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R V ERNEST HOLT

Report for Cruise 6/1969

Staff: N Reynolds Duration: 28 May - 19 June
V J Bye
J M Last
A J Jones
J K Curtis
J Thronsen (Univ. of Oslo, part time)

Aims

1. To count phytoflagellates in the Barents Sea, set up cultures and make direct preparations for electron microscopy.
2. To trawl for a wide variety of species of fish for pineal gland studies.
3. To collect plankton samples, and core samples, for Foraminifera for Dr Wiseman, British Museum.
4. To collect ray parasites for Dr Kearn, University of East Anglia.
5. To collect krill for deep freezing for fish food.
6. To sample for dinoflagellates along the north east coast of England.
7. To measure cod in the Hjelmsøy Bank area.

Narrative

ERNEST HOLT sailed from Grimsby at 1530 hours, 28 May. Sampling for dinoflagellates started at the Humber Lightvessel at 1700 hours and continued to the Firth of Forth at 1700 hours, 29 May. Course was then set for the Viking Bank where the first trawl haul was made. The ship then proceeded to Tromsø, arriving at 0500 hours, 2 June. After refuelling, departure was made at 1400 hours, via Fugloy Sound, for the Barents Sea. Two trawl hauls were made in the vicinity of Hjelmsøy Bank (Aims 2 and 7). A series of algal stations was worked (Aim 1) with 24-hour observations at three places: 1. $71^{\circ}05'N$, $26^{\circ}06\frac{1}{2}'E$ (Kamoyfjord), 2. $74^{\circ}30'N$, $25^{\circ}E$, 3. $74^{\circ}25'N$, $16^{\circ}12'E$. At 2 and 3 and also at $71^{\circ}30'N$, $25^{\circ}E$ a series of tows with the 20" Nansen net were made, and bottom core samples taken (Aim 3). Trawl hauls were made as necessary (Aim 2). On the completion of this work a return to Tromsø was made. After refuelling, rewatering etc, between 0400 and 1800 hours, 14 June course was set for Viking Bank where the last trawl haul was made. A second series of dinoflagellate samples was taken along the Northeast coast during the return to Grimsby which was reached at 1630 hours, 19 June. Light to moderate winds prevailed over most of the cruise and no time was lost due to bad weather.

Results

Aim 1. After some trials of different methods it was found that the best results were obtained when samples were concentrated by centrifuge, fixed in 2% osmic acid and stained in safranin. In this way some of the more delicate types, such as cryptomonads, which normally burst under the microscope, could be counted and identified.

The three 24-hour stations were worked to get information on the diurnal variation (if any) in numbers of flagellates in the surface water. Material from the first and second stations was counted at sea, that from the third station was preserved for counting in the laboratory. The counts obtained ranged from 30 to 240 per ml of seawater. The results so far show a tendency for counts to be lower during the period 0000-0800 hours LMT, than during the rest of the day, but much more information is needed before a relationship is definitely established.

Of the three stations, Kanyofjord appeared to have the richest flora in respect of the variety of types found, there being representatives of seven of the classes of flagellates. Station 2, with a low water temperature of 2°C was notable for the wide variety of dinoflagellates and for the presence of large numbers of the colonial flagellate Dinobryon. Station 3, in the warm water (5°C) west of Bear Island yielded mainly members of the Haptophyceae and Cryptophyceae.

Cultures were put up as opportunity arose, and about 150 direct preparations were made for electron microscopy.

Aim 2. Heads were collected from a range of demersal teleosts, and from the spiny dogfish Squalus acanthias and preserved in a variety of fixatives for subsequent histological and histochemical examination.

The anatomy of the pineal region was closely studied in all species of fish caught. Heads were collected and deep frozen to enable these studies to be continued.

Bulk samples of pineal glands, required for hormone examination, were collected from cod, haddock and coalfish. At least 7,000 glands were collected.

Two deep water species, the Greenland halibut Reinhardtius hippoglossoides and the Grenadier Macrurus fabricii were caught in relatively large numbers in the one deep water trawl (350 fathoms). Heads for both species were collected and fixed.

Aim 3. Hauls with a 20" Nansen net were made at four depths at each of three stations. Each tow was of half hour duration with the ship's engine running at 40 rpm. The amount of plankton collected was very small. Coring was successful at the first two stations but was abandoned at the third station after three unsuccessful attempts.

Aim 4. About 20 rays were collected for Dr. Kearns.

Aim 5. No suitable echo traces were seen, so this was not attempted.

Aim 6. Samples were collected on the outward journey with a 600 mpi net and preserved in Lugol's iodine. An organism resembling, but not positively identified as, Gonyaulax was common in the Farne Islands area. Seawater samples concentrated by centrifuge also revealed large numbers of a small Gymnodinium which was not caught by the 600 mpi net. On the return journey quantitative samples were collected and fixed in osmic acid for examination in the laboratory.

Aim 7. A total of 467 cod were measured; of these 262 were also measured round the girth for the length/girth relationship, and the feeding rate assessed. 138 otoliths were collected. All the fish were above the legal minimum size for the area but a proportion were not up to the minimum size the market will accept.

Miscellaneous

Selected ship meteorological observations were made at synoptic hours, and instrumented wave recordings were also carried out.

N Reynolds

20 6 69

Seen in draft: E A B
G W A

Initialled: A J L

Distribution:

Basic list, plus the following:

Dr Reynolds
Mr Bye
Mr Last
Mr A J Jones
Mr Curtis
Mr Throndsen