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Abstract

Actinomycete strains isolation and selection from Algerian saline soils as environment-friendly tool for Solanum lycopersicum fertilization

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Abstract:

The excessive use of chemicals in agriculture has deleterious effects on soils, with negative consequences on crop productivity. New biological approaches are required to improve agricultural productivity without altering the environment and living organisms. Plant-growth- promoting rhizobacteria (PGPR) can be a valid tool to achieve these goals. The aim of the present study was to evaluate the capability of some actinomycete isolates to colonize roots and stimulate plant growth and development of tomato (Solanum lycopersicum L.). Sixty actinomycete strains were isolated from two saline soils of northeast region of Algeria - Ezzemoul sebkha and Djendli sebkha. Strains were first characterized in vitro for their capability to solubilize phosphate, produce indole acetic acid, hydrocyanic acid, and ammonia, and for the presence of different enzymatic activities. Then, strains that obtained best in vitro results

were investigated for their root colonization ability by scanning electron microscopy and utilized in a greenhouse experiment to assess inoculation biostimulant effects on tomato plants. Among sixty isolates, fourteen PGPR were selected based on their plant-growth promoting traits. These strains, belonging to Streptomyces sp. and Nocardiopsis sp. genera, showed good association capability with tomato plants in vitro. Greenhouse experiment results showed that tomato plants were positively influenced by actinomycete inoculation. Inoculated plants showed better growth and morpho-physiological characteristics with respect to the control. Results obtained suggest that these actinomycetal strains could be used as biofertilizers. The investigation and the development of these products should be encouraged to reduce the use of chemical fertilizers to improve environment quality and preserve living organism's health.

Biography:

Rihab DJEBAILI has two baccalaureates degrees in nature and life science and in microbiology (option microbial ecology). Rihab was a Staff promo during the master's years. Currently, she is a PhD student in general and applied microbiology at University of brothers Mentouri, Constantine (Algeria). She is in collaboration with the laboratory of environmental microbiology of University of L'Aquila (Italy) where is currently attending an abroad internship. Rihab's PhD thesis focuses on the application of actinomycetes strains as a biofertilizer for sustainable agriculture and has an international publication on "Actinomycete Strains Isolated from Saline Soils: Plant-Growth-Promoting Traits and Inoculation Effects on Solanum lycopersicum". Rihab also did a practical internship on cytobacteriological urine exam and antibiogram at a renal clinic; she has one-year experience in a pharmacy, temporary teacher of bacterial systematics, and food microbiology. She participated in an international seminar, at Hammamet, Tunisia; "5th International Conference on Sustainable Agriculture and Environment - ICSAE2018".

Publication of speakers:

1. Smati M, Kitouni M. (2019). Diversity of actinobacteria in the marshes of Ezzemoul and Djendli in north-eastern Algeria. Eur. J. Ecol. 5:41–53.
2. Pagnani G, Galieni A, Stagnari F, Pellegrini M, Del Gallo M, Pisante M. (2020). Open field inoculation with PGPR as a strategy to manage fertilization of ancient Triticum genotypes. Biol. Fertil. Soils 56:111–124.

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