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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.

Mianrun Chen et al.

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General Comments: Chen et al report seasonal and spatial variations of copepods on ^{13}C and ^{15}N values in a temperate estuarine system. They present a nice description of these data and use a lot of mathematical analysis models (linear mixing models, Bayesian isotopic mixing models and generalized additive models) to deeply analyze the trophic structure of plankton. I am in favor of some salient results on averaged trophic position of different copepods and contribution of two size fractions of diets. These kinds of results are hard to be obtained by direct measure as copepod community is highly complex so that the individual samples are difficult to separate, which also

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claimed by the authors. Although the size-selective feeding behaviors of copepods are not new in literature, the patterns shown in this manuscript are reasonable. More important, it still provides a powerful technique to treat such investigation data that can be followed by readers and provide insight biogeochemical information about the trophic interaction between copepods and primary producers. Therefore, this is potentially a very useful paper providing important information and methods for the biogeochemical study (i.e., food resources and trophic levels) in the complex coastal ecosystem, as well as the influence of the freshwater input in an estuary. The main shortfall of this manuscript is that it can only provide the trophic information of several major genera of copepods. Genera with low biomass or appearance frequency like Euchaeta, Calanus and Oithona, which are also popular in the world ocean cannot be treated by the same way. In addition, I would like to suggest more discussion about the uncertainty or disadvantages of these analysis models. And, reasons for some results on feeding pattern of some species are not discussed enough. For example, what are the mechanism of the feeding selectivity of the three carnivorous genera like Tortanus, Labidocera, and Sinocalanus? Finally, it will be more visual if the authors can provide a conceptual map about the planktonic food web from their conclusion, showing the relationship and the seasonal differences of the energy flow on this map as well? Overall, I recommend this manuscript for publication in Biogeosciences with minor revision. Some specific comments are indicated below.

- Response: We appreciate for the reviewer's positive comments. We also admit the criticism of the shortfall of this paper. It is hard to estimate the isotope ratio of those species that contribute a very small fraction in total copepod biomass in Gwangyang Bay. However, we believe that the same way can be applied to Euchaeta, Calanus and Oithona when they dominate in community and have relatively high biomass. Such cases were commonly found in adjacent waters like East China Sea and South China Sea. As pointed out by other reviewers, we will also try to increase the discussion of the potential prey of the three carnivorous genera Tortanus, Labidocera, and Sinocalanus in the revised version.

Specific comments: 1. A reason or a reference to calculate trophic enrichment is C2

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needed. - Response: We have added it to Page 7 Line 24. To remove confuse, we will also explain it more careful in figure legend.

2. L21 _m 3. How about the errors or residual (eq. 4) for Linear regression models? - Response: We can add the errors of the model tests. 4. Y-axes in Figure 5 to 11 need plural number. - Response: We will revise accordingly.

5. Increase the resolution of Figure 3. - Response: We will input the separate pdf version for each figure.

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