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SURVIVAL RATE OF THE EARTHWORMS IN THE METEORITE BASIS- ISRU EXPERIMENTS
DURING ICARES-1 ANALOG MISSION.

Abstract

For the future Martian and Lunar colonies it is crucial to develop as much self-sufficient solutions as possible. Among the most important ones are those connected with production of food and medicines on board of the habitats by people who have only a little experience in growing and planting biomass. Up to 20 percent of the calories shall be produced onboard during the early phase of the missions, and gradually rise, hopefully replacing the Earth-dependent resources. Plants and animals may be used not only as a source of the proteins and calories, but, thanks to the biological knowledge it is possible to compose such a group of organisms, which will not only survive in the harsh Martian environment, but also provide many substances useful during long flights- like antibiotics, anti-clotting agents, or sedatives. During our analog mission ICares-1 we launched a Noah's Arc project which was aimed to check how simple organisms –earthworms, maggots, and leeches will perform in the simulated Martian environment – on the meteorite pulverized rockbed ground, and in the simulated microgravity. In our presentation we will focus on the survival rate of the earthworms in the meteorite material. The aim of the experiment is to determine whether earthworms can be cultured within the ground of extraterrestrial origin. The additional goal is to determine if earthworms are capable of transforming the chondrite into the fertile soil (vermicompost production). Short-term colonies of European nightcrawler (*Eisenia hortensis*) were maintained at RT on one of the three tested grounds 1) the standard natural soil, 2) meteorite dust 3) the standard natural soil and meteorite dust mixed in half. The earthworm survival rate was determined by counting the number of live individuals at the end of the experiment. All analyzes were conducted by analog astronauts, participants of the ICARES mission using previously prepared protocols. Detailed results will be presented during the conference.