Interactive comment on “Differential analysis of prokaryotic communities from pristine mangrove tidal zone sediments reveal distinct structures and functional profiles” by Carolina Oliveira de Santana et al.

Anonymous Referee #1

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General comments: This study collected samples from 3 tidal zones of a pristine mangrove habitat for 16S amplicon sequencing and analysis. There needs to be a massive overhaul of the writing and synthesis of the results in order for this to be a publishable piece of work. Generally, there are a lot of writing issues with the current manuscript, with grammar/spelling errors, typos, and run-on sentences throughout. The introduction needs the most work. There are abrupt transitions between paragraphs, and many concepts are not adequately introduced. Specifically, the introduction needs to explain why it is important to study the different tidal zones in a mangrove habitat, why microbes are important to mangroves specifically, and what the broader implications are for this work. The results section is too long and can be shortened. Much of the results describe methods which are already present in the methods section. The results also have discussion and implications that should be left in the discussion section. The PICRUSt results section reads like a combined results/discussion section, when it should be just the results. The discussion section primarily covers how current findings corroborate or conflict with previous findings. There is little synthesis of results, though the last two paragraphs of the discussion touch upon the beginnings of what could be synthesized from these results. There also needs to be discussion of the limitations of using PICRUSt. The wording throughout the manuscript needs to be changed to reflect the nature of the data (that this was done using 16S data, not metagenomes). What is the novelty of this study, what are its contributions, and why is it important? These are especially vital questions to answer because there are already studies characterizing pristine mangrove microbiomes. The discussion needs to highlight how the findings fit into large ecological processes happening in the mangrove tidal zones, and not just a rehash of existing literature.

Specific comments: Line 21 mentions past metagenomic studies, but line 27 states this study used 16S rRNA amplicon sequencing. Currently it seems like the authors are using the two terms interchangeably.

Line 29: I think there should be some elaboration of how findings from this study contrast results from anthropogenically impacted mangroves in the abstract. It’s not informative to the reader to just state that there is a difference.

Line 40: Explain the role of mangrove ecosystems in climate change mitigation

Line 45: This paragraph concludes with acknowledging the dependency of mangrove forests on the sediment microbiomes, but the first paragraph in the introduction wasn’t written in a way that convinces me of this dependency. How, specifically, do sediment microbes benefit mangroves?
How does increased microbial diversity lead to an enrichment of microbes that play essential roles in ecosystem functioning? Which specific taxa are enriched by these dynamic conditions that would go on to maintain ecosystem functioning?

This is the first time that the sensitivity of the mangrove microbiome is introduced, which I found to be really surprising. I think there should be more of a lead up to this statement (what is the microbiome sensitive to? How is that sensitivity manifested?)

I have a problem with the term "16S rRNA amplicon metagenomics". 16S amplicon sequencing and metagenomics are two very different techniques.

Why did the authors hypothesize that the intertidal zone would have the highest microbial diversity? And also what would this mean ecologically? These types of information needs to be included in the introduction, particularly since mangrove zonation is not introduced until the last lines of the introduction.

But aren't there other studies that have looked at mangrove microbiomes under pristine conditions? I.e. Nogueira et al 2015. I don't have a problem with that, but this introduction is written in a way that implies this is the first study to look at pristine mangrove sediment microbiomes.

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KEGG should be capitalized throughout.
Figure 6: elemental pathways should not be capitalized.