

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

1975 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 7

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

STAFF

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A K Steele
J Curtis
R J Turner
R Unsworth (Fleetwood)
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J P Pearn (Thames Technical College)
R A Bray (BM Natural History)

DURATION

Left Grimsby 1330h 5 July

Arrived Grimsby 0810h 30 July

All times are Greenwich Mean Time

LOCALITY

Labrador, Newfoundland and Nova Scotia

AIMS

1. To obtain cod tissue specimens for biochemical and genetic analyses of races.
2. To take series of seawater samples for a baseline study of trace elements.

NARRATIVE

Water sampling and biological collections were concurrent, but are outlined separately below. The first narrative deals with the water; the second with cod.

5 July CIROLANA left Grimsby 24 hours later than planned. The completion of repairs to an emergency generating engine caused this delay. The outward course followed northabout past Ronaldsay, then westwards to the Newfoundland banks.

6-7 July Samples of surface seawater were taken along the westerly course from 2°W to 7°W at unit degree intervals over the continental shelf north of Scotland to augment the sampling programme for caesium 137 on CORELLA Cruise 11/75.

- 7-11 July Daily surface seawater samples were collected, filtered and frozen as part of the ICES trace metal baseline study. Also at two positions on the outward track seawater samples were collected from the water columns down to 2000m using 30 l Niskin sampling bottles. At these stations salinity samples were collected and temperature measurements were made. 50 l samples of seawater were collected at each spatial sampling position for analysis of caesium 137 arising from nuclear weapon test fallout.
- 11-23 July On each of the 8 major banks fished, surface water samples were collected for trace metal and Caesium 137 analyses. At two positions a sample of cod muscle was collected for caesium 137 analyses.
- 23-31 July The water sampling programme on the return passage was similar to that of the outward journey with an added station on the Mid-Atlantic Ridge. In addition, a series of surface samples were collected at 2° intervals of longitude between 14°W and 8°W to extend southerly the grid of sample positions worked as part of the ICES trace metal baseline study on CIROLANA Cruises 4/75 and 5/75.

This following narrative deals with cod, as does the attached course outline chart.

- 11-12 July Three stations were trawled on Flemish Cap. On this bank alone, small cod in the back cover were as numerous as cod in the cod end. All were sexually immature. 188 cod specimens were measured, bled, dissected, sexed and otolithed. Their haemoglobins were stored in liquid nitrogen. Specimens of sera, livers, skeletal muscles and hearts were blast-frozen in individual tubes and polythene bags. In addition to cod, small numbers of other fish species were tissue-sampled for comparative isozyme studies. A few specimens were preserved for the BM and for the Nuffield Institute. Others were candled on board for parasites. All of those activities continued for cod and other selected material hauled on board throughout the trawling part of the programme. On Flemish Cap a total of 25 trawlers of assorted Spanish, Portuguese and Russian designs were observed, but not one English trawler. Not one other trawler was sighted on any of the seven banks fished after leaving Flemish Cap.
- 12 July Three hauls between the eastern edge to the northern edge of the Grand Bank produced only 5 cod in all. This was the first of three distinct transects fished over the Grand Bank proper during this cruise. All three were uniformly unproductive of cod. Most of the cod caught on the Grand Bank had well developed gonads.
- 13-14 July Seven hauls at a position 100 miles north from Grand Bank, Rittubanki yielded 112 sexually immature cod specimens.
- 14-15 July Three hauls on Hamilton Bank, off Labrador produced 119 cod. About one third of them were sexually mature.
- 16-17 July The second transect of the Grand Bank, from the NW edge southwards, produced only 16 cod in 5 hauls.

- 17-19 July: Four hauls on Green Bank and another four on St Pierre Bank yielded but a solitary cod from each bank. However, incidental catches of halibut provided 70 hearts which were blast-frozen as requested by Dr Wilson, University of Essex.
- 19-21 July: After crossing the Laurentian Channel to the Nova Scotia shelf 56 cod were obtained from 7 hauls on Banquerean, and 23 from 3 hauls on Sable Bank.
- 22-23 July: The third and final transect of the Grand Bank was from the SW edge, passing 40 miles S. of the Virgin Rocks and on to the E. edge. Only 10 cod were caught in 4 hauls, bringing the Grand Bank final total to 31. This consistently poor catch rate was despite the apparent abundance of cod food such as sandeels, capelin and amphipods.
- 11-23 July: Throughout all the fishing part of the cruise the ships progress was limited by (a) poor catch rates of cod on all banks excepting Flemish Cap (b) 12 days of very intense fog over all the banks (c) numerous icebergs down as far as the latitude of Cape Race ($46^{\circ}36'W$).
- 28 July: On passage home in the SW approaches to the English Channel a 30" diameter tin tow net was tested in action using the present rig as designed for the lesser, 20" model.
- 30 July: Vivostat storage used for fish proteins on board CIROLANA was at risk towards the end of the cruise. Strike action by Canadian port pilots had prevented us replenishing liquid nitrogen at mid-cruise. Fortunately no material was lost.

RESULTS

1. By discarding none of the cod that were caught, and by bleeding the smaller specimens, the final total of tissue samples collected exceeded the number collected on CIROLANA Cruise 3/71 which was to the same area when visibility and catch rates were more favourable. The present cruise produced a potentially informative collection of material. The results of the findings should be apparent in time, after laboratory analyses at Lowestoft. Analyses of the sample of cod from Labrador and Sable Bank should extend the known genetic tag information for this species. The new samples from other banks should test the statistical repeatability of the genetic races of cod described in the literature.
2. As in the biological part of the programme, the seawater sampling programme also produced a series of samples required for subsequent analyses. The 37 samples of seawater collected for Caesium 137 analyses were left on board for filtration and extraction by ammonium molybdophosphate on silica gel. The analyses are to be done during CIROLANA Cruise 8-75.

Minor aim

The tests using the 30 inch tin tow net suggested modifications, to be reported elsewhere.

Miscellaneous Collections

Helminth parasites of fishes were collected by Mr Bray. Digenetic trematodes, costodes, acanthocephala, nematodes, leeches and a few copepod parasites were taken from the alimentary canal, gills, liver mesenteries, urinary and gallbladder and skin of 142 fishes of 39 species.

Numbers of fishes and crustaceans were preserved for the collections of the British Museum (Natural History) for radiology at the Nuffield Institute and for biochemical studies at Essex University.

Three halibut caught on Bank St Pierre survived the return journey and were offered to the hatchery.

Alan Jamieson
(Naturalist in Charge)
18 August 1975

SEEN IN DRAFT THF (Master)
 WKS (Fishing Skipper)

INITIALLED AJL

DISTRIBUTION

Basic list +

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R A Bray (BM Natural History)

Mr A Wheeler (British Museum, Natural History)

Dr du Boulay and Miss M Darling (Dept of Radiology, Nuffield Institute)

Mr A W May (FRBC Biological Station, Newfoundland)

Dr M Wilson (University of Essex)

Mr S Prudhoe (British Museum, Natural History)

60°

50°

N

SHIP'S TRACK

55°

100 FATHOM

HAMILTON

RITTU

NEWFOUNDLAND

FLEMISH

GRAND

GREEN

ST. PIERRE

BANQUEREAU

SABLE

50°

