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Pelagic redfish in the Irminger Sea.  
Distribution and abundance.



by

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Since Tåning presented his work on the redfish larvae in the Irminger Sea in 1949 (TÅNING 1949), it was known that adult redfish inhabited the oceanic area of the Irminger Sea.

But it was not until 1962 that systematic fishing experiments on adult redfish in the Irminger Sea were undertaken. (ZAKHAROV 1964). These experiments together with handline fishing for redfish during the NORWESTLANT surveys in 1963 and angling for redfish from the weather ships confirmed that the redfish inhabited the Irminger Sea, most probably the whole year around.

During 1971-1975, particularly in 1972 and 1973, the Icelandic Marine Research Institute carried out systematic experimental fishing for pelagic redfish in the Irminger Sea with R/V "Bjarni Sæmundsson", mainly in the spring (April-May) and in the autumn (Sept. - Oct.)

On 8 cruises, a total of 157 hauls were made, 137 with the Engels pelagic trawl (opening 710 meshes, mesh size: 560 mm) and 20 with a small capelin trawl (table 1). Echo sounders were used throughout all cruises in order to trace pelagic redfish. As known the echo traces originate from various objects, small ones like Euphausiids, Scopelids etc. and bigger ones like jellyfish and redfish. With the echo sounders used during the experiments, it was very difficult if not impossible to distinguish between echo traces of jellyfish and redfish.

Consequently, the catches consisted almost always of a mixture

of those two species, in variable proportions. Sometimes, hauls were made though no echo traces could be seen on the recorders, yet redfish was also caught in those hauls.

Pelagic redfish was found throughout the entire Irminger Sea (figs. 1 and 2). The main concentrations were found in the western part of the Irminger Sea and on a conventional fishing ground SW of the Reykjanes ridge in autumn. However, big catches were not obtained and thus, the redfish seems to be distributed throughout the area without any dense concentrations in it. In order to get an idea of the areal distribution, the Irminger Sea was divided into 4 subareas, i.e. in SE, SW, NW and NE areas, the boundaries being north and south of the 63 N Lat. and east and west of the 32 W Long. The average catch has been summarized in table 2 for the 4 different areas and is given in number of fish pr. trawling hour. Hauls above the continental shelves and hauls with the capelin trawl are excluded in table 2 because the redfish caught over the continental shelves is of a different population, and the catches with the capelin trawl are not comparable to those with the Engels trawl.

The catches were on the average highest in the SW area, both in spring and autumn. By far the biggest catches were taken in 3 hauls in autumn with 314, 365 and 384 specimens per hour of trawling, corresponding to 300 to 350 kg per/hrs trawling (fig. 2). In the SE area, redfish was much more abundant in the spring time than in autumn (see table 2).

The vertical distribution of the redfish is also very wide. Thus, redfish was present in almost all hauls made in depths from 50 to approx. 800 meters. However, the material hardly allows reliable comparison of the depth range for each area separately in spring and autumn. Therefore, in table 3, the number per hour tr. is given by depth for the whole oceanic area of the Irminger Sea in spring and autumn. As can be seen from table 3, there is an obvious difference in the depth distribution according to season. Thus, in spring, the redfish seems to be most abundant in 300-500 m depth, i.e. the same depths in which redfish is usually caught with bottom trawl on

on the continental slopes and on the fishing banks. On the other hand, in autumn, redfish was most numerous in depths less than 200 meters. These differences in the depth distribution are most probably related to the state of maturity in spring and to feeding in autumn.

In table 5 and fig. 3, the length distribution of the oceanic redfish population is given for males and females separately, in spring and autumn.

As to the sex composition of the catches, the females were more abundant in the Irminger Sea than the males, both in spring and autumn. Thus, in spring time, 61.4% of the total catch consisted of females and in autumn, 57.8%. However, the sex composition in the different hauls was very variable. Sometimes, the catches consisted exclusively of one sex only. The maturity stage of pelagic redfish was in accordance with the seasons. Table 4 gives the proportions of the stage of maturity in spring and autumn. (stage I immature, II maturing III spawning, IV newly spent).

Table 4. Stage of maturity in %

	♂				♀			
	I	II	III	IV	I	II	III	IV
spring	14.75	81.13	-	4.12	22.20	-	12.18	65.62
autumn	0.45	-	98.43	1.12	0.65	98.70	-	0.65

It should be pointed out that the percentage of immature males and females is very small in autumn although they seem to be fairly well represented in spring. Further, the low percentage of spawning females in spring and the high percentage of spent females indicates that spawning had already taken place in May, i.e. the time in which the greater part of the material was collected. Judging from the material at hand, it seems that maturity of the oceanic redfish population is reached at a smaller size than by S. marinus and S. mentella of the shelf regions. Spawning females of 30 cm in size were observed and 19.5% of females, stage III, were 35 cm and smaller.

