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ANALYSIS OF PURE MICROGRAVITY AND LOW EARTH ORBIT ENVIRONMENT EFFECTS ON
MICROBES RESIDING IN THE HUMAN GUT**Abstract**

Since all possible known life forms have been exposed to an exact gravitational force of 1g, there was little or no chance of evolution under other conditions like microgravity in space. It is of great importance to have a prior assessment on the effect of spaceflight on human health and give proper prior/countermeasures to sustain the health of the on-board astronauts. This poses many challenges as it is increasingly difficult to maintain the health of on-board crew in pursuit of expeditions beyond the Earth's orbit with little or no chance of return in case of emergencies. The missions can last for months in case of lunar mission or years in case of planetary expeditions. Enough evidence is there to show that long space missions compromise the immune system. Also, there risk of contamination of the spacecraft with varied microbiota persists. In addition to the above-mentioned facts, bacteria have good adaptation techniques and certain classes of pathogenic bacteria like *Salmonella typhimurium* shows increased virulence under microgravity conditions which can lead to more exposure and harm to astronauts. Microbes have been studied using bioreactors for microgravity simulation on ground, but it requires that all the space environment conditions have to be provided, which is practically hard to achieve. This follows that an actual spaceflight is required. Nano-satellites are cost-effective methods for analysing the safety of onboard astronauts in pursuit of long duration spaceflight, prior to the actual spaceflight itself. The test results thus obtained are made open-source and are utilized by space agencies for further testing. RVSAT1 is one such attempt for analysing the growth of certain species of microbes in space. This paper deals with the analysis on growth of bacteria under pure microgravity conditions at a low earth altitude of around 500km.