Impact of perchlorates on radiation tolerance of microorganisms from Mars-analogues sites

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Assessing the habitability of Mars and detecting life depends on knowledge of whether the combined environmental stresses experienced on Mars are compatible with life. Such stresses would be radiation, desiccation and high perchlorate concentrations. The results of this evaluation are limited by a lack of knowledge on the combined effects of different environmental stresses. In particular, many combinations of stress, such as high radiation combined with an absence of water and the presence of perchlorates have not been investigated.

For this Test five anaerobic isolates from Mars-analogue sites were used. These isolates showed extant survival after treatment with sodium perchlorate (up to 3 M). For example, *Trichococcus* sp. MASE-IM-5 had a D_{10}-value of 1.88 M.

For *Yersinia intermedia* MASE-LG-1 it could be shown that the addition of perchlorates did not alter the tolerance to ionizing radiation.

The results of this study will give an explanation how organisms from extreme terrestrial environments (Mars analogues) respond to such stresses and will undermine our knowledge of Mars as a location for life.

In the future the influence of a mars-like spectrum (UV-a/UV-B) on cells cultivated in the presence of perchlorates, or treated with perchlorates, respectively will be investigated.

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