

Growth and tolerance of a terrestrial cyanobacterium, *Nostoc* sp. HK-01 under harsh environment

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A terrestrial cyanobacterium, *Nostoc* sp. HK-01, has several abilities; photosynthesis, nitrogen fixation, utility as food, and tolerance to extraterrestrial environments. *Nostoc* sp. HK-01 may be utilized for biochemical circulation in closed bio-ecosystems, such as Mars. Tolerance to extraterrestrial environments are important for transportation to Mars. Akinetes, which are dormant cells of *Nostoc* sp. HK-01, are tolerant against dry heat, upto 100 °C for 10h. These results indicate that some functional substances which provide tolerance against heat exist in the akinete cells. Akinetes of *Nostoc* sp. HK-01 could be transported to Mars. Before we introduce *Nostoc* sp. HK-01 to Mars' environments, we need to understand its growth in an environment with poor nutrition. We tested whether akinetes of HK-01 can grow using components of their dead cells or/and Martian regolith simulant. We will discuss the possibility that a colony of HK-01 can be grown in an environment with poor nutrition. *Nostoc* sp. HK-01 could contribute to soil formation from Martian regolith, so that plants could grow. *Nostoc* sp. HK-01 is a good candidate for an initial organism to introduce into the Martian environment.

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