CRUISE: COR 1_01

STAFF:

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DURATION: 1 – 19 February 2001 (All times are GMT)

LOCATION: Southern Biscay and west of Portugal

AIMS:

1. To conduct a plankton survey using a 53cm Gulf VII plankton sampler to determine the distribution and abundance of mackerel (*Scomber scombrus*) and horse mackerel (*Trachurus trachurus*) eggs in the southern and western spawning areas.

2. To sample adult mackerel and horse mackerel for the estimation of fecundity and atresia using pelagic and semi-pelagic trawls.

These aims are in support of the ICES co-ordinated international mackerel and horse mackerel egg survey. This cruise was fully funded by the EU (C1260) in support of the tri-ennial assessment of these stocks.

NARRATIVE:

RV CORYSTES sailed from Lowestoft at 14:00h on 1 February, in thick fog. Visibility had improved by the following morning and good progress was made in the channel *en route* to southern Biscay. The Portuguese High-Headline Trawl (PHHT) was deployed at 17:00h on 2 February in the western channel (49º 47.5'N, 03º 07.2'W) to check that winches and trawl were functioning correctly. Unfortunately the automatic trawl warp sensor system and the creep pump on the starboard winch were both malfunctioning. Neither of these problems could be repaired at sea and an alternative, manual system of deploying the trawl was devised. While RV CORYSTES continued steaming south, both trawl warps were pulled off the winches and the warps marked every 50m. This enabled the trawl to be shot manually with equal amounts of warp on each side. For all following PHHT hauls the deck crew had to control the winches from the deck, as operation from the bridge was limited.

Plankton sampling began at 04:40h on 4 February on the edge of the continental shelf in southern Biscay (Figure 1). Several data logging problems were encountered which were gradually overcome during the next few days. The wind increased to gale force (SW) during the night and very slow and uncomfortable progress was made on the plankton sampling grid until the winds began to ease the following day. Plankton sampling continued down the French coast and into Spanish waters and by 6 February the trawl warps had been marked and

the trawl reconnected. Despite increasing winds, which reached 50 knots at times, a PHHT station was completed north-east of Santander in the early evening (Figure 2).

During the next three days plankton sampling progress was slowed by a large westerly swell, as RV CORYSTES worked westwards along the north Spanish coast on short, north-south transects. A PHHT station was completed each day but catches were very light and few mackerel or horse mackerel were sampled. By 10 February the swell had decreased and steady progress was made sampling south down the west coast of Spain. Two trawl hauls were made in this area but again catches were extremely light. Plankton sampling continued into Portuguese waters where the most southerly station was worked at latitude 39º 15'N the following day. A trawl haul was completed nearby and a few mackerel and horse mackerel ovary samples were collected. RV CORYSTES then headed north, working plankton stations off the shelf along longitude 9º 45'W back towards Cape Finistere.

On 12 February, a serious leak of hydraulic fluid from the main drive seal of the plankton winch became apparent. The winch had to be kept cool with fresh water as the sampler was recovered on station 54 (Figure 1). No repairs could be carried out at sea and further plankton sampling was restricted to a towing speed of 4 knots and 150m depth to try to reduce the strain on the winch.

The following day, a strong NE wind and moderate easterly swell slowed progress as plankton sampling continued from west to east, off the shelf in the Cantabrian Sea. A PHHT haul was completed in the early morning but the catch was again light, consisting mainly of small blue whiting.

During a PHHT station (Stn 63) on 14 February, the trawl came fast after only 20 minutes and the starboard warp parted. Fortunately, the gear was eventually recovered on the port warp (even the starboard door) and amazingly, a good catch of mackerel and horse mackerel was landed on the deck. The crew spent all day repairing the trawl to enable it to be ready for use the following morning. The fishing skippers and crew showed great skill and professionalism to enable the whole trawl to be recovered and eventually repaired. The final two plankton stations in the Cantabrian Sea were completed by 21:00 the same day.

Two 30 minute PHHT stations were completed off Santander and Bilbao on 15 February. The first catch of about 1.25 tonnes was landed into a modified fish hopper. This proved to be an extremely efficient way of handling the catch, but a slight redesign and repositioning of the hopper will be required before it can be used routinely. Good numbers of mackerel and horse mackerel ovaries were taken from both these stations.

