

Poster

Characterization of plant growth promoting bacteria isolated from red fruits. Studies on growth promotion and fruit quality in strawberries plants.



Canosa Pérez-Fragero, I. (1), Camacho, M. (2), Cárdenas Rodríguez, S. (1,*)

(1) Universidad Pablo de Olavide, Ctra Utrera, Km 1, 41013 Sevilla.

(2) IFAPA Centro "Las Torres-Tomejil", Ctra Sevilla-Cazalla, Km 12,2 41200 Alcalá del Río, Sevilla.

Tutor académico: Canosa Pérez-Fragero, I.

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ABSTRACT

Microorganisms associated to the rizosphere of cultivated plants used for human consumption are scarcely analyzed. However, nowadays, organic farming, where the use of microbial inoculants is essential, has arisen as an emergent alternative with great commercial interest.

In this study, a collection of bacterial strains isolated from strawberry and blueberry rhizosphere (healthy and infected with *Macrophomina phaseolina*) as well as from the inside of stolons of strawberries plants (endophytic bacteria) has been constructed and characterized by their PGP and biocontrol properties.

Three PGP properties have been determinate: auxin and siderophores production and phosphate solubilization. Regarding biocontrol activities, the presence of five enzymatic activities have been determined: protease, chitinase, cellulose, amylase and β -Glucosidase. On the other hand, the ability of the isolated strains to inhibit under in vitro conditions the growth of two pathogenic fungi of rump fruits, TOR 102 and TOR 872 (both belonging to the specie *M. phaseolina*) was tested. Strains reaching the better results were sequenced and identified as: *Cupriavidus metallidurans*, *Bacillus proteolyticus*, *Arthrobacter pascens*, *Bacillus amyloliquefaciens*, *Raoultella planticola*, *Enterobacter roggenkampii*, *Bacillus megaterium*, *Pseudomonas multiresistorans*, *Bacillus invictae*, *Pseudomonas aeruginosa*, *Chryseobacterium cucumelis*, *Klebsiella pneumonia*, *Achromobacter denitrificans*, *Bacillus velezensis*, *Burkholderia contaminans*, *Bacillus niacin*, *Pantoea annatis*, and *Bacillus frigoritolerans*.

After that, a strawberry growth promotion assay was performed under controlled conditions. Strawberries plants were inoculated with three bacterial strains previously characterized by its high level of auxin production, namely *Enterobacter roggenkampii* (AC8), *Chryseobacterium cucumelis* (ACH2) and *Klebsiella pneumoniae* (ACH7t). A greenhouse assay was carried out, with 6 replicates per treatment, including three strains as well as an uninoculated control. Biometric parameters (flowering precocity, number and weight of fruits, root and shoot dry weight), as well as quality ones (fruit size and Brix degrees) were determined at the end of the assay. Results showed that strains ACH7t was significantly superior in flowering precocity and number of fruits, while strains AC8 and ACH7t showed Brix values significantly different than the other treatments.

REFERENCES

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