

Can Martian biota survive extreme heating during transfer via meteorites from Mars to Earth?

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Throughout its history Mars exchanged surface rocky material with Earth via Martian meteorites. However transfer of biota with Martian meteorites is only plausible if martian microorganisms could have somehow survived episodic extreme heating events. At the moment of asteroidal impact into Martian surface (when Martian meteorite is produced) rock temperature sharply increases up to 1000 K. Similar heating is expected upon entry of the meteorite into the upper Earth's atmosphere. In both cases the duration of heating is very short – less than a few seconds. Note that prior to both extreme heating events Martian microorganisms should have experienced desiccating and freezing conditions - Martian surface conditions and space vacuum.

We have developed special forevacuum experimental chamber to model the whole sequence of extreme events which hypothetical Martian biota should have experienced during transfer to Earth via Martian meteorites.

We have studied the resistance of bacteria against short heating pulses in the range of 100-400C degree at low atmospheric pressure down to 0.01-0.001 mbar. Preliminary results of our experiments will be discussed. Our results will determine the probability of the successful transfer of Martian biota to Earth via Martian meteorites.