Plant Growth-Promoting mechanisms of *Kocuria* strains under saline stress

Poster

Halophiles in food, agriculture, and human health , Agricultural applications of halophiles in soil salinity management

Ivan Arroyo Herrera [1], Alan Mendoza Ocampo [1], María Soledad Vásquez Murrieta [1].

(1) Instituto Politécnico Nacional, Microbiología, Escuela Nacional de Ciencias Biológicas, Prolongación de Carpio y Plan de Ayala s/n. Col. Santo Tomás. ZP: 11340, Mexico City, Mexico.

ivanarroyoqbp@gmail.com

Soil salinization in Mexico represents a significant agricultural challenge, impacting crop productivity and food security for future generations due to the growing global population. Various strategies have been proposed to mitigate this problem; however, their effectiveness has been limited. The use of halotolerant plant growth-promoting bacteria (HPGPB) has gained attention for their ability to enhance crop growth even under saline soil conditions. The genus *Kocuria* has been proposed as a viable alternative to support sustainable agriculture while addressing soil salinization. The aim was to assess the potential of *Kocuria* strains to promote plant growth under salt stress through genotypic and phenotypic analyses. Taxonomic identification of the strains was performed using overall genome relatedness indices (OGRI), revealing the strains as *K. rosea* ATCC 186T, *K. rosea* subsp. *rosea* AN6, and *K. oceani* LNSP5103-1. All three strains harbor genes associated with multiple plant growth-promoting (PGP) mechanisms, as well as genes involved in tolerance to salinity. PGP-related genomic features were corroborated through phenotypic assays, in which the strains exhibited siderophore and exopolysaccharide production, alginate lyase activity, indole-3-acetic acid, gibberellic acid synthesis, ammonium production, organic acid production, and biofilm formation. Notably, these traits were frequently expressed under saline stress conditions (1 and 3% NaCl). These findings suggest that the genus *Kocuria* could serve as an effective strategy for promoting more sustainable agriculture, particularly

in soils affected by salinity.

Palabras Clave

(1) soil, (2) salinity, (3) agriculture, (4) microorganism.

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