

Biogeosciences Discuss., referee comment RC1
<https://doi.org/10.5194/bg-2021-240-RC1>, 2021
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Comment on bg-2021-240

Anonymous Referee #1

Referee comment on "Spatial changes in community composition and food web structure of mesozooplankton across the Adriatic basin (Mediterranean Sea)" by Emanuela Fanelli et al., *Biogeosciences Discuss.*, <https://doi.org/10.5194/bg-2021-240-RC1>, 2021

This manuscript provides a description of the differences in taxonomic composition and several trophic indicators of mesozooplankton between several subregions. The authors claim that this is the first study covering both shallow and deep waters across the whole Adriatic basin, a productive ecosystem within the otherwise oligotrophic Mediterranean sea. From plankton data collected in a single cruise, several communities were characterized from abundance and biomass composition assemblages as well as by their values of natural abundance of stable carbon and nitrogen isotopes. While the description of the characteristics of these communities and the new data constitute a valuable contribution for the understanding of the functioning of the Adriatic ecosystem, the manuscript requires a careful revision addressing several important issues:

- The word "mesoscale" in the title and in the objective is misleading, as no evidence is presented on hydrographic features or dynamics (i.e. currents, fronts, eddies,...) characterising the different subareas or were directly related to the described plankton assemblages. As the study conclusions are limited to large subregions, mostly related to the fishery management, the title and the objective should be more precise in this regard (e.g. Differences in taxonomic and trophic mesozooplankton assemblages across the Adriatic basin...).
- The claim that the study is relevant for the whole basin is not entirely supported by the data. The samples were collected on mostly the southern coast, with most of the stations on shallow depths (< 50 m) and none of the stations were located in the deepest waters (>200 m). The study characterized differences between inshore and offshore plankton and also between some subregions. The latter, initially defined from fishery survey areas, were subsequently grouped in the different analysis. However, because the limitations in the sampling, the different zones finally considered for the analysis need to be clarified. In the current version of the manuscript, the initial expectation of having 4 geographic subareas and two major depth categories (Fig. 1) is dismissed in the subsequent analyses. It would be appropriate to define the final analysed regions from the beginning by providing clearly the reasons for grouping the "fishery" areas and use an specific, more intuitive naming (e.g. North, Central, South) instead of the non-intuitive original code names (GSA17N, GSA18,...). Also, the

variables used for supporting the groupings must be detailed (e.g. L 129-131), as well as the criteria for the inshore vs. offshore classification (L 176).

- The organization of the manuscript must be improved. There is methodological information among the results (e.g. co linearity tests L 298-300; acidification test L 307-310), excess of auxiliary tables that could be safely moved to supplementary information (e.g. Tables 1 to 3, table 6), results among the discussion (e.g. L 421-424; 427-429), and analysis not well justified (e.g. PERMANOVA on untransformed data in L 174-177 and later on transformed data in L 182, a priori classification in trophic groups in L 209-213 and cluster in Fig. 4). In addition there are several inaccuracies and inconsistencies in the naming of variables and data through the text and tables (e.g. taxa with unknown trophic group = "Unk" or "?").
- The abundance and biomass comparisons are made on data averaged in the water column (i.e. N or B / m³). Given the difference in the water column depths sampled in the different stations this approach tend to reduce the importance of offshore stations as the numbers are "diluted" in a large volume of water. In this case a normalization per unit surface (m²) may be appropriate (or at least explored). Also, the use of a logarithmic scale in the relevant plots (e.g. Fig. 2a) will facilitate the comparison of values.
- The isotopic niche comparisons are flawed because of the lack of samples of species of low trophic position (TP<3) in one of the areas (Table 5). It would be more appropriate to limit the comparison of ellipses to all three areas but only for species with TP>=3 and the comparison of species to the ones having samples in all areas (e.g. *C. helgolandicus*, *Chaetognatha*, and *Decapoda-zoea*). In addition, the trophic position estimations are based on only one d¹⁵N measurement of *G. tenuispinus* from the central area that is applied to all areas. The authors must clearly justify the use of this baseline taking into account that the feeding of this species is ranked as "Unknown". The use of a single baseline implies that the average source of N is the same across the basin which does not seem the case because of the inputs of the Po river (e.g. L 34-36, 125-126). Have the authors explored the possibility of using other values reported for zooplankton in the region?

In addition there are several minor issues that need the attention of the authors, as exemplified below:

L 21: "DistLM model" is not defined previously and perhaps can be safely removed from the abstract

L 26-28: This sentence is too generic as a conclusion of the study

L 31-56: This paragraph is too long.

Fig. 1. Explain the "hauls" or remove them (samples not used in this study). Add the final area names (North, Central, South as suggested) along with the "fishery survey codes".

L 120: explain "acoustic sampling"?

L 123: indicate here the variables measured (L 190-192)

L 133: fresh weight? indicate precision (L 138)

L 166-170: Perhaps is not necessary this detail as the use of a flowmeter is a standard practice in zooplankton sampling (e.g. Harris, R.P., Wiebe, P., Lenz, J., Skojdal, H.R., Huntley, M., 2000. ICES zooplankton methodology manual. Academic Press, San Diego)

L 176: define "inshore and offshore"

L 190-191 pressure units are dbar not "db", chlorophyll fluorescence?, salinity has no units (remove PSU), density units must be kg/m³ not "km/m³"

L 241: The correction of *A. clausi* (instead of *A. tonsa*) also affects other parts of the manuscript (L 377, 347)

Fig. 2. Station names are almost unreadable; indicate the number of samples for each bar; explain the meaning of box-plot symbols (box, whiskers, line)

Fig. 3. Consider drawing circles around the samples in the main zones for clarity

Table 4. Indicate all the variables used in the heading (t, S, DO, fluorescence, turbidity,...?)

Table 5. In addition to this table consider making accessible the raw isotope data per species in an international repository (e.g. <https://www.pangaea.de>). These data will be invaluable as further reference for this region.

Figs. 5 and 6, and Tables 6 and 7. The information provided is misleading of the isotopic differences between stations, as the distribution of species and trophic categories is very different among them (e.g. lack of herbivores in the north area)

L 373-380. Despite the general coincidence with previous studies, the analysis of samples in this study was incomplete (L 243-245). Is there additional information of the formalin-preserved samples (L 122)? Detail the bias caused by the use of frozen samples for community analysis.

L 381-382. The difference in mean volumetric abundance may not be the same when integrated values are considered

L 434-444. The match between a priori defined trophic classifications and estimated trophic positions from d15N needs further justification. From the text it is not clear whether the trophic classifications were based on species-specific studies or in inferences from available information on species. In this regard there are several references providing trophic classifications for some zooplankton groups (e.g. <http://doi.org/10.1093/plankt/fbv096>; <https://esajournals.onlinelibrary.wiley.com/doi/abs/10.1890/15-1275.1>)

L 467-468. However, predation on protozoa may have been overlooked by traditional stable isotope measurements (e.g. <https://doi.org/10.4319/lo.2014.59.5.1590>)

L 471-472. The isotopic comparison must consider species (or TPs) present in all areas

L 473-474. Some more recent similar studies comparing community assemblages and trophic variables: <https://doi.org/10.3389/fmars.2018.00498>; <https://doi.org/10.1016/j.dsr.2020.103402>