The corresponding figures for males are: 32 cm and 13.1%.

One of the outstanding features of the oceanic redfish population is the abnormal coloration (i.e. black spots on the skin) and the heavy infestation with Sphyrion lumpi. Of 2095 specimens, which were specially examined for this purpose, 33.8% were with abnormal coloration and 17.9% were infested by Sp. lumpi. Females suffer more under these abnormalities than males. Thus 47.2% of the females and 14.9% of the males were with abnormal coloration and 25.3% of females and 7.3% of males were infested with Sp. lumpi.

Redfish of this kind is very seldom found on the commercial fishing grounds at Iceland and East Greenland. It resembles much more the redfish caught on Hamilton Inlet Bank in 1958.

This difference in the general appearance, the above mentioned abnormalities (in coloration and in infestation by Sp. lumpi) as well as the small size in which maturity is reached, all this supports strongly the opinion that the oceanic redfish is to be considered as a special population.

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Table 1.

Pelagic redfish in the Irminger Sea.  
Cruises and summary of material.

Cruise	Year	Month	No. of hauls		No. of redf.		per/hrs.		Area
			tot. neg.	tot.	tot.	per/pos			
B10-71	1971	Oct.	13	10	14	1.1	4.2	E-Greenl.	
B6-72	1972	May	20	3	729	20.6	24.4	E-Irm. Sea, W a. SW Icel.	
B10-72	1972	Sept.	25	5	3588	79.1	87.3	SE-Irm. Sea, SW-Icel. Reykjanes ridge area.	
B13-72	1972	Oct.	21	0	5008	119.0	119.0	SW-Irm. Sea	
B13-72	1972	"	13	7	137	21.1	45.7	Capelin trawl NW a. SW Irm. Sea.	
B5-73	1973	May	7	1	17	1.5	1.6	N-Irm. Sea	
B9-73	1973	Oct.	27	8	440	14.75	20.0	Irm. Sea a. E-Greenl.	
B9-73	1973	"	7	6	1	0.2	2.0	Capelin trawl.	
B4-74	1974	Mar-Apr.	19	4	554	25.2	30.8	S-Irm. Sea a. W-Icel.	
B5-75	1975	May	5	0	115	20.0	20.0	E-Irm. sea a. SW-Icel.	
			157	44					

Table 2.      Pelagic redfish in the Irminger Sea.  
Average catch pr/hrs. according to areas and season.

Area	Spring (April-May)		Autumn (Sept. - Oct.)	
	No. stations	No. pr/hrs.	No. stations	No. pr/hrs.
SE	22	25.1	28	3.7
SW	8	33.4	31	84.8
NW	2	1.1	2	12.0
NE	13	15.9	1	6.0
Average:	45	22.9	62	44.6

Table 3.      Pelagic redfish in the Irminger Sea.  
No. of fish pr/hrs. by depth

Depth	Spring		Autumn.	
	No. st.	Catch/hrs.	No. st.	Catch/hrs.
<100	1	12.00	9	106.23
101-200	1	0	19	82.63
201-300	16	11.35	15	10.08
301-400	8	48.45	11	3.13
401-500	7	34.65	7	4.44
>500	12	16.88	1	17.00

Table 5. Length distribution of redfish in the Irminger Sea in spring and autumn.

