

Interactive comment on “Copepod community growth rates in relation to body size, temperature, and food availability in the East China Sea: a test of metabolic theory of ecology” by K. Y. Lin et al.

Anonymous Referee #2

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General comments:

This paper studies community growth rates of marine copepods estimated by using the artificial cohort (AC) method in the East China Sea and further explore the relations between measured rates to body size, temperature, and food availability in a framework of the metabolic theory of ecology (MTE). Here are some concerns about the approach when comparing the estimated parameters in fitted MTE models with theoretical values reported by Gillooly et al., 2001 with underlying assumptions of no food limitation. In subtropical waters, high metabolic costs associated with relatively high temperature and low biomass of food resources can cause food limited growth. The authors also

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mentioned that the one of the critical issues to estimate in situ growth rates of copepods is to maintain the natural resource condition over the period of experiments. I would consider the less perfect match between model parameters estimated by using the measured data with the theoretical values could be related to the following: (1) species may have different responses to temperature and body weight in terms of the growth rates. Using data of non-species specific rates could be one possible cause. (2) The measured rates were likely under food limitation. The assumption of MTE likely wasn't met. (3) Another approach could be considered to validate the MTE model. Splitting the measured rates, using one half to build MTE models and then do projections and compare the projected and measured rates using the second half.

Specifics:

Page 6 line 10-11, It's not clear how the CTD measurements of temperature were used to monitor the temperature over the incubation experiments.

Page 6 line 20, The two sizes of 50-80 and 100-150 μm may miss some seasonally important species in zooplankton community.

Page 7 line 1, 50 μm may also remove microzooplankton, food resource of copepodit-
ed and nauplii

Page 7 line 14, incubation experiments conducted in dark may reduce the possibility of growth of food resources such as phytoplankton and other microzooplankton.

Page 9 line 10, taxon? Or morphotype at here.

Page 10 line 6, not clear based on what to define food limited. Only chl a is not sufficient.

Page 12 line 4, We consider the following variables (is equation more relevant?).

Page 12 line 23, check figure 4, it should be oncaeid, not corycaeids.

Page 13 line 2, check the chi-squared values for 50-80 μm , it seems too small compared to the 13.69 for 100-150 μm . If the d.f. is similar the two chi-squared values should be

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very close to achieve the same significance level.

Page 13 line 13, is the theoretical value -0.25 applicable for all taxon? Don't know why select this as a standard for comparisons in the paper.

Same page line 23, no "f" in figure 6, is it "e"?; also plot the fitted lines (see comment in figure).

Page 14 line 11, no "except for" the rates of harpacticoid nauplii > calanoid nauplii in figure 5.

Page 16 line 8-9, using two mesh sizes may limit the total range of body size and could be a cause at here.

Page 16 line 13, how did the authors correct the temperature effect? This should be included in methods.

Page 19 line 21-25, the discussions about toxins effect on growth rates jump too much from the results presented at here.

Page 20 line 8-13, these should be results and not discussion.

Page 21 line 12, add (ANOVA?)

Page 22 line 1-5, these models have been tested previously. It isn't a surprise that these empirical models always tend to under or over estimation.

Page 22 line 10-17, this is very short for discussion and consider to combine it with others.

Table:

In Table 1-5, why don't report a1 instead of E to keep the results consistent?

Figure:

Figure 3. is the station # matched the station # in Figure 1?

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Figure 4. Present the three plots vertically with identical x scale.

Figure 5. specify the labels a,b,c,d etc.

Figure 6. add the fitted lines using the monod function.

Figure 7. this plot is not well presented (some bars are too small to see). Also no data for harpacticoid nauplii (50-80µm)

Reference:

Kingsolver and Huey 2008 is missing

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