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(D.c. 3)ICNAF Res.Doc. 74/55ANNUAL MEETING - JUNE 1974Distribution of cod eggs in the south Labrador
and north Newfoundland areas in 1973

by

A. I. Postolaky
Polar Research Institute of Marine
Fisheries and Oceanography (PINRO)
Murmansk, USSRAbstract

This paper deals with studies carried out on the distribution and abundance of cod eggs in the south Labrador and north Newfoundland areas in 1973. Results show that in 1971 and 1973 the abundance of cod eggs was one-half that in 1970 and 1972 and that the major spawning in the Labrador area took place somewhat later in 1972 and 1973.

Introduction

Determination of the abundance of cod eggs in the south Labrador and north Newfoundland areas has been conducted by the Polar Research Institute of Marine Fisheries and Oceanography (PINRO) since 1970. This paper deals with results of the ichthyoplankton survey carried out in 1973. Data on the abundance of cod eggs in 1973 are compared with those obtained for 1970, 1971 and 1972; the comparison was made on the basis of results of vertical hauls.

Material and Methods

Collections of cod eggs were made on standard hydrological sections by the R/V *Protsion* from 14 May to 23 June 1973 (Fig. 1). Three hauls by an egg net (with a 80-cm diameter mouth opening) were made: vertical (Table 1), oblique (Table 2) and surface (Table 3). In areas where depths were below 500 m a vertical haul was made from the bottom to surface and in areas with depths over 500 m with an oblique one (50-0 m) when the 10 min circle was being made and the ship was moving at its lowest speed. Nets for the hauls mentioned were fastened to one cable 50 m apart.

During the cruise, 125 ichthyoplankton stations were made and 369 samples were collected. Ichthyoplankton samples were fixed in the 4% formalin solution. Samples were analysed ashore. Stages of egg development were determined according to the scale by Rass (1949).

Results of Determination of Egg Abundance

The quantitative distribution of cod eggs is shown in Fig. 2-4. The greatest quantity of eggs was taken by vertical hauls (Fig. 2) on Sections 40-A, 41-A and on tacks of "the triangle". On the remainder of the sections the quantity of eggs was considerably less.

Of the samples taken near the surface and in the 0-50 m layer the greatest quantity of cod eggs was found on Section 4-A and tack SE of "the triangle". The smallest quantity was observed on Sections 8-A and 3-A (Fig. 3 and 4, Tables 2 and 3). Eggs in the 1st and 2nd stages of development were found on all the sections. The greatest quantity of eggs of the 1st stage was found on the northern sections and Section 7-A. Eggs at the 3rd stage of development were found in the greatest quantity on Sections 41-A, 6-A, 7-A and on tacks SW and NW of "the triangle"; those at the 4th stage occurred on Sections 40-A, 41-A.

Following the scheme for locating cod spawning grounds in the Labrador and Newfoundland areas (Postolaky, 1963, 1968; Serebryakov, 1967) one can conclude that on all the sections north of 47°N eggs of

the Labrador cod were collected. To the north, on Sections 3-A, 4-A and 6-A, eggs at stages 3 and 4 evidently belong to the Labrador cod as well and eggs at stages 1 and 2 belong to the cod spawning on the north-eastern slope of the Newfoundland Grand Bank.

When comparing the data on average quantities of cod eggs per one vertical haul obtained in 1970-1973 (Table 4) it is evident that the greatest quantity of eggs was found in 1970 and 1972. In 1971 and 1973 a quantity of eggs was one-half that in 1970 and 1972. Analysis of data on stages of egg development (Table 4) shows that in 1972 and 1973 the mass spawning of cod in the Labrador areas evidently took place somewhat later comparing to that in 1970 and 1971.

References

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Table 1. Average number of cod eggs per vertical haul, May-June 1973.

Section	Date of survey	Stages of egg development				Total	No. of stations
		I	II	III	IV		
3-A	14-17 May	0.3	0.1	-	0.1	0.5	16
4-A	18-20 May	0.5	1.3	1.8	-	3.6	13
6-A	22-27 May	0.7	0.5	0.4	0.3	1.9	12
7-A	26-28 May	0.7	0.2	0.4	-	1.3	11
Tack SO	29 May-1 Jun	1.7	0.8	0.6	0.3	3.4	10
Tack SW	1-2 Jun	3.5	1.0	0.3	-	4.8	8
Tack NW	2-4 Jun	3.7	0.8	0.9	0.3	5.7	9
41-A	4-5 Jun	3.0	0.8	2.5	0.5	6.8	4
40-A	17-20 Jun	0.9	1.0	1.3	2.2	5.4	10
39-A	21-22 Jun	0.7	0.4	0.4	0.2	1.7	9
8-A	22-23 Jun	0.9	0.2	0.1	-	1.2	10

Table 2. Average number of cod eggs per oblique haul, May-June 1973.

