

Interannual variability in distribution and age structure of larval euphausiids in relation to the environmental conditions (Marguerite Bay, Western Antarctic Peninsula).

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ABSTRACT

The spatial patterns of larval euphausiids in Marguerite Bay (MB) were studied during fall/winter of 2001 and 2002 using net and environmental data. Differences were observed in age structure, stage distribution, and abundance of the three dominant species, which were linked to varying chlorophyll concentrations in the Bellingshausen Sea (BS) and MB during spring-summer 2000/2001 and 2001/2002. All euphausiids showed a rapid population response to elevated chlorophyll in 2000/2001, with differences in relative abundance resulting from varying life history strategies. *Thysanoessa macrura*, which has a rapid development from larvae to juvenile between spring-fall of the same year, were most abundant in 2001, while the slower developing *Euphausia crystallorophias* and *E. superba* had abundant young larvae in 2001, which recruited to juveniles in 2002. Younger larvae generally occupied shallower layers, and although all species occupied similar average depths, maximum abundances of different species did not overlap at any given location, suggesting habitat-partitioning behavior. Younger larvae of *E. superba*, presumably advected from the BS, occurred offshelf in the Antarctic Circumpolar Current, while older individuals were present on the inner shelf. This larval spatial distribution supports models predictions for *E. superba*, which suggest that populations are maintained via advection of individuals from the BS, as well as local spawning and retention. Although recruitment has historically been linked to sea ice extension, our results support that population connectivity and the influence of summer phytoplankton blooms are important for recruitment. The role of advection in maintaining populations west of the Antarctic Peninsula is discussed.

Keywords: Larval euphausiids, *Euphausia superba*, *Euphausia crystallorophias*, *Thysanoessa macrura*, chlorophyll concentrations, Antarctic Peninsula

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