



Serial No. 2980  
(D.c.3)

ICNAF Res.Doc. 73/41

ANNUAL MEETING - JUNE 1973

Distribution of beaked redfish (*Sebastes mentella* Travin)  
by depths in areas off the Great Newfoundland Bank and South Labrador

by

T.L. Nikolskaya  
PINRO, Murmansk, USSR

Abstract

In 1963-1971 in the areas of the Great Newfoundland Bank and South Labrador the material on size -age composition of the "beaked" redfish was collected aboard the scouting and research vessels.

Trawlings carried out in the 201-300, 301-400, 401-500, 501-600, 601-700 m depths were compared for characteristics of redfish distribution.

It is pointed out that on the slopes of the Great Newfoundland Bank the length of the "beaked" redfish increases with the depth of inhabitation. In relation to the depth of inhabitation the increase of the mean length during the spring-summer, autumn and winter periods is observed for males and females on the north-east slope of the Grand Bank.

INTRODUCTION

Scientists from the USSR and other countries undertake the investigations on redfish distribution by depths in NW Atlantic (Templeman, 1959, 1962; Lundbek, 1961; Magnusson, 1962; Tokareva, 1966; Savvatimsky, 1966; Savvatimsky & Sidorenko, 1966; Sidorenko, 1967; Chekhova, 1970). It was observed that usually the size of redfish increases with greater depths. Our task is to show the differences in size-age composition by depths and seasons in the areas off the Great Newfoundland Bank and South Labrador.

The data summarized for 1963-1971 collected aboard the scouting and research vessels are represented in the paper. We have compared the trawlings, carried out in the 201-300, 301-400, 401-500, 501-600 and 601-700 m depths. It was assumed that all investigated specimens of redfish were of the same genus *S. mentella* Travin ("beaked" redfish). However, according to data by Barsukov (1968), Barsukov & Zakharov (1972) in the area off South Labrador and Newfoundland except the "beaked and "golden" redfish, one species more, *S. fasciatus* Störer, is observed in considerably smaller depths compared to *S. mentella*, usually from 70 to 350 m and very seldom deeper. The existence of this species has not yet acknowledged by all the ichthyologists. It should be noted that the conclusions on redfish distribution by depths made by us will be completely important for trawl fishery, even if it would be proved in future that in the area off South Labrador and Newfoundland equally with "beaked" redfish *S. fasciatus* also inhabited.

#### SIZE COMPOSITION

It is seen from Fig. 1, that the size compositions of "beaked" redfish in the 201-300 and 301-400 m depths on the St. Pierre Bank are similar. The peak of size frequency for males is 30 cm, for females - 35 cm. In the 401-500 m layer compared to previous depth the number of males of 35-37 cm long increases; a mode for females (35 cm) remains the same as in the 201-400 m depth. Deeper than 401 m the relative number of large females of 40 cm in length increases.

On the southwest slope of the Grand Bank in the 201-300 m depth the species of 25-26 cm long prevail among the males; the species of 25-28 and 32-35 cm in length dominate among the females. Deeper than 301 m the relative number of large males of 26-30 cm and large females of 32-35 cm long increases. In the 401-500 m depth the peaks of size frequency of males and females coincide (35 cm). Deeper than 501 m the portion of large females of 35-38 cm long increases. The peaks

of size frequency for males in the 401-500 and 501-600 m depths are similar.

On the southeast slope of the Grand Bank in the 201-300 and 301-400 m depths the peak of the size frequency for males coincides (28 cm). With the increase of the depth from 201-300 to 401-500 m the peak of the size frequency for females shifts from 32 to 40 cm. The largest females were registered in the 401-500 m depth.

On the northeast slope of the Great Newfoundland Bank in the 201-300 and 301-400 m depths the peak of the size frequency for males constitutes 35 cm, for females - 40 cm. Deeper than 401 m the predominant length of the redfish increases. So, in the 401-500 m depth the peak of the size frequency for males is 36 cm, for females - from 40 to 43 cm. The largest species were observed in the 501-600 m depth: males with the peak of size frequency of 38 cm, females - of 45 cm.

Inconsiderable differences by size between males and females are typical for the "beaked" redfish off the South Labrador. Size curves for males and females are almost of the same type, their peaks coincide. The peaks of size frequency for males in the 201-300, 301-400, 401-500, 501-600 and 601-700 m depths are similar (35 cm). However, in the 601-700 m depth the relative number of large males of maximum size of 40-42 cm increases. With the increase of the depth from 201-300 to 401-500 m the relative number of large females increases, but in the 501-600 m depth it reduces, as the result of the latter: the mode decreases up to 35 cm. In the 601-700 m depth maximum length of females increases again: the species of 40-42 cm in length constitute the basis of the catches.

#### AGE COMPOSITION

Age composition varies by depths by analogy with the size composition. It can be shown in the case of South Labrador, where the most complete material was collected, covering the great range of depths.

