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Composition of Catches in the Northern Flemish Pass from Data of Russian Trawl Survey in February 1996 and Some Information on Biology of Roughhead Grenadier

by

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Introduction

Flemish Pass is a relatively new fishing area, where during recent years successful fishery for Greenland halibut and other demersal fish has been carried out. However, data on catch composition and biology of those fish species are poor. This paper presents composition of catches taken by bottom trawl during the survey in February 1996 and characteristics of age and growth rate of roughhead grenadier, bycatch of which during deep fishery for Greenland halibut is rather sizable.

Materials and Methods

Trawl survey by R/V "Ozernitsa" in the northern Flemish Pass was carried out from 17 to 24 February 1996. 11 strata were surveyed in depth from 732 m to 1463 m. A bottom trawl 1625a with a small-mesh insertion (12mm mesh) in the codend was used. Method of survey is presented in detail in the paper by Gorchinsky (Gorchinsky K.V., SCR Doc. 96/). Age sample of roughhead grenadier (Macrourus berglax) was taken in the position 48°14'N and 46°55'W from the catch at 1300 m depth and consisted of 41 males and 80 females. Full length was measured from the tip of snout to tip of tail. Scale and otoliths were collected. Fish and liver were weighed. Fatness was determined as relative weight of liver expressed in per cent of fish weight. Roughhead grenadier were aged by otoliths and scale in polarizing transmitted light.

Qualitative analysis of feeding was carried out and food composition of roughhead grenadier was examined for food components.

Results

Species composition of catches in the Flemish Pass was various at different depth. At depth 601-700 m catches were dominated by redfish (98.2%). Percentage of redfish were sharply decreasing with depth (Table 1). It is worth noting that in two catches taken by commercial trawl with 130 mm mesh size at 850-940 m depth (46°30'N and 47°20'W) long rough dab constituted 48-67%. Greenland halibut were predominant in catches coming from 700 m to maximum depth when conducting trawl survey (1400 m). The largest bycatch during fishery for Greenland halibut was bycatch of roughhead grenadier (in average 24-25% by weight during tows at 1201-1440 m depth). From Spanish surveys (Paz I. and J.V. Casas, 1995) when tows were made at depth lower than 61 m biomass of roughhead grenadier in catches was estimated at 16%. The rest of fish constituting bycatch in the Russian survey were catching in minor amounts. Bycatch of roundnose grenadier (Coryphaenoides rupestris) was very small (the largest - 5% at 1301-1400 m depth). However, according to Canadian deepwater survey in August-September 1991 in Divs.3L and 3M in catches taken at 951-1300 m depth amount of this species was considerable (Brodie et al., 1992). Other data (Yokawa K. and J. Koga, 1995) indicated that in deepwater strata 523 (701-800 m) biomass of roundnose grenadier and Greenland halibut were comparable (nearly 50% each).

Those discrepant information appear a reason to conduct special investigation of ratio of different fish species in catches during trawl survey in February 1996 in the Flemish Pass.

Results shown by Russian research and fishery vessels since 60's suggested that at 800 m depth and lower Greenland halibut and roughhead grenadier were predominant by weight in catches. On the eastern slopes of the Grand Bank of Newfoundland catches of roughhead grenadier by bottom trawl reached several tonnes per tow. It is known that German fleet was taking grenadiers (mainly roughhead grenadier) in the East Greenland area in the amount more than 3 thou. tonnes per year (Sahvhage, 1986) and 8 thou. tonnes (Kosswig, 1979). Undoubtedly, fish of this species can serve as an additional base of fishery. Technical and chemical characteristics of raw materials from roughhead grenadier is given in the paper by Savvatimsky (Savvatimsky, 1992).

Males were 33-60 cm long but females constituted from 30 to 96 cm in length (Fig.1). A ratio between length and weight in both males and females (Fig. 2), as well as growth rate of roughhead grenadier (Fig. 3, 4) in the Flemish Pass area and Divs. 0b, 2G, 2H, 3K were very similar to each other (Savvatimsky, 1994). Apparently, roughhead grenadier dwelling in the Flemish Pass area and on the Grand Bank of Newfoundland refer to a single poulation.

Mean weight of males was estimated at 538.5 g, females at 1326.1 g. Relative weight of male liver constituted 13.8%, females - 9.9%. Fish scarcely fed. The mean degree of stomach fullness according to the 5-point scale was estimated at 0.05 in males and 0.34 in females. The main prey species were shrimp, squid, side-swimmers and fish.

Thus, data collected indicate that roughhead grenadier are the main bycatch by weight in Greenland halibut fishery. Similarity of studied biological characteristics of roughhead grenadier dwelling in the northern Flemish Pass and Divs.0B, 2GH, 3K indicates the continuity of their distribution area within the above limits and their belonging to a single population.