Section	Date of survey	Stages of egg development				Total	No. of stations
		I	II	III	IV		
3-A	14-17 May	1.2	1.9	0.4	0.1	3.6	16
4-A	18-20 May	12.0	19.0	8.7	0.3	40.0	13
6-A	24-26 May	4.4	5.0	2.8	0.6	12.8	12
7-A	26-28 May	13.5	4.7	2.4	0.3	20.9	11
Tack SO	29 May-1 Jun	7.4	18.6	4.1	0.4	30.5	10
Tack SW	1-2 Jun	4.4	4.8	1.4	0.3	10.9	8
Tack NW	2-4 Jun	10.0	7.1	2.9	0.2	20.2	9
41-A	4-5 Jun	5.0	2.5	2.0	1.0	10.5	4
40-A	17-20 Jun	3.8	2.9	0.7	1.0	3.4	9
39-A	21-22 Jun	6.5	2.8	0.3	-	9.6	8
8-A	22-23 Jun	4.9	0.4	-	-	5.3	9

Table 3. Average number of cod eggs per surface haul, May-June 1973.

Section	Date of survey	Stages of egg development				Total	No. of stations
		I	II	III	IV		
3-A	14-17 May	3.1	2.9	0.5	-	6.5	16
4-A	18-20 May	38.2	29.2	6.7	0.5	74.6	13
6-A	24-26 May	4.2	3.2	1.0	0.1	8.5	12
7-A	26-28 May	15.5	7.0	1.7	-	24.2	11
Tack SO	29 May-1 Jun	27.5	16.8	2.4	-	46.7	10
Tack SW	1-2 Jun	9.9	8.6	3.1	0.8	22.4	8
Tack NW	2-4 Jun	13.6	9.8	4.1	0.6	28.1	9
41-A	4-5 Jun	2.5	2.5	0.5	-	5.5	4
40-A	17-20 Jun	17.2	4.2	1.6	0.7	23.7	9
39-A	21-22 Jun	12.0	6.0	0.8	-	18.8	8
8-A	22-23 Jun	2.0	0.1	0.1	-	2.2	11

Table 4. Average number of cod eggs per vertical haul, May-June 1970-1973.

Date of survey	Average no. of eggs per one haul	Stages of egg development, %			
		I	II	III	IV
1970 (6-25 May)	7.6	30.2	22.4	26.3	21.0
1971 (5 May-5 Jun)	3.2	37.5	18.8	18.7	25.0
1972 (16-29 May)	6.0	48.4	28.3	20.0	3.3
1973 (14 May-23 Jun)	2.9	44.7	20.7	24.2	10.4

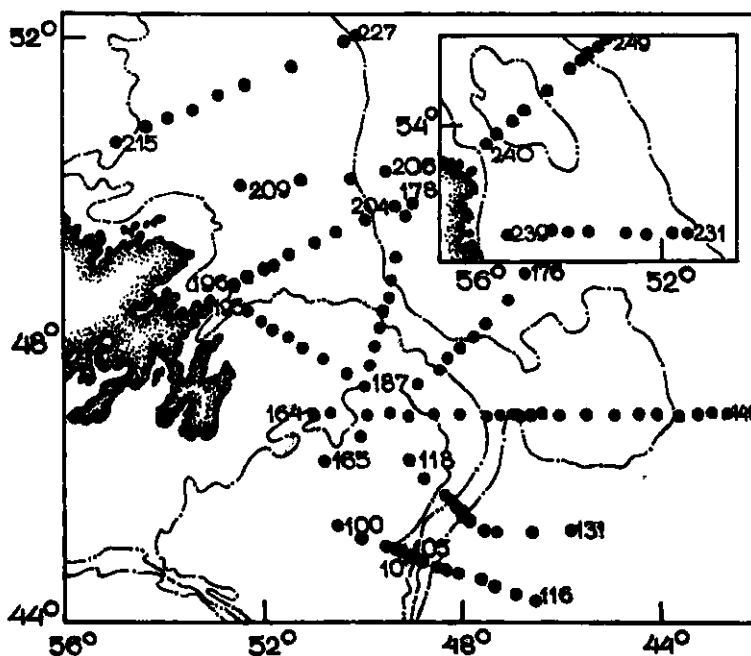


Fig. 1. Location of ichthyoplankton collections in 1973 (figures indicate No. of station): 100-116 - Section 3-A; 118-131 - Section 4-A; 140-164 - Section 6-A; 165-176 - Section 8-A; 178-187 - Tack SE; 187-195 - Tack SW; 196-204 - Tack NW of "the triangle"; 206-209 - Section 41-A; 215-227 - Section 40-A; 231-239 - Section 39-A; 240-249 - Section 8-A.

