

SCOTTISH MARINE BIOLOGICAL ASSOCIATION

Dunstaffnage Marine Research Laboratory

CRUISE REPORT

RRS CHALLENGER

CRUISE 7/81

28 April - 12 May

1981

RRS CHALLENGER CRUISE 7/81

Duration of cruise: 28 April 1981 (Ardrossan) to 12 May 1981 (Barry).

Localities: One trawl at the SMBA permanent station ($55^{\circ}\text{N}12^{\circ}\text{W}$) and thereafter trawling on the Porcupine Sea Bight and the Goban Spur ($49^{\circ}20'\text{N}$ to $52^{\circ}30'\text{N}$; 11.00°W to $15^{\circ}00'\text{W}$).

Scientific Staff:

J.D.M. Gordon, SMBA	Principal Scientist
J.A.R. Duncan (Mrs.), SMBA	
S.E. McLean (Miss), SMBA	
N.R. Merrett, IOS (Wormley)	
R.A. Russell (Mrs.), IOS (Wormley)	
M. Stehmann, Institute fur Seefisherei, Hamburg	
M. Parker, University Marine Biological Station, Millport	
J. Dunne, University of Galway, Eire.	Irish Observer

Ship's Officers:

Captain	G. Selby-Smith
Chief Officer	G. Long
2nd Officer	J.J. Price
3rd Officer	A. Louch
Fishing Skipper	F. Dunning
Chief Engineer	C. Storer
2nd Engineer	R. Anderson
3rd Engineer	H. Peck
4th Engineer	B. Entwistle

Aims of the cruise: (1) To continue the seasonal survey of the deep-sea demersal fish populations of the upper slopes (500 - 1250 m) of the Porcupine Sea Bight using the SMBA Granton trawl.

- (2) To continue the seasonal survey of the deep-sea demersal fish using the Porcupine Sea Bight (500 - 4800 m) using the IOS semi-balloon otter trawl (OTSB 14).
- (3) To trawl for demersal fish at the SMBA permanent station (2900 m) on the Rockall Trough and collect the invertebrates for Dr. Gage, SMBA.
- (4) To collect fish samples for Dr. Pentreath (MAFF Radiobiological Laboratories, Lowestoft)
- (5) To collect ripe ovaries from a wide range of species for studies of egg quality by Dr. Craik, SMBA.
- (6) To collect specimens for the Zoological Museum, University of Hamburg; Royal Scottish Museum, Edinburgh and the University Marine Biological Station, Millport.

Narrative (All times G.M.T.)

The scientific equipment was loaded on board RRS Challenger during the morning of 27th April and the scientific party assembled throughout the day. Challenger sailed from Ardrossan at 13.00 hrs on 28th April and set course for the SMBA permanent station in the Rockall Trough. Challenger was on station 51001 at 00.12 (30/4) and after a short delay due to boiler trouble the OTSB trawl was shot and fished until 07.30 hrs. Challenger then steamed to begin a transect of stations on the northern slopes of the Porcupine Sea Bight using both the OTSB14 and the Granton trawl. Stations 51002 and 51003 were worked with the OTSB14 at soundings

