



Mars-Like Soils in the Atacama Desert, Chile (Alexander von Humboldt Medal lecture)

R. Navarro-Gonzalez

Laboratorio de Química de Plasmas y Estudios Planetarios, Instituto de Ciencias Nucleares, Universidad Nacional Autónoma de México, Circuito Exterior, Ciudad Universitaria, Apartado Postal 70-543, México D.F. 04510, Mexico

The Viking missions showed the martian soil to be lifeless and depleted in organic material and indicated the presence of one or more reactive oxidants. The presence of Mars-like soils have been documented in the extreme arid region of the Atacama Desert. The Atacama desert is one of the driest and oldest deserts of the world that extends across 1000 km from 30°S to 20°S along the Pacific coast of South America. Geological and soil mineralogical evidence suggest that extreme arid conditions have persisted in this desert for about 10-15 Myrs. The surface soil from this region has organic species only at trace levels and extremely low levels of culturable bacteria. Some samples from the extreme arid region were tested for DNA and none was recovered. Incubation experiments, patterned after the Viking labeled-release experiment but with separate biological and nonbiological isomers, show active decomposition of organic species in these soils by nonbiological processes. The Atacama Desert is now a valuable testing ground by NASA and ESA for instruments and experiments designed for future Mars missions for the search of life.