

Effect of a soil biofertilizer in the functional profile of the soil microbial community through the Biolog Assay

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Introduction

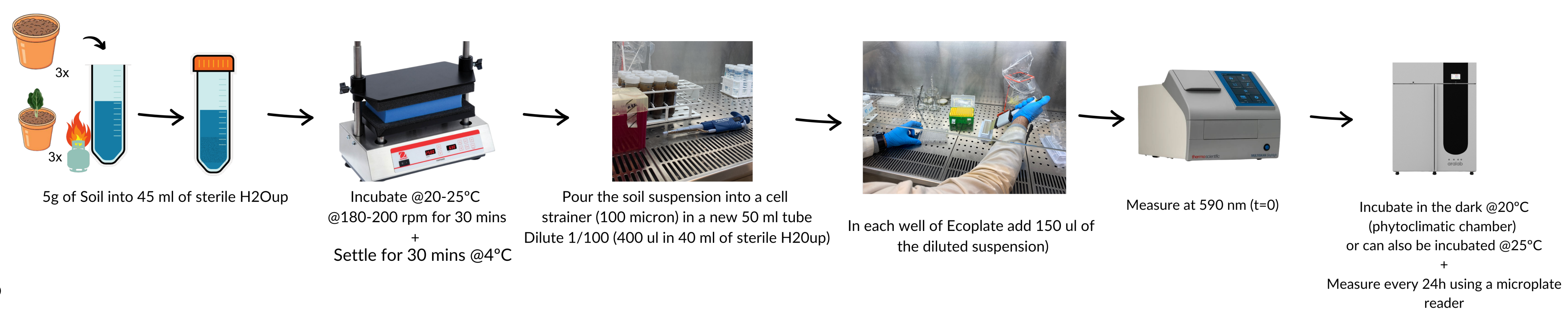
The dependency on crops of products with synthetic chemical compounds, whether fertilizers or pesticides, for saving the development and yield has been a challenge to the environment, and new alternatives are being sought to change this reality. The excessive use of chemicals affects human health and soil quality. Therefore, there is a significant need to produce green compounds that are environmentally sustainable, aimed at improving or restoring microbial activity in the soil. Biofertilizers are compounds that contain biological substances capable of stimulating plant development, by providing nutrients and other plant-growth promoting compounds, of increasing soil microbial activity, and of reducing the environmental impacts of mineral fertilizers

Aims

- To assess the effects of applying a biofertilizer inoculum, containing rhizospheric microorganisms, that positively interact with plant roots, on the functional profile of the bulk soil microbial community
- To evaluate soil microbial activity after 30 and 60 days of organic biofertilizer application through the BIOLOG assay.

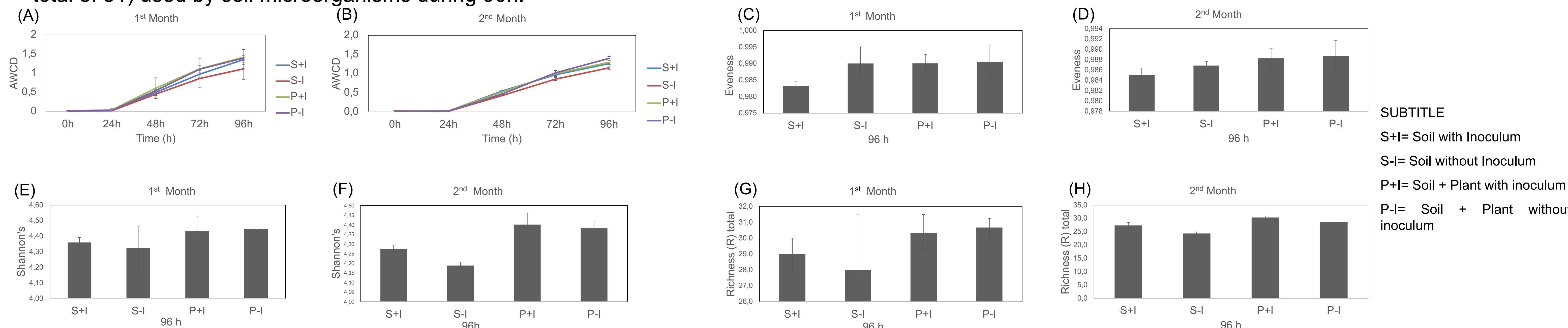
Methodology

An agricultural natural soil inoculated with the biofertilizer (Vitasoil™), applied or not in plant roots (*Brassica oleracea*), was incubated at 01/10/2024, under photoperiod conditions, 16h L: 8h D, temperature 20±2°C and 25000 lux. Afterwards it was analyzed after 30 and 60 days of incubation and compared with non-inoculated soil, using Biolog EcoPlates system.



Results

Average well color development (AWCD) (A) 1st month; (B) 2nd month; Evenness Index (C) 1st month; (D) 2nd month; Shannon's Index (E) 1st month; (F) 2nd month; Richness (G) 1st month; (H) 2nd month. Evenness, Shannon Index and Richness are calculated based on the number of carbon substrates (in a total of 31) used by soil microorganisms during 96h.



Conclusion

- The soil without inoculum was the one with the lowest microbial activity (measured by the AWCD) after both incubation periods, although the differences do not seem to be significant (data under analysis).
- The presence of the plant was able to compensate for the possible effect of the biofertilizer on the highest consumption of some substrates in detriment of others, as suggested by the Evenness index (C, D).
- Both the plant and the biofertilizer inoculum promoted a higher soil functional biodiversity of the soil, as measured by the Shannon Index (E, F) and the Richness (G, H), calculated based on the number and type of carbon substrates mineralized by the soil microbial community.

References

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Organização

Apoio

