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Redfish Above The Oceanic Depths

By: G. P. Zakharov

In 1962 and 1963, the Polar Research Institute of Marine Fisheries and Oceanography / PINRO / set up two research cruises with the aim to study the bathypelagic concentrations of redfish in the North Atlantic.

The first cruise of the trawler "Pobeda" was carried out in the West and East Greenland areas in April/June, 1962. One of the tasks of this cruise was to investigate the area south-west and south-east of Greenland for the purpose of discovering redfish over the oceanic depths. 73 control trawlings were made with 20- mid-water trawl of the PINRO design over the period from 4 to 24 of June. The route covered area from West Greenland to Iceland. One-hour tows were carried out at the depth of 200-570 m, spaced at 25 miles intervals. Taking into account the possible diurnal vertical migrations of redfish, trawlings were made at great depths (300-570 m) in the daytimes, and mainly at 200-250 m in the evening and night hours. Some redfish, chiefly Sebastes mentella Travin, were found almost in every haul. Some individuals were preliminarily attributed to the intermediate type. Sebastes marinus L. was not encountered above the great depths south and east of Greenland. Only 22 specimens of this redfish were caught above depths of 600-1000 meters near the continental slope in South-West Greenland. A total of 76 redfish were taken. Every fish was studied as to its length, weight, sex, stage of maturity, fatness grade (according to fat content on the internal organs). The degree to which redfish are parasitized by Sphyrion lumpi Kröyer and Chondrocanthopsis nodusus (O.F. Müller) was studied. Scales and otoliths of each fish were taken for age determination. The morphometric studies of 41 specimens were carried out.

The stomachs of most redfish were turned out. Of 20 redfish, the stomachs of which were not turned out, squids, ctenophores, shrimps, euphausiids and lantern anchovies were found in the stomachs of 6 redfish.

Depth in meters	Number of trawlings	Number of redfish caught (specimens)
200	9	7
201-250	12	11
251-300	18	12
301-350	22	23
351-400	5	12
>500	7	11

The length of Sebastes mentella Tr. was 32/48 cm, of Sebastes marinus L. - 39/65 cm. Sex ratio was almost the same (32 females and 31 males).

The males of Sebastes mentella Tr. were mature (the III and IV stages of maturity). Most females were at the IX stage (after the larvae extrusion). Some fishes contained single not deposited larvae. Some females taken over the Reykjanes Ridge were immature.

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Almost all specimens of Sebastes mentella Tr. had no fat on the internal organs except some redfish with low fat content. 13 of 54 specimens of Sebastes mentella Tr. contained from one to several parasites of Sphyrion lumpi. Chondrocanthopsis nodosus was not found in a single specimen of Sebastes mentella Tr.

In February 1963, cruise of the trawler "Zapad" was carried out. The cruise had for an object discovering places and terms of formation of pre-spawning concentrations of redfish above the oceanic depths south-west of Iceland. The area to investigate was chosen considering the data on the redfish larvae distribution in May, 1961, obtained by Magnusson (Positions: 62°N, 65°N and 22°W - 34°W).

Over the period from 9 to 22 February, 1,300 miles were covered and 6 traverses along the latitude were made. The continuous fish detection with the "Kalmar" echo-sounder was conducted in the 0-600 m range. Records obtained from the 150-250 m layer were often found on the plotting chart. In the experts opinion, these records did not correspond to those of commercial fishes. The control tows were carried out with a 20-m mid-water trawl at depths of 150-200 meters in the areas, where those records were obtained.

A 8-mm cotton net was inserted into the trawl cod-end. Sometimes a plankton net was fixed to the trawl. During the entire period of investigations, 24 trawlings were made, only 5 specimens of Sebastes mentella Tr. were taken at a depth of 150-170 m. The sizes of males were 43 and 44 cm, females - 39, 42 and 44 cm. Males were at the II maturity stage, females - at the IV and VI maturity stages. Euphausiids and medusae were found in the stomachs of redfish.

Of other fishes Maurollicus mülleri and lantern anchovies (Myctophidae) were often taken with a trawl on the southern traverses. Of invertebrate animals, medusa were encountered in great quantity (up to 100 kg), shrimps and euphausiids were found in smaller quantity. Small amounts of euphausiids, Calanus, amphipods and lantern anchovies were taken with a plankton net. Fish were seldom observed in the trawl on the northern traverses, the plankton nets were empty, and only medusa occurred in the trawl catches.

