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Report on the cruise carried out by the Spanish vessel "CIERZO" in the waters off Newfoundland, June-July 1955, by D. Olegario Rodriguez, biologist of the Dirección General de Pesca Marítima.

INTRODUCTION

This report deals with the third scientific cruise carried out by Spain in the waters off Newfoundland, in accordance with the Research Program elaborated by ICNAF.

The area investigated is on the southern part of the Grand Banks of Newfoundland (Subarea 3), between the northern latitudes 44°50' to 44°20' and between the western longitudes 51°31' and 50°02'.

The cruise took place in June and July 1955.

The otter trawler "CIERZO" was used for the investigations. This vessel has a length of 56 m., and the holds carry 1,000 tons of fish.

It is equipped with radio telegraphy and radio telephony, goniometer, echo sounder and fish lupe down to 600 m.

The trawl used was a Vigneron-Dahl trawl with slight modifications. The meshes in the trawl were measured during the cruise; a calibrator KLEINSCHAR INDUSTRIES, Model 28, Serial No. 10, with a pressure of ten lbs. was used.

Dimensions of meshes:

Cod-end (trawl used and wet).....113 mm.
The mouth of the trawl has an opening of 40 metres. 1)

The cod (*Gadus callarias* L.) and the haddock (*Melanogrammus aeglefinus* (L.)) were the object of study.

