

R1/6

2CR83

In confidence Not to be quoted without prior reference to the Laboratory

FRV "Clupea"

Cruise 2/83

Report

17 February - 4 March

Objectives

1. To observe the behaviour of fish in a trawl when light and bioluminescence are absent.
2. To test a new motor system and a new multiplexed instrument system for the remote TV vehicle.
3. Radio-caesium monitoring: a sample of 25 litres will be collected at Buckie position 57° 49' N 2° 58' W for the Lowestoft Fisheries Laboratory.

Results

Only one day 27 February was lost during the cruise due to weather. Various essential pieces of scientific apparatus failed during the cruise, affecting programme of observation of fish behaviour in trawls when light and bioluminescence are absent. Fourteen tows were made of which five were in dark conditions. Two of the night hauls suffered apparatus failures. Of the three successfully observed night tows, two showed useful fish reactions, allowing experiments to be performed. These two night hauls were successfully observed with the television camera. By positioning the camera at the left hand end of the bobbin rig, inside the mouth of the net, fish reactions were observed under red illumination. When plenty of fish were being encountered the light was turned off for five seconds and then on again and the reactions of the fish when the light came on were recorded on videotape. The first impressions are that fish are reacting very close to the bobbins either by the touch of the gear on the fish or by contact of the fish with the turbulent water close to the moving objects. On a number of occasions as the light came on fish were seen moving rapidly forward away from the bobbins. The majority of fish were drifting close to the bobbin rig showing no reaction. A number of fish appeared inert after collision with the bobbin rig. These recordings need careful analysis.

During one daylight haul East of the Skerries large numbers of small sandeels were encountered close to the sea bed. These fish were either streaming out of the sea bed or were lying close down on the sand the flash camera was triggered through a cable on this tow and the flash photographs may show the details of behaviour here.

A number of tests were made to develop the running of the observation vehicle. One AC rotor motor was replaced with a similar sized DC design and tested on 26 February. The problem of interference on the TV picture was still present. On 7 March a prototype multiplexed instrument package was tested and found to work well not suffering any interference from the motors and displaying continuous readout of depth speed and camera tilt. A new compact controller for the rotor motor was mounted in an underwater housing in the vehicle and this system showed no TV interference and gave control and power equivalent to the surface controllers. Bioluminescence levels were measured at a number of stations in the Moray Firth.

Muscle contraction times along the length of the body of eight species of fish were measured, 60 fish being sampled, in relation to swimming speed studies.

A radio-caesium sample and salinity sample were taken off Buckie at 57° 49' N 2° 58' W.

C S Wardle

15 March 1983

Seen in Craft A Mair