

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

1970 RESEARCH VESSEL PROGRAMME

REPORT: RV CIROLANA: CRUISE 2

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

STAFF

H A Cole
A Jamieson
C T Macer
P D Wallace
V J Bye
A E Howard
Mrs B M Thompson
Miss C A Pleasants
Miss G A Pull

DURATION

Left Grimsby 2000 hours 20 August
Arrived Grimsby 0600 hours 2 September

LOCALITY

West coast of Britain and Ireland

AIMS

1. To survey abundance and distribution of horse mackerel and other species suitable for industrial fishing.
2. To collect hake and other species for racial studies.
3. To extend previous deep trawling surveys.
4. To examine feasibility of undertaking electro-physiological work at sea.

NARRATIVE

Sailing was delayed for 12 hours by the late arrival of a spare anchor. One trawl haul was made in the Moray Firth with the Dutch herring trawl on 21 August but the main trawling survey was started off Cape Wrath on 22 August. During this and the following five days trawl stations were worked with either the Dutch herring trawl or the Granton trawl in the North and South Minches, off Dubh Artach, on the Klondyke and Stanton Bank Grounds, off Donegal Bay and Tory Island, South west of Barra Head and around St Kilda at depths ranging between 40 and 120 fathoms. Plankton hauls were made at intervals as required.

On 28 August deep trawling was begun north of the Faeroe Shetland ridge and hauls were obtained at 250, 300 and 350 fathoms. Some trouble was experienced with the winch drums fouling the main carriage of the winch. Deep trawling at 400 fathoms was resumed on 29 August but after the first haul it was apparent that there was a risk of serious damage to the winch and it was decided to terminate the cruise and return to Grimsby. A call was made at Stornoway on 30 August to collect mail, etc., the ship leaving on 31 August and docking at Grimsby at 0600 hours, 2 September.

RESULTS

Aim 1. Industrial species were not abundant in the catches taken from the grounds examined. The best catches of horse mackerel were in the North Minch (3 baskets/hour), Dubh Artach ($7\frac{3}{4}$ baskets/hour) and Brierley Bank (5 baskets/hour); none were caught on the deep stations north of the Wyville Thompson Ridge. In addition to routine measurements from all hauls, a total of 268 horse mackerel were fully sampled; most of them had just completed spawning.

The maximum catch of Gadus esmarkii was 2 baskets/hour in the North Minch but they were very scarce elsewhere. In addition to measurements, a total of 69 fish were fully sampled; Gadus poutassou were widespread though nowhere abundant. They were found from the Klondyke area to the deep water of the Wyville Thompson Ridge; the maximum catch of 1 basket/hour was taken on the latter ground. A total of 287 G. poutassou were otolithed and sexed.

Gadus minutus was fairly widespread but occurred only in very small quantities. Gadiculus argenteus was taken sparingly on the Brierley Bank and Wyville Thompson Ridge; 56 fish were otolithed and sexed. Argentina silus was taken only on the Wyville Thompson Ridge, to a maximum of $1\frac{3}{4}$ baskets/hour; a biological sample of 146 fish was analysed.

Mackerel were caught everywhere except on the Wyville Thompson Ridge and were most abundant in the North Minch, where up to 12 baskets/hour were caught. Herring were most abundant in the North Minch (maximum $2\frac{3}{4}$ baskets/hour) and at Dubh Artach ($4\frac{3}{4}$ baskets/hour). A total of 420 herring and 269 mackerel were sampled biologically. A fleet of about 15 purse seiners was seen working (presumably on herring) about 20 miles NW of Sule Skerry.

Aim 2. Tissue samples were taken from seven species, as follows.

Merluccius merluccius

219 hake were caught near the Outer Hebrides. Their lengths ranged from 8 cm to 99 cm. The 67 hake bled

for electrophoretic separation of blood proteins all exceeded 30 cm in length. Shorter hake did not yield enough blood. The hake blood protein variants will be compared with recent results for similar material from the Firth of Clyde and off Plymouth. Otoliths were taken.

Gadus morhua

All of the shelf areas sampled yielded about two cod per hour of trawling. Cod lengths ranged between 38 cm and 97 cm. All of the 59 cod caught were bled. Gut, liver and kidney tissue samples were dissected from 50 cod for despatch to Houston Texas where Dr C R Shaw's biochemical methods should help to extend our present capacity to tag the enzyme products of the cod genes used as stock labels.

Lepidorhombus whiffiagonis

20 whole megrims and skeletal muscle samples from 50 additional megrims were collected in the North Minch and stored frozen for taxonomic and biochemical analyses by Dr P Dando, Marine Biological Association, Plymouth.

Pollachius pollachius

The total catch of pollack was 10 fish ranging from 55 cm to 72 cm in length. All were bled at the request of Mr N Wilkins who analyses pollack haemoglobin at University College, Galway.

Helicolenus dactylopterus

Sebastes viviparus

Sebastes marinus

10 samples of skeletal muscle from individual fish were taken from each of the three Scorpaenid species at the request of Dr F Utter of Seattle.

- Aim 3. As noted above only the first series of deep trawl hauls was completed at depths of 250, 300, 350 and 400 fathoms on grounds north of the Wyville Thompson Ridge. Black halibut and the macrourid Coryphenoides rupestris were not found until 350 fathoms had been reached. There were other marked differences between the fish catches taken at the various depths.
- Aim 4. As the trip was considerably shortened there was not sufficient time to perform meaningful electrophysiological experiments. However, the apparatus was set up and tested, demonstrating that electrophysiology is feasible on the CIROLANA. Despite electrical interference, recording electrodes shielded in an earthed, wire-mesh cage can be suppressed to reasonable levels. The electrically

shielded room is suitable for high gain electrophysiology on isolated tissue but is not suitable for whole animal studies because of the absence of piped sea water and refrigeration.

OTHER AIMS

Material collected for histology and histochemistry

Heads from a size range of Cod (49), Hake (121), Mackerel (20), Horse Mackerel (25), and Greater Silver Smelt (25), were collected and fixed in a variety of ways for subsequent histological examination. The cod material forms part of a series surveying seasonal and maturation cycles in structure and secretory activity of the pineal gland and its associated nuclei in the brain.

The material from the other species will ultimately be used in a comparative study of fish pineal glands.

Eight pineal glands were dissected from cod, double-fixed and embedded in epoxy resin for electron microscopic examination.

Dissected brains and samples of pectoral fin were collected from a range of sizes of the black mouthed dog fish (Galeus melastomus) for Professor Dodd of the University College of North Wales, Bangor.

H A Cole

23 September 1970

SEEN IN DRAFT

E A Binnington (Master)
G W Argumont (Fishing Skipper)

DISTRIBUTION

Basic List

H A Cole

A Jamieson

C T Macer

P D Wallace

V J Bye

A E Howard

Mrs B M Thompson

Miss C A Pleasants

Miss G A Pull

Dr P Dando, Plymouth

Professor J M Dodd, Bangor

Dr F M Utter, Seattle

Professor C R Shaw MD,
Houston

Mr N P Wilkins, Galway