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.

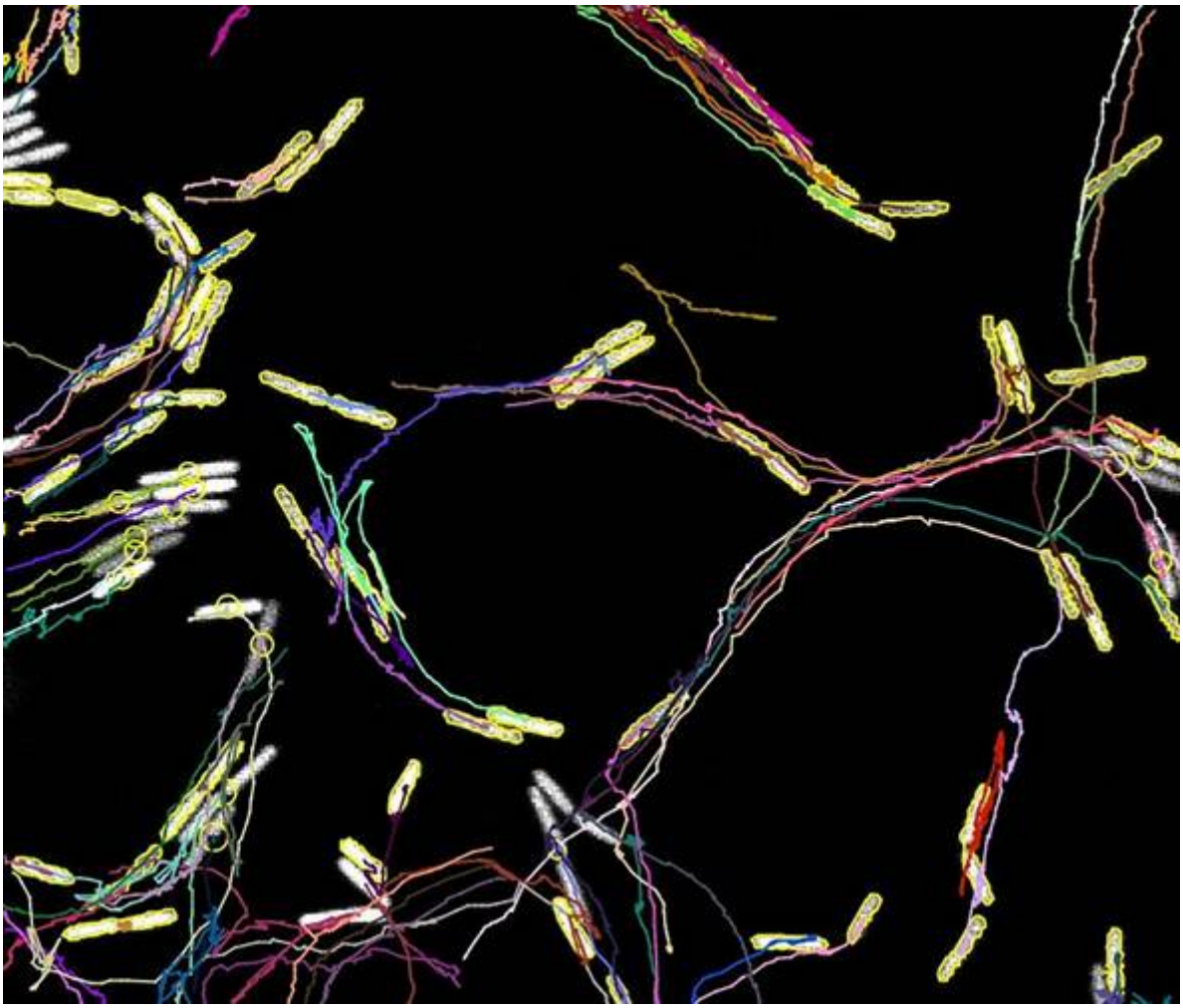

Foto: Se hace camino al andar. Celeste Dea. 1er puesto. Concurso fotográfico SAMIGE 20 años.

QUANTIFICATION OF VIABLE CULTIVABLE HETEROTROPHIC BACTERIA IN SOIL SAMPLES FROM THE ANTARCTIC COAST

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In recent decades, there has been an increase in research aimed at understanding and characterizing the bacterial biodiversity of Antarctic waters and soils. The interest in this type of study is based on the need to understand the role played by the bacterial microbiota in modulating and mitigating the effects of climate change and abiotic and biotic contamination of these ecosystems. The research work has been designed with the objective of obtaining data on the quantification of viable cultivable psychrophilic and psychrotrophic heterotrophic bacteria present in soils of the Antarctic coast. Likewise, establish relationships and correlations with different physicochemical and chemical parameters, which will allow to develop a monitoring system using remote sensing methods. All this for help to understand the dynamics of the bacterial microbiota of Antarctic soils and the effect of climate change and environmental pollution on it. To carry out the study, soil samples were obtained from 5 different sites on the Antarctic coast during the development of the XXVII Ecuadorian Antarctic expedition with the help and collaboration of the scientific stations in Antarctica of Chile and Colombia. The samples were collected aseptically and kept refrigerated until their processing in the microbiology laboratory of the Faculty of Chemical Engineering of the Central University of Ecuador.

Once in the laboratory, membrane filtration method using 0.45 um pore Millipore filters and serial dilutions in sterile physiological solution were made for isolation and quantification (UFC/g of soil) of bacterial colonies. The filtered diluted samples were spread on different culture media. Bacterial were then identified preliminarily by Gram staining and biochemical tests of catalase and oxidase. The number of colonies obtained ranged from 2.80 x 10 to 3.72 x 102 CFU/g, with an average value of 1.10 x 102 CFU/g for heterotrophic bacteria. Some of these bacteria were identified as Pseudomonas spp (1.30 x 10 CFU/g), while others as Actinomycetes (1.0 x 10 CFU/g). The results obtained show a predominance of Gram-negative bacteria over Gram-positive bacteria,

highlighting the presence of pigmented strains. The results in the quantification are low compared to those indicated by other authors. This is probably due to soil properties that result in a limiting environment for microbial development, such as unfavorable mineralogy, chemical structure, salt content, pH, low temperatures, and low water availability. Significant sources of organic matter are also limited, and this could explain the low values ??observed in the bacterial microbiota. It is necessary to monitor them in the following expeditions to observe their dynamics over time and relate it to the values ??of the physicochemical and chemical parameters such as conductivity, pH, salinity, presence of heavy metals, total sulfur, carbon, phosphorus and nitrogen content of the soil in order to build models and the design of a remote monitoring system.

Palabras clave: Heterotrophic bacteria – Soil – Antarctic Coast