

In-situ feeding by *Euphausia superba* in the West Antarctic Peninsula: new insights from DNA analysis of gut contents

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Antarctic krill, *Euphausia superba*, are keystone organisms in maritime Antarctic food webs, linking primary producers to higher trophic levels such as penguins, seals, and whales. Understanding krill feeding is thus essential to understanding energy flows through this seasonally highly productive ecosystem. We used next generation 18S rDNA sequencing of gut contents to provide high taxonomic resolution information on in-situ feeding by krill in the West Antarctic Peninsula in summer. Gut contents from 171 *E. superba* individuals from Flandres and Andvord bay's and adjacent areas in the Gerlache strait yielded over 30 million Illumina sequence reads. The observed krill diet was diverse, with diatoms forming the largest portion of the dietary sequences, but other prey items also important, including dinoflagellates, cercozoa, and copepods. Differences were observed between krill from within fjords, which contained mainly diatoms, and krill in more open areas, which contained more diverse dietary assemblages including more dinoflagellates and heterotrophic prey. Krill also exhibited indications of selective feeding within the diatom assemblage; compared with the assemblage present in the water column, krill gut contents contained unexpectedly high proportions of *Chaetoceros* spp. sequences, a result which was also observed in tank experiments. Improved understanding of in-situ krill feeding may help with understanding the responses of these keystone zooplankters to a changing physical environment, with implications for commercial fisheries and the many charismatic predators which rely on krill as prey.