The materials, collected during the two cruises, give rise to the assumption that only Sebastes mentella Tr. inhabits the waters in the bathypelagic part of the North Atlantic. Sebastes marinus L. does not probably migrate far from the slope. The discovery of the Sebastes mentella Tr. females above the great depths during the period of eggs ripening and after the extrusion of larvae testifies to the fact that they extrude larvae in these areas.

Both males and females occur above great depths. They may be mature and immature. The presence of redfish of only large sizes in the bathypelagic zone permits us to consider them as the age population.

Catches of single specimens of Sebastes mentella Tr. show that redfish are dispersed over the entire area investigated. This consideration does not exclude the possibility of formation of redfish concentrations in other seasons.

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DATA ON REDFISH OBTAINED BY THE TRAWLER "POBEDA" 4-24 JUNE, 1962

STATION No.	POSITIONS	DATE	FISHING DEPTH DM	T. OF FISHING DEPTH °C	REDFISH SPECIES	L CM	SEX AND MATURITY STAGE
288	62°05'N - 50°48'W	1.VI 1962	330		S. MARINUS	45	♂ 3
					"	65	♂ 3
					"	41	♀ 2
					"	50	♀ 2
293	62°02'N - 50°43'W	2.VI	360		"	39	♂ 3
					"	46	♂ 3
					"	48	♂ 3
					"	60	♂ 3
					"	63	♂ 3
					"	40	♀ 2
					"	41	♀ 2
					"	42	♀ 2
					"	48	♀ 2
294	62°02'N - 50°44'W	3.VI	330		"	43	♂ 3
					"	47	♀ 2
					"	61	♀ 2
297	61°45'N - 50°45'W	"	350	3.87	"	1	
301	60°31'N - 49°00'W	4.VI	350	4.30	"	1	
305	59°52'N - 47°26'W	"	290	4.10	"	1	
308	59°32'N - 45°48'W	5.VI	310	4.90	"	2	
312	58°35'N - 44°00'W	6.VI	330	4.40	S. MENTELLA TWO REDFISH		
313	57°53'N - 44°00'W	7.VI	290	4.10	"	37	♂ 4
					"	38	♂ 4
314	57°25'N - 44°00'W	"	250	3.36	"	34	♂ 4
					"	37	♀ 9
317	57°05'N - 42°00'W	"	310	3.90	"	38	♀ 9
318	57°35'N - 42°09'W	8.VI	350	3.60	"	35	♂ 4
					"	36	♂ 4
319	58°05'N - 42°00'W	"	250	4.40	"	39.5	♀ 9
					"	38	♀*
					"	37	♀*
					"	32	♀*
322	58°48'N - 41°08'W	10.VI	350	4.07	"	37	♀ 9
					"	35	♂ 4
					"	36	♀ 9
					"	35	♀ 9
					"	41	♀ 9

* / MATURITY STAGE WAS NOT DETERMINED, AS FISHES WERE FIXED.

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STATION No.	POSITIONS	DATE	FISHING DEPTH OM	T. OF FISHING DEPTH °C	REDFISH SPECIES	L CM	SEX AND MATURITY STAGE
323	58°31'N - 40°00'W	10.VI	400	4.19	S. MENTELLA "	36 38	♂ 4 ♂ 4
324	58°11'N - 38°42'W	"	250		"	41.5	♀ 9
326	58°12'N - 36°45'W	11 "	300	5.81	"	36	♀ 9
327	58°25'N - 35°55'W	"	350	4.80	"	44	♂ 4
330	59°35'N - 37°50'W	12.VI	310	4.00	"	39	♀ 9
333	60°44'N - 39°30'W	13.VI	300	4.80	"	36	♂ X
345	61°02'N - 37°20'W	16.VI	300	4.33	INTERM. TYPE REDFISH	38	♀ 9
347	60°12'N - 36°04'W	"	250	4.40	S. MENTELLA	40.5	♀ 9
349	59°27'N - 34°55'W	17.VI	300	6.15	INTERM. TYPE REDFISH	35	♂ 4
351	59°10'N - 33°15'W	"	300	5.20	"	43	♀ 9
352	59°20'N - 32°20'W	"	200	5.40	6 REDFISH WERE NOT STUDIED		
357	61°05'N - 33°55'W	18.VI	260	5.50	S. MENTELLA " " "	40 35 34 38	♀ 9 ♂ 4 ♂ 4 ♀ 9
358	61°28'N - 34°31'W	19.VI	200	5.51	INTERM. TYPE REDFISH	33	♂ 3
362	62°37'N - 32°36'W	20.VI	250	5.20	S. MENTELLA " INTERM. TYPE REDFISH	39 38 41	♀ 9 ♀ 9 ♂ 4
374	61°38'N - 26°45'W	22.VI	570	6.30	S. MENTELLA	47.5	♀ 2
375	62°15'N - 25°50'W	"	570	"	" "	43 42	♀ 2 ♂ 3
376	62°37'N - 25°26'W	23.VI	570	6.26	" " " "	44 46 46 43	♀ 3 ♀ 3 ♀ 9 ♂ 3
378	63°45'N - 26°17'W	"	550	6.20	"	44	♀ *
380	64°34'N - 27°36'W	"	550	5.08	"	48	♀ *
382	65°25'N - 29°13'W	24.VI	550	6.06	" "	47 45	♀ 3 ♂ 2

