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MISS HOWARD

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

1971 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 2

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

STAFF

A Jamieson
L Birkett
D Thompson
C N Humphreys
R J Turner
J M Evans (SCS)
J M Curtis (Grimsby)
N E Platt (FHU)

DURATION

Left Portland 1955 hours 29 January

Arrived Grimsby 2045 hours 25 February

All times are British Standard Time

LOCALITIES

Iceland, Newfoundland and Nova Scotia

AIMS

1. To sample a wide range of cod stocks for (a) genetic analyses
   (b) helminth studies
   (c) iron-55 estimates.

2. To attempt electrophoretic analyses of fish blood proteins on board.

3. To bring back live halibut.

NARRATIVE

CIROLANA left Portland Dockyard at 1955 hours on 29 January and bunkered at Brixham between 0020 and 0600 hours on 30 January before sailing for Iceland. Rough weather from 30 January until 2 February caused the ship to roll heavily, injured a steward, damaged movable objects and caused engine overheating. Dodging was necessary from 2200 hours on 1 February until 0900 hours on 2 February.

The first haul, at the Whaleback, SE Iceland at midnight on 2 February produced 31 baskets of large immature cod. Samples were measured, sexed and otoliths collected. Tissue samples were taken for blood type, enzyme, iron-55 and helminth analyses. This sampling procedure was repeated throughout the cruise whenever the numbers of cod were considered sufficiently large. Winds gusting up to 60 knots caused a

reduction in speed to 7 knots as CIROLANA sailed westward round the south of Iceland arriving at 0900 hours on 4 February on Selvogsbanki where two hauls produced 11 baskets of cod used for tissue samples, also 44 baskets of coley and 20 baskets of redfish.

Electrophoretic analyses of cod haemoglobin types were applied to all of the cod specimens bled at Iceland. This work on board on the night of 4-5 February at anchor in Reykjavik Roads was completed by 0323 hours when CIROLANA sailed for Newfoundland. Engine trouble, primarily brought about by bad weather, reduced speed periodically on 7 February, and at midnight on 8 February a bank of packice was sighted and the ship was laid for $7\frac{1}{2}$ hours until daylight.

Cod on the North American banks were sampled at steaming time intervals of less than a day each along the Maritime banks between Cape Bauld and Cape Cod. The first haul was at Rettibanki, east of Bell Isle at 1210 hours on 9 February, followed at 0200 hours on 10 February at Grand Nord. Adequate samples were secured at both positions. Fewer cod were found in the colder water at Woolfall Bank, but the numbers increased again on the south edge of Green Bank and at the eastern corner of Banquereau. Deep and shoal hauls south of Sable Island produced a few small hake but no cod. Four successive hauls on Georges Bank produced 42 cod to make the most southerly but least numerous sample before sailing for Halifax, Nova Scotia, at 2200 hours on 13 February.

CIROLANA anchored off Dartmouth Cove at 1230 hours on 14 February. Two days of tests completed the haemoglobin type analyses of all the blood samples on board before going alongside at the Bedford Institute of Oceanography, Dartmouth, at 0800 hours on 16 February.

Over seventy guests welcomed on board were conducted round the ship, shown scientific demonstrations and served drinks and canapés between 1400 and 1600 hours. The arrival of the new vessel and the cruise objectives were given favourable press coverage on CBC television and radio, and also in the 'Chronicle-Herald'. Mr Birkett presented a seminar to Dr Dickie's Marine Ecology Department at the Bedford Institute and the blood-typing team were kindly shown research activities at the Halifax Laboratory by Dr Odense.

Fresh water was taken on board before departing for Grimsby at 1000 hours on 17 February. The fresh water pipes and valves on board froze up while crossing the Newfoundland Banks and the ship's course was altered southeasterly to find warmer conditions. Three comparatively calm days preceeded a return to rougher weather south of Iceland, but fortunately the strengthening winds were astern and moderated before CIROLANA docked at Grimsby at 2045 hours on 25 February.

RESULTS

1. Cod stocks were sampled at two positions off Iceland and at five positions dispersed along the Canadian coast. Erythrocyte samples were kept fresh for haemoglobin analyses on board. Sera and muscle samples were preserved at low temperatures for future analyses at Lowestoft and at Plymouth.

2. The 658 cod blood specimens were successfully tested for haemoglobin types, the electrophoretic tests being carried out on board on a

refrigerated gimbal table designed for this purpose. It was necessary to anchor in sheltered positions at Iceland and at Canada to pour the fresh gel media used in this technique.

The advantage in testing fish blood samples at sea was the immediate relevance and clarity of the results using fresh material. This genotypic information was obtained at the expense of cruise time otherwise available for sampling stocks. More samples could be gained if ready-made gel media could be devised for use on board. Alternatively, if the techniques for preserving fish haemoglobin were improved, all the possible information about haemoglobin as with the other genetic system could be obtained without interrupting the testing routines at Lowestoft.

The haemoglobin results are shown in the appended table.

3. All of the six halibut caught were placed alive in a deck tank. All showed some sign of bruising due to the trawl. The tank contained sand and a constant flow of clean salt water. No halibut survived the homeward crossing. Frozen halibut semen storage was attempted on board.

MISCELLANEOUS

A dozen small hake were frozen for Mr Brian Jones.
Algae were cultured for Dr Reynolds.
More unusual teleost species were preserved for Dr Greer Walker.
Population statistics were collected mainly on cod, haddock, coley and spurdogs.
Cod muscle samples were frozen for Dr Dando of the MBA Laboratory, Plymouth.

A Jamieson
(Naturalist in Charge)

2 March 1971

SEEN IN DRAFT: E A Binnington (Master)

G W Argumont (Fishing Skipper)

INITIALLED: HAC

DISTRIBUTION

Basic list

+ Staff on cruise
Dr L M Dickie, FRBC Dartmouth, NS
Dr P Odense, FRBC Halifax, NS
Dr P Dando, MBA Plymouth

Date	Position	Bank	Cod haemoglobin genotypes				Allele frequency
			HbI^1/HbI^1	HbI^1/HbI^2	HbI^2/HbI^2	Rare	HbI^1
2.2.71	62°25'N 12°31'W	Whaleback	1	7	99	1	0.04
4.2.71	63°20'N 21°40'W	Selvogsbanki	0	2	74	0	0.01
9.2.71	50°36'N 51°26'W	Rittibanki	2	9	96	1	0.06
10.2.71	48°52'N 50°41'W	Grand Nord	0	4	101	3	0.02
11.2.71	45°05'N 54°30'W	Green Bank	1	15	91	1	0.08
12.2.71	44°37'N 57°30'W	Banquereau	0	17	90	2	0.08
13.2.71	42°10'N 66°18'W	Georges Bank	0	6	36	0	0.07

Table 1. The haemoglobin types in 658 cod in two samples of cod at Iceland and five samples along the Atlantic coast of North America were tested on board CIROLANA. The proportions of types showed very good agreement with published data covering much the same regions.