It is seen from Fig. 2, that in the 201-300 m depth the

males and females of 8-10 years aged constitute the basis of catches. Males of 12-15 years dominate in the 301-400 and 401-500 m depths. With the increase of the depth from 301-400 to 401-500 m the number of species of 19-22 years aged increases among the females. Deeper than 501 m the number of females of junior ages increases and the percentage of large females of elder ages sharply decreases: species of 14-16 years prevail. As for the depth range 601-700 m the predominant age of males is 18-19 years, of females - 21-22.

#### DISTRIBUTION OF "BEAKED" REDFISH BY DEPTHS DURING THE YEAR

During the year the size and age compositions of redfish in the same depth vary; it explains by seasonal migrations of fish. Three periods in the annual cycle of adult redfish are settled out:

- 1) spring-summer (March-July) - larvae extrusion and feeding;
- 2) autumn period (August-October) - feeding and copulation;
- 3) winter period (November-February) - wintering and maturation of sexual glands.

Let's consider the seasonal changes of redfish distribution by depths on the northeast slope of the Great Newfoundland Bank. Larvae extrusion is observed in March-June in the 300-500 m depth. In March-June the females with the larvae ready for extrusion descend to the deeper depths, where the number of large females of elder ages increases (Table 1). Sex ratio in that moment in the depth range 300-500 m was 1:1, that was the evidence of the lack of the disconnection between males and females in the period of larvae extrusion. After this period females probably keep the smaller depths, where they constitute 61% of the catch.

While comparison the size compositions of redfish by depths in the spring-summer, autumn and winter periods, it is marked that during all the periods of the year the length both of males and females increases with the depth.

REFERENCES

- Barsukov, V.V. 1968. On the systematic ratios of redfishes of the genus *Sebastes* in the North-Western part of the Atlantic. Dokl. AN SSSR, tom 183, No. 2.
- Barsukov, V.V. & G.P. Zakharov. 1972. Morphological and biological peculiarities of *Sebastes fasciatus*. Trudy PINRO, vyp. 28.
- Chekhova, V.A. 1970. Depth distribution of "beaked" redfish (*Sebastes mentella* Travin) on Flemish Cap Bank. ICNAF Redbook, Part 3.
- Lundbek, I. 1961. Durchführung und Ergebnisse des Programmes zur Erschliessung neuer Fangplätze 1958-1960. Allgemeine Fischereizeitung, Nr. 1-2.
- Magnusson, I. 1962. Icelandic Research Report, 1961. ICNAF Redbook 1962, Part 2.
- Savvatimsky, P.I. 1963. The materials on distribution of redfish (*Sebastes mentella*) in the Northwest Atlantic. ICNAF Ann. Meeting, June 1963, Res. Doc. 63/59 (mimeographed).
- Savvatimsky, P.I. & I.N. Sidorenko. 1966. Results of investigations on deep-sea redfish. ICNAF Research Bulletin, No. 3.
- Templeman, W. 1959. Redfish distribution in the North Atlantic. Bulletin Fisheries Research Board of Canada, No. 120.
- Templeman, W. 1962. Canadian Research Report, 1961. ICNAF Redbook, Part 2.
- Tokareva, G.I. 1966. Data on the distribution of young *Sebastes mentella* Travin in the Labrador-Newfoundland area. ICNAF Research Bulletin, No. 3.
- Sidorenko, I.N. 1967. Distribution of "beaked" redfish (*Sebastes mentella* Travin) at different depths on the North Newfoundland Bank. Materialy sessii Uchyonogo Soveta PINRO po result. issledovaniy v 1965, Murmansk.

Table 1. Sex ratio (%), mean length of males and females (cm), quantity of material tested by periods and depths (m)

Period	Sex	201-300		301-400		401-500		501-600					
		%	Mean length : spec.:	No. of : spec.:	%	Mean length : spec.:	No. of : spec.:	%	Mean length : spec.:	No. of : spec.:			
I Spring- summer	males	39	34.0	3,407	41	34.7	3,212	43	36.4	2,202	47	37.6	301
	females	61	38.6	5,277	59	39.3	4,541	57	41.2	2,935	53	41.2	346
II Autumn	males	68	34.3	4,127	45	34.4	5,453	32	36.2	2,543	20	38.8	196
	females	32	34.8	1,940	55	37.7	6,647	68	40.5	5,496	80	42.0	780
III Winter	males	83	35.6	6,477	47	35.8	3,842	24	36.9	441	16	40.5	356
	females	17	38.3	1,297	53	38.5	4,422	76	39.9	1,387	84	42.4	1,842

