area in Ecuador. The area is part of the binational reserve between the desert in northern Peru and the dry forest in southern Ecuador.

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