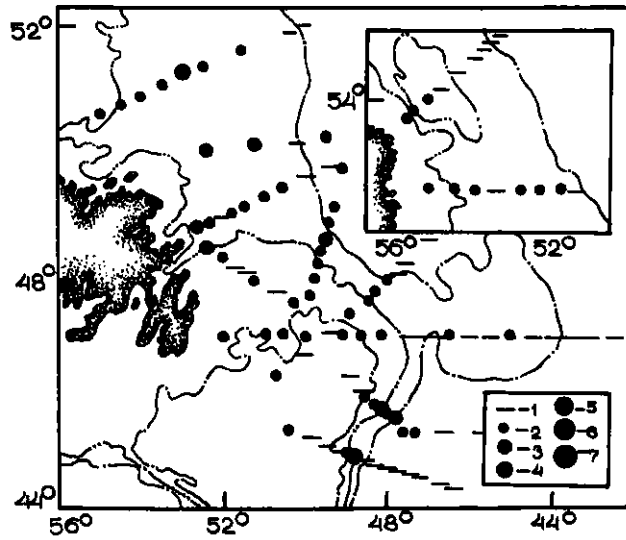


Fig. 2. Quantities of cod eggs; vertical hauls, 1973. Symbols: I. - no eggs; II - 1-10 eggs; III - 11-20 eggs; IV - 21-50 eggs; V - 51-100 eggs; VI - 101-200 eggs; VII - more than 201 eggs.

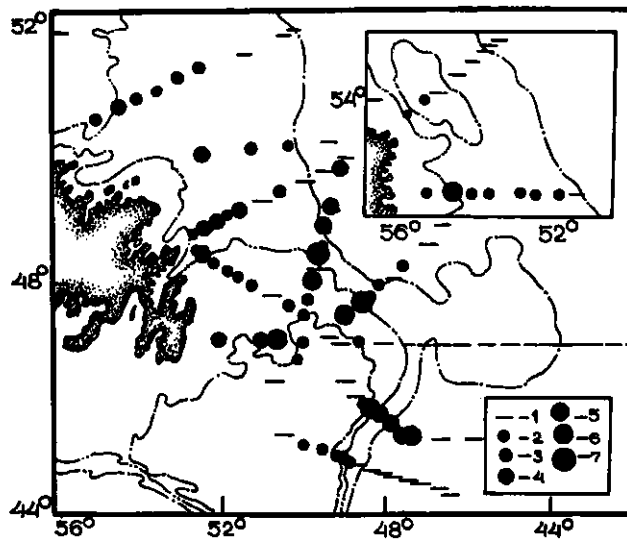


Fig. 3. Distribution of cod eggs; 50-0 m layer; oblique hauls, 1973 (symbols as in Fig. 2).

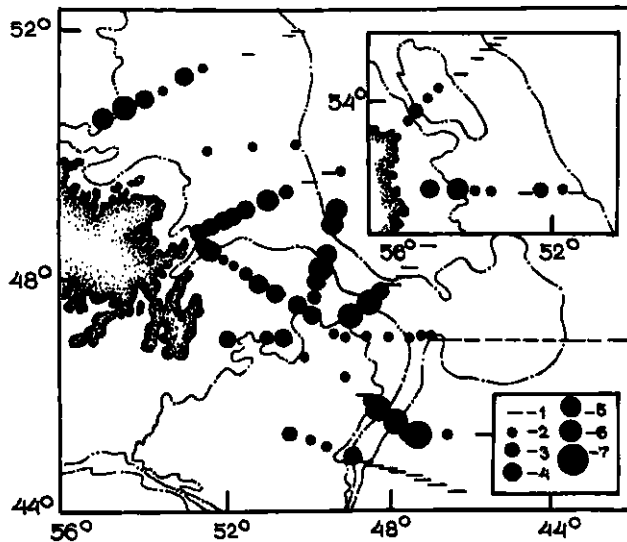


Fig. 4. Distribution of cod eggs; surface layer, 1973 (symbols as in Fig. 2).