References

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Table 1. Species composition of catches (%) by 100-m depth ranges in Flemish Pass area based upon deepwater survey in Feb. 1996.

Catch composition	Depth, m							
	601-700	701-800	801-900	901-1000	1001-1100	1101-1200	1201-1300	1301-1400
Gr.halibut	0,8	36,9	73,2	77,9	77,6	80,2	62,1	60,0
Roughhead grenadier	-	2,8	9,0	7,7	11,1	12,7	23,9	24,7
Sharks	-	-	0,8	0,1	1,7	1,4	5,4	-
Rn.grenadier	-	+	0,1	-	+	+	+	5,0
Skates	0,5	10,5	2,1	2,4	2,9	2,0	3,8	-
Eels	-	0,1	0,3	0,3	0,2	0,2	0,2	-
Red hake	-	-	0,2	0,4	0,3	0,6	1,2	0,3
Cod	-	0,1	+	-	-	-	-	-
Am.plaice	0,5	3,2	2,6	5,4	2,3	1,4	0,7	-
Witch flounder	-	-	3,5	1,5	2,0	0,7	1,1	-
Atl.halibut	-	0,3	-	-	-	-	-	-
Northern wolffish	-	-	+	0,5	1,0	0,4	0,9	-
Redfish	98,2	37,9	6,5	0,1	+	+	+	-
Com.grenadier	-	8,0	1,6	3,7	0,7	0,3	0,5	-
Blue antimora	-	-	-	-	+	0,1	0,1	10,0
Average catch, kg/hr	1025,0	360,5	292,5	341,5	284,9	298,8	340,5	240,0

