International Council for the Exploration of the Sea

C.M.1977/F: 16
Demersal Fish (Northern) Committee

FECUNDITY OF LONG ROUGH DAB OF THE BARENTS SEA

by

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Abstract

Fecundity of long rough dab of the southern Barents Sea and that of southern slope of the Bear Island Bank are compared in the paper. Absolute and relative fecundity values of fish of various length, weight and age are given.

Résumé

La fécondité du balai de la région sud de la mer de Barents et celui de la pente sud de banc de l'Ours est comparée dans le présent travail. La fécondité absolute et relative des poissons de differents tailles,poids et âge est citée.

Material and methods

Materials on the fecundity of long rough dab were collected in 1974; 50 specimens were cought in the southern Barents Sea in January and 64 specimens were taken on the southern slope of the Bear Island Bank in April.

Fecundity of females which had gonads at the maturity stages III and IV was determined. The maturity stage was determined according to the scale compiled by K.E.Fyodorov (1968). The length of the fish

[x/] PINRO,Murmansk,USSR

was measured by a calliper accurate to 0,1 cm and the weight was determined accurate to 1,0 g. Gonads were weighed on pharmaceutical scales accurate to 0,05 g and were fixed in 10% solution of formalin. Under laboratory investigation dry gonads were weighed in closed boxes on analytical scales. 0.5 to 1.6 g samples were taken from the head part of the left and right gonads separately. The total number of eggs was determined proceeding from the number of eggs in the sample and total weight of the gonad. The number of eggs spent by a female for one spawning period was taken as absolute fecundity (AF). The number of eggs per 1 g of the gutted fish body weight was taken as relative fecundity (RF).

Discussion

The greatest number of females from the southern Barents Sea was from 38 to 40 cm long. They mainly weighed from 500 to 650 g and were of the age 12-15 years. These figures for the southern slope of the Bear Island Bank were 36 to 44 cm, 560 to 750 g, 12 to 17 years respectively.

Absolute fecundity varied over a wide range: from 60,9 to 347,7 thousand eggs in fish from the southern Barents Sea and from 58,0 to 383,6 thousand eggs in fish from the southern slope of the Bear Island Bank. Relative fecundity varied from 209 to 581 and from 155 to 615 eggs respectively. Mean values of AF and RF was higher for fish caught in the area of the southern slope of the Bear Island Bank (206,32 thousand eggs and 390 eggs against 184,43 thousand eggs and 338 eggs respectively).

Mean values of fecundity went up with the increase in length, weight and age (Tables 1,2,3). Analysis of material shows the closest

relationship of the absolute fecundity with length, the weakest one with age. For example, fishes at the age of 13 years from the southern Barents Sea with large mean length and weight had a higher IAF and IRF than fishes of older age groups of smaller length and weight.

To reveal the dependance of absolute fecundity on length, weight and age, coefficients of correlation were calculated (Table 4). Results of calculations showed the closest relationship of the absolute fecundity of fishes from the southern Barents Sea with length. AF relationship with the total weight and weight of gutted fish from the southern Barents Sea was practically single-valued while that of southern slope of the Bear Island Bank was more closely connected with weight of gutted fish.

Correlative relationship of the relative fecundity was of another character. In all cases the correlation coefficients proved to be very low, had negative values and no relationship was found (Table 4).

Conclusions

1. Females of similar length, weight and age from the southern slope of the Bear Island Bank had a higher absolute fecundity than those from the southern Barents Sea and it fluctuated from 58,0 to 383,6 and from 60,9 to 347,7 thousand eggs respectively.

2. Absolute fecundity of long rough dab depends to a greater extent on the length (r=+0,77; +0,74) and weight (r=+0,71; +0,67) and to a smaller extent on the age (r=+0,20; +0,44).

Literature.

1. Fyodorov K.E. 1968. Ovogenesis and sexual cycle of Greenland halibut. Trudy PINRO, vyp. 23, p. 425-451.

Table 1

Average individual fecundity of long-rough dab females of different age.

