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IDENTIFICATION OF NATIVE BACTERIA OF THE CANDELARIA AND TATACOA SEMIARID ZONE, CAPABLE OF WITHSTANDING A MARS UV RADIATION SIMULATION

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This work is the first study to describe native bacteria from the semi-arid areas in Candelaria and Tatacoa in Colombia, able to withstand a simulation of UV radiation, in order to draw an analogy with microbial growth on the surface of Mars. Sampling was carried out in the areas mentioned taking 50 samples of sediment divided into 25 samples of surface and 25 deep samples. As soon as the samples were transferred, they were subjected to a test of UV radiation in an atmospheric simulation chamber designed for the experiment, for periods of 1, 6 and 12 hours of exposure. Microbiological analysis as a method of plate dilution and isolation were performed using the modified AIS growth medium, macroscopic and microscopic description of morphotypes, biochemical identification of the morphotypes found, extraction of the feasible mycelium, DNA extraction and amplification of the gene 16 S by PCR. 13 morphotypes of bacteria resistant to UV radiation were found, mostly compatible with the gender of Streptomyces. One of the morphotypes found resisted 12 hours exposure. Molecular analyzes did not produce any results, because it was not possible to amplify the 16S by PCR, this may be due to that the exposure to UV radiation can degrade the DNA in existence, a affecting the results. The finding of native bacteria capable of withstanding conditions UV radiation can give us an approximation of microbial growth, mechanisms of resistance and survival under extreme conditions such as those found on Mars, in order to develop biotechnological applications and establish planetary analogues to understand the origin and evolution of the universe.

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EVOLUTION OF EARTH LIKE PLANETS

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In order to study and explain the evolution of our own planet we have done a review of works related to the evolution of Earth-like planets. From the stage of proto-planet to the loss of its atmosphere. The planetary formation from the gas and dust of the proto-planetary disk, considering the accretion by the process of migration, implies that the material on the proto-planet is very mixed. The newborn planet is hot and compact, it begins its process of stratification by gravity separation forming a super dense nucleus, an intermediate layer of convective mantle and an upper mantle that is less dense, with material that emerges from zones at very high pressure The surface with low pressure, in this process the planet expands and cools. This process also releases gas to the surface, forming the atmosphere, with the gas gravitationally bounded.

The most important thing for the life of the planet is the layer of convective mantle, which produces the magnetic field, when it stops the magnetic field disappears, as well as the rings of van allen and the solar wind evaporates the atmosphere, accelerating the evolution and cooling of the planet. In a natural cycle of cataclysms and mass extinctions, the solar system crosses the galactic disk every 30 million years or so, the increase in the meteorite fall triggers the volcanic activity and the increase in the release of CO2 into the atmosphere reaching critical levels (4000 billion tons) leads us to an extinction by overheating that last 100 000 years, the time it takes CO2 to sediment to the ocean floor. Human activity will lead us to reach critical levels of CO2 in approximately 300 years.

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