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Biogeosciences Discussions

Interactive comment on "Variability in copepod trophic levels and in feeding selectivity based on stable isotope analysis in Gwangyang Bay off the southern coast of Korea" *by* Mianrun Chen et al.

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General Comments This manuscript provides results from seasonal and spatial variation in the stable isotopes 13C and 15N of POM and copepods along a salinity gradient in Gwangyang Bay, off the southern coast of Korea. The authors combined this information with linear mixing models, Bayesian isotopic mixing models and generalized additive models to derive a statement on food selectivity and trophic level of copepods. In general, this manuscript is very well structured and provides valuable information on the flow of matter through the food web. Still, some concerns have to be clarified before publication. - Response: We appreciated the positive comments of the reviewer

and will follow the suggestion to improve the manuscript.

Specific comments. Introduction 1. Page 3, line 7: Please give more information here on the usage of different N sources and enrichment factors. - Response: Agree. Accordingly, we will explain more information here based on literature.

2. Page 3, line 19: "highly mixed species"- Please clarify, mixed with what? - Response: Here the "highly mixed species" means the assemblage contained too many different species and those species had similar size. So such species were hard to be sorted out from the assemblage based on current microscopic technique. To remove confuse, we will revise it to "high diversity of the assemblage and . . ." .

3. Page 3, line 21: Instrument sensitivity has increased and compound specific analysis (CSI) of stable isotopes in amino acids make it possible to track diets of mesozooplankton and determine their trophic position. - Response: Yes, of course. We admit that highly developed instrument can do so. But for doing so, researchers still need taxonomic expertise to sort out the species from a complex mixture to prepare the sub-sample. It requires a lot of lab processing works.

4. Page 3, line 21: Please give some reason why this site was chosen. - Response: The stations were chosen based on salinity regime and different geographic characteristics, e.g. stations 1∼3 are river sites with extremely low salinity, stations 4∼6 are in the central bay with moderate salinity, while stations 7∼9 are in the channel towards to the open ocean with relatively high salinity.

Material and Methods 5. General: why did the authors not use literature data on average weight values for each of the species investigated instead of assigning the weight to each group? - Response: In the revised version, we will search the literature data just like suggestion of this comment and also suggested by other reviewers.

6. General: How where copepodite stages treated regarding abundance and body mass? - Response: They were averaged to adults.

7. Page 4, line 15: Change to “increasing”. - Response: Agree and we will revise accordingly.

8. Page 4, line 16: Specify “in the middle of Gwangyang Bay. - Response: Agree. We will revise to ïĆšin the middle part of the Gwangyang BayïĆš.

9. Page 4: Please add information on when sampling took place- day or night? - Response: We all sample at the day time. We will add such explanation in M&M.

10. Page 5, line 11: “pico- and nano- sized phytoplankton”. Doesn’ t sampling with a mesh also include nanozooplankton like heterotorphic and mixotrophic flagellates- so it does not only comprise phytoplankton?! - Response: Here the plankton less than 20 micron but larger than GF/F (0.78 micron) were defined as nanoplankton. Thus they contains both phytoplankton and heterotrophs.

11. Page 6, line 29: something is missing at the end of the sentence- “illustrated in figures?”. - Response: The figures here do not mean citations. We try to explain that the mean and standard deviations were illustrated by forms of figures. To remove confuse, we can delete this sentence in the revised version.

Results and Discussion 12. There are too many figures. Some might be moved to the supplemental section, e.g. Fig. 3, 7,8,11 - Response: We agree to do so. We plan to move Fig.3, 7 and 8 to supplementary materials, but no Fig.11. We believe that Fig.11 is relatively important for readers and other reviewer want to know more about the information of the feeding of carnivorous species.

13. Page 12, line 16: What is a “heavy carbon pool”, give an example? - Response: The phrase is located at “Page 12, line 24”. “Heavy carbon pool” here means the dissolved inorganic carbon pool in which the carbon was primarily composed by light carbon (12C).

14. Page 12, line 31: Wording! Please revise “much reduced”. - Response: We will change it to “low”.

15. Page 13, line 15: “with low fractionation effects”- give example. - Response: We will search more suitable examples from literature for this comment.

Conclusion 16. Please provide a simplified figure of the energy flow for the different seasons. - Response: Based on revised estimation, we try to provide such simplified figures.

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