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BACTERIAL MODIFICATION OF LUNAR AND MARTIAN REGOLITH FOR PLANT GROWTH IN LIFE SUPPORT SYSTEMS

Abstract

Life support systems are a crucial factor in any type of moon village or Mars outpost. To achieve a sustainable set-up, a growth medium as well as several essential nutrients are necessary. The typical approach in current mission architectures is to resupply these nutrients and growth medium from Earth, which is costly and has a high degree of dependence on cargo rockets. Here, we discuss emerging technologies to utilize lunar and Martian soil and increase their nutrient composition for plant growth. We are using microbes to remove heavy metals and increase the concentration of suitable biomolecules in the regolith. The combination of life-support systems with biological and technical in situ resource utilization would increase the reliability and sustainability of extraterrestrial plant-growth in a significant way and ultimately pave the way for human colonies on other celestial bodies.