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MARS ANALOGUES FOR SPACE EXPLORATION

Abstract

Searching for life on extraterrestrial planets is the goal of many space missions. Especially our neighbour planet Mars is of astrobiological interest. Assessing the habitability of Mars and detecting life, if it was ever there, depends on our knowledge about Earth organisms and their capability to survive the combined environmental stresses experienced on Mars. Samples from different Mars analogue areas on Earth were collected and anaerobic microorganisms adapted to these extreme conditions were isolated. These new strains were subjected to mars-relevant environmental stress factors alone and in combination in the laboratory under controlled conditions, e.g. radiation, high salt concentrations, low water activity, oxidising compounds. The aim is to find out, if these organisms are also able to survive under Martian conditions. So far, eight only distantly related microorganisms are under detailed investigation. The limiting factor for many but not all of these new strains is the exposure to desiccating conditions. Some strains survive surprisingly well. Some are also resistant against radiation or perchlorates. The future experiments aim at the identification of the underlying cellular and molecular mechanisms and the comparison to other new isolates from Mars analogue environments on Earth in the MASE project.

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