of 500 and 750 m from 00.20 to 02.10 (1/5) and 04.28 to 06.38 respectively. The OTSB net was then dismantled and the Granton trawl was rigged whilst Challenger steamed back to the 500 m sounding. Shooting was delayed for a short while by turns in the net and this station (51004) was worked between 09.50 and 13.15 hrs. Station 51005 was fished at a sounding of 750 m between 15.30 and 19.17 and the final Granton trawl of this transect (Station 51006) was worked over a sounding of 1000 m between 20.39 and 01.29 (2/5). The Granton trawl was then dismantled until later in the cruise and a series of OTSB trawls were begun at progressively increasing depths. Stations 51007 to 51010 were fished at soundings of 1000, 1250, 1500 and 1750 m between 03.30 (2/5) and 00.34 (3/5) with little difficulty. Challenger then steamed to station 51011 over a sounding of 2100 m and the OTSB net was shot at 05.35 (3/5) in gradually deteriorating weather conditions. By the time the net was recovered onboard at 11.40 the wind was blowing at a steady 35 knots from the west and a considerable swell had built up. Challenger remained hove to for the rest of the day and by 08.00 (4/5) vessel was 10 miles south of the proposed 2300 m station. Although the swell had moderated the imminent arrival of another depression deemed it inadvisable to shoot the trawl and it was decided to proceed southwards to a station at 3900 m in the hope that the depression would track northwards. Station 51012 was eventually reached at 20.12 (4/5) and although the wind speed was still 30 knots from the north west it was decided to shoot the trawl. The trawl was successfully recovered at 07.00 (5/5) and Challenger steamed to occupy station 51013 over a sounding of 4100 m. The station was reached at 13.00 hrs but shooting was delayed until 14.40 because

because of the heavy swell and persisting 30 knot winds. Station 51013 was completed by 00.26 (6/5) and Challenger steamed to begin a transect of stations on the Goban Spur. The western tip of the spur is poorly charted and some time was spent in attempting to find a suitable station of approximately 2000 m and after a sounding run over the ground the OTSB¹⁴ was shot over a reciprocal course at 04.20 and station 51014 was complete by 09.14. It was then decided to trawl at stations of 2500 and 2300 m to the north of the Goban Spur, the latter to replace the station abandoned earlier in the cruise. The two stations (51015 and 51016) were successfully fished between 12.12 to 17.48 and 20.49 to 03.15 hrs (7/5). Course was then set for the upper slope of the Goban Spur to begin a transect of stations with the Granton and OTSB trawls. Challenger was on station 51017 over a sounding of 1250 m at 08.00 but with a wind speed of 30 knots it was decided not to shoot the Granton trawl, however by 09.00 Challenger had entered the eye of the depression and it was decided to work the Granton trawl while these calmer conditions prevailed. The net was shot at 09.34 and despite some problems due to lack of steam the net was successfully recovered at 13.58 hrs. A further Granton trawl (Station 51018) was fished over a sounding of 1000 m between 15.15 and 19.29 hrs. During the latter part of this haul the weather deteriorated rapidly and Challenger hove to until day break, by which time Challenger was once again in the eye of the depression with 10 knot winds and a confused swell. The Granton trawl was shot over a sounding of 750 m (Station 51019) between 05.07 and 08.39 hrs (8/5). This was followed by a further Granton trawl (51020) over a sounding of 500 m between 09.49 and 13.06.

Challenger then steamed east to occupy a proposed 200 m station but on leaving the eye of the depression the wind speed increased to 35 knots and it was decided to abandon this station and return westwards to complete the transect with the OTSB net. On passage the Granton trawl was dismantled and the OTSB prepared for shooting. Stations 51021 to 51023 over soundings of 1750, 1500 and 1250 m were fished successfully between 02.16 to 06.40 (9/5), 08.57 to 13.24 and 14.52 to 19.00 hrs respectively. By 22.20 hrs Challenger was over a sounding of 1000 m to fish the OTSB 14, but the weather had deteriorated considerably. The net was shot at this station 51024 but probably because the heavy swell and head wind required a higher towing speed the net failed to fish on the bottom resulting in a small midwater catch. The net was recovered at 02.00 (10/5) and Challenger steamed to station 51025 over a sounding of 500 m in the hope of once more finding the eye of the depression. Challenger was on station at 06.00 and remained there until 10.38 when it was considered that the weather had moderated sufficiently to shoot the trawl. The net was recovered inboard at 13.04 and Challenger steamed west to work stations 51026 and 51027 over soundings of 750 and 1000 m with the OTSB net. These stations were fished between 14.40 to 17.15 and 18.40 to 22.00 hrs respectively. There remained 4½ hours scientific working time left before steaming for Barry and with little possibility of working a 200 m station to the east it was decided to cease scientific work. Throughout the cruise we had been in daily contact with the German Fishery Research Ship Anton Dohrn and it was decided, if possible, to rendezvous with her on the passage home and transfer the fish samples, including deep frozen specimens collected

