Sociedad Argentina de Microbiología General

XIX CONGRESO DE LA SOCIEDAD ARGENTINA DE MICROBIOLOGÍA GENERAL

22 al 25 de octubre del 2024
Centro cultural y Pabellón Argentina de la Universidad Nacional de Córdoba, Córdoba, ARGENTINA.

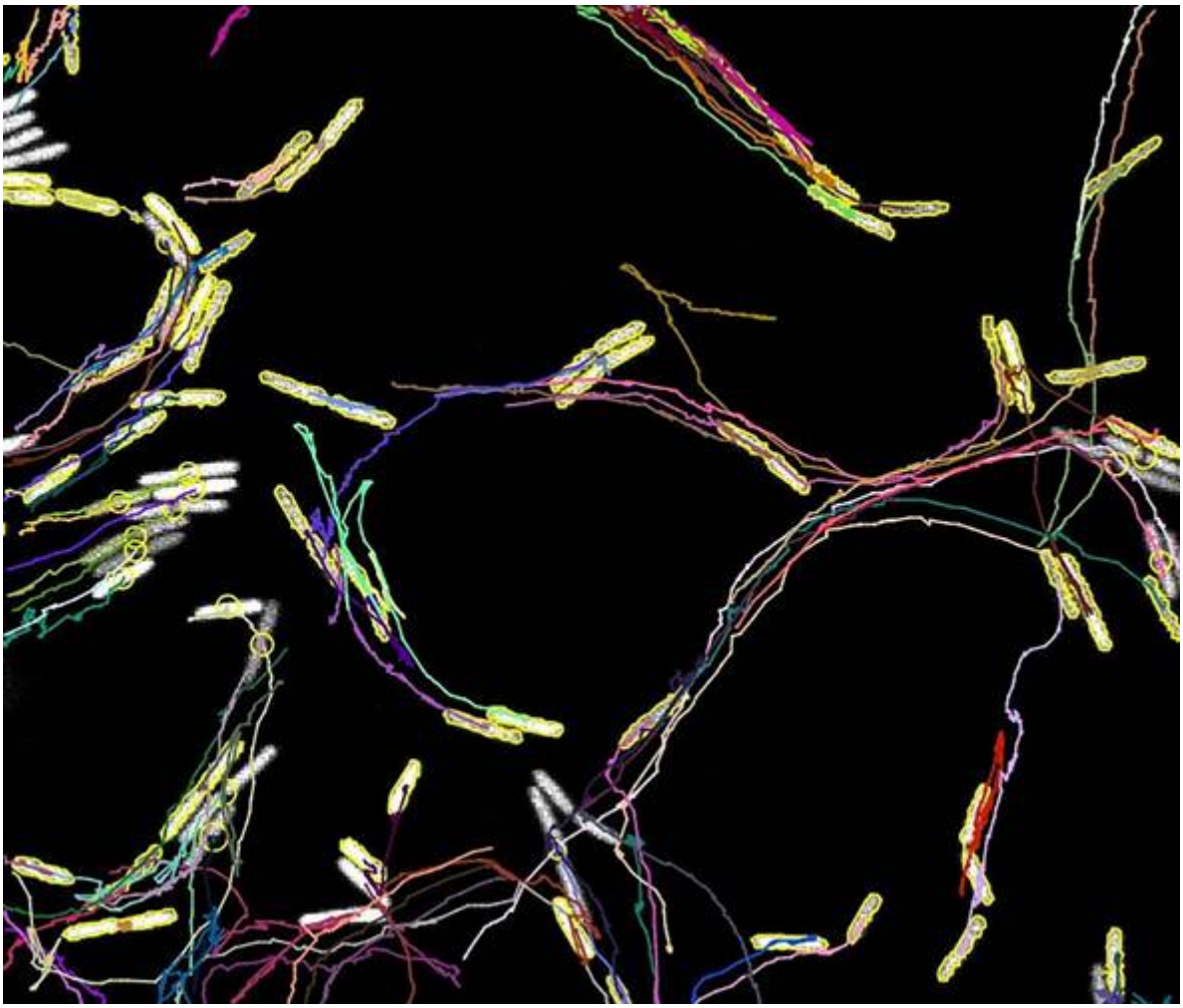

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

INFLUENCE OF OXYGEN CONDITIONS ON ROOT HAIR DEVELOPMENT AND COLONIZATION OF *Arabidopsis thaliana* BY *Pseudomonas extremaustralis* 14-3b

Agranatti, Carola [1] - Ricardi, Martiniano M. [2,3] - Tribelli, Paula M. [1,4]

1) Dpto. Química Biológica, FCEN-UBA, Buenos Aires, Argentina,
2) IFIBYNE-CONICET, Buenos Aires, Argentina
3) Dpto. FBMC, FCEN-UBA, Buenos Aires, Argentina,
4) IQUIBICEN-CONICET, Buenos Aires, Argentina
Contacto: carola99@uba.ar

The soil and different parts of plants harbor a vast microbial diversity. The *Pseudomonas* genus includes several plant growth-promoting bacteria (PGPB). PGPB can exert their beneficial effects on plant growth through the production of secondary metabolites such as siderophores and plant hormone analogs, increasing nutrient availability and competing for the ecological niche with phytopathogens. Oxygen is a key factor that affects bacterial physiology, and variations in its availability cause changes in a large number of cellular functions. Oxygen gradients can be found along the different parts of the plants and the soil. *Pseudomonas*' physiology responds diversely to O_2 availability, with complex alternative metabolisms. In this work, we analyze the effect of low oxygen conditions on different PGPB characteristics in *P. extremaustralis* 14-3b (P.ext) *in-vivo*.

A. thaliana seedlings were inoculated 36 hours after germination with P.ext from aerobic or microaerobic cultures. The root hairs of roots from seedlings inoculated with P.ext grown in aerobic cultures (336.3 ?m) were longer than those inoculated with P.ext grown under microaerobic conditions (293.7 ?m). Both treatments showed significantly longer hairs in comparison to the non-inoculated controls (116.6 ?m).

To evaluate the ability of P.ext grown under aerobic or microaerobic conditions to colonize roots, *A. thaliana* seedlings were inoculated with aerobic or microaerobic cultures of P.ext strains expressing the GFP protein (pBBR1-MSC-2 GFP) or the mCherry protein (pSEVA 237R, KmR). Single inoculations were performed with each strain from each aeration condition and with both strains from opposing aeration conditions (co-inoculated plants) to assess competition. Controls with the unmarked strain (P.ext wt) were used as autofluorescence blanks. Photos of the roots were taken in the green and red channels for each plant using a fluorescence stereomicroscope. Average fluorescence per area in the apical root zone was measured. P.ext was capable of colonizing *A. thaliana* roots by forming a large biofilm on them, regardless of the aeration condition from which the bacterial culture originated. Using this technique, no difference in fluorescence levels in each channel was observed in co-inoculated seedlings, indicating that at least in the studied time periods, there would be no advantage

in root adhesion or growth based on the aeration condition of the inoculant.

Palabras clave: Pseudomonas - OXYGEN - A.thaliana - ROOT HAIR - COLONIZATION