

**Potential impact zooplankton prey preferences on the estimation of mesoscale zooplankton processes.**

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Crustacean zooplankton dominate the mesozooplankton biomass in the oceans and quantifying rates and pathways of their production and grazing are crucial to understand and model the fluxes of carbon and nutrients through the food web and vertical export from the euphotic zone. Mesozooplankton can directly affect both the standing stocks and community composition of prey assemblages via their grazing activities, and may also impact the biomass and diversity of populations at lower trophic levels via trophic cascades. Conversely, the taxonomic, size and trophic structure of the prey have profound influences on zooplankton dynamics. Although pelagic mesozooplankton have been considered primarily the major grazers on phytoplankton in most marine ecosystems, heterotrophic protists, such as microzooplankton, can be a significant, and at times an essential dietary component of mesozooplankton. However most global based models do not fully consider the nutritional diversity of mesozooplankton, and the importance of heterotrophic prey for their growth and reproduction. We carried out meta-analysis of published data on mesozooplankton grazing on autotrophic and heterotrophic prey for the World Ocean. We find that crustacean zooplankton ingested a higher proportion of heterotrophic prey relative to their abundance compared to that of phytoplankton, and they constitute a disproportionately large fraction of the ingested ration. Heterotrophic microplankton appear to be a prey resource that is sufficient for both metabolic and reproductive requirements. Neglecting to consider non-phytoplankton prey, especially in warm oligotrophic ocean, will result in potentially large uncertainties in estimates of the flux of primary production through the food web.

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