NEW MODELORGANISMS FOR ASTROBIOLOGY FROM MARS ANALOG ENVIRONMENTS

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A selection of the core questions in astrobiology deal with the origin of life on Earth, life in extreme environments on Earth, and the search for past and present life on other celestial bodies. We are therefore searching for new model-organisms for astrobiology in extreme environments, the so-called Martian analog environments, which are similar to past and present-day Mars in some characteristics and properties (anoxic conditions, low nutrient availability, high salinity, low temperatures, etc.).

At the moment we are working with three facultative anaerobic model-organisms, namely *Yersinia intermedia* MASE-LG-1, *Buttiauxella* sp. MASE-IM-9, and *Salinisphaera shabanensis*. These organisms are being evaluated for their tolerance to Mars relevant stress factors such as desiccation, Martian atmosphere, radiation (polychromatic / monochromatic UV; ionizing radiation), oxidizing compounds (perchlorates), and the presence of an analog Martian regolith. All these influencing factors were tested under anoxic conditions as single stresses and in combination [1, 2].

The results showed that the new model-organisms for the most part clearly survived the various stress factors, thus qualifying them as possible candidates for our future space experiment called MEXEM (Mars EXposed Extremophiles Mixture). MEXEM which will be an exposure experiment which is installed on the outside of the international space station.

References

1. Beblo-Vranesevic *et al.* (2017) *PLoS One,* **12(10)**:e0185178.
2. Beblo-Vranesevic *et al.* (2022) *International Journal of Astrobiology*, 1-18.