

***Interactive comment on “A one-month study of the zooplankton community at a fixed station in the Ligurian Sea: the potential impact of the species composition on the mineralization of organic matter” by L. Mousseau et al.***

**Anonymous Referee #3**

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In the role of zooplankton in the mineralization of organic mater, metabolic studies are always important and useful, especially when they concern CO<sub>2</sub> and RQ ratios measurements where there are few published data. Generally there are some nice parts to the paper, drawing together of diverse sets of original information. However, there are several important issues to be dealt.

- 1) An abstract section is missing
- 2) The introduction section does not correspond to the content of the paper. This

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introduction is too general, presenting mostly the general aim of the cruise project and developing aspects that are not directly related to this the paper (e.g. vertical transfer of particulate matter, diversity of feeding strategies, faecal pellets). I think the introduction should be more focused to the mineralization of organic matter, as the paper title indicates.

3) Material and methods. Please specify which animal stage was sorted (adults?), how many replicates were used, which statistical test was applied and at what time of the day were made the metabolic measurements.

4) Results. Table 1 and figure 6 show a repetition of values. Instead of this repetition it would be really nice to show the values of respiration and excretion presented in weight specific units.

My main concern is about carbon ingestion rate estimates based on respiration measurements. The authors use Hernandez-Leon and Ikeda (2005), as reference for this estimation method. I suppose they refer to JPR, 27, 153-158 (since this reference is missing from the reference list), a paper that uses this estimation method, but that is not the one that originally presented this estimation method (see the original references cited in Hernandez-Leon and Ikeda 2005). The assumptions necessary to apply this estimation are not considered at all. The validity of assumptions for assimilation efficiency and gross growth efficiency, at the local scale of the Ligurian Sea, and for different species should be examined carefully, as some authors advise against such a relationship because respiration is the result of so many different and highly variable processes (Bamstedt et al., 2000, Ices Zooplankton Methodology Manual 2000 p337). Even if the validity of these assumptions is respected, I would prefer to see these estimates in the discussion section. In addition it should be specified everywhere in the paper (including titles and figure legends) that these are estimates (not measurements). Finally, if these estimates are to be expressed in mgC d<sup>-1</sup> (Figure 8) diel variability should be discussed too.

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5) Discussion. I do not see where the impact of species composition on the mineralization (title of the paper) is presented and discussed. Species composition and physiological data are presented separately with no link.

Figures. -Please use in all figures the same time axis (same units, same starting and ending day) -Figure 4 (b) Y-axis: change scale of axis in order to display ind m<sup>-3</sup> -Figure 4. Specify layers -Figure 4. Why 2 measurements appear on the same day? - Figure 5 has a low quality -Figure 5 has two times 'September' and no '25 September'

References. The authors should consider references as an important part of the paper that should be checked carefully. There is a lack of many cited references in the text in the reference list, almost 20% of the total references cited : - Andersen and Prieur 2000; Harris et al. 2000; Johnson et al. 1987; Holmes et al. 1999; Hernandez-Leon and Ikeda 2005. References should be given at: p. 1000 line 21 (where do the concentration data of this diatom come from?); p. 1001 line 13; p. 1005 line 9. There are mistakes in the references: p.997 line 3 Marty et al. 2008, wrong year; p.996, line 14 correct spelling of 'Longhursts'

Terminology and Units. Please pay attention to the uniformity of terms and units used: - Do not use both concentration and biomass term for zooplankton. Use only biomass term instead. - Vague subjective expressions as 'some wind', 'some wind stress'; or 'at first sight' should be avoided. - Confusion of  $\mu\text{M}$  and  $\mu\text{m}$  - Volume units are found in  $\text{cm}^3$ ,  $\text{dm}^3$ , liter and ml. - Volume units should not be expressed with negative exponent - Biomass data are found both in  $\text{gDW m}^{-2}$  and in  $\text{mgDW m}^{-2}$  - Are you sure there is only one *Clausocalanus* species in the area? If not, please use the term 'genera' and replace 'sp.' by 'spp.' Please check this for other species too.

Other remarks. - p1001 line 6 : the range ( $1.5\text{-}2 \text{ g m}^{-2}$ ) does not correspond to the one found in figure 3 - p1001 line 10: replace 'concentration were equal' by 'most biomass values were generally at the same level' - p1001 line 26 : slight increase appears until the 5th and not the 7th in the figure 4 - p1002 line 8: replace '<100 ind 100m<sup>-3</sup>' with

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'<1 ind m-3' - p1002 line 9: should be 'increased up to 8 ind m-3'? Please check with figure 4. - p1002 line 13 : replace 'total community' with 'total non copepod community' - p1002 line 21: should be 500um instead of 300 um - p1002 line 24: should be 'except of the 24th and 26th' following the figure 5 - p1003 lines 18 to 24: please move this part to the discussion section - p. 996, line 14 remove one comma - 'siphonophor' should be 'siphonophore' - p. 1004, line 17, appendicularian - circa and versus abbreviations do not need a dot at the end - mgDW.m-2 - Legend of figure 4. 'Night' - p. 998 line 19 Replace 'as two vertical hauls were made' by 'as vertical hauls were made at midday and midnight' - Please check the instructions to authors of the journal and use either British or American English, not both (e.g. mineralisation and mineralization). - Please check the meaning in - p.997 line 12; p.998 line 17; p.1000 line 25; p.1002 line 4

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