SURVIVAL OF HALOARCHAEA IN HIGH CONCENTRATION OF PERCHLORATE-SIGNIFICANT REQUIREMENT FOR SURVIVAL ON MARS

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Extreme environment persists on Martian surface characterized due to presence of perchlorate, high salinity, high concentration of minerals like magnesium sulphate and radiation[1]. Recent evidences suggest that tolerance to perchlorate, salt and magnesium would be a characteristic requirement for survival in martian soil [2]. In the current investigation, we have studied the effect of perchlorate stress on halophilic archaea. The halophilic archaea were isolated from extremely saline salterns from Mumbai, India. All the haloarchaea demonstrated growth upto 0.4 M perchlorate above which most of the haloarchaea could not survive. However *Haloarcula argentinensis* grew well upto 0.5 M perchlorate in Sehgal and Gibbon's medium containing 15% NaCl. *H. argentinensis* demonstrated growth in presence of high concentration of Epsonite (0.5-1 M $MgSO_4$) and Sodium Chloride (25-30% NaCl). Results indicate that haloarchaea have the ability to tolerate multiple stress conditions of salinity, perchlorate and $MgSO_4$ concentrations that are a hallmark of Martian environment. The possibility of survival of haloarchaea in Martian conditions or the application of haloarchaea as 'models' for studying survival response during (Lithospermia) as well as the possibility of extreme halophilic life on Mars cannot be precluded.

References:

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