

Response to the Reviewers (Round 2)

Disclaimer: The referenced lines always refer to the revised manuscript WITH tracked changes.

Associate Editor Chiara Borrelli:

The authors incorporated the suggestions provided to them during a first round of reviews in a satisfactory manner. The manuscript will be suitable for publication after the authors will address the latest minor revisions they received after this second round of evaluation of their work.

Anonymous Referee #2:

The Authors have addressed all my (Reviewer 2) comments adequately, and the significance and importance of the study stands. Following the authors revisions, I have two further points for them to address prior to acceptance of this manuscript.

1) Line 438: please define “PAR”.

Line 429: Changed. Since the abbreviation “PAR” only appeared once in the manuscript, we have replaced it with the full term “photosynthetically active radiation” for clarity.

2) Thank you for adding in details regarding the tank effects. In it, you show that there are significant variations in Fe, Cu, and Pb between the control tanks, and in Mn, Fe, Ni, Cu and Zn in the ash-exposed tanks. Bearing in mind a key conclusion was that “Ash exposure enriched skeletal concentrations of V, Mn, Fe, Ni, and Zn while depleting Cu and Pb”, the last thing the manuscript needs is clarity on how you concluded this when same treatment tank effects show significant variations in the majority of these elements. Presumably statistical tests demonstrate that variation relating to the treatments is greater than that relating to within-treatment tank effects.

The authors thank reviewer #2 for this comment related to tank-related effects in the chemical composition of coral skeletons and to ensure the clarity of our conclusions. To address this we have: (i) conducted a nested ANOVA test to checked the importance of treatment versus tank; and (ii) performed a Tukey’s post-hoc test to detect statistical differences in the skeletal compositions between nubbins of individual tanks. As both tests have not been performed before in the scope of the manuscript, we have added a sentence in chapter “2.4 Statistical Analysis” (lines 319-320). The obtained statistical results are now presented in a newly added supplementary table (Tab. S9) and visualised in a newly added supplementary figure (Figure S1).

The nested ANOVA results (Table S9) indicate that only for copper the tank-related effect is stronger than the treatment effect, but given the tank-related effect is dominant in ash-exposure treatments versus controls, we believe the population effect using the ANOVA test are still valid (Table S8). Consequently, the key conclusion “Ash exposure enriched skeletal concentrations of V, Mn, Fe, Ni, and Zn while depleting Cu and Pb” remains valid as it refers to the average chemical composition of the coral skeletons at the population level (i.e., comparing nubbins from both control tanks with those from both ash-exposed tanks). To improve clarity, we have added a small section summarizing this information (lines 453-468), along with Fig. S1 and Tab. S9.