Exploration of Other Destinations (5)
Exploration of Other Destinations (1) (1)

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A MICRO BIOSPHERE FOR LONG-DURATION SPACE TRAVEL

Abstract

In 2015, SIMEON Technologies launched its program called" MicroBiosphere for Space". The program consists in the realization of a box who reproduces in miniature (35x22x26cm) a complete biosphere, also with its different layers of soil. Three types of lichens from south France and the Alpen was planted, as well as three types of low grass. In July 2019, the plants were confronted of the heatwaves who burned the whole of the plants. Extreme temperature of 49C of soil surface temperature was recorded. In the end of 2020, a good soil condition has been seen. We also noted the development of a new underground ecosystem in the subsoil, essentially supply by recycled water by the layers of rock, ground and sand. As humans explore deep space, they will want to have plants for both practical and healthy reasons. They're good for their psychological well-being on Earth and in space. They also will be critical for keeping astronauts healthy on long-duration missions. In fact, a lack of vitamin C was all it took to give sailors scurvy, and vitamin deficiencies can cause a number of other health problems. Right now, on the space station, astronauts receive regular shipments of a wide variety of freeze-dried and prepackaged meals to cover their dietary needs – resupply missions keep them freshly stocked. When crews venture further into space, traveling for months or years without resupply shipments, the vitamins in prepackaged form break down over time, which presents a problem for astronaut health. NASA with its program "Advanced Plant Habitat (APH)" is looking at ways to provide astronauts with nutrients in a long-lasting, easily absorbed form-freshly grown fresh fruits and vegetables. The concept of our MicroBiosphere involves in the creation of a Garden, an autonomous ecosystem where it will be possible to spend time and cultivate. The other challenge is how to do that in a closed environment without sunlight or Earth's gravity.