Spring							Autumn					
♂♂			♀♀		♂♂ ♀♀		♂♂		♀♀		♂♂ ♀♀	
cm	no	%	no	%	no	%	no	%	no	%	no	%
49			1	0.11	1	0.07						
8	2	0.34	6	0.65	8	0.53						
7	3	0.51	8	0.86	11	0.73			1	0.08	1	0.05
6	6	1.03	11	1.19	17	1.13			3	0.25	3	0.14
45	8	1.37	17	1.83	25	1.65	1	0.11	15	1.23	16	0.76
4	14	2.40	28	3.02	42	2.78	1	0.11	41	3.35	42	1.98
3	15	2.57	54	5.82	69	4.57			88	7.20	88	4.16
2	11	1.89	80	8.62	91	6.02	9	1.01	192	15.70	201	9.50
1	10	1.72	115	12.39	125	8.27	15	1.68	255	20.85	270	12.76
40	12	2.06	126	13.58	138	9.13	40	4.48	249	20.36	289	13.66
9	30	5.15	110	11.85	140	9.27	138	15.45	179	14.64	317	14.98
8	48	8.23	74	7.97	122	8.07	191	21.39	115	9.40	306	14.46
7	61	10.46	49	5.28	110	7.28	232	25.98	52	4.25	284	13.42
6	54	9.26	22	2.37	76	5.03	146	16.35	21	1.72	167	7.89
35	53	9.09	10	1.08	63	4.17	72	8.06	7	0.57	79	3.73
4	34	5.83	10	1.08	44	2.91	31	3.47	2	0.16	33	1.56
31	31	5.32	15	1.62	46	3.04	13	1.46	2	0.16	15	0.71
2	36	6.17	17	1.83	53	3.51	2	0.22	1	0.08	3	0.14
1	42	7.20	46	4.96	88	5.82	1	0.11			1	0.05
30	37	6.35	31	3.34	68	4.50						
9	39	6.69	34	3.66	73	4.83						
8	15	2.57	33	3.56	48	3.18	1	0.11			1	0.05
7	7	1.20	22	2.37	29	1.92						
6	7	1.20	7	0.75	14	0.93						
25	6	1.03			6	0.40						
4	2	0.34	2	0.22	4	0.26						
<b>Tot.</b>	<b>583</b>	<b>99.98</b>	<b>928</b>	<b>100.01</b>	<b>1511</b>	<b>100.0</b>	<b>893</b>	<b>99.99</b>	<b>1223</b>	<b>100.00</b>	<b>2116</b>	<b>100.00</b>
<b>%</b>	<b>38.58</b>		<b>61.42</b>		<b>100.00</b>		<b>42.20</b>		<b>57.80</b>		<b>100.00</b>	
<b>ML</b>	<b>34.990</b>		<b>37.908</b>		<b>36.782</b>		<b>37.277</b>		<b>40.367</b>		<b>39.063</b>	

