Annual cycle of lipid dynamics in zooplankton from the Beaufort Sea shelf, Canadian Arctic

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The trophic transfer of lipids is a distinct feature of high latitude ecosystems, in which zooplankton are key mediators. We determined lipid content, lipid classes, and fatty acids of 7 taxa of zooplankton over an annual cycle (September 2003 – August 2004) on the Beaufort Sea shelf, Canadian Arctic. All taxa, except the chaetognath, *Eukrohnia hamata*, had distinct seasonality in their fatty acid profiles, where seasonality was strongly influenced by temporal patterns of phytoplankton fatty acids, even in omnivorous (*Metridia longa*) and carnivorous (*Parasagitta elegans, Paraeuchaeta glacialis*) taxa. Samples from summer and fall were most often associated with C_{16} and C_{18} polyunsaturated fatty acids (PUFA), while winter samples were associated with saturated fatty acids and C_{16} and C_{18} monounsaturated fatty acids. Most taxa had C_{16} PUFA/C_{18} PUFA ratios < 1, highlighting the importance of non-diatom PUFA to the diets of these zooplankton on the Beaufort Sea shelf. In contrast, diatoms were relatively more important to adult and juvenile *Calanus hyperboreus,* which had ratios > 1 for most of the year. Seasonality in fatty acid profiles in *C. hyperboreus* was likely a function of total lipid content, which decreased from January through May at a rate of ~450 µg month^{-1} ind^{-1} in adult females, and ~100 µg month^{-1} ind^{-1} in juvenile CIV, representing 75-85% loss of lipids. Future work will assess spatial and temporal patterns in the standing stock of the essential fatty acids DHA and EPA in 3 key copepods in the region, *C. hyperboreus, C. glacilias,* and *M. longa.*

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