Sociedad Argentina de Microbiología General

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

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Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.

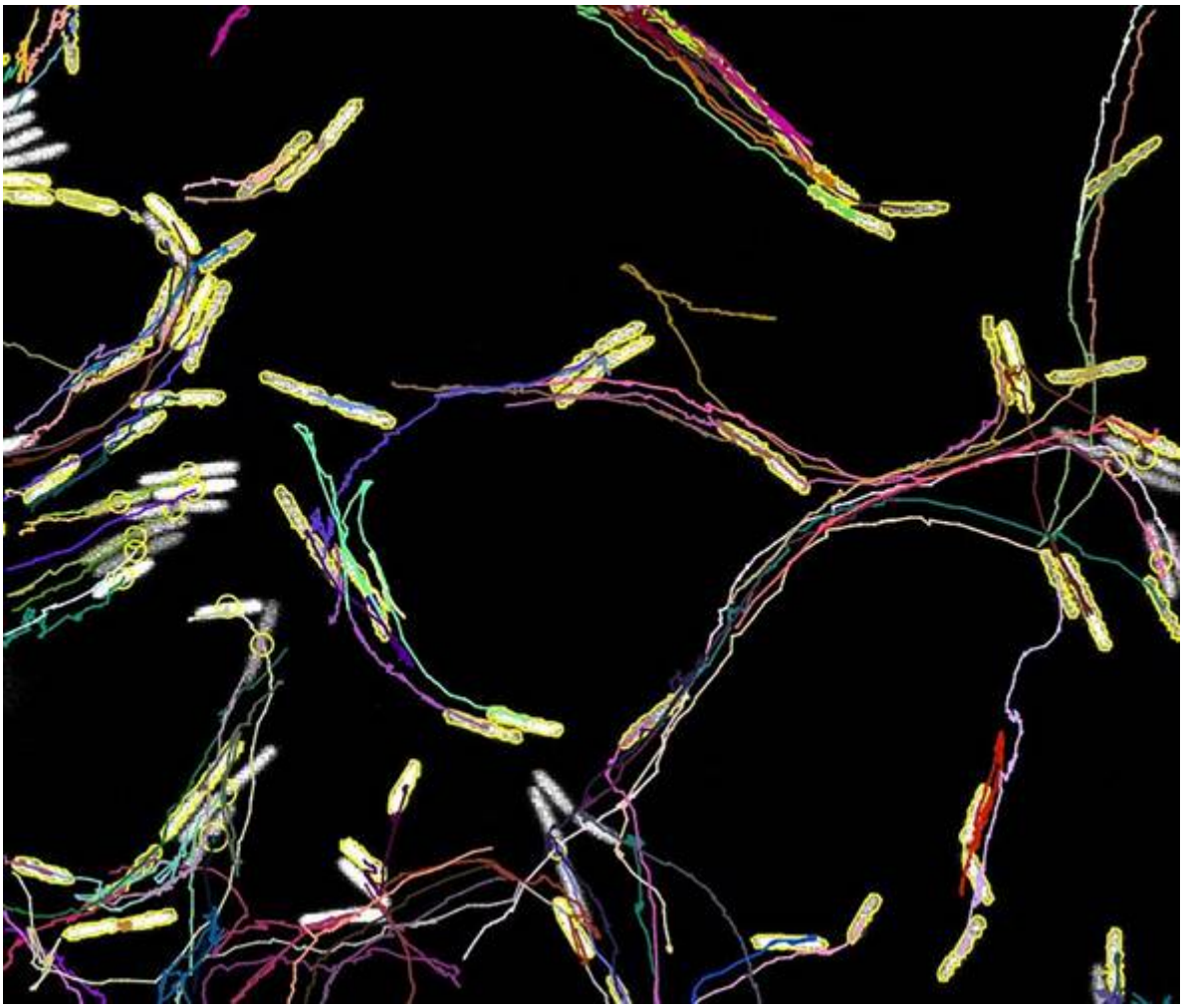

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

211 - Microbiología Ambiental, Agrícola y del Suelo

INDIRECT EFFECTS ON PLANT GROWTH PROMOTION OF NOVEL BIONOCULANTS FOR AGRICULTURE: IMPACT ON THE RHIZOSPHERIC MICROBIOME

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A sustainable approach to enhancing plant health and productivity involves using bioproducts based on beneficial microbes. Plant Growth-Promoting Rhizobacteria (PGPR) are rhizosphere-inhabiting bacteria that facilitate plant growth and improve health through various mechanisms. While the direct effects of PGPR on plant growth are well-documented, less is known about how microbial bioproducts influence the rhizospheric microbiome and the potential additional benefits to plants. Our preliminary results indicate that root colonization by specific PGPR alters root exudate profiles, potentially attracting more cells of the same microorganism and other beneficial microbial species through chemotaxis. This study aims to investigate the impact of seed inoculation on the rhizospheric microbial diversity and explore the potential roles of these microorganisms in promoting plant growth. Rhizospheric soil samples were collected from a field trial conducted in a productive field in the northwestern region of Argentina during the 2023/24 growing season. Soybean (Glycine max) seeds were inoculated with three M4Life® products, and samples were taken at three phenological stages: V3/V4, R1, and R6. To obtain microbial isolates, serial dilutions of soil samples were plated on various agar media (LB 0.1x, LB 1x, M9, and PDA). After incubation, colonies with distinct morphologies were isolated, preserved, and screened in vitro for biochemical traits associated with plant growth promotion, including indole acetic acid (IAA) production, siderophore production, and phosphate solubilization. A total of 206 isolates were obtained, of which 36% produced IAA, a key phytohormone for plant growth and development. Additionally, 61% produced siderophores, enhancing plant iron acquisition, and 25% were capable of solubilizing tricalcium phosphate, making it bioavailable for plant uptake. Some motile isolates also demonstrated positive chemotaxis towards root exudates in vitro. This work lays the groundwork for further studies on the colonization dynamics of the rhizosphere by microorganisms attracted to root exudates following inoculation with commercial bioproducts.

Palabras clave: Bioinoculants - Rhizosphere - Plant Microbiome - PGPR