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RV DANA (Danish Institute for Fisheries and Marine Science)

Cruise 8/93

## REPORT

20-30 October 1993

Loading and Unloading: Aberdeen

## Personnel

K Richardson	DIFMAR (in charge)
M St John	DIFMAR
A Christoffersen	DIFMAR
M Carlsen	DIFMAR
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## Objectives

1. To determine the distribution, development and physiological states of *Calanus finmarchicus* in relation to the oceanographic features of the northern North Sea/Faroe Bank, and the southern Norwegian Sea.
2. To collect measurements of primary production and copepod egg production in the northern North Sea.

## Narrative

*Dana* arrived in Aberdeen at 1800 on 21 October. SOAFD equipment was loaded immediately, and the vessel sailed at 0400 the following morning. After equipment trials and flowmeter calibrations southeast of Orkney, the vessel commenced sampling along a northeasterly track as shown in Figure 1. At most stations, CTD, *in situ* particle counts and depth integrated zooplankton samples were collected with a towfish. Specimens of *Calanus finmarchicus* were sorted from the samples, development stage identified, and preserved in liquid nitrogen for subsequent assessment of lipid composition. At selected stations (approximately two per day), additional detailed vertical profiles of zooplankton were sampled using ARIES, and live material was collected for copepod egg production and primary production measurements. The vessel returned to Aberdeen to unload SOAFD equipment at 2200 on 29 October.

## Results

Immature stage 4 and 5 specimens of *C. finmarchicus*, and mature stage 6 specimens were caught at all sites. Stage 5 is recognised as being the main overwintering form, capable of entering diapause at low temperatures. Of the stage 6 specimens, only those caught in the surface waters off the shelf edge were actively producing eggs. Stage 6 copepods caught in the North Sea and on the continental shelf produced very few eggs.

In the deep water off the shelf edge, maximum concentrations of stage 5 *C. finmarchicus* were found at depths of 400-800 m. These were identified from particle size distributions generated by the towed *in situ* counter, and confirmed by serial net samples collected with ARIES. The deep distribution of *C. finmarchicus* coincided with the interface between cold (<0°C) water of Norwegian Sea origin flowing south towards the Atlantic, and the poleward flow of warmer Atlantic Ocean water.

Overall, the equipment used to sample *C. finmarchicus* performed well. ARIES was previously untested at the maximum deployment depth achieved during the cruise (1,200 m) but functioned without failure on all deployments, apart from the loss of the nose cone during a deployment in heavy swell. The *in situ* particle counter operated well until an "O"-ring failure resulted in partial flooding of a housing during the last two days of the cruise.

M Heath  
15 November 1993

Stations sampled by RV Dana, 20-30 October 1993

