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MINISTRY OF AGRICULTURE, FISHERIES AND FOOD
FISHERIES LABORATORY, CONWY, GWYNEDD, U.K.

1987 RESEARCH VESSEL PROGRAMME

REPORT : R.V. PRINCE MADOG

STAFF: B. R. Howell (SIC)
A. R. Child
D. Thompson (from 21 May)
B. Dunne (UCNW)
A. Cooke (")

DURATION: Left Menai Bridge 1000h 18 May 1987
Arrived Menai Bridge 0900h 22 May 1987

LOCALITY: Irish Sea

AIMS:

1. To collect live mature sole to supplement broodstocks held at the Conwy laboratory.
2. To attempt artificial fertilisations of sole eggs.
3. To attempt the production of gynogenomes as a means of investigating the sex determining mechanism of sole.
4. To collect samples of fish for AEP2 (Franklin).

NARRATIVE: PRINCE MADOG arrived at a position about 8m north of Llandudno at 1230h on 18 May. An exploratory tow with a 12 fm otter trawl rigged with a chain tickler established the presence of adequate numbers of mature sole. Subsequent fishing was therefore confined to this area. Approximately 1 h tows were made during the late afternoon and evening of each day when catches of sole and the incidence of females containing ovulated eggs would be expected to be high. This view was supported on the first night by the capture of a female containing a large quantity of ovulated eggs which were successfully fertilised.

Live fish were landed during the mornings of 19 and 20 May at Llandudno and 21 May at Menai Bridge. These were transported to the Conwy laboratory and either set aside as broodstock or used to test procedures for activating and irradiating sperm (Drs Baynes and Thompson). Dr Thompson joined the ship on 21 May bringing with him samples of normal and irradiated sperm from these trials. These were used at sea during the final evening in attempts to produce normal and gynogenetic artificially fertilised eggs. These eggs were transported to the laboratory for further observation after docking on 22 May.

RESULTS:

1. Over 90 live sole were transported to the laboratory, of which 60 were set aside as potential broodstock. Subsequent mortalities have been low (<20%).
2. The cruise took place late in the spawning season and many females appeared spent. Nevertheless of 30 females examined 10 contained ovulated eggs and in 6 of these there were sufficient to attempt

artificial fertilisations. Activated sperm was readily obtained from dissected testes. Two of these attempts produced viable developing eggs which subsequently hatched in the laboratory.

3. In laboratory tests it proved possible to dilute sperm from excised testes without activation by using a diluent used routinely with rainbow trout sperm. U/V irradiation of diluted sole milt established that maximum dose that did not prevent activation of the sperm up to 24h later. Gynogenesis was attempted on the evening of 21 May using sperm irradiated in the laboratory early that morning. (Halibut sperm obtained from the SFIA stocks at Ardtoe the previous week had lost its capability for activation despite storage at 0°C under oxygen.) Sperm from 2 males were tested separately using eggs from a single female. Twenty minutes after fertilisation the eggs were abruptly transferred to sea water at 0°C and held at that temperature for 3h. Though after a further 7h there was some evidence of development, all eggs aborted before hatching. Control groups fertilised with untreated sperm from the same males developed normally and few larvae hatched from groups fertilised with irradiated sperm but not coldshocked (haploids, spontaneous gynogenomes or normal diploids). To establish a basis for assessing the level of gynogenesis muscle samples from several males and females were taken for subsequent electrophoretic analysis (Dr Thompson).
4. Fishing was restricted to an area outside that of interest to AEP2. No fish samples were therefore retained.

In addition to fulfilling the stated aims, the two students from UCNW were able to acquire ample supplies of dogfish and monkfish for their studies. Their assistance with the main objective of the cruise was much appreciated.

B. R. HOWELL
9 June 1987

INITIALLED : D J G

DISTRIBUTION :

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