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Dietary lipid assimilation and metabolism in *Temora longicornis*

Franco-Santos RM [a,b,*], Graeve M [a], Meunier C [c], Boersma M [c], Niehoff B [a]

[a] Alfred Wegener Institute for Polar and Marine Research, Am Handelshafen 12, 27570 Bremerhaven, Germany

[b] University of Bremen, Marine Zoology Department, 28334 Bremen, Germany

[c] Alfred Wegener Institute for Polar and Marine Research, Biologische Anstalt Helgoland, 27483 Helgoland, Germany

* Contact author, Rita M. Franco-Santos, rsantos@awi.de, +49 0471 4831 1085

Herbivores play an important role in the energy transfer between primary producers and higher trophic levels. Lipids are energy-rich molecules, and their transfer in the marine environment occurs conservatively. The fatty acid (FA) composition of herbivorous copepods reflects that of their dietary items, since they cannot synthesize *de novo* many of the essential FAs. The aims of the present study were to (1) follow and differentiate the incorporation of dietary lipids into *Temora longicornis* in relation to two different food sources, *Oxyrrhis marina* (heterotrophic dinoflagellate) and *Thalassiosira weissflogii* (diatom) and (2) investigate whether FA biosynthesis occurs in this species. For the experiment, zooplankton samples were collected off Helgoland in June 2015 and healthy looking adult females were immediately sorted. The medium used to batch culture the food items was enriched with labelled bicarbonate ($NaH^{13}CO_3$), and cells were allowed to grow for 5 days before feeding to copepods. *T. longicornis* individuals were kept in the laboratory for 5 days; half were fed with diatoms and half with dinoflagellates. Copepods were sampled before (*in situ*), during (day 2) and upon termination (day 5) of the experiment to compare carbon and nitrogen content as well as FA profiles between individuals feeding in the wild and in the lab, and at different experimental days. Body mass and lipid content of *T. longicornis* increased by the end of the experiment. The pathway and transfer of FAs into the copepod were then followed by means of compound specific stable isotope analysis.

Keywords: compound specific stable isotope analysis, fatty acid, metabolic pathway, *Temora longicornis*