

Can nauplii use bacteria as a phosphorus or energy source?

Carolyn Faithfull^{1*}, Craig Nelson¹, Erica Goetze¹

¹University of Hawai'i, HI, USA, *Umeå University, Sweden

Recent reports show that phytoplankton biomass and production in the global oceans are declining, whereas bacteria are predicted to increase with climate change. However, bacteria and their grazers may not be efficiently incorporated into the classical food web due to their small size. Many species of copepod nauplii are able to graze on small bacterial sized particles, but, the extent to which bacterial carbon and nutrients are ingested, assimilated and incorporated into naupliar biomass is unknown. Nauplii tend to have low body nitrogen: phosphorus (N:P) ratios, and may be able to selectively graze on P-rich food. As bacteria tend to have higher cellular P contents than phytoplankton, naupliar grazing on bacteria may be a way of meeting P needs when phytoplankton P availability is low. Here we present the results of an experiment where we used radioisotopes of ¹⁴C and ³³P to label bacteria and *Tisochrysis lutea*, to measure ingestion, assimilation and incorporation of C and P from different food sources to *Parvocalanus crassirostris* nauplii. To examine if nauplii used more P from bacteria when phytoplankton was P limited, we repeated the experiment with P-limited and P-replete *T. lutea*. We predict that bacterial will not be an important C source for *P. crassirostris* nauplii, but that when phytoplankton are P-limited, bacteria may be an important P source for nauplii.

Keywords: Copepod nauplii, food quality, bacteria, stoichiometry

Contact author: Carolyn Faithfull, University of Hawai'i and Umeå University,
carolyn.faithfull@umu.se