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FRV *Clupea*

6pt2CR90

Cruise 6/90 Part 2

REPORT

23 May-1 June 1990

M Heath	PSO	
A Hawkins	CSO	(28-29 May)
R Mitchell	SSO	
J Dunn	HSO	
C Glass	HSO	(26-29 May)
T Taylor	ASO	(23-26 May)
J Campbell	Visitor, Camera Alive	(26-31 May)

Objectives

1. To carry out field trials of a photographic system for investigating the small scale distribution of plankton.
2. To compare the vertical distributions of plankton recorded by the photographic system and ARIES.
3. To compare vertical distributions of plankton recorded by the photographic system and by dual frequency acoustic measurements, over a minimum period of 24 h.
4. To carry out an acoustic, chemical, biological and hydrographic survey of the Firth of Lorne and Loch Linnhe.

Narrative

Clupea sailed from Ardrossan on 24 May to commence surveying and towed acoustic and hydrographic sensors along a track from off Colonsay up the axis of the Firth of Lorne and Loch Linnhe, to Fort William. On completion, sampling in Loch Linnhe and the Firth of Lorne with the Methot-Isaacs-Kidd Midwater trawl (MIKT) was carried out.

Additional staff joined the vessel at Dunstaffnage on 26 May and the following day trials of the plankton photographic system were performed. During 28-29 May, sampling with both the photographic system and ARIES was carried out at a series of stations, during both daylight and night-time.

During 30-31 May acoustic, hydrographic and photographic sampling was carried out over a 24 h period whilst at anchor in Loch Linnhe. On completion, the visitor from Camera Alive was disembarked at Dunstaffnage and the vessel made a passage to Kyle for unloading.

Results

Dual frequency (38 and 200 kHz) echosounder data were collected along the survey track up the axis of the Firth and Loch Linnhe during daylight and at night. Dense scattering at 38 kHz was observed in the upper part of the Loch, and MIKT sampling indicated that this was due to large crustaceans (*Pasiphaea*). Near surface hydrographic and chemical parameters, phytoplankton and zooplankton densities were sampled continuously throughout the surveys using an instrumented tow-fish with a hose inside the towing cable and a small pump on deck. Highest phytoplankton and zooplankton biomass was recorded in the lower basin of Loch Linnhe, and this was subsequently confirmed by MIKT and ARIES sampling. A large proportion of the zooplankton in the lower basin was composed of juvenile euphausiids (*Meganyctiphanes*).

The camera system for *in situ* photography of zooplankton was mounted in a frame together with CTD, chlorophyll fluorescence, transparency, light intensity, oxygen and bioluminescence sensors. Several of the films were developed aboard the vessel for evaluation of the data and to guide adjustment of the system. Large numbers and a wide size range of particles were visible in each photograph, and the images from different depths (max 90 m) appeared to concur with the data from the transparency and chlorophyll fluorescence sensors.

Day and night deployments of both the camera and ARIES were carried out at three sites in Loch Linnhe, and day-time sampling at a further three sites in the Firth of Lorne. In addition, dual frequency echosounder data and vertical profiles with the camera system at 2 h intervals were recorded over a 24 h period at anchor in a depth of 80 m in Loch Linnhe.

M Heath

18 June 1990

Seen in draft: George B Calder

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