

Title of abstract: Cascading effects of UV radiation on a simple marine food chain

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Ultraviolet (UV)-B levels are still increasing at high and polar latitudes where ozone depletion continues. Changes in the quality of algae at the base of the food web can have a cascading effect on higher trophic levels. We examined whether UV radiation altered the synthesis of fatty acids (FA) and mycosporine-like amino acids (MAAs), as well as the C:N elemental stoichiometry of marine primary producers and whether these modifications transferred through a simple food chain (algae-copepods-fish larvae). Two diatoms (*Thalassiosira weissflogii* and *T. pseudonana*) and one flagellate (*Dunaliella tertiolecta*) were exposed to three different UV exposure treatments. Copepod nauplii were then fed with UV exposed *T. pseudonana* for 3 days. Fish larvae were, in turn, fed with these nauplii. C:N ratios and total lipid decreased with increasing UV exposure in the diatoms, but did not vary in copepods or fish larvae. PAR-only-treated algae had more saturated FAs, myristic (14:0) and palmitic acid (16:0), while UV-treated algae had more long-chain polyunsaturated FAs. However, these changes were not visible in the copepods or the fish larvae. Grazing rates measured on adult copepods fed on the same algae showed that copepods were able to compensate (by a ~66% increased grazing on UV exposed algae) for lower food quality by increasing food intake. No MAAs were found in either algae, copepods or fish.

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