Feeding strategies of four dominant copepod species in Prydz Bay, Antarctica: Insights from a combined fatty acids and stable isotopes approach

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Feeding strategies and dietary preferences of four dominant copepod species (*Calanoides acutus*, *Calanus propinquus*, *Metridia gerlachei* and *Rhincalanus gigas*) sampled during late austral summer in Prydz Bay, Antarctica, were investigated using fatty acid and stable isotope signatures. The results show that the contribution of diatoms, dinoflagellates and ciliates to the hypothesized food sources (phytoplankton and particulate organic matter) were higher in the inner bay regions than in the oceanic regions of Prydz Bay. Regional differences in composition and abundance of food sources were also reflected in the fatty acid biomarkers and stable isotope values. In the inner bay region, there were nearly twofold higher total fatty acid contents, higher contributions of fatty acids of dinoflagellate origin and higher $\delta^{13}C$ and $\delta^{15}N$ values compared to oceanic region. Fatty acids and stable isotopes biomarkers in copepod species roughly mirrored the spatial patterns in food sources. As found in primary producers, concentrations of dinoflagellate fatty acids, $\delta^{13}C$ and $\delta^{15}N$ values were higher in copepods from the inner bay region. Moreover, fatty acids and stable isotopic values of copepods show some inter-species differences. *C. acutus* and *C. propinquus* show little regional differences in total fatty acid contents while *M. gerlachei* from inner bay region shows higher fatty acids values. *C. acutus* and *C. propinquus* had higher compositions of long chain fatty acids 20:1n-9, 22:1n-9 and 22:1n-1, while DHA was higher in *M. gerlachei*. $\delta^{15}N$ values indicates that the trophic level of *C. acutus* was higher than other copepod species. While the higher fatty acid ratios DHA/EPA and 18:1n-9/18:1n-7 in *M. gerlachei* indicates that this species fed more opportunistically and preferred a carnivorous diet. Insights from the combined fatty acids and stable isotopes approaches suggested dominant copepods in Prydz Bay, Antarctica have flexible feeding strategies in response to food sources during late austral summer.