Sociedad Argentina de Microbiología General

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

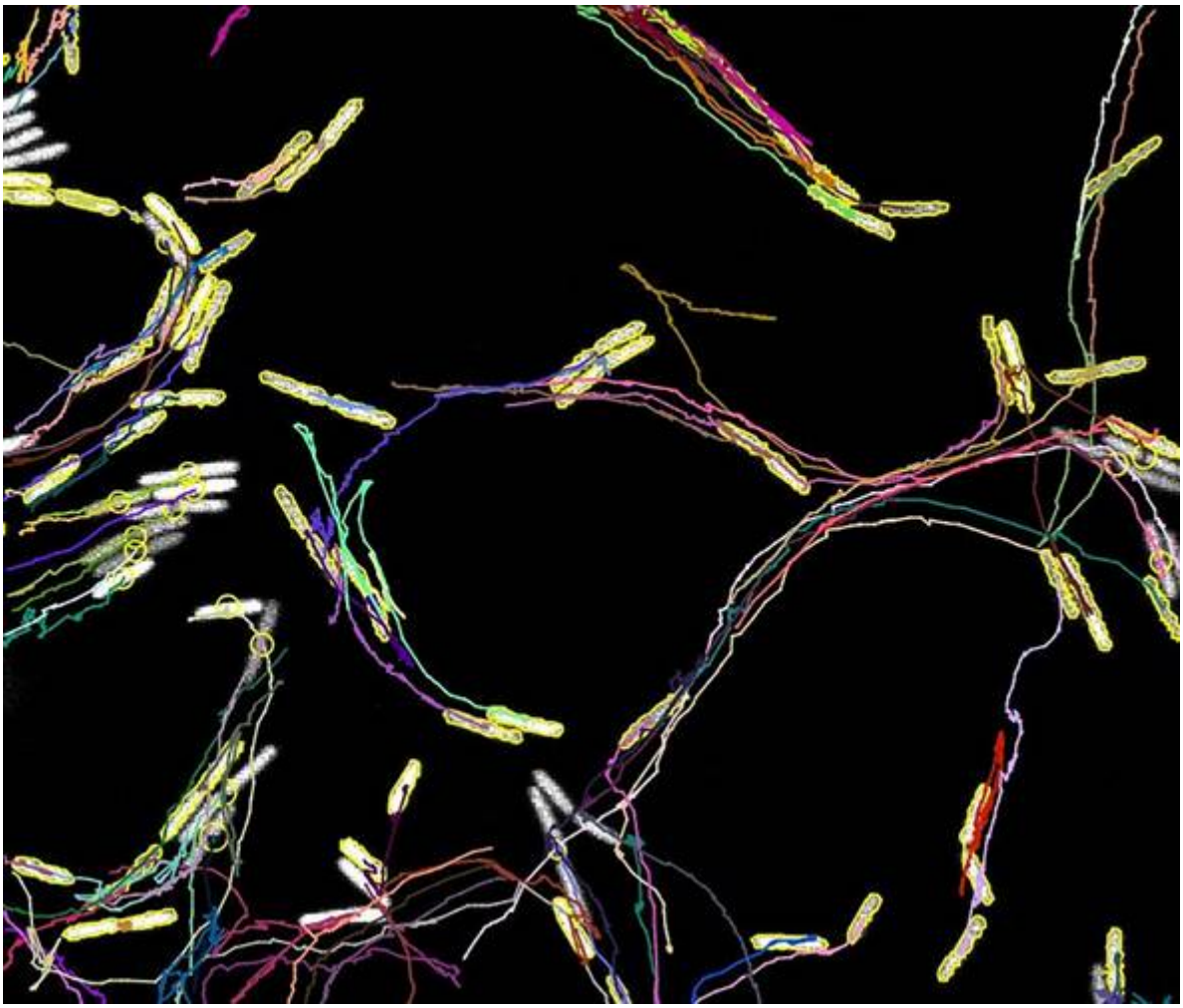

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

MICROBIAL BIOSTIMULANTS TO MITIGATE SALT STRESS IN LETTUCE

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The effectiveness of a specific plant growth-promoting rhizobacteria (PGPR) strain for enhancing plant tolerance to abiotic stress depends on the crop, the type and level of the stress. This study aims to evaluate different PGPR strains and their combinations to improve lettuce germination and early growth under salinity stress. Two sets of assays were conducted. In the first one, *Azospirillum argentinense* strains (Az19, selected for its osmotic and salinity stress tolerance, and Az39, as the reference strain) and their combinations were evaluated through germination assays. The most promising treatment was then evaluated on early growth in pot experiments. In the second set, germination assays included *Pseudomonas rhodesiae* ZME4, both alone and combined with Az19, to compare their effectiveness with the best treatment from the first set. The effect of inoculation on the germination rate 24 and 48 hours post-sowing (ps) under saline stress was evaluated in Petri dishes irrigated with 80 mM NaCl solution. Control treatments without stress and not inoculated were included. The best treatment of the first assay was Az19+Az39, which was then evaluated in pots to confirm its effect on promoting early growth under 120 mM stress conditions. For the second germination assay the treatment Az19+Az39 was compared to *P. rhodesiae* ZME4 and its combination with Az19. Finally, the two best treatments (Az19+Az39 and ZME4+Az19) were evaluated in a third assay under normal conditions to assess their impact on germination and early growth of the seedlings in Petri dishes. In the first germination assay, at 24 hs ps, treatments inoculated with Az19 alone and in combination with Az39 increased the percentage of germinated seeds in 43 and 58 %, respectively, compared to the non-inoculated stressed control. At 48 h ps, all inoculated treatments improved germination compared to the stressed control, matching the germination rate of seeds without stress. One month-old plants grown in sterile substrate under saline stress (120 mM) inoculated with the combination Az19+Az39 had significantly higher dry and fresh aerial weight and SPAD greenness index

compared to the control stress non inoculated. In the second germination assay, treatments with ZME4 (alone or combined with Az19) showed the best performance at 24 h ps, however at 48 h ps all the inoculated treatments had significantly higher germination rate compared to the stressed control non-inoculated. Seven-day seedlings inoculated with ZME4+Az19 had significantly higher fresh weight and root length germination compared to the stressed control non-inoculated. Under normal conditions at 24 h, both treatments increased the germination rate. These results encourage further research to identify the best combination of PGPR to mitigate saline stress in lettuce, from seedlings to harvest.

Palabras clave: Azospirillum argentinense – Pseudomonas rhodesiae – coinoculation - salt stress - lettuce