

MINISTRY OF AGRICULTURE, FISHERIES AND FOOD  
FISHERIES LABORATORY, LOWESTOFT, SUFFOLK, ENGLAND

1976 RESEARCH VESSEL PROGRAMME

REPORT: RV CORELLA: CRUISE 3

(PROVISIONAL: Not to be quoted without prior reference to the author)

STAFF

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DURATION

Left Lowestoft 1000 h 18 February  
Arrived Lowestoft 0700 h 28 February

LOCALITY

West Central North Sea - North Norfolk Coast to 56°N.

AIMS

- 1 Investigate the distribution and abundance of planktonic fish eggs and larvae, zooplankton predators and competitors and the phytoplankton using the Lowestoft multipurpose plankton sampler.
- 2 Monitor the sub-surface water continuously along the ship's track for temperature, salinity, transparency and chlorophyll "a".
- 3 Collect water samples from the pump for salinity and nutrient analyses; calibrate the fluorometer with chlorophyll "a" extracts; measure phaeophytin, and identify the phytoplankton contribution to chlorophyll "a" fluorescence including the preparation of slides for electron microscope examination of the micro-flagellates.
- 4 Carry out hauls with the Boothbay net to sample young fish.
- 5 Use the changing net sampler to investigate vertical distribution of fish eggs and larvae and the zooplankton, alternating with water bottle casts for phytoplankton, chlorophyll "a" and phaeophytin in relation to temperature and light penetration into the water column over a 26 hour period.
- 6 Collect samples of fish for stomach content analysis using the young gadoid trawl in midwater.
- 7 Collect live plankton and fish eggs as required.

## NARRATIVE

RV CORELLA sailed at 1000 h 18 February. Once clear of the harbour the surface sea water monitoring systems were calibrated and linked to their recorders to begin continuous monitoring for the remainder of the cruise. The solarimeter and quantum deck cell were also switched on. The 30" multiple plankton sampler was calibrated in the deep water running up to the Haisboro' lightvessel, and the plankton survey grid was begun at 1700 h. Sampling continued without interruption until completion of the penultimate grid station at 0330 h 24 February off Berwick Bay. In Berwick Bay the Boothbay net was rigged and tested using the port side towing gallows, before CORELLA set course through the Farne Islands to complete the last grid station at 0930 h 24 February. Whilst off the river Tyne on 21 February a short detour from the survey grid was made to pick up new batteries for the quantum deck cell, despatched from Lowestoft via the S. Shields pilot boat.

The only inclement weather conditions met during the survey were thick fog banks off the Northumberland coast and a short-lived S.W. gale which caused the abandoning of six stations at the north-east corner of the projected grid. Thus CORELLA was able to complete the 93 stations of this 1150 ml survey at an average speed of 8.5 knots in  $5\frac{1}{2}$  days.

With the plankton survey completed CORELLA set course for the centre of the plaice egg patch 30 mls off Flamboro' Head. En route the 30" multiple sampler was re-calibrated and the changing net rigged. At 2300 h 24 February plankton vertical distribution sampling began. Sampling consisted of a changing net haul and Nansen bottle casts at four hourly intervals until 0100 h on the 26 February. During the morning and afternoon of the 25th two series of light measurements were made with the spectral radiometer down to 40 metres. A third series with this instrument was done at midday on the following day between trawling stations.

On completion of the vertical distribution series and in calm conditions, CORELLA's ramp was rigged for trawling. Sampling with the young gadoid trawl in the centre of the plaice egg patch, where fish traces had been noted, began at 0600 h on the 26th. Five hauls were made up to 2130 h when a 40 mile echo survey search for denser fish traces within the plaice egg patch began. Trawling recommenced at a position 15 mls farther south at 0400 h on the 27th. Five hauls were made in this area ending with a dusk haul between 1800 h and 1945 h.

At 2030 h on the 27th with all aims completed CORELLA set course for Lowestoft docking at 0700 h 28 February.

Most of the electronic equipment and continuous monitoring systems functioned satisfactorily. Some difficulties were experienced with the electric flow meters on the multiple plankton sampler and were probably caused by faulty plug connections. The recording pens on the twin channel 'Servoscribe' flat bed recorders, gave considerable trouble throughout the cruise. This is a serious problem which results in loss of data and needs solving by the manufacturers. The quantum deck cell functioned satisfactorily after replacement of the faulty batteries.

700 sea bed drifters were released at 14 selected stations over the survey grid: one of these stations was in the Humber sludge dumping area.

## RESULTS

Preliminary examination of the plankton samples shows both plaice and cod egg densities increasing since the previous cruise. The centre of the plaice egg patch has moved some 30 miles west to a position 25 miles east of Flamborough Head, and increased in density from ca: 120 eggs to 430 eggs per sample. Early stage plaice larvae were present on many stations in the densest part of the egg patch. Further north in the Baymans Hole area, there has also been a notable increase in plaice spawning (see Fig. 1).

The additional stations completed on the eastern edge of the grid confirm that the limits of the plaice egg patch can be defined at the north eastern but not at the south eastern edge of the survey area. Cod eggs and larvae were found at many stations throughout the survey, but were most abundant in an area about 50 mls NE x E of Flamborough Head.

Echo traces from the M.S.29 which was run continuously throughout the survey, were densest in the coastal areas, often coinciding with large numbers of euphausiids and some sprats in the plankton catch.

The fluorometer was run continuously throughout the cruise. Acetone extract determinations of chlorophyll "a" and phaeophytin were made at all stations, and the results, expressed as acetone extract fluorescence, plotted on a chart (Fig 1). In general chlorophyll "a" values were slightly lower than had been found on the previous cruise, and in particular the relatively higher values previously found close inshore along the coast north of the Tees had disappeared. On this occasion the highest values were found in the Wash, the mouth of the Humber and on the eastern edge of the grid at 55°N.

Material was collected on 10 µm net, and on membrane filters and preserved in glutaraldehyde for laboratory examination. Electron microscope preparations for shadow casting were made.

The operation of the Boothbay net from the port side gallows was not successful, resulting in the net being badly torn by the vessel's propeller. A more satisfactory method of operating this large frame net from CORELLA must be found.

Catches in the young gadoid trawl were small in both areas fished, ranging from a few sprats to one basket of mixed fish including sprats, anchovies, sandeels, dabs, grey gurnards, and one cod. Samples of whole fish or their stomachs, of all species caught, were preserved for subsequent stomach content analysis.

One observation of interest, was the presence of late stage pelagic larvae of the lemon sole, in many of the trawl hauls and four of the plankton stations near the trawling area.

J H Nichols

8 March 1976

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DISTRIBUTION

Basic list

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