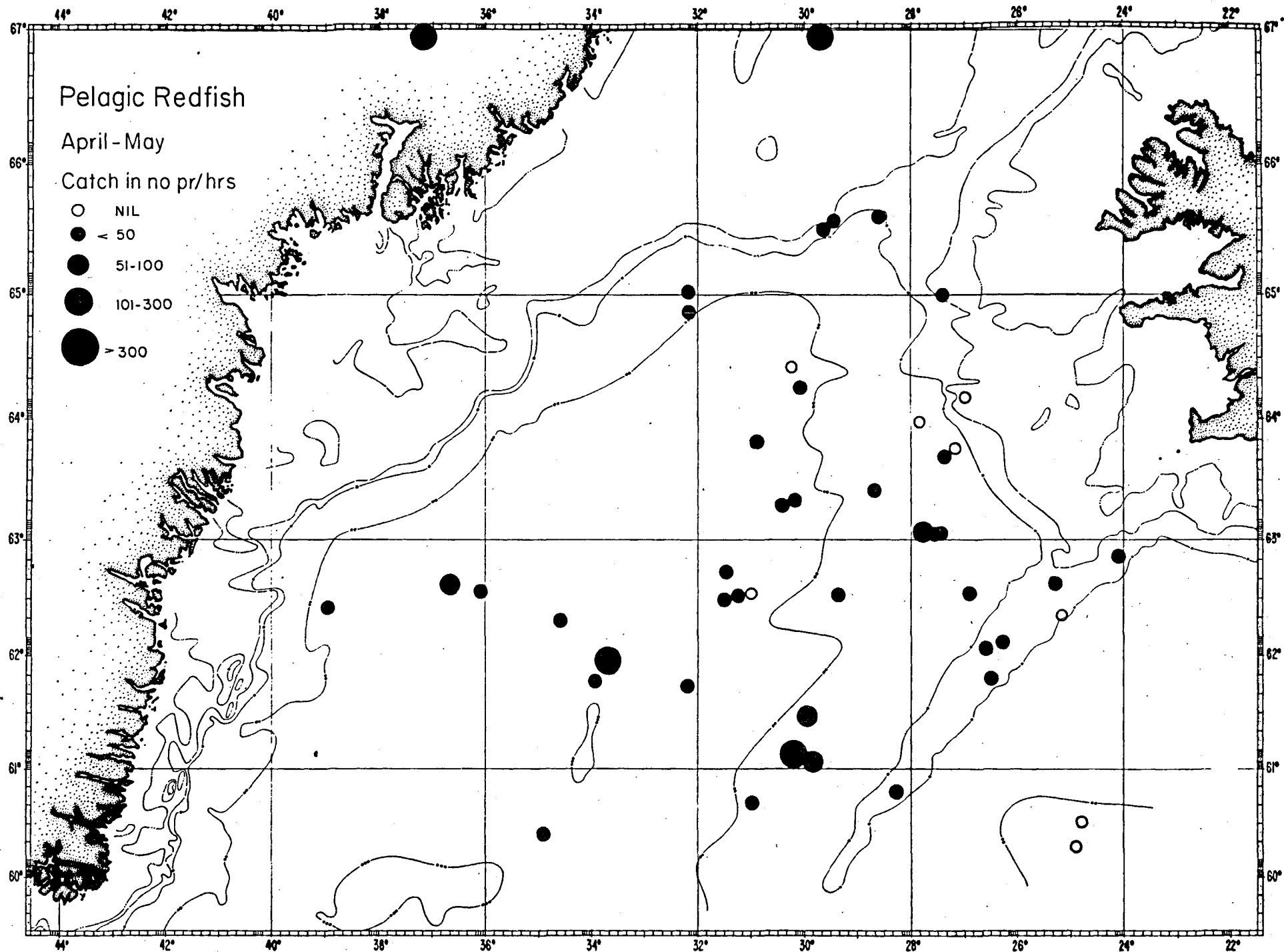


Fig. 1. Distribution and abundance of Pelagic redfish in the Irminger Sea in spring.



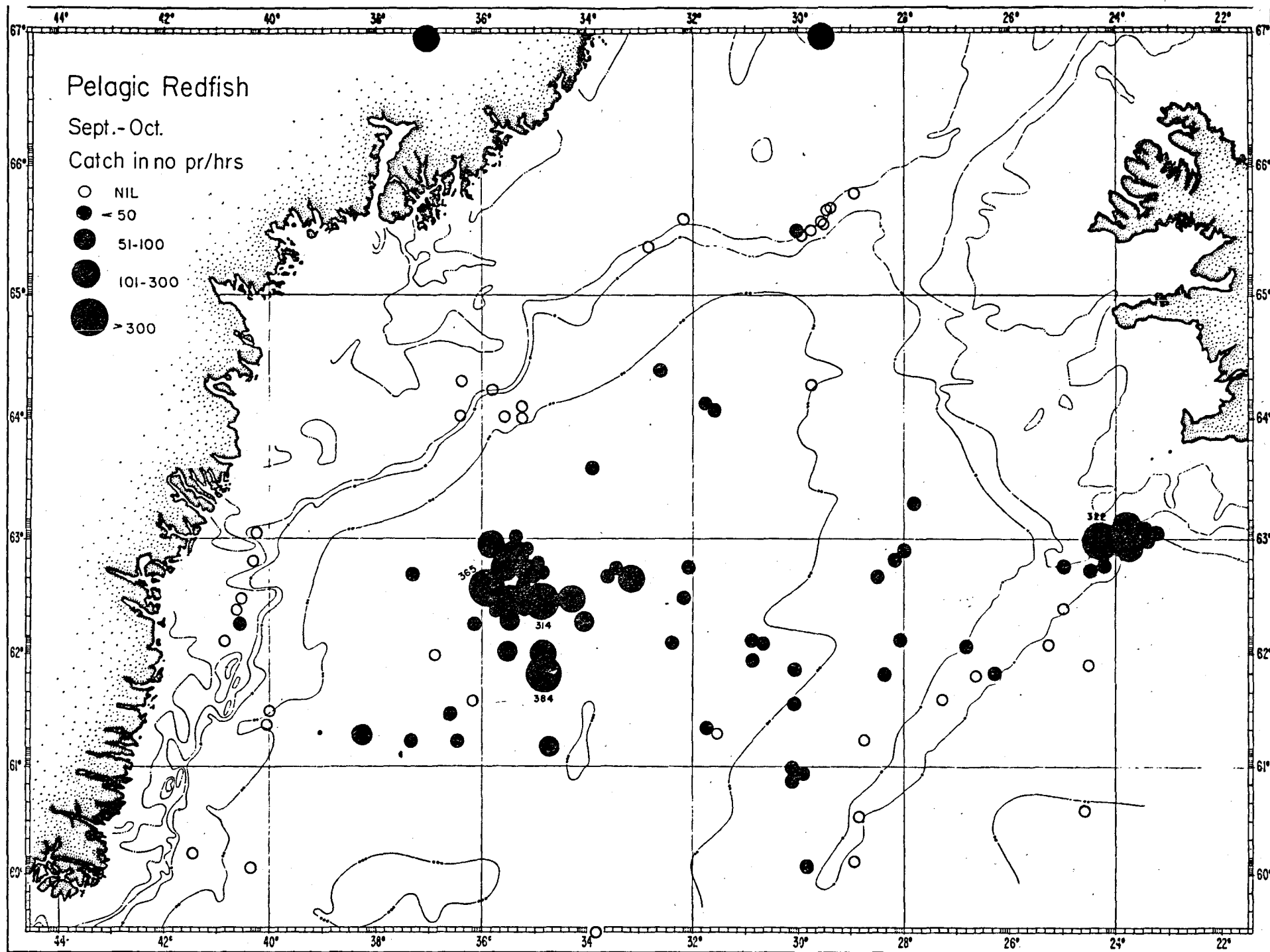


Fig. 2. Distribution and abundance of Pelagic redfish in the Irminger Sea in autumn.

