

Limits of survival: The effect of mars-like conditions, irradiation and humidity on the vitality of bryophyte species

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Due to their ability of desiccation tolerance Bryophytes are able to colonize extreme habitats. Pretests show the remarkable resistance of *Grimmia sessitana* to simulated space vacuum, Mars-like atmosphere, extreme temperatures, UVC radiation and desiccation. These are results from the BIOMEX-project (Biology and Mars Experiment)- a space experiment on the exposure platform EXPOSE-R2 on the International Space Station (ISS) (unpublished).

As a contribution to the BIOMEX-project, we investigate in addition to *Grimmia sessitana*, other species that may survive simulated mars-and space-like conditions. This work aims to give an overview about survival, damage of photosynthesis-apparature and germination of the examined species after exposure to (I) mars conditions and (II) earth conditions under different doses of irradiation and different levels of humidity. Therefore different moss species with different morphological adaptations to extreme environmental conditions are used. The plant material was taken from *Grimmia sessitana*, *Grimmia alpestris*, *Grimmia pulvinata*, *Ceratodon purpureus*, *Tortula muralis* and *Polytrichum piliferum* as well as spores from *Grimmia pulvinata*. To simulate mars-conditions and UV- irradiation we used the Mars simulation Facility of the German Aerospace Center (DLR) in Berlin.