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OLFACTORY ENHANCEMENT FOR ASTRONAUT WELL-BEING IN CONFINED SPACEHABITATS

**Abstract**

Effective accomplishment of a space mission required timely completion of various tasks on a day-to-day basis by astronauts. Such timely completion often influences the success and failure of the missions. During space missions, astronauts often deal with many unfavorable factors that make it difficult for them to function efficiently and perform their tasks. Such factors include but are not limited to reduced gravity, radiations, etc., influencing mental health as well. Astronauts experience isolation, longing for their loved ones and their everyday life on Earth. Additionally, their time tables are planned in advance and followed critically to complete various tasks and goals. Often such, the factors influencing the health and even life of astronauts depending on the timely and correct performance of a given activity. Therefore, it becomes of critical importance to design some appropriate techniques to improve the mental health of astronauts in such cases. One of the factors that can improve the everyday functioning and performance of tasks by astronauts is scent. Research shows that through proper selection of scent, the olfactory system of a human being can significantly improve the well being and task performance of the subject. When a scent is detected, olfactory neurons in the upper part of the nose generate an impulse that is transmitted to the brain via the olfactory nerve. Olfaction is located in the limbic system, a set of structures in the brain that scientists believe play an essential role in controlling mood, memory, behavior and emotions. Appropriate scent release techniques can be employed to improve the mental health of astronauts at some time intervals of day. This publication describes research conducted inside Earth stations simulating Lunar and Martian conditions, such as ExoSpaceHab-X made by EuroMoonMars and Habitat Marte, where an analogue astronaut crew was tested for well-being and motivation under the influence of neutral and positive scents. A very important aspect of the study was the complete and voluntary isolation of participants from the outside world during missions.