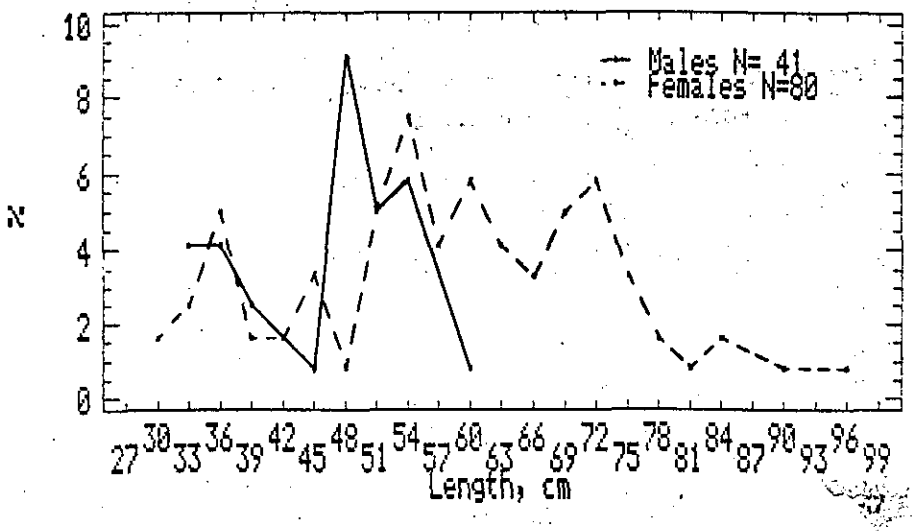

Fig. 1. Length composition of M. berglax in Flemish Pass area, Jan.- Feb., 1996

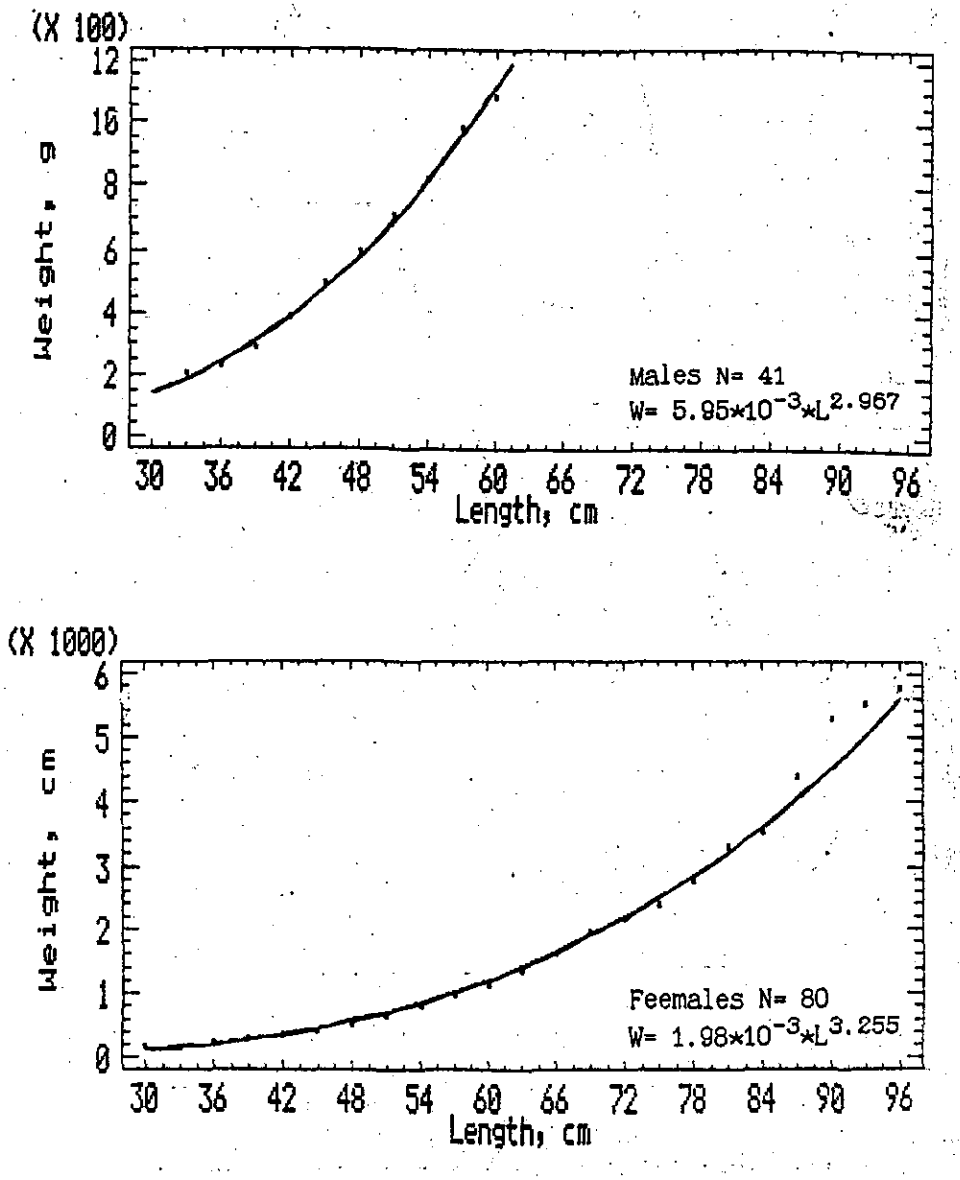

Fig. 2 . Length and weight relation of M. berglax in Flemish Pass area, Jan.- Feb., 1996