RV CORYSTES steamed north-east overnight into the ‘Western’ area. Fish sampling continued the next day in French waters where the final two PHHT hauls were made. A good catch of mackerel and horse mackerel was made on the first station and full samples of ovaries were collected. A very light catch of mainly juvenile horse mackerel was taken on the second haul. RV CORYSTES then steamed north-east and began the final four plankton stations just before midnight on 16 February. These stations were completed by 11:00h the next day before course was set for Lowestoft, docking at 18:00h, 19 February.

RESULTS:

AIM 1: Plankton sampling

A Gulf III type plankton sampler, fitted with a 20cm aperture nosecone and 270μm mesh net was used during this survey. A Guildline CTD attached to the sampler provided 'real time' flowmeter data as well as salinity and temperature profiles for each station. The sampler was towed at 5 knots on a double oblique dive profile to 200m depth as recommended by the ICES WG sampling protocol. After Station 54 sampling was limited to a towing speed of 4 knots and 150m depth because of winch problems (see above).

Sixty plankton stations were completed, 46 of which were in the 'Southern' area (Figure 1). Catches of plankton were light, particularly over deep water off the continental shelf. On only one station (Stn 24, Figure 1) were large numbers of fish eggs evident and a preliminary examination indicated that most of these were not mackerel or horse mackerel.

A Chelsea Instruments CTD was installed to continuously log sea surface temperature and salinity throughout the cruise. Unfortunately, a fault with either the CTD or the software was not resolved at sea and no data were collected. Discrete surface seawater samples were taken at alternate plankton stations to provide a salinity calibration for the Guildline CTD.

AIM 2: Sampling for fecundity and atresia.

The Portuguese high-headline trawl (PHHT) was fitted with Scanmar door/distance, headline height, and depth sensors. These sensors proved to be extremely useful when the automatic trawl sensor system failed as they provided information on the alignment of the trawl doors.

The trawl was towed for between 30 minutes and 1 hour depending on the quantity of fish expected and the bottom topography. The PHHT was deployed at 13 stations (Figure 2), eleven of which were in the southern area. Gear damage was minimal, (except on station 63 when the starboard warp parted, see above), despite fishing in unknown waters.

Catches were generally light except for three stations off the north Spanish coast (Stations 63, 66 and 68) and one off the French coast (Station 69) in south-east Biscay. The numbers of mackerel and horse mackerel ovaries collected for histological analysis of fecundity and atresia, are given in Table 1. Otoliths were taken from each fish where ovaries were sampled.

Additional aim: To take ovary samples from mature hake.

All hake caught were weighed (by station) and measured. All hake greater than 35cm in length were examined for presence of mature ovaries. One ovary sample was taken from a 62cm fish on station 68. Otoliths were removed from 23 hake (all fish greater than 30cm in length and from all 21 hake caught on stations 69 and 70).

Miscellaneous samples taken

1. Scales were taken from one Bass caught on station 69.
2. Eggs were removed from the ovaries of eight species of fish to help with the identification of eggs caught in the plankton samples.

S. Milligan (SIC)
18 February 2001

SEEN IN DRAFT
Master: Capt. R. McCurry

Senior Fishing Mate: Mr A. Lincoln

INITIALLED BY: Dr R. Millner

Table 1. Numbers of mackerel and horse mackerel ovaries collected for fecundity and atresia by PHHT station

Mackerel. Fecundity samples. (stage 3 only)						
Station No.	**=< 250g**	**251 - 400 g**	**401 - 550g**	**> 550g**	**Atresia**	**Total**
18	2	1	0	0	0	3
23	0	0	0	0	0	0
27	1	1	0	0	0	2
35	0	1	0	0	0	1
39	0	0	0	0	0	0
42	0	0	0	0	0	0
48	3	3	0	0	0	6
59	6	13	1	0	0	20
63	15	10	0	0	0	25
66	3	0	0	0	16	19
68	0	1	1	0	1	3
69	15	2	0	0	14	31
70	0	0	0	0	0	0
						110

Horse Mackerel. Fecundity samples. (stage 3 only)						
Station No.	**=< 150g**	**151 - 250 g**	**251 - 350g**	**> 350g**	**Atresia**	**Total**
18	5	2	0	0	0	7
23	0	0	0	0	0	0
27	0	0	0	0	0	0
35	0	0	0	0	0	0
39	0	0	0	0	0	0
42	0	0	0	0	0	0
48	10	2	0	0	0	12
59	0	2	0	0	0	2
63	2	14	0	0	0	16
66	18	5	0	0	17	40
68	4	2	0	0	19	25
69	12	0	0	0	8	20
70	0	0	0	0	0	0
						122

