Review of: "FIRST REPORT OF HALOBACTERIA DOMINANCE IN A TROPICAL CAVE MICROBIOME"

Qingbei Weng

Potential competing interests: The author(s) declared that no potential competing interests exist.

This is the first report of microbial compositions and evaluates the relations between environmental factors and microbial communities in tropical cave habitats, and the data appear to be good. This research result contributes to understanding microbial diversity in extreme cave habitats.

However, the manuscript should still be advanced in several aspects as follows:

1. **What is the importance of the microbiome in cave habitats?** How will the data advance our knowledge regarding microbial diversity in the tropical cave? Not just highlight the first case in the tropical cave. TR cave as a tropical cave, **what's the unique microbial groups and functions compared with the temperate caves?**

1. **The sampling and analysis need more details. For example:**
2. Were only the sediment samples conducted the chemical compositions? I suppose it is. But the information about the chemical analysis is unclear in the method and results sections. There are eight variables in table 1. However, only four variables are shown in figure 4 (CCA analysis). The process of filtering variables?
3. For the season effect, did you merge the three sample sites in the same season to compare the composition? Based on Figure 2, I doubt this result. If you mix and merge the compositions of different sites from the same season together, and then you should detect the no effect of season. However, you should more details about this comparing.

1. **Legends of tables need to contain the essential information to be understandable without reading the main text. For example:**
2. The lowercase letters in table 1 reflect the difference between two seasons or among three sample sites? Why does only "substrate moisture" have a significant comparing?
3. What's the meaning of the NA values in table 2, missing value? Please elaborate.

1. **The result descriptions are not accurate. For example:**
2. 77-79 line, “Nevertheless, studies evaluating the presence and dynamics of other microbial groups in the caves - the Archaea and Eukarya – are rare.”, there are a bunch of reports about the fungi in the

cave, why the authors claimed it is rare?

3. 300-305 line, “Species richness (Fig 3) was highest in the surface samples (1,791.77 ± 287.24), 301 followed by the dark zone (1,627.45 ± 1,101.80) and entrance samples (1,541.22 ± 478.32)”. The highest richness is observed in the dark group in figure 3, excluding outlier values. please check. “Surface samples showed a slightly increased Simpson dominance (0.08 ± 0.08) compared to the entrance (0.07 ± 0.03) and dark zone (0.04 ± 0.02) samples”. The values in the text are different from the values in Figure 3.

1. **The discussion section needs more evidence to support the conclusions. For example:**
2. 337-340 line, “this is the first comprehensive study reporting the microbiome composition from a tropical cave, including prokaryotic and fungal assemblages through next generation sequencing”. What's the trophic gradient of organic substrates in your results? And how do your results support this conclusion of other's research?
3. 116-118 line, “discuss the possible role of the cave microorganisms in the trophic structure of the subterranean habitats.” However, the content about the roles of microorganisms in the cave is unclear. It could use a bit more details and cases. Especially, what’s the functions of the dominant groups?
4. 429-430 line, “Thus, the microbiome at the cave entrance clearly shows the highest degree of microbial specialisation compared to the two other studied sites”. The authors just discussed the bacilli and Cladosporium halotolerans two groups from the entrance, and they did not compare or discuss the specific groups in other sites (surface and dark zone). How can we get to this conclusion?