Sociedad Argentina de Microbiología General

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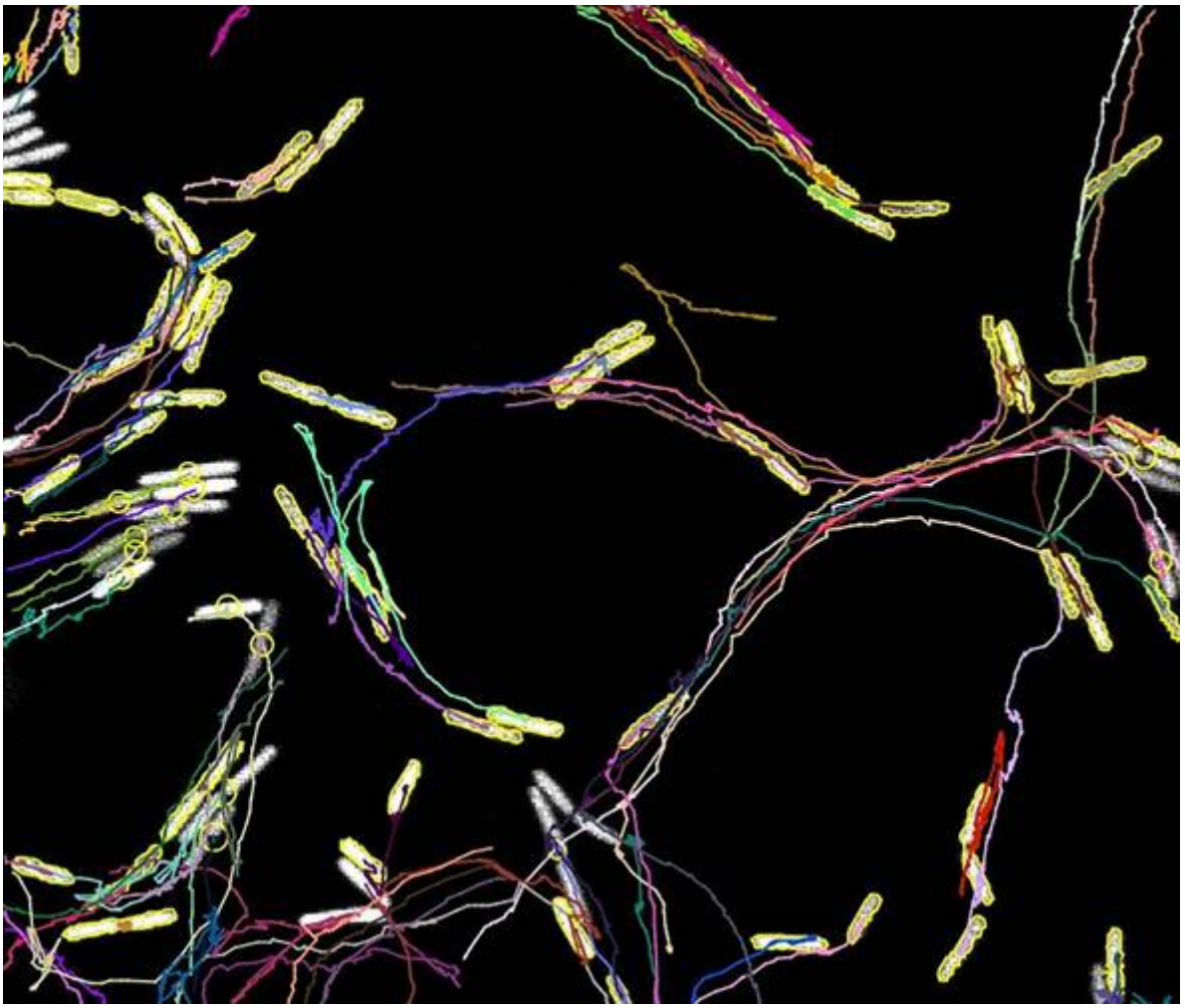

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

CHARACTERIZATION OF PLANT GROWTH-PROMOTING RHIZOBACTERIA ISOLATED FROM Nassella tenuissima

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The rhizosphere, defined as the portion of the soil that is strongly influenced by plant roots, is a highly favorable habitat for the proliferation of microorganisms. The rhizobacteria are an important member of these microbial communities that competitively colonize plant roots and stimulate their growth, thereby reducing the incidence of disease. These are known as Plant Growth-Promoting Rhizobacteria (PGPR), which improve soil fertility and promote plant growth through various mechanisms, including nitrogen fixation, phosphorus solubilization, iron sequestration via siderophores, auxin and enzyme production, and biocontrol of phytopathogens, among others. In the current context, where the effects of climate change aggravate the biotic and abiotic stresses suffered by plants, inoculation with selected PGPR is an alternative aimed at increasing yields and reducing the use of agrochemicals. They can also be used to treat soils that have been deforested, contaminated, burnt, under salinity stress, etc. The success of using bioinoculants depends on factors such as soil texture, pH, temperature, and moisture, as well as the activity of the native microbiota, making studies on the effectiveness of bioinoculants an ongoing challenge. In the piedmont region of Potrerillos, in Mendoza, native plants have been used to revegetate degraded areas. However, the lack of persistence of plants in degraded areas is common, partly due to adverse environmental conditions, including a severely affected microbial community. There are numerous studies on PGPR, but we have not found any information on then in native plants of our region. Therefore, the aim of our study is to characterize PGPR from the rhizosphere of *Nassella tenuissima*, a grass used in reforestation in Mendoza. For this purpose, samples of the rhizosphere of *N. tenuissima* were collected from three georeferenced sites. The physico-chemical characteristics of the soil from which the samples were taken were also analyzed. A total of 159 strains were isolated and their morphological and cultural characteristics, as well as their plant growth promoting (PGP) properties: nitrogen fixation, siderophore production, enzyme production, phosphorus solubilization were studied. Of the isolates, 25% were able of fix nitrogen, produce enzymes, and solubilize

phosphorus, and 12% also produced siderophores. From these, five strains with the best PGP properties were selected and the growth rate of each was evaluated. This allowed us to select the two most effective strains to evaluate the effect of different doses and incubation times in assays on *N. tenuissima* seeds. This has allowed to advance in the study of PGPR adapted to the region, as possible microorganisms with potential as biofertilizers, that can be used in the restoration of degraded soils and in landscaping.

Palabras clave: plant growth-promoting rhizobacteria - native grasses - degraded areas