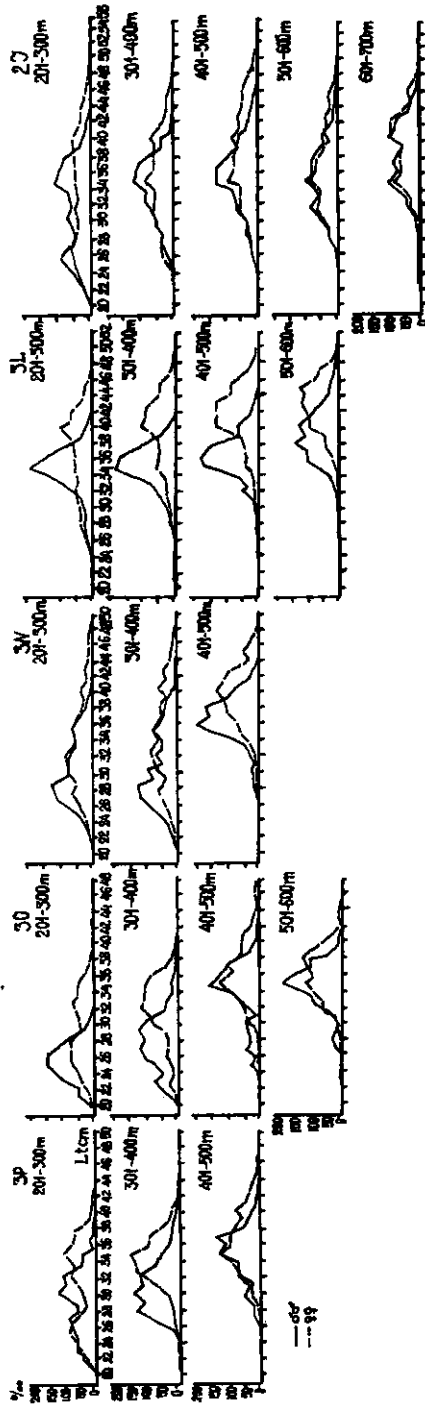


Fig. 1. Size composition of the beaked redfish in different depths.

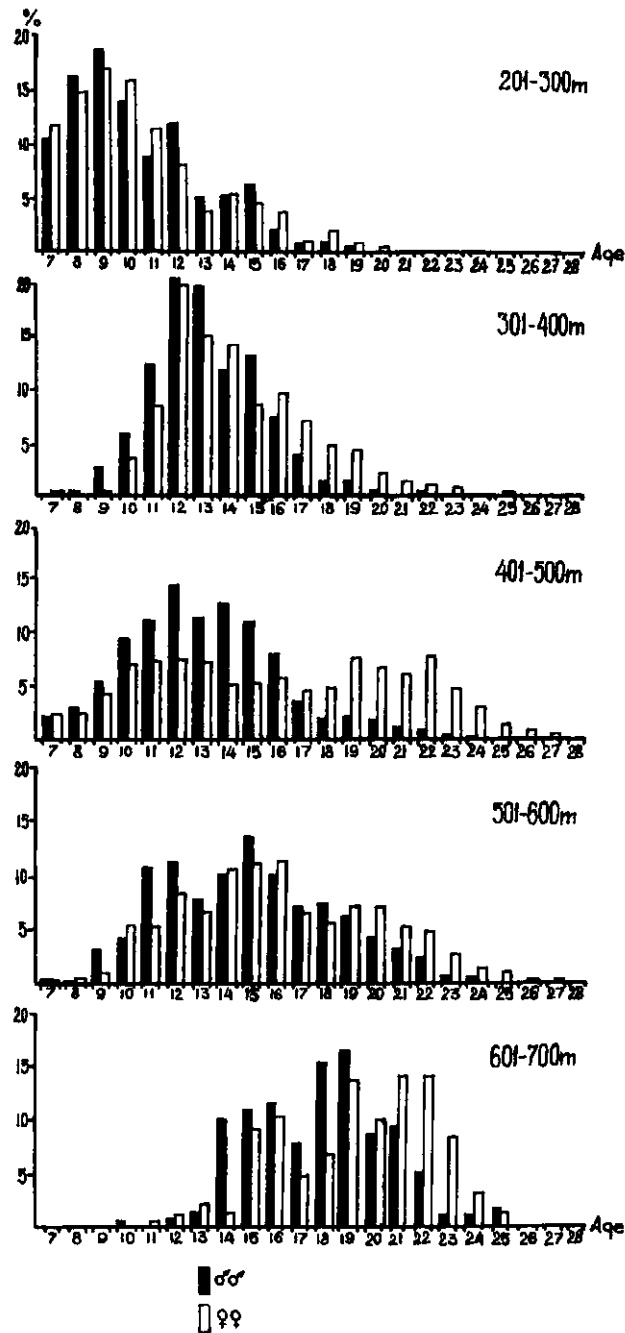


Fig. 2. Age composition of the beaked redfish in different depths in the South Labrador area.