



Isolation and characterization of soil bacterial strains from natural protected areas in Bajío (lowlands) Region (Guanajuato, Mexico) exhibiting different biotechnological potential.

Colli Mull, J.G.¹, C.D. Vargas Sámano¹, J. A. Muñoz Luna^{1,2}, D.C. Quiroz Solís², G.A. de la Riva de la Riva¹Departamento de Biología, Instituto Tecnológico Superior de Irapuato (ITESI). Carretera Irapuato-Silao Km. 12.5.C.P. 36821 Irapuato, Gto, México. jcolli@itesi.edu.mx. Universidad Autónoma de San Luis Potosí, Álvaro Obregón 64 Antiguo, CP 78000, San Luis Potosí SLP, México.

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Introduction. The Bajío (lowlands) is a region of Central Mexico that includes the plains south of the Sierra de Guanajuato, in the state of Guanajuato, as well as parts of the states of Querétaro (the Valley of Querétaro), Aguascalientes, Jalisco and Michoacán (particularly the area around Zamora). In general parlance, it is usually associated with the States of Guanajuato and Querétaro, although it only forms a part of them. It is characterized by its highly mechanized agriculture, with mean precipitation in the order of 700 millimeters (28 in) per annum (one of the highest in the country).

The goal of this project was the isolation, biochemical characterization and agricultural application of microbial biodiversity.

Methods. We selected several locations to carry on intensive bioprospection studies. The location known as "Rancho Las Palomas", Sierra de Guanajuato, Mexico; was used to start this bioprospection project on microbial soil community. Other locations as Sierra de Pénjamo, Parangueo Crater, Sierra de Xichú, among other places, etc. were also included in this study.

The collected samples which were properly treated and different types of endogenous microorganisms were isolated on solid Luria Broth (LB) and Potato Dextrose Agar (PDA) media.

Results. Up to 200 bacterial strains and 50 fungi were isolated and preserved in the ITCC Regional Cell Culture Collection. Bacterial isolates were microbiologically studied and tested for various biochemical activities such as auxin synthesis, siderophores production, chitinase, glucanase and cellulase activities.

Considering the biochemical analysis results we selected a group of bacteria with remarkable characteristics for molecular analysis. Total DNA from selected bacterial strains was extracted from each of selected isolates its 16S ribosomal gene fraction were amplified, purified and sequenced. The obtained results allowed us to classify these strains.

Some of these bacterial strains were used to explore their biotechnological potential use in agriculture plant. A greenhouse experiment was carried out to observe if some of these bacterial strains stimulate the development of plants during the first steps of development and the bacterial strain ITCC97 showed the best results.

Conclusions. We created the ITCC Regional Cell Culture Collection with up to 200 bacterial strain and 50 fungi. Around 70% of all bacterial strains have biochemical activities for cellulase, chitinase, glucanase, auxin synthesis and siderophores production.

ITCC97 bacterial strain showed high plant growth promotion in potato, maize and pea in greenhouse experiments.

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