

## RHIZOBACTERIAL ISOLATED FROM THE SEMIDESERT PROMOTED GROWTH IN *ARABIDOPSIS THALIANA* AND PRESENTED BIOCONTROL ACTIVITY AGAINST PHYTOPATHOGENIC FUNGI AND *CLAVIBACTER MICHIGANENSIS*

Mónica Hernández-Rodríguez<sup>1</sup>, Gleb Turlakov<sup>1</sup>, José Humberto Valenzuela-Soto<sup>1</sup>, Ivana Moggio<sup>1</sup>, Eduardo Arias<sup>1</sup>

<sup>1</sup>Centro de Investigación en Química Aplicada, Blvd. Enrique Reyna 140, Col. San José de los Cerritos, C.P. 25294, Saltillo, Coahuila.

E-mail: [mohernandez95@gmail.com](mailto:mohernandez95@gmail.com)

The Plant Growth Promoting Rhizobacteria (PGPR) studies have been broadly reported with multiple benefits in plants, such as a biocontrol, biostimulant, biofertilizer, and biopesticide, among other effects. This study is focused on the isolation of PGPR from the rhizospheric soil from semidesert (25°39'15.51" N, 101°6'56" W) of Coahuila, Mexico. Seven isolates were selected by screening and later characterized under *in vitro* conditions for PGPR traits. The evaluations were performed to determine the phosphorus (P) and zinc (Zn) solubilization, nitrogen fixation, antagonistic activity against *Alternaria alternata* (Aa), *Fusarium oxysporum* R3 (F3), *Sclerotinia sclerotiorum* (Sc), and *Clavibacter michiganensis* (Cm). Growth promotion bioassays were also achieved in *A. thaliana* Col-0<sup>1</sup>. The isolated M5-2B, M5-2C, and M4-2A showed either a positive result for N fixation, or presented positive results for P and Zn solubilization in five isolates. The antagonistic activity by the isolated: M5-2B was of 14.72% for Aa, M5-2C was of 24.13% for F3, and for isolated M5-2C was of 42.94% for F3. Meanwhile, the isolated M4-2A, M4-2B, and M4-2C showed a complete inhibition of the growth of Cm. Conversely, with growth promotion experiments, the isolated M4-2B and M5-2B showed a phytoestimulant response, which allowed an increase in leaf area of 14.77% and 13.52% compared to control (non-inoculated) plants; interestingly, the root development was increased by 47.53% and 77.06%, respectively. The biocontrol activity and phytoestimulation abilities of rhizobacteria suggest their potential use as biocontrol agents for phytopathogenic fungi and bacteria in crop plants.

### References

1. Hernández-Rodríguez, M., Jasso-de Rodríguez, D., Hernández-Castillo, F. D., Moggio, I., Arias, E., Valenzuela-Soto, J. H., & Flores-Olivas, A. (2024). *Microorganisms*, 12(11), 2380.