Paper ID: 11664
oral

SPACE LIFE SCIENCES SYMPOSIUM (A1)
Life Support and EVA Systems (6)

Author: Dr. Nataliya Novikova
Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

MICROBIOLOGICAL CHARACTERISTICS OF THE ENVIRONMENT OF THE INTERNATIONAL SPACE STATION

Abstract

Microorganisms, the automicroflora in humans, and also the residents of soil, water, and air, all isolated from the biosphere existing outside the boundaries of a hermetically closed environment, are the constant ecological partners of humans during manned space flight. In the process of exploitation of the International Space Station (ISS) microflora of air, interior surfaces and equipment are monitored on a regular basis to keep continuous assessment of sanitary and microbiological state of the environment. Up to present time 79 species of microorganisms have been recovered in the ISS, namely 46 species of bacteria and 33 species of moldy fungi. In the composition of microbial species mainly nonpathogenic species have been found. However, a number of bacteria discovered on the ISS, particularly some representatives of human microflora, are capable of causing different diseases when human immune system is compromised. Moreover, some bacteria and a considerable number of fungi are known to be potential biodestructors of construction materials, and that leads to bio-deterioration of construction materials and equipment. Results of our research show that the existing set of life-support systems can in whole maintain microbial contamination within regulated levels. Furthermore, constant microbial monitoring of the environment is an integral part, which provides for the safety of space missions. In order to improve microbiological monitoring of manned spacecraft habitats it is necessary to develop methods of express analysis of environment bio-contamination. For this purpose one can use the device named “Electronic nose” allowing determining the presence of microorganisms basing on their metabolism products analysis.