	Age groups								
	10	11	12	13	14	15	16	17	18
Southern Barents Sea		139,8 / 326 x	140,5 / 316	217,1 / 409	200,5 / 356	175,5 / 331	225,5 / 363	258,8 / 359	125,5 / 276
Number of specimens		7	10	6	10	9	4	3	1
Southern slope of Bear Island Bank	175,5 / 576	175,5 / 426	218,3 / 463	143,7 / 376	234,6 / 403	200,5 / 344	235,5 / 390	210,5 / 350	
Number of specimens	1	6	8	10	11	8	10	10	

x Absolute fecundity in numerator, thousands of eggs.
Relative fecundity in denominator, number of eggs.

Table 2

Average individual fecundity of long rough dab females of different length.

	Length, cm								
	32	34	36	38	40	42	44	46	48
Southern Barents Sea	75,5[x] / 300	108,8 / 326	145,5 / 326	175,5 / 388	165,5 / 306	233,0 / 357	225,5 / 326	275,5 / 326	275,5 / 300
Southern slope of Bear Island Bank	125,5 / 376	100,5 / 350	150,5 / 450	155,5 / 392	188,0 / 303	257,6 / 440	288,0 / 413	275,4 / 286	375,5 / 426

[x] Absolute fecundity in numerator, thousands of eggs.

Relative fecundity in denominator, number of eggs.

Table 3

Average individual fecundity of long rough dab females of different weight.

Areas	Weight, g (gutted fish) 250	300	350	400	450	500	550	600	650	700
	I	2	3	4	5	6	7	8	9	I0
Southern Barents Sea	75,5 / 276	75,5 / 350	225,5 / 576	I25,5 / 326	I50,5 / 350	I75,5 / 396	I67,I / 35I	I75,5 / 336	2I0,6 / 276	250,5 / 376
Number of eggs	I	2	I	3	4	I2	6	5	5	4
Southern slope of Bear Island Bank			II8,2 / 404	I57,8 / 420	I92,I / 459	I8I,I / 392	206,7 / 369	225,5 / 396	2I3,0 / 3I3	288,0 / 436
Number of eggs			7	9	6	9	8	5	8	4

Areas	Weight, g (gutted fish) 750	800	850	900	950	I000	I050	II00	II50	I200
	II	I2	I3	I4	I5	I6	I7	I8	I9	20
Southern Barents Sea	250,5 / 350	225,5 / 276	-	300,5 / 350	-	275,5 / 326	-	-	225,5 / 226	
Number of eggs	2	I		2		I			I	
Southern slope of Bear Island Bank	325,5 / 476	225,5 / 276	376,5 / 426	-	-	275,5 / 326	-	375,5 / 326	-	275,5 / 226
Number of eggs	2	2	I			I		I		I

Absolute fecundity in numerator, thousands of eggs.
Relative fecundity in denominator, number of eggs.

Table 4

Correlation coefficients and regression equations between fecundity and length, weight and age of long rough dab females.

	Fecundity	Southern Barents Sea		Southern slope of Bear Island Bank	
		correlation coefficient	regression equation	correlation coefficient	regression equation
Length, cm	absolute	+ 0,77	y = 12,929x - 318,4	+ 0,74	y = -463,18 + 16,86x
Total weight, g		+ 0,73	y = 39,95 + 0,24x	+ 0,57	y = 36,98 + 0,27x
Weight of gutted fish, g		+ 0,71	y = 0,244x + 49,16	+ 0,67	y = 0,2915x + 50,898
Age		+ 0,44	y = -21,29 + 15,06x	+ 0,2	y = 109,84 + 6,71x
Length, cm	relative	- 0,07	y = -0,0087x + 338,59	- 0,09	y = -3,188x + 517,06
Weight of gutted fish, g		- 0,26	y = -0,117x + 402,43	- 0,19	y = -0,121x + 454,91
Age		+ 0,07	y = 3,0595x + 295,73	- 0,25	y = -14,623x + 596,99

Технический редактор Е.Б.Рабкина

Подп. в печ. 28/VI 1977 г. Формат 60x84 1/8 Тираж 200
Объем 1,0 п.л. Заказ 758

ЦНИИТЭИРХ. 101925. Москва, ул. Архипова, 4/2