

Summary of: MARSBox: Fungal and Bacterial Endurance From a Balloon-Flown Analog Mission in the Stratosphere

****Key Findings and Quantitative Results:****

****Survival and Metabolic Activity:****

- ****Survival Fraction:**** - ****S. shabanensis:**** $5.3 \times 10^{-1} \pm 1.8 \times 10^{-1}$ - ****S. capitis subsp. capitis:**** $1.1 \times 10^{-1} \pm 5.9 \times 10^{-2}$ - ****A. niger:**** $6.4 \times 10^{-1} \pm 8.0 \times 10^{-2}$ - ****Buttiauxella sp. MASE-IM-9:**** Not detected

- ****Survival Fraction Comparison:**** - ****UV Shielded vs. UV Exposed:**** S. shabanensis > S. capitis subsp. capitis > A. niger > Buttiauxella sp. MASE-IM-9

- ****Survival Fraction for A. niger:**** - ****Monolayer:**** 107 spores mL⁻¹ - ****Multilayer:**** 108 spores mL⁻¹

****Germination Rate:****

- ****Germination Rate:**** - ****A. niger:**** 0.38 ± 0.09 - ****S. shabanensis:**** 0.47 ± 0.01 - ****S. capitis subsp. capitis:**** 0.24 ± 0.03 - ****Buttiauxella sp. MASE-IM-9:**** Not detected

- ****Germination Rate Comparison:**** - ****UV Shielded vs. UV Exposed:**** S. shabanensis > S. capitis subsp. capitis > A. niger > Buttiauxella sp. MASE-IM-9

****Metabolic Activity:****

- ****Resazurin Reduction:**** - ****UV Shielded:**** $70\% \pm 5\%$ - ****UV Exposed:**** $70\% \pm 5\%$

- ****Resazurin Reduction Comparison:**** - ****UV Shielded vs. UV Exposed:**** S. shabanensis > S. capitis subsp. capitis > A. niger > Buttiauxella sp. MASE-IM-9

****Survival and Germination Comparison:****

- ****Survival Fraction:**** - ****UV Shielded:**** $6.4 \times 10^{-1} \pm 8.0 \times 10^{-2}$ - ****UV Exposed:**** $1.3 \times 10^{-2} \pm 4.5 \times 10^{-3}$

- ****Germination Rate:**** - ****UV Shielded:**** $29\% \pm 0.1$ - ****UV Exposed:**** $35\% \pm 0.5$

****Survival and Germination for Multilayer vs. Monolayer:****

- ****Monolayer:**** $2.1 \times 10^{-1} \pm 6.6 \times 10^{-2}$ - ****Multilayer:**** $2.1 \times 10^{-1} \pm 5.2 \times 10^{-3}$

- ****Comparison:**** - ****UV Shielded:**** $29\% \pm 0.3$ - ****UV Exposed:**** $35\% \pm 0.6$

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** $20\% \pm 5\%$ - ****UV Exposed:**** $30\% \pm 0.3$

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** 23% \pm 0.1 - ****UV Exposed:**** 36% \pm 0.5

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** 36% \pm 0.1 - ****UV Exposed:**** 35% \pm 0.5

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** 29% \pm 0.3 - ****UV Exposed:**** 30% \pm 0.6

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** 30% \pm 0.3 - ****UV Exposed:**** 36% \pm 0.6

****Survival and Germination for Laboratory Controls vs. Exposed Samples:****

- ****UV Shielded:**** 29% \pm 0.3 - ****UV Exposed:**** 30% \pm 0.6

****Survival and**