Fig 1: Corystes 1/2001 Plankton Stations

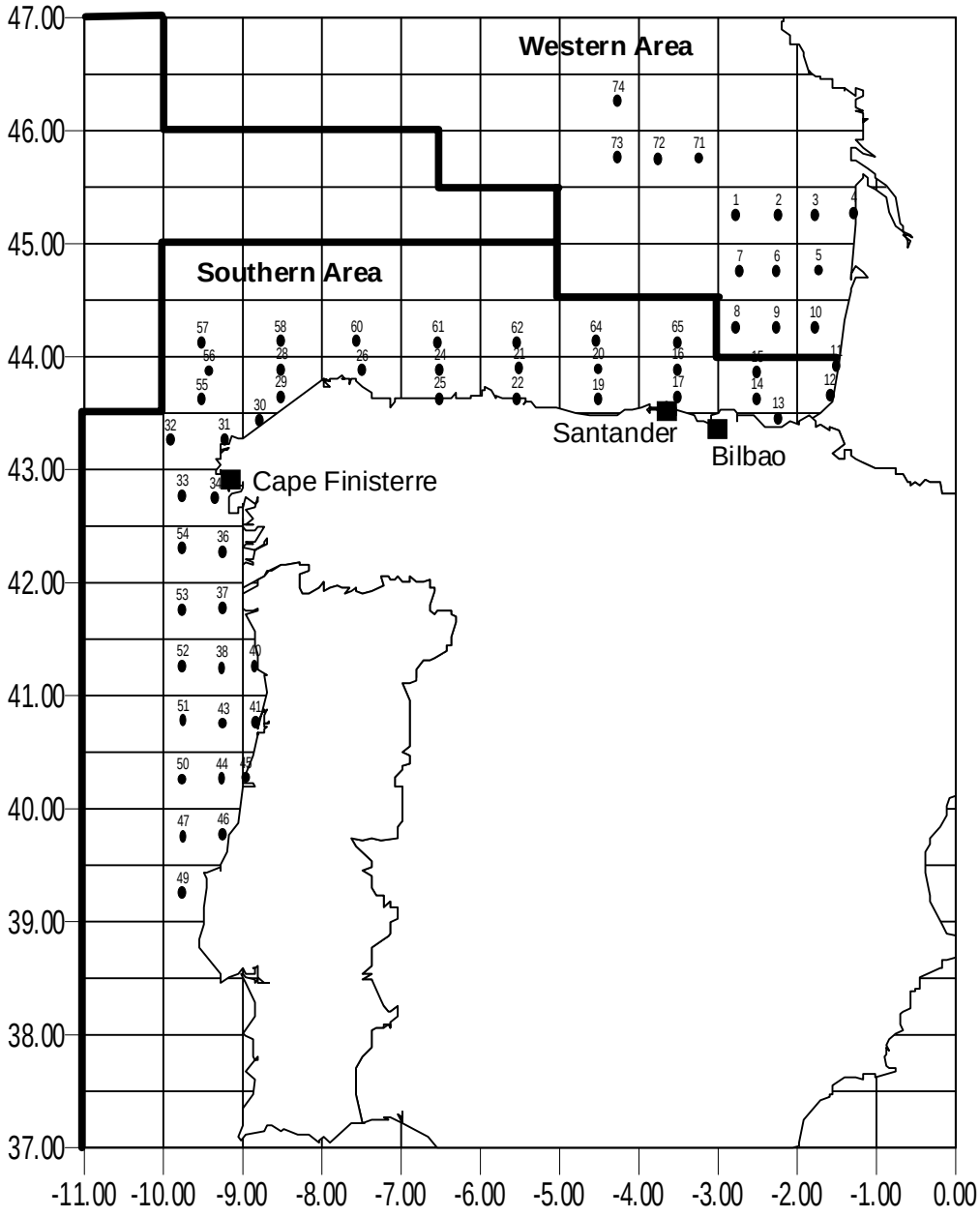

Fig 2: Corystes 1/2001 Trawl Stations