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

1972 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 3

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

STAFF

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DURATION

Left Grimsby 1725 h 29 January

Arrived Grimsby 1810 h 27 March

All times are Greenwich Mean Time

LOCALITY

Greenland, Iceland, Faroe, Scotland and Norway

AIMS

1. Collect blood and tissue samples from cod and hake for biochemical-genetic analyses of stocks.
2. Collect Corpuscles of Stannius for Department of Zoology, Sheffield University.
3. Collect and examine fish for helminth studies.
4. Transport large live cod to Aberdeen for NERC/Birmingham University target strength project.
5. Estimate nanoplankton abundance and set up cultures.
6. Obtain two big live halibut and produce species hybrids for Dr Purdom.
7. Make a series of observations on passage for the IGOSS Pilot XBT Project.

NARRATIVE

CIROLANA sailed from Grimsby at 1720 h 29 February on course for Cape Farewell, Greenland. Phytoplankton samples and bathythermograph observations started on passage, were continued intermittently throughout the cruise. Rough weather

delayed progress on 3, 4 and 5 March and destroyed the female plaice carried in deck tanks and intended as species hybrid parents. CIROLANA approached Cape Farewell, from the east, but access to fishing grounds was prevented by pack ice, scattered bergs and growlers also poor visibility. After making a detour of 100 miles and dodging out a force 10 the Farewell fishing grounds were reached from the south west. Trawling started south of Nanat Isle at 1600 h 9 March. Cod were measured, sexed, otolithed, bled, dissected and candled for helminths. This routine sampling was repeated along the west Greenland coast at Nanertalik Bank, Narssalik Bank, Danas Bank and Toroussak Bank between 9 and 12 March.

On the West Greenland Banks air temperatures of -25° Centigrade froze fish as they were being hauled from the water, deck tank contents solidified and live fish collection became impossible. Some tissue samples from different species were stored frozen or fixed to meet minor requests. All of the cod blood samples taken at West Greenland were tested for haemoglobin types at Godhaab where CIROLANA tied up between 1645 h 12 March and 1600 13 March. Danish scientists, local fisheries inspectors and a doctor visited the ship. All the ships complement satisfied medical examinations before being granted shore leave.

CIROLANA set out southerly from Godhaab Fjord then made the reverse detour of the ice at Farewell aiming to sample the cod along the East Greenland banks. At Cape Walloe Bank on 17 March the skipper of the Bremerhaven trawler SCHELLFISH, catching redfish, volunteered five baskets of live cod as research material. This gesture saved CIROLANA trawling on a bank notorious for fastners. An inflatable boat was quickly launched for this transfer. Extensive ice made Bille Bank inaccessible to German and English trawlers, so CIROLANA proceeded northerly to fish samples of mature cod at Mostings Ground, Angmagssalik Bank and Dohrn Bank. On route to Reykjavik, trawling at Snaefellsjokul Gulley provided control samples of cod, against which to compare the Greenland cod test data. All the remaining cod bloods were tested at anchor in Reykjavik roads. Water and mail were received while alongside between 1300 and 1700 h 22 March. Icelandic scientists made a brief visit on board.

CIROLANA arrived on Faroe Bank on the morning of 23 March. About 300 large cod were trawled in six hauls. 27 live cod were placed in circulating seawater in deck tanks for delivery to Aberdeen for the NERC/Birmingham University project. Two big Faroe Bank halibut were kept alive for Dr Purdom at Lowestoft.

Fishing for hake during 24 March at Muckle Flugga yielded 78 large specimens from which blood and tissue specimens were secured. By moving east beyond the Norwegian Deep another hake ground provided 27 big specimens similarly sampled on 25 March. The live cod remaining on board since Faroe Bank were offloaded at Aberdeen dock between midnight and 0100 h 27 March. Dr Plack collected his frozen samples. CIROLANA left Aberdeen at 0100 h 27 March to make Grimsby on the next tide.

RESULTS

Aim 1. Cod blood heart and muscle samples for biochemical genetic analyses were obtained at Greenland on Toroussak Bank, Danas Bank, Narssalik Bank, Nanat Isle, Cape Walloe, Mosting Ground, Angmagssalik Bank and Dohrn Bank, also at Snaefellsjokul Gulley, Iceland. The more distant bank samples were tested for haemoglobin types in Godhaab Fjord and the remaining half in Rejkjavik roads. A table of cod haemoglobin data is appended to this report.

Hake for biochemical analyses were bled and dissected on two grounds.

78 specimens north west of Muckle Flugga, Shetland, another 27 north west of Utsira, Norway.

Other gadoids bled were 21 haddock and 15 coalfish at Muckle Flugga also 12 ogac at Toroussak Bank.

Aim 2. Corpuscles of Stannius were taken from 300 cod at East Greenland for the Department of Zoology, Sheffield University.

Aim 3. A total of 248 cod from East and West Greenland, Iceland and Faroe Bank were examined for the incidence of nematode parasites in their flesh. Samples of these worms and the viscera from several fish were preserved for examination on shore.

Several specimens of the velvet belly dogfish, the black mouthed dogfish and a squid were preserved for an examination of their parasites at the laboratory.

Aim 4. A total of 26 large cod were brought to Aberdeen dock alive for the NERC/Birmingham University target strength project.

Aim 5. Fluorometer observations showed that phytoplankton was very sparse throughout the cruise and that what little there was was almost entirely nano-plankton. Cultures were set up, in five different culture media, from 10 stations all situated about 60°N and ranging in longitude from 51°W to 3°E. Direct preparations for electron microscopy were made and at selected stations material was collected on membrane filters and made into permanent preparations for light microscopy. At 10 stations membrane filtrations of sea water were done to provide material for a comparison of the spectrophotometer and the fluorometer for the determination of chlorophyll in acetone extracts.

Aim 6. As no ripe male halibut was caught, no semen sample was available for crossfertilization work or for cold storage. The gonads of 16 chicken halibut were fixed for cytogenetic observations. Two moderate sized halibut caught on Faroe Bank were transported alive to Grimsby then to the Lowestoft laboratory by road.

Aim 7. Weather Bracknell received 24 XBT reports. On 10 other occasions reports were not sent because traces were very obviously unsatisfactory.

Miscellaneous. An assortment of gonads were collected for Dr Plack NERC, FBRU, Aberdeen.

Muscle samples from long rough dabs and from a few halibut were collected for Dr Dando, MBA, Plymouth.

Cod, hake, haddock and coalfish specimens provided blood and muscle tissue samples for comparative biochemical work on fresh Coelacanth material at St Bartholomew's Hospital.

A Jamieson
7 April 1972

SEEN IN DRAFT: M R Sutcliffe (Master)

G W Argumont (Fishing Skipper)

INITIALLED: DHC

DISTRIBUTION: overleaf

DISTRIBUTION

Basic List

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Position	Fishes	$Hb I^1$ Frequency	State of Gonads
Toroussak Bank	118	0.07	Immature
Danas Bank	31	0.05	"
Narssalik Bank	56	0.13	"
Nanertalik Bank	71	0.09	"
Nanat Isle	91	0.08	"
Cape Walloe	40	0.12	"
Mosting Ground	89	0.02	Mature
Angmagssalik Bank	86	0.03	"
Dohrn Bank	149	0.08	"
Snaefellsjokull Gulley	35	0.24	"

The above table outlines the haemoglobin type data for cod Gadus morhua sampled during March 1972. The high $Hb I^1$ frequency in the Iceland material in the final row contrasts significantly with the 9 remaining samples, all of which were at Greenland.