Dear editor,

In this manuscript we document the dynamic responses of an extremophilic microbial community from the Atacama Desert to a record-breaking rainstorm in 2015, which was preceded by 13 years of drought. The study leverages state-of-the-art sequencing analysis methods to uncover the taxonomic and functional impacts of this major perturbation on halite microbiomes – endolithic (inside rock) communities residing inside salt nodules. Being the first to investigate the adaptive potential of endolithic communities, this study has implication for astrobiology and extraterrestrial life detection on Mars, where salt nodules have recently been discovered. This work also demonstrates the importance of seed banks in the functional persistence and resilience of highly specialized microbial communities. Finally, the adaptations observed in this dynamic model system were used to uncover two differing modes of community response. The analysis in this work was made possible because of the tractable nature of endoliths, but we believe our model of *Type I* and *Type II* shifts will help support future studies investigating the responses of more complex microbiomes to major perturbations. Our proposed measure for taxonomic rearrangement within functional categories (the *RI* index) may also be apply to other microbiomes to quantify the degree of taxonomic turnover in communities after significant stress such as antibiotic administration and ecological disasters, as well as a general measure for strain variation between samples.