Investigating the human salivary microbiota using the Mars500 mission

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Abstract

The Mars500 mission was a psychosocial isolation experiment designed to study the effects of long-term space travel on humans, but it also presented a unique opportunity to study human microbiota. Our microbiota play key roles in our health and are thus important subjects of study. However, it is often difficult to distinguish between resident and transient microbes and to control outside variables, but in the Mars500 mission the subjects were isolated for 520 days while on a standardized diet. Samples were collected during and after the isolation period, and researchers assessed the diversity of their salivary microbiota. While time, diet, and individual subject differences each had a significant impact on microbiota variation, the individual differences between subjects had the greatest influence. The Mars500 mission allowed a reduction in outside variables that is difficult to achieve in most experiments and highlighted the pronounced personalization of salivary microbiota even when sharing the same space for over a year.