

Interactive comment on “Arctic Gypsum Endoliths: a biogeochemical characterization of a viable and active microbial community” by L. A. Ziolkowski et al.

Anonymous Referee #2

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This is an interesting paper mostly devoted on microbiological issues. As far as the physical environment, its description and discussion, this paper seems to me significantly less interesting. Although the authors have carefully collected data on the ecology of the environment (appropriate job and well done), there is not a satisfactory work on the physical substrate on which these microbial communities settled. There is not a real study on the microfacies (for examples through optical microscopy) and this is clearly evidenced by the poor physical documentation of the microbial communities and their EPS products.

Below a few details:

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Introduction - Lines 55-58: I hardly think that microbes organize endolithic communities pressed by lack of solar radiation. Most probably it is the opposite.

- line 82-86: Are these statements related to what? There is no reference, nor geographic indication.

Methods - Line 126-134: which type of material was sampled? I can only presume it was gypsum. Neither figure nor, even less, the description in text, provide any detail on the type of rock sampled. Figure 3 seems to suggest it was a granular rock (wethered?) with possibly some dust. . .Is the sampled material a superficial crust?

Biogenic and physical weathering - Line 357: “endolithic habitats covered by bacteria and associated extracellular polymeric substances (EPS)”. I can hardly envisage any resemblance with filamentous bacteria or (even worse) EPS. Since morphology does not provide any real help, it would be necessary to have some other line of evidence. Perhaps some optical microscopy would have substantially improved this poor section of physical description of the microenvironment.

Discussion - Line 376-377 “. . .with little evidence of microbe mineral interaction.” Since these interactions can be both physical and chemical, it seems to me that the paper does not provide any convincing evidence of at least physical interactions that may occur in a number of ways. Therefore, this statement should really be discussed.

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