

Interactive comment on “The composition of endolithic communities in gypcrete is determined by the specific microhabitat architecture” by María Cristina Casero et al.

Anonymous Referee #1

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General comment. This work focuses on gypcrete as one of the lithic habitats found in the Atacama Desert in northern Chile. It provides new and important information on the architecture of this microhabitat and its impact on diversity and composition of endolithic lifeforms, complementing previous works carried out by this research team. The manuscript should be accepted for publication once the authors consider the following comments. Specific comments. 1. The last sentence on the Abstract (line 27) includes “. . . might be an essential factor in. . .”. This rather ambiguous expression on the importance of microscopic features of endolithic habitats does not agree with the stronger terms found in the text on this major point (see Conclusions). I suggest that authors reconsider how to express their findings. 2. In reference to the UV ra-

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diation in Atacama by Cordero et al. (2018) at the Introduction (lines 49-50), authors should clarify that the highest measurements came from high altitude coastal and Andean sites and it does not apply to the whole territory since, as we know it today, UV radiation increases with the altitude. 3. I do not agree completely with the authors when they state (line 51) that life has found refuge in very specific endolithic (inside rocks) microhabitats. Microbial life has found not only endolithic habitats to cope with similar environmental conditions and several examples have reported life in other lithic locations at the coastal and hyperarid core of Atacama. Then, that sentence should be revisited. 4. On lines 60-61, authors emphasize the importance of the dominant genus *Chroococcidiopsis* leaving behind another cyanobacterial genus (*Halothece*), as part of more diverse lithic microbial communities than previously reported in earlier Atacama studies that include an accompanied microflora made of fungi and viruses and, supported by recent publications not properly credited in the manuscripts. 5. Authors indicate that they have coined “Microbiogeography” (line 73) as a new term. An important conceptual contribution whose scientific value will be validated by further studies in other lithic habitats, showing that gypcrete is not only a peculiar case. If the authors have information on this, they should stress it here to support the introduction of this new term and the international scientific community will have the opportunity to adopt it. Gypcrete samples came from a 3,000 m pre-Andean site, a quite different habitat when compared with others along Atacama but also, other endolithic substrates have other microscopic architectures depending upon their composition and crystal formation. I would like to have that author comments in their responses but also on the next revised manuscript. 6. Some parts of sections of Experimental procedures are brief, lack information and must be expanded or appropriate references should be added. Samples were taken during 2015; then, how storage time may have influenced the samples biodiversity? This a recurrent question and is important to know the authors position on this. Considering the microscale of the work, authors should clarify how they obtained samples from the three microhabitats involved in the study without “contamination”. To learn about this strategy is of major importance if someone would replicate or apply

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the protocols involved. This is finally the objective of the having a Material and Methods section in a paper. Cyanobacterial isolation was carried out from a bulk endolithic sample. Did the isolation strategy was independent of the inner location within the sampled rock? Did I understand correctly? Please, explain. DNA extraction was done with minor modifications. Well, modifications must be indicated. 7. Line 183. Alpha diversity differences were not found among the microhabitats. Then, do microhabitats affect colonization? Please, explain. Technical corrections. Line 22: "investigations": did you mean investigation? Line 107: add period after (Philips). Line 123: check for spaces at "score

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