TR. "ZAPAD" 9-23 FEBRUARY, 1963.

62°14'N - 30°00'W	11.II	150	S. MENTELLA	44	♂ 2
			"	44	♀ 4
62°40'N - 26°59'W	12.II	150	"	42	♀ *
64°02'N - 31°11'W	13.II	150	"	39	♀ 6
64°36'N - 31°04'W	17.II	170	"	43	♂ 2

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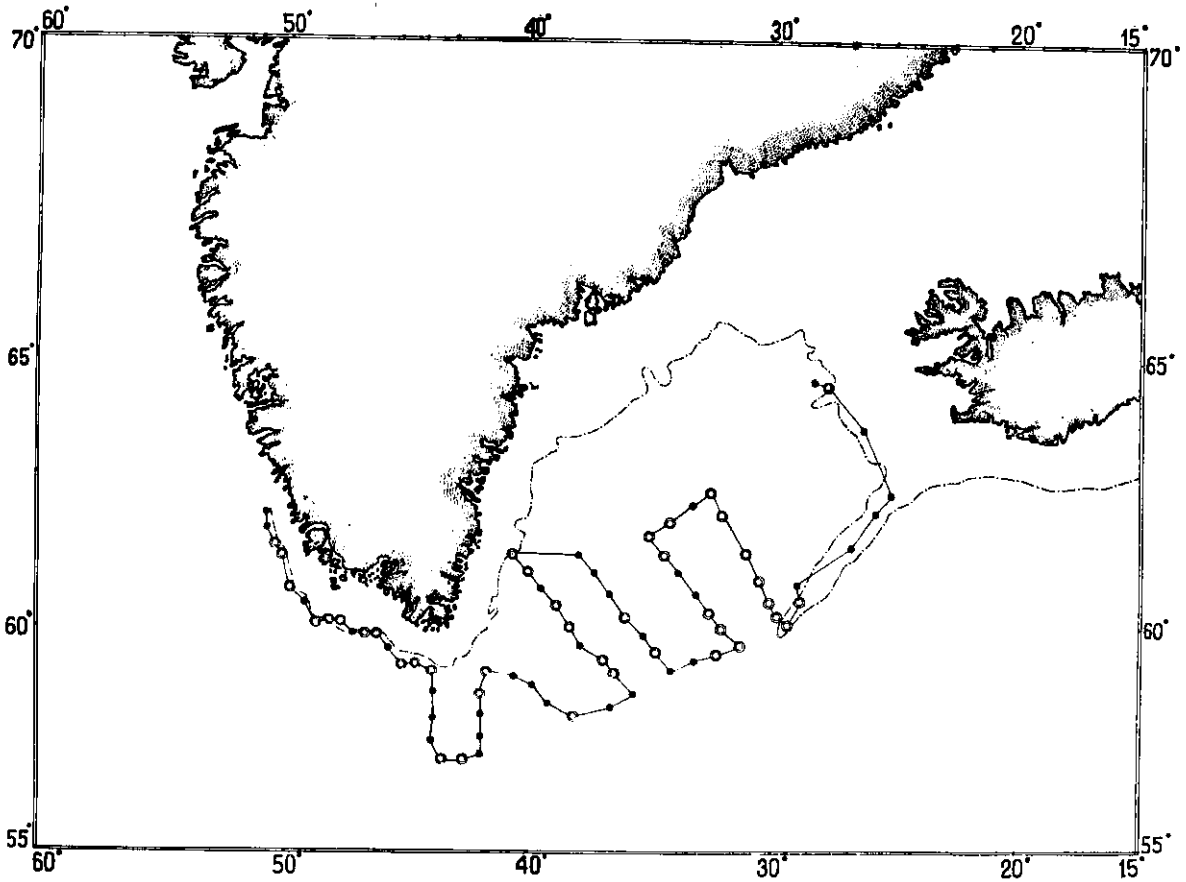


Figure 1. The area of the trawler's "Pobeda" investigations above the oceanic depths.