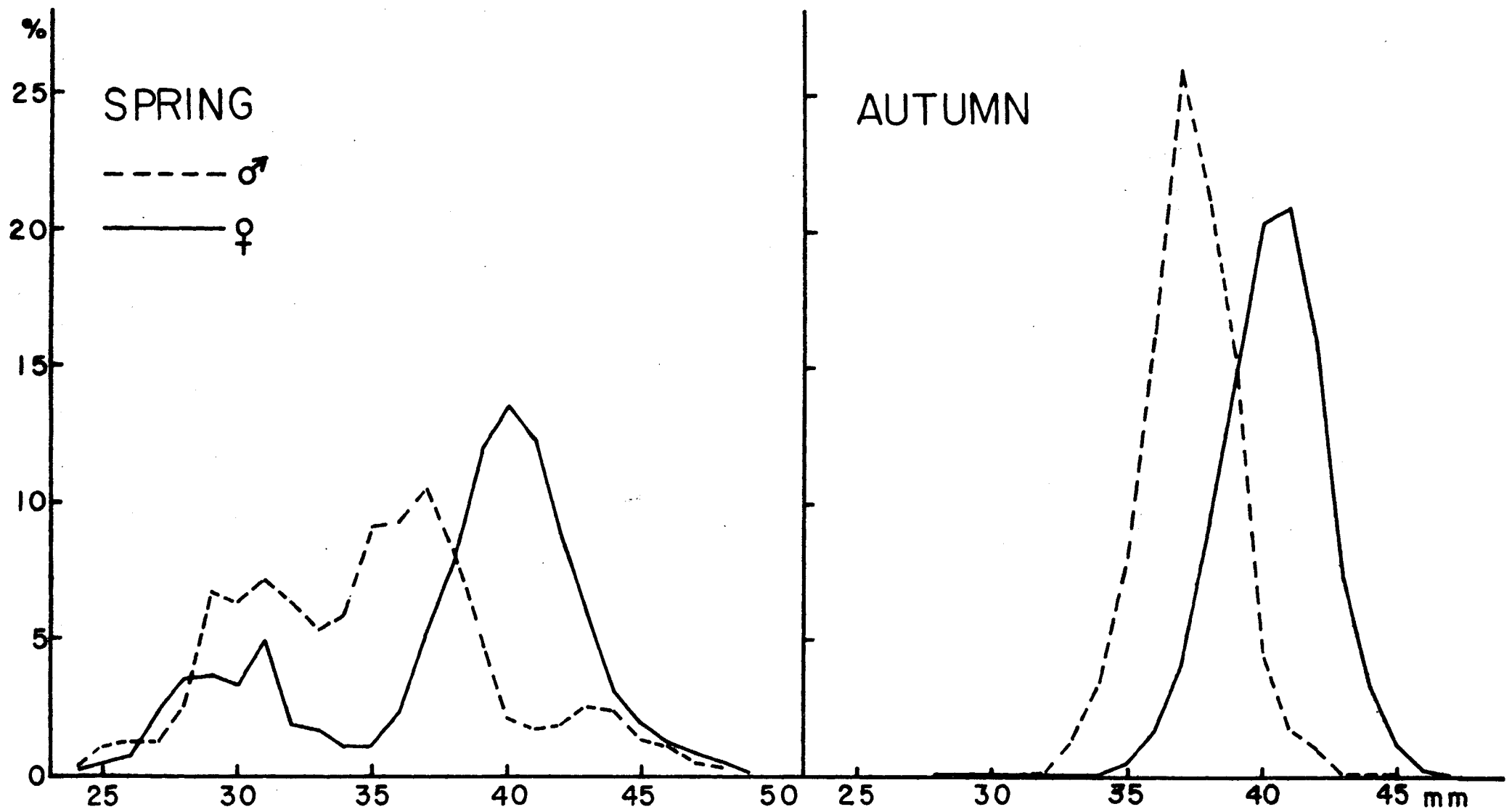


Fig. 3. Length distribution of Pelagic redfish in the Irminger Sea in spring and autumn.