Paper ID: 54734
student

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Biology in Space (8)

Author: Mr. Avishek Ghosh
India

Ms. Sonal Baberwal
France

GROWING GREEN ON MARS:AN EXPERIMENT TO EVALUATE GROWTH STUDIES OF VARIOUS SEEDS IN MARS SOIL.

Abstract

The geological conditions on Mars is not just different but also the atmosphere is unlike Earth. Due to the absence of proper atmosphere; more ultraviolet reaches on the ground than the actual sunlight. It will be a definite requirement to grow food onsite for the future colonization or long-term settlement on Mars. For that reason, an investigation is required to evaluate the survival of plants in extra-terrestrial soil under less sunlight.

In this paper, an investigation is reported on the possibility of growing various seeds and plants in artificial Mars soil under a controlled atmosphere and 40% less sunlight. A study on Greenhab and soil composition has been performed during and after an analogue simulation at Mars Desert Research Station (MDRS), Utah. This experiment involves soil samples collected from Pooh's corner during an EVA in MDRS, prepared charcoal, artificial Martian soil (JSC-MARS-1) and regular garden soil.

Various grain sizes (125 to 500 μm) are extracted by processing technique which plays and important role to prevent the soil compaction. Several mixtures are prepared out of processed soil with varying amount of organic component up-to 25% without addition of any nutrients. The preliminary results exhibit the soil mixtures have different capacity of holding moisture when a day-night water treatment has been performed. Fenugreek, mat bean, kidney bean, and sesame seeds were planted in normal garden soil to initiate the germination and sprouting process. The initial stage of germination and plant growth is observed in all soil mixtures. The differences in surviving capacity of sprouts and plants are also observed in various soil mixtures when they are transferred from regular garden soil. A similar studies have also been performed with all types of soil samples mixed with nutrients.The results exhibit; JSC-MARS-1 combined with organic mixture seems more promising as compared to local MDRS soil mixtures. However, most sprouts planted in MDRS soil mixtures have weakened after some days.