Biological agriculture for good nutrition, food security and health: the use of soil microorganisms as a local solution

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Abstract

People are aware of the fact that organic food means avoid pesticides and GMOs, and is better for the soil. But organic agriculture can also be a part of the solution to other global issues – such as climate change and food security and health. All over the world, about 800 million people are hungry and another two billion people suffer from life-threatening disease related to under-nutrition and contamination from pesticides. Many parts of the world are experiencing a decline in yields despite the increased use of chemical inputs. In contrast, organic agriculture has proven to be effective in increasing and stabilizing yields, particularly in marginal lands. This means it is a system that empowers farmers to restore and uphold food security. In their natural environment, plants are part of a rich ecosystem including numerous and diverse microorganisms in the soil. It has been long recognized that some of these microbes, such as mycorrhizal fungi or nitrogen fixing symbiotic bacteria, play important roles in plant performance by improving mineral nutrition. However, the full range of microbes associated with plants and their potential to replace synthetic agricultural inputs has only recently started to be uncovered. We have used them to grow several plants and results showed to be very prominent. The used microorganisms increased plant growth, crop yield and nutritional composition. As result of these works, it was concluded that soil microorganisms are real alternative to the use of chemical fertilisers, whose use is harmful to the environment. Thus, the development and insertion of these bio-fertilisers would contribute to reducing the risk of diseases caused by the consumption of products treated with chemical fertilisers and pesticides, to reducing the rate of soil impoverishment, to increasing crop yields and to the emergence of developing countries.

Recent Publications

1- Haro H, Semde K, Bahadio K & Sanon KB. (2020). Effet de l'inoculation mycorhizienne avec des souches des champignons mycorhiziens arbusculaires sur la croissance de Mucuna pruriens (L.) DC en condition contrôlée. Int. J. Biol. Chem. Sci. 14(3): 1065-1073. DOI: https://doi.org/10.4314/ijbcs.v14i3.32

2- Djouhou FMC, Nwaga D, Fokou E. (2019). Comparative Effect of Arbuscular Mycorrhizal Fungi and Biostimulants on the Antioxidant and Nutritional Potential of Moringa oleifera. Nutri Food Sci Int J. 9(2): 555757. DOI: 10.19080/NFSIJ.2019.09.555758

3- Jacoby, R., Peukert, M., Succurro, A., Koprivova, A., & Kopriva, S. (2017). The Role of Soil Microorganisms in Plant Mineral Nutrition-Current Knowledge and Future Directions. Frontiers in Plant Science, 8. doi:10.3389/fpls.2017.01617

4- Souza, R. d., Ambrosini, A., & Passaglia, L. M. (2015). Plant growth-promoting bacteria as inoculants in agricultural soils. Genetics and molecular biology, 38(4), 401–419. https://doi.org/10.1590/S1415-475738420150053



Biography

DJOUHOU FOWE Michelle Carole is a Research Associate. As a scientist, her areas of interest are Food Science, Nutrition, Metabolism, Soil Bio-fertilization for Sustainable Agriculture and Food Safety. Michelle Djouhou, in addition to her academic background in Biochemistry, has followed several national and international training courses on leadership, personal development, business and entrepreneurship, data analysis and processing, scientific document writing, climate change, ethics. Involved in food processing techniques and processes allowing better valorization of food and reduction of post-harvest losses, she is also interested in the development of bio-products for plant protection against biotic and abiotic stress. Michelle Djouhou is the author of numerous scientific publications

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