

R1/4

3ER74

9

IN CONFIDENCE: NOT TO BE QUOTED WITHOUT REFERENCE TO THE LABORATORY
CRUISE REPORT

FRV EXPLORER

3 April - 1 May 1974

OBJECTIVES:

To study the patchiness of gadoid larvae in relation to environmental factors, particularly their food supply.

NARRATIVE:

Explorer left Aberdeen at 1100 hours on 3 April and started work at 2130 that evening. Between then and midnight on 5 April, six current meter moorings were deployed along $00^{\circ}30'E$ between $58^{\circ}N$ and $61^{\circ}N$ and a preliminary survey carried out to 15 miles on either side of this line.

The first of the continuous surveys along $00^{\circ}30'E$ from $61^{\circ}N$ to $59^{\circ}N$ was then commenced, with surface temperature and salinity being monitored continuously with a Thermosalinograph, surface nitrate with an autoanalyser and surface chlorophyll with a fluorometer; zooplankton was sampled, with oblique hauls at half hour intervals of a high speed double net (68, outside mesh, 250, inside mesh). Surface samples of water for salinity, nitrate and chlorophyll determination were collected from the pumped supply for calibration of the continuous recorders and a few sedimentation samples were collected for cell counts and phytoplankton species identification.

On completion of this first continuous survey, a line of stations were worked north, along the same line, to $61^{\circ}N$, with the same parameters as previously being sampled at various depths to the bottom, as well as the surface. Four parachute drogues were deployed at $60^{\circ}30'N$. Work along $00^{\circ}30'E$, in the pattern described above, formed the main outline of the rest of the cruise.

A second continuous survey, and an associated line of stations, were then carried out and completed by 0400 on 9 April and the next 28 hours were devoted to a study of the depth distribution of gadoid larvae using a Hardy-Longhurst sampler and a vertical closing net. Drogues were then lifted.

A third continuous survey, which had to be modified because of bad weather, was completed at 0900 on 11 April, but weather prevented stations being worked northwards and instead the continuous survey techniques were used on the return passage. This however also had to be abandoned later that day at $59^{\circ}40'N$, when two crew members in need of medical attention were taken to Lerwick.

Explorer arrived back in the survey area at noon on 12 April and a second "large scale" survey of the area 15 miles on either

side of $00^{\circ}30'E$ and the deployment of drogues was completed by midnight on 13 April.

An attempt was then made to obtain further data on diurnal variation but this was cut short after about two hours because of strong winds. By 1530 on the 14th conditions had improved enough for a line of hydrographic stations to be worked between $60^{\circ}45'N$ and $59^{\circ}00'N$. On completion of these stations the fourth continuous survey was carried out between $59^{\circ}N$ and $61^{\circ}N$ between 0630 on the 15th and 0200 on the 16th. The next seven hours were occupied in zooplankton sampling and the checking and laying of drogues; at 0900 Explorer proceeded to Lerwick for a mid cruise break and to exchange scientific staff.

Explorer left Lerwick on the afternoon of 18 April and proceeded to the area where the drogues had been laid. After checking the drogues the fifth continuous run was started at 0600 on the 19th and the associated line of stations started at 2315 on the same day - and completed at 1930 on the 20th. The next three days were devoted to a restricted survey to the east of $00^{\circ}30'E$; searching for and deploying drogues; plankton sampler flowmeter calibrations; attempts to study in more detail the zooplankton just inside and just outside a patch of rich phytoplankton (discontinuity study); and further sampling for a study of diurnal variation in the depth distribution of gadoid larvae.

The sixth continuous survey was commenced at 2000 hours on 23rd and it and the associated line of hydrographic stations had been completed by 1430 on 25th. The remainder of that day and the early hours of the next was devoted to recovering drogues and a farther attempt at a discontinuity study. The following three days were occupied in a third "large scale" survey and to the lifting of the current meter moorings during daylight hours, the hydrographic stations at the moorings being used as the transect to complement the seventh continuous run which was started at 1013 on 29 April and was completed at 1600 on 30 April.

Having completed a very successful cruise, and with the plankton winch in need of repair, Explorer returned to Aberdeen slightly early, docking at 0930 on 1 May.

During 15-24 April FRV Clupea worked in association with Explorer.

RESULTS:

Numerous samples and observations have been obtained and it will be many months before they can be analysed and evaluated. In addition to the data which will be obtained on the gadoid larvae and their relationships with the other members of the plankton, some interesting details should also be obtained on the progress of the spring outburst of phytoplankton which was observed at a stage before the development of the zooplankton blurred the relationship between the nutrients and the phytoplankton standing stock.

Throughout the period of the survey fish larvae were virtually absent south of approximately 59° 50'N and were most abundant at about 60° 45'N. Chlorophyll a levels increased markedly south of about 60° 15'N in all but the last two continuous surveys and during the first survey on 6 April reached the very high values of 28_μ Chlorophyll a/l at some stations. The chlorophyll a levels gradually decreased in this southern region until by 24 April values were less than 0.5_μ g/l. At that time chlorophyll a levels in the northern part of the survey had increased compared to earlier values but they never reached the high values found to the south.

J H Steele
J A Adams
30/5/74