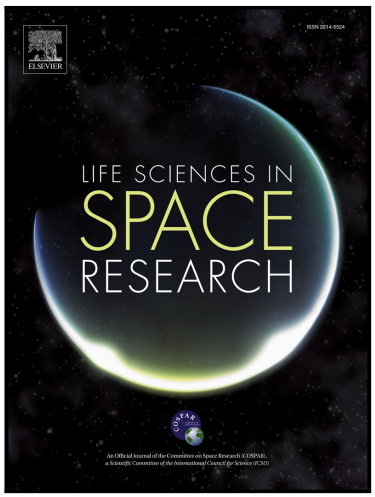

Astrobiological implications of dim light phototrophy in deep-sea red clays

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HIGHLIGHTS

- Aerobic anoxygenic phototrophs (AAP) dominated dark abyssal red clay TVBC-08, that are hydrothermally altered.
- Purple/green sulphur bacterial enrichments indicate an active S-cycle in CIB red clays.
- Anaerobic chemolithotrophy followed by anoxygenic phototrophy lead to oxygenic photoautotrophy during hydrothermal cooling.
- Hydrothermal emissions promote photoautotrophy. These emissions include chemiluminiscence by sulphide nano-clusters.
- These could be some of the lowest photosynthetic limits on Earth and are astrobiological significant for Mars and beyond.