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Haloterrigena sp. SGH1: first extreme halophile Archaeon isolated from Atacama halites.

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Halites rocks (NaCl) from Salar Grande, Atacama Desert, Chile, are rough substrates colonized by complex microbial consortia that include *Eubacteria* and *Archaea* representatives and are dominated by cyanobacteria from the *Halotheca* genus, all unculturable microorganisms. Our purpose was to isolate and grow members of the community to learn on the underlying adaptive mechanisms of survival to the combined extreme environmental conditions (desiccation, high solar radiation, salinity) at Salar Grande, Atacama. Colonized fragments were dissolved in sterile Z8 liquid medium (20% salt, final concentration, 50 mM KCl, 10 mM compatible solutes: L-proline, trehalose or betaine) and incubated at 30°C. After 4 weeks, the liquid medium turned reddish and pigmented colonies were isolated in solid medium. Optimal growth conditions (salinity, pH, temperature, and potassium requirement), metabolic capabilities, molecular taxonomy, pigment analysis and ultrastructural features were studied on the isolate. SGH1 is red-pigmented coccus (1.2 µm mean diameter) with gas vesicles and a complex intracellular membrane network. Based on 16S rRNA gene sequences, SGH1 is an Archaeon cell belonging to the *Haloterrigena* genus. SGH1 grew optimally at 25% w/v NaCl and 25 mM KCl. It also is a mesophile and neutrophile. We report the isolation, growth and characterization of the SGH1, the first extreme halophilic, carotenoids-rich Archaeon isolated from microbial consortia of Atacama halites that uses the salt-in strategy to cope with high external osmotic pressures. Acknowledgments: Grants CODEI-5394 and SI-5305 (Universidad de Antofagasta, Chile); FIC-R 4603 and CeBiB FB0001 (CONICYT, Chile); CGL2013-42509-P (Ministerio de Economía y Competitividad de España).