

Not So Different – *Pseudocalanus* sp. Distribution and Diet in Arctic Fjords

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Abstract

Pseudocalanus spp. are highly abundant Arctic copepods and play a key role in zooplankton biomass and ecosystem functioning (Auel and Hagen 2002; Mumm et al. 1998). Their substantial numbers make them important secondary producers, mediating the transfer of primary production from microalgae and protists to higher trophic levels (McLaren et al. 1989; Napp et al. 2002; McLaren and Corkett 1978; Cleary et al. 2016). They are also significant contributors to carbon cycling in the Arctic (Cleary et al. 2016). Despite their ecological relevance, species-specific feeding ecology of *Pseudocalanus* remains poorly understood. This study explores the species composition and gut content of *Pseudocalanus* spp. across Arctic- and Atlantic-influenced fjords in the Svalbard archipelago. Species identification was carried out using species-specific PCR assays, and dietary analysis was performed via DNA metabarcoding of gut content. Sampling was conducted at four locations representing a hydrographic gradient in the Isfjorden system: Grønfjorden, Isfjorden Karlskronadypet, Isfjorden Adventfjorden, and Billefjorden.

Out of the identified individuals, *P. acuspes* dominated in the collected material, followed by *P. moultoni* and *P. minutus*. The metabarcoding analysis of gut contents, which included all sampled *Pseudocalanus* individuals, revealed a high dietary overlap between species, with Alveolata and Nucleotmycea as the most prevalent prey groups. NMDS ordination and diversity indices (Shannon, Simpson, Pielou) indicated minor differences in prey composition and evenness, suggesting overlapping ecological niches and potential opportunistic feeding behavior across species. The study did not find significant species-specific dietary differentiation despite previous literature suggesting niche separation. Low salinity variation among sampling sites and the presence of a relatively homogenous prey community likely contributed to the observed dietary similarities.

The findings suggest that co-occurring *Pseudocalanus* species in Western Svalbard fjords utilize similar food resources, potentially due to environmental constraints rather than

strong dietary specialization. Further studies incorporating prey field analysis and temporal sampling are necessary to disentangle niche dynamics in this copepod genus under ongoing climate-driven environmental shifts.

Keywords: *Pseudocalanus*, Arctic zooplankton, metabarcoding, dietary overlap, ecological niche.

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