by Dr. Stehmann. This was successfully accomplished between 00.45 and 02.03 (12/5) and Challenger then made good progress to Barry docking at 16.00 hrs on 12th May. The scientific equipment and samples were unloaded during the morning of 13th May.

Results

(1) Granton trawl

The species composition of the Granton trawl catches was broadly similar to that obtained on previous cruises to the Porcupine Sea Bight. Table 1 shows the total weight of the catches at each station with the corresponding weights obtained for August 1980 in parenthesis. The differences were to a large extent due to the greater abundance of the smooth head Alepocephalus bairdii in the catches. Many of these were in spawning condition which seems to confirm previous observations on the Rockall Trough that this species aggregates on the slope for spawning. The Chondrichthian species were examined by Dr. M. Stehmann and the most notable specimens were a Raja (Dipterus) spp. which is probably a hitherto undescribed species and a possible new record of the squaloid shark Lepidorhinus spp. for the Porcupine Sea Bight. Miss McLean collected deep frozen samples of species with ripe ovaries for a biochemical study of egg quality being carried out by Dr. Craik at the SMBA. Specimens were also collected for the Royal Scottish Museum, the University Marine Biological Station, Millport and the University of Galway.

(2) OTSB 14

Nineteen successful tows of the OTSB14 were completed during the cruise, 1 in the Rockall Trough and 18 in the Porcupine Sea Bight. An acoustic monitor, mounted horizontally behind one of the trawl doors, telemetering depth, temperature and angle of tilt was used on 11 hauls.

Collections in the Sea Bight were made between 490 - 4242 m mid-depth soundings, yielding 775 kg and more than 5000 specimens of bottom-living fishes. Catch rates of $<0.1 - 2.8$ kg/1000 m² were recorded over this sounding range, with the highest occurring at mid to lower slope levels. Around 80 species were identified, of which 6 are additions to the total represented in the current series of surveys. Overall, the catches provide more valuable data on the seasonal aspects of the bathymetric distribution and ecology of the bottom-living deep-sea fishes of the area. The dominant families sampled were the Synphobranchidae, Notacanthidae, Alepocephalidae, Moridae and Macrouridae. Again, the most abundant species was found to be Synphobranchus kaupi as it comprised over 50% of the total collection. Among the unusual species Bathyraja pallida, an undescribed species of Ilyophis and preliminarily unidentified specimens of an aphyonid and a paraléparid are most notable.

Once again samples of blood from Chinaera monstrosa were collected for Salford University and whole fish samples for radiological analysis were taken for the MAFF Directorate of Fisheries Research, Radiological Laboratory, Lowestoft.

Acknowledgements

In view of the adverse weather conditions, particularly towards the end of the cruise, we can consider ourselves extremely fortunate

to have completed all the essential stations on this cruise. This success is to a large extent due to the willing co-operation of Captain Selby-Smith and the ship's company. Special thanks are due to the fishing skipper, Mr. Frank Dunning, for his expert assistance. We are also grateful for the help given by Mr. M. Parker, skipper of the University Marine Biological Station's vessel 'Leander' during this cruise. The ship's engineers had continual problems with fuel oil during the cruise and it is to their credit that this caused only minimal disturbance to the scientific programme. Finally it is a pleasure to acknowledge the help of R.V.S. in the planning of the cruise.

John D.M. GORDON

24/5/81.

Table 1

Total weight of fish (kg) obtained from the Granton Trawls.
 Results from Challenger Cruise 11/80 (August) are given in
 parenthesis.