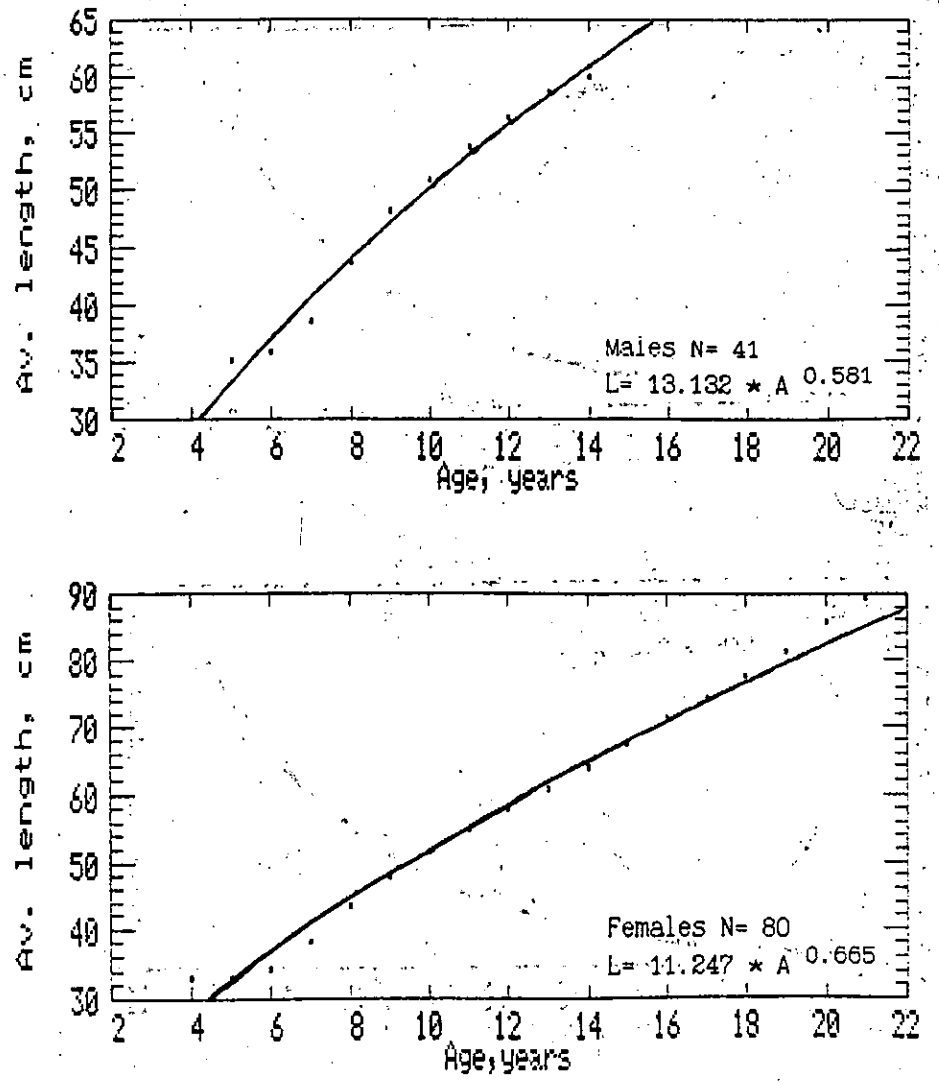

Fig. 3 . Age and length relation of M. berglax in Flemish Pass area, Jan.- Feb., 1996

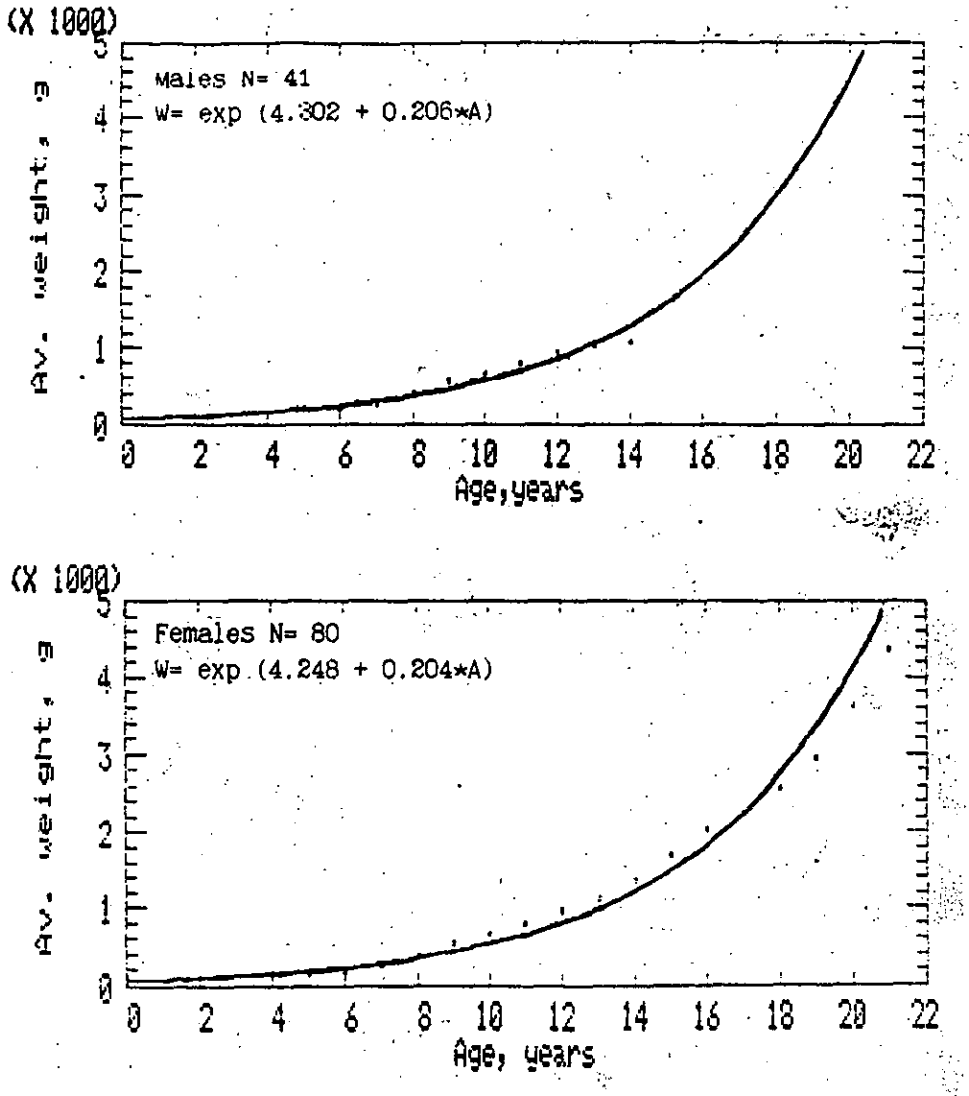

Fig. 4 . Age and weight relation of M. berglax in Flemish Pass area, Jan.- Feb., 1996