

Review of DiRuggiero et al. for Biogeosciences

General comments:

This is another interesting manuscript documenting endolithic colonization of substrates by microorganisms in the Atacama Desert. In contrast to previous work, it uses high-throughput sequencing to better characterize the microbial communities in these habitats. Similar climate data was employed in an earlier manuscript, however it is still relevant to this work.

Perhaps most interesting and relevant is the nature of what controls microbial colonization of these habitats, described by the authors in the abstract as “a complex set of factors.” They point to this again on page 15616 (lines 19-21) and page 15691 (lines 1-2) but leave the question largely unanswered. Besides moisture, can the authors comment on this issue further? Does mineralogy play a role, or is it simply moisture retention? And how does higher solubility play an important role in possible osmotic stress in this hyper-arid desert environment? This issue should be postulated further or the authors should provide suggestions as to how to better resolve this question.

Despite the benefits of the manuscript in describing new habitats for endolithic colonization in this part of the world, it does not seem – given the ubiquitous nature of bacteria in these environments – that this work is novel. The authors have employed many of these same techniques to characterize such environments previously, and many such observations have been described before; it is therefore more an addition to the growing scope of knowledge about these microbial habitats than truly groundbreaking. I would therefore suggest reconsideration of terms such as “novel” and “cutting-edge” in the manuscript. This research is indeed necessary for publication, but such descriptions are not necessary; the work stands for itself. I look forward to seeing more from these authors in the future.

Comments/Corrections:

Page 15605, line 19 – should be “indicate”

Page 15605, line 24 – “west coast of South America –“

Page 15606, lines 14-15 – “Here we describe chasmoendolithic photosynthetic...”

Page 15606, line 18 – remove “,” after “crust”

Page 15607, lines 20-21 – should be “...by Wierzchos and Ascaso (1994).”

Page 16510, line 5 – “precipitations” should be “precipitation”

Page 16510, line 16 – remove “The” before “X-ray”

Page 16510, line 17 – remove the word “respectively”

Page 16510, line 18 – replace “presented” with “exhibited”

Page 16510, line 28 – “This endolithic colonization...”

Page 16511, line 14 – “Observations of microbial...”

Page 16511, line 15 – remove the word “the” before “autofluorescence”

Page 16511, line 22 – remove the word “will”

Page 16511, line 23 – should be “petrographic”

Page 15611, line 25 – is “detritical” the same as “detrital”?

Page 15612, line 23 – is it “baecocyte” or “baecocytes”?

Page 15614, line 25 – “No Archaea were found...”

Supporting Information:

Page 4 – “cacodilate” is normally spelled “cacodylate”

Page 5 – should read “Specific sets of filters...”

Page 5 – remove “for” after “and”

Page 5 – should read “...were used for green and red signal visualization, respectively.”

Page 6 – What were the control DNA extractions based upon?

Page 6 – remove “The” before “DNA”

Page 6 – I think there are only 5 criteria, not 6

Page 13, Fig. S2 – I think this mineral material might be clays. Also, I don’t think (d) is required as it is adequately presented in (c)