- - some redfish in trawl
- ⊙ - no redfish in trawl

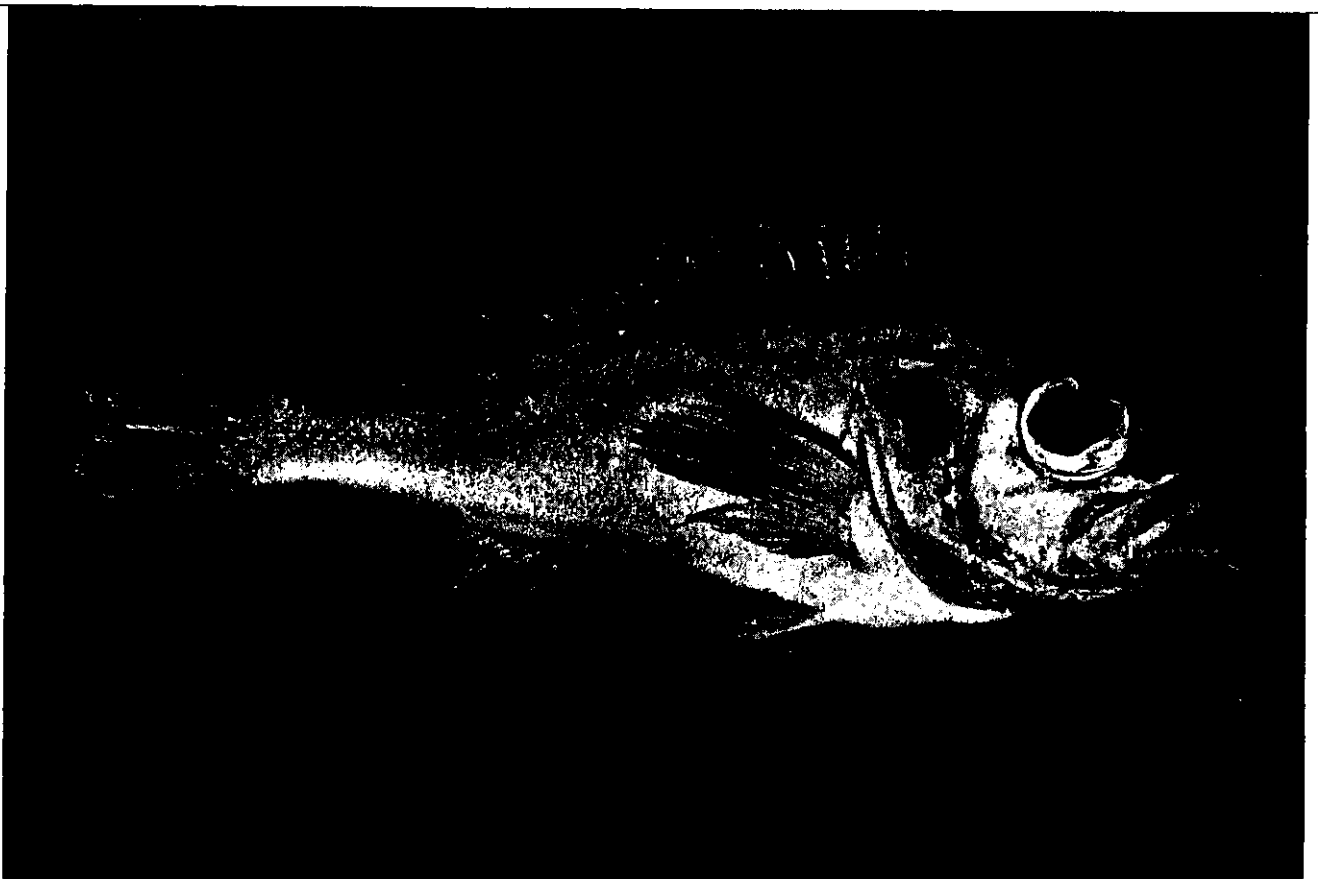


Figure 2. Sebastes mentella Tr. L-47.5 cm ♀ 2
Station 374 61°38' N 26°45' W
Depth 570 m 22. VI. 62