

The Search for Interplanetary Pioneers: An unusual hypersaline community from Bolivia

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We focus on life moving beyond its planet of origin, a question of evolutionary interest and because the human exploration of space is the movement of life from Earth. Our first objective is to identify new terrestrial organisms and ecosystems that will survive space radiation and vacuum. Laguna Colorada, a naturally occurring hypersaline lake in the Bolivian altiplano, provides a novel ecosystem that contains organisms that may have the capacity to survive interplanetary transfer. The name of the lake refers to its intense red color, a result of the dense community of halophiles. Water samples were collected in Nalgene containers and returned to the laboratory. Microscopic analyses revealed the presence of rod, cocci, and pleiomorphic morphological types. This occurrence is unusual, because the dominant morphological type present in hypersaline systems are square organisms, and none were found in this system. This observation suggests that the microbial community structure is different than nearly any other known hypersaline system. Samples were also inoculated into various media. Growth was detected only in halophile medium B containing NaCl 200 g, Hy-Case 5 g, MgCl₂·6H₂O 20 g, yeast extract 5 g, KCl 2 g, CaCl₂·2H₂O 0.2 g, in 1.0 L H₂O. Microscopic observation reveals unusual long rods, short rods, and pleiomorphic rods, but no cocci, squares or cubic organisms. We are currently screening the samples for organisms that are desiccation and radiation resistant. *We are indebted to Nathalie Cabrol of the SETI NAI team for invaluable logistical support.*