

Challenges of Life Support/Medical Support for Human Missions (8)
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GROWING PLANTS IN SPACEFLIGHT IS THE MOST IMPORTANT FACTOR IN THE LIFE
SUPPORT SYSTEM

Abstract

Optimal engineering systems for life support of astronauts, researchers, etc. in space flights must be include zones with growing and flowering different plants, allowing solving technical and psychological problems. In this respect, it is worth to consider plants in cosmos as one of the units in a life-support system. For modern development of plant biotechnologies in space flights, we use nanotechnology for plants growing and receiving the best yield. We have devised a nutrient medium in which essential metals such as iron, zinc and copper were added as electro neutral nanoparticles instead of metal salts. Such replacement is appropriate through unique nanoparticles properties: metal nanoparticles are less toxic than metal ionic forms; produce prolonged effects, serving as a depot of elements; nanoparticles introduced in biotic doses stimulate metabolic processes of the organism; nanoparticles action is multifunctional. Venice tomato was used for cultivation on a nutrient medium with iron, zinc and copper nanoparticles in different concentrations. Tomato plants grown on the nutrient medium with metal nanoparticles showed better morphometrical and physiological characteristics than controls: seedlings and plants were compact with the developed and active root system and the best fruit yield.