

Growth and shrinkage is sex-dependent in Antarctic krill

Tarling GA₁, Hill S₁, Peat H₁, Fielding S₁, Reiss C₂, Atkinson A₃

1. British Antarctic Survey, Natural Environment Research Council, High Cross, Madingley Rd, Cambridge, CB3 0ET, UK
2. Southwest Fisheries Science Center, 8604 La Jolla Shores Drive, La Jolla, CA 92037, USA
3. Plymouth Marine Laboratory, Prospect Place, The Hoe, Plymouth PL1 3DH, United Kingdom

The ability of Antarctic krill to withstand the overwintering period is critical to its success. Laboratory evidence suggests that krill may shrink in body length during this time in response to the low availability of food. Nevertheless, verification that krill can shrink in the natural environment is lacking because winter data are difficult to obtain. One of the few sources of winter krill population data is from commercial vessels, which fish throughout the year and have reported body length frequency data, via an observer programme, for the past 13 years. This study examined length frequency data of adult krill (>35 mm total body length) obtained from commercial vessels in the Scotia-Weddell region, South Georgia and the Western Antarctic Peninsula. Comparisons were made to a combination of science and commercial sampling operations carried out in these regions at other times of the year. Two lines of evidence indicate body length shrinkage in adult females during overwinter, firstly, a 4 mm decrease in the female modal peak relative to that of males and, secondly, a large increase in the male:female ratio in the largest size classes. Other explanatory factors, such as differential mortality, immigration and emigration, could not explain the observed differences. Fitted growth functions predicted a pattern of overwintering shrinkage in all size classes of females, but only stagnation in growth in males. The sex-dependent changes that we observed need to be incorporated into life-cycle- and population dynamic models of this species, particularly those used in managing the fishery.

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Contact: Geraint Tarling, British Antarctic Survey (gant@bas.ac.uk)

