

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.

D. McKinnon (Referee)

d.mckinnon@aims.gov.au

Received and published: 7 December 2012

A strong paper, using a very similar method to that we used in McKinnon & Duggan 2003, but taking the results further by making a comparison of directly-measured growth rates with those predicted by the metabolic theory of ecology (MTE). This comparison is somewhat compromised in that it is only possible in circumstances where food-limitation can be discounted. Food-limitation of growth is inherent in zooplankton communities in waters such as these, and the authors have gone to some length to only use data where they can meet the assumption that growth is not food-limited.

The authors quote Mauchline (1998) as justification for classifying small calanoids as

C6366

herbivorous, however I feel strongly that the field has moved on substantially since those times. Though I am not familiar with the E China Sea study area, I feel confident that the phytoplankton is dominated by picoplankton, that microbial processes dominate, and that the most important grazers of primary production in this system are small protists such as heterotrophic nanoflagellates, ciliates and heterotrophic dinoflagellates. There is plenty of evidence that the small copepods are primarily feeding on these protists, and it is highly likely that they are also feeding on detrital aggregates, rather than on phytoplankton per se. Since it is impossible to assay these primary food sources, we are stuck with chlorophyll as a proxy measurement of food availability. The assumption that the growth measurements made using the artificial cohort method match those in situ then depends on the assumption that the microbial composition of water within the cubitainers during the 48h of incubation matches those in the ocean, and that the chlorophyll concentration is a fair measurement of this. This is a rather large assumption, and in my view is probably the origin of the less than perfect correspondence with MTE predictions.

Interactive comment on Biogeosciences Discuss., 9, 16303, 2012.