Depth (m)	Northern slope	Goban Spur
500	4.9 (36.0)	10.0 (17.7)
750	136.7 (125.0)	138.2 (76.0)
1000	316.2 (189.0)	158.5 (181.0)
1250	- (-)	444.0 (292.0)

Table 2

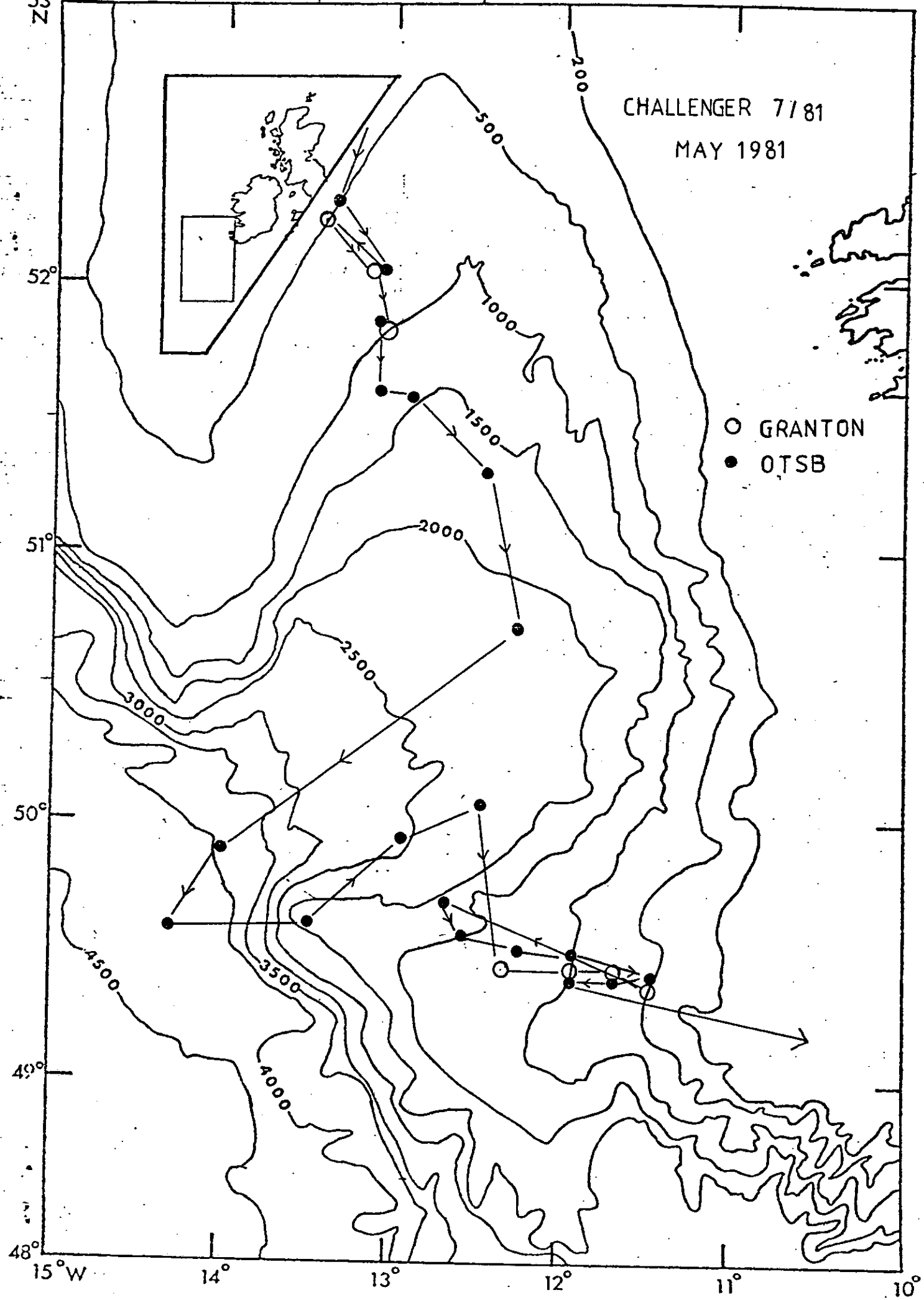
CHALLENGER CRUISE 7/81 STATION LIST

Station No.	SMBA reference No.	Gear	Date	Duration on bottom (mins.)	Position (starting)	Sounding (m)	Temperature (°C)	Distance run (N. miles)
51001		OTSB14	30/4/81	103	54°44.7'N 12°23.5'W	2885-2895	-	-
51002		OTSB14	1/5/81	33	52°19.9'N 13°18.5'W	490-490	9.9	2.0
51003		OTSB14	1/5/81	32	52°00.8'N 13°01.8'W	780-790	9.3	1.8
51004	63	Granton trawl	1/5/81	89	52°10.4'N 13°25.7'W	510-520	-	-
51005	64	Granton trawl	1/5/81	90	52°03.2'N 13°00.1'W	770-785	-	5.2
51006	65	Granton trawl	1/5/81	90	51°45.0'N 13°04.5'W	1030-1060	-	6.6
51007		OTSB14	2/5/81	65	51°45.6'N 13°05.9'W	1025-1020	7.2-7.8	2.8
51008		OTSB14	2/5/81	65	51°35.8'N 13°01.6'W	1290-1335	5.6-6.1	2.6
51009		OTSB14	2/5/81	63	51°34.2'N 12°54.2'W	1475-1485	4.9-5.1	2.7
51010		OTSB14	2/5/81	70	51°19.1'N 12°29.5'W	1685-1700	3.95	3.2
51011		OTSB14	3/5/81	96	50°44.6'N 12°14.8'W	2180-2165	3.2-3.4	4.5
