

Anonymous Referee #2

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GENERAL COMMENTS

The present manuscript is part of the OUTPACE Experiment, a multidisciplinary effort to study the functioning of the western tropical South Pacific ecosystems and associated biogeochemical cycles. In that sense, the work presented by Carlotti et al. matches the scope of Biogeochemistry, since it includes the description of the mesozooplankton compartment as part of the studied ecosystems. It presents valuable information about mesozooplankton abundance, diversity and biomass, including a stable isotope analysis and estimations of carbon demand, grazing impact and zooplankton excretion rates in a poorly studied area, adding value to the results presented here. However, the manuscript is often too descriptive, relying excessively on other analyses included within the same Special Issue and in other previous studies, masking the meaning of the present dataset. I think that the manuscript could be accepted for publication in Biogeosciences but only after major revisions.

SPECIFIC COMMENTS

Grammar mistakes and poor editing are evident throughout the whole manuscript, while reading is difficult because of wordiness.

Answer:

We hope that the new structuration of the manuscript make the paper easier for reading. The text has been read by a native speaker.

Hypothesis are missing, and conclusions are not clear for the reader.

I strongly recommend

- 1) reducing and rewriting the Discussion section, focusing on the results from this study, and also

2) balancing the story as well as the number of tables (e.g. including some of the latter as supplementary material).

Answer:

The different objectives have been rebalanced between trophic and biogeochemical processes and zooplankton community structure. Therefore, we strongly reduced the description of zooplankton community structure with reduction and re composition of figures and tables. The two other objectives on the Interactions with diazotroph microplankton and on the fluxes related to zooplankton have been developed with new data analysis synthesized in tables. The discussion part is structured in relation with these three objectives.

Some detailed comments:

Abstract:

(P1, L25) It would be more accurate to use “secondary consumers”, rather than “mesozooplankton”.

Answer:

We considered now herbivorous mesozooplankton and carnivorous zooplankton from the observed taxa. Biomasses of both groups have been separated to estimate the impact on phytoplankton.

(P1,L25-29) Please split up this sentence in two.

Answer:

We changed it.

(P2, L20). Please correct ingestion rates units.

Answer:

We changed it.

(P2, L21 and throughout the text) NH₄⁺ and PO₄³⁻ are a charged cation and anion, respectively; please correct.

Answer:

We changed it.

It is difficult to extract the main conclusions of the study from the Abstract.

Answer:

The abstract has been fully rewritten.

Introduction:

(P3L5) This is the first time that the authors name ENSO, please define the acronym as El Niño Southern Oscillation (ENSO) here and not in Section 2.1.

Answer:

We put the definition of ENSO in the introduction part.

(P3L13) Please provide more details about the filamentous cyanobacteria biomass after summer blooms or link this paragraph with the following one.

Answer:

We linked the two paragraphs.

(P3L16) when referring to “productivity of zooplankton”, do the authors refer to an increase in zooplankton biomass? Please correct.

Answer:

You are right. We changed it.

(P2 L21-22). I assume there are some brackets missing here.

Answer:

It has been corrected.

(P4L10) Authors do not use quotation marks but the Spanish “ñ” when referring to El Niño, please be consistent when referring to La Niña.

Answer:

It has been corrected.

Material & Methods:

(P5L2-9) Authors refer to Table 1 from Moutin et al (2017) for all general characteristics of the stations. However, a list of acronyms and main environmental features that could be relevant for the present zooplankton study would help the reader in a substantial way.

Answer:

Moutin et al. (2017) ‘ Table 1 present the date, location, and general characteristics of the stations investigated along the OUTPACE transect : Distance in kilometers from the first SD station (SD1),

Arrival date, Departure date, Latitude, Longitude, Bottom depth. We believe that the main environmental features needed for the best interpretation of our results have been presented. We pay attention that the different acronyms have been correctly explained when firstly quoted.

(P5L17) Authors mention that station SD-13 was not sampled for zooplankton. Any reason for that? Please specify.

Answer:

Station SD13 was an additional very short station done just out of the bloom patch, not initially planned and with limited measurements. Zooplankton net tows were not realized at this station.

(P5L22 and throughout the text) Please correct units and be consistent. In this case, the correct for would bem s-1. (P5L25) I guess that something is missing here, do you mean 0.3 m3 rev-1? Please correct.

Answer:

We give more details in the text. R: is revolution and there are 10 counts per revolution. K units are correct.

(P5L30) Please rewrite; do not use symbols (+) in the description and include a formula for the sake of clarity.

Answer:

It has been corrected.

(P6L6 and throughout the text) Please correct to ind m-3.

Answer:

It has been corrected.

(P6L6) Why to use the Shannon-Weaver diversity index amongst others to estimate zooplankton diversity? Please provide a short explanation. (P6L23)

Answer:

Shannon-Weaver diversity index is a widely used method of calculating biotic diversity in plankton studies.

Please add the word "software" after "Identifier".

Answer:

It has been added

(P7L17-24) Please split up this paragraph in two sentences. (P8L8)

Answer:

It has been rephrased in three sentences !

Results:

(P11L1). Chaetognaths are considered as gelatinous zooplankton, so it is wrong to consider this group apart during the analyses. Same is valid for Fig3B and Fig 9A. Unless there is a reason to consider chaetognaths separately $\hat{A} \sim T$ in that case, please specify $\hat{A} \sim T$ please correct this point throughout your manuscript.

Answer:

In the table, chaetognaths are now grouped to gelatinous. Fig3B and Fig 9A have been recomposed.

(P11L5) I think that authors refer to early life stages, rather than larval forms. Copepod larval forms are nauplii, while copepodites are copepod juveniles, both with their corresponding stages depending on the copepod species. Please differentiate both properly and correct accordingly in this paragraph and throughout the text.

Answer:

It has been changed

Discussion:

(P17L14) Which group do the authors refer to when using the term “small zooplankton”? Please clarify.

Answer:

In the new version this part has been removed

(P20L1-4) Why do authors refer here to the study from Caffin et al. (2017) and not to their own dataset (Fig 10)? Please correct accordingly.

Answer:

It has been changed and we now refer to Fig.7 A and B.

(P20L29-34) The fact that daily grazing pressure of zooplankton represents >100% (234%) of primary production calls for an argumentation of this result. According to the authors, which are the reasons of such a difference between their result with those from Dam et al. (1995)?

Answer:

We now quote the Calbet (2001) paper who presents a synthetic analysis of grazing vs. primary production based on data compilation (including those by Dam et al. (1995)).

(P21L33-34) This is the first time that authors mention the (possible) trophic link between the plankton community studied along the manuscript and the tuna marine food web and needs clarification.

Answer:

This sentence has been shifted in the introduction of the paper, as it is a key characteristic of the region. Our study is based on mesozooplankton and we did not study any linkages with the mesopelagic fish.

One main output of the paper is to highlight quite high rates of phyto and zooplankton production (despite rather low stocks) which may explain a consistent trophic flux up to tunas.