51012		OTSB14	5/5/81	150	49°51.0'N 13°57.8'W	3880-3920	-	5.9
51013		OTSB14	5/5/81	176	49°33.0'N 14°05.9'W	4195-4290	-	8.5
51014		OTSB14	6/5/81	70	49°36.2'N 13°29.2'W	1920-1935	-	-
51015		OTSB14	6/5/81	94	49°54.8'N 12°56.5'W	2540-2520	2.3-2.4	3.7
51016		OTSB14	7/5/81	89	50°00.4'N 12°37.8'W	2385-2410	2.5	3.3
51017	66	Granton trawl	7/5/81	90	49°28.6'N 12°11.8'W	1265-1195	-	4.7
51018	67	Granton trawl	7/5/81	92	49°27.2'N 11°53.0'W	1055-1050	-	6.0
51019	68	Granton trawl	8/5/81	89	49°30.7'N 11°36.0'W	765-730	-	5.3
51020	69	Granton trawl	8/5/81	92	49°23.1'N 11°25.4'W	480-585	-	5.8
51021		OTSB14	9/5/81	64	49°38.6'N 12°40.9'W	1860-1875	3.0-3.1	2.2
51022		OTSB14	9/5/81	69	49°33.0'N 12°38.8'W	1575-1600	3.9-4.0	2.4
51023		OTSB14	9/5/81	65	49°30.1'N 12°10.8'W	1275-1270	-	2.0
† 51024		OTSB14	9/5/81		49°24.0'N 11°45.8'W			
51025		OTSB14	10/5/81	60*	49°26.5'N 11°25.1'W	480-460	-	2.2*
51026		OTSB14	10/5/81	57*	49°24.5'N 11°34.4'W	750-730	-	-
51027		OTSB14	10/5/81	60*	49°32.4'N 11°50.5'W	970-985	-	2.4*

* Estimated

† No sample

CHALLENGER 7/81
MAY 1981



○ GRANTON
● OTSB

ALSO STATION 51001 AT 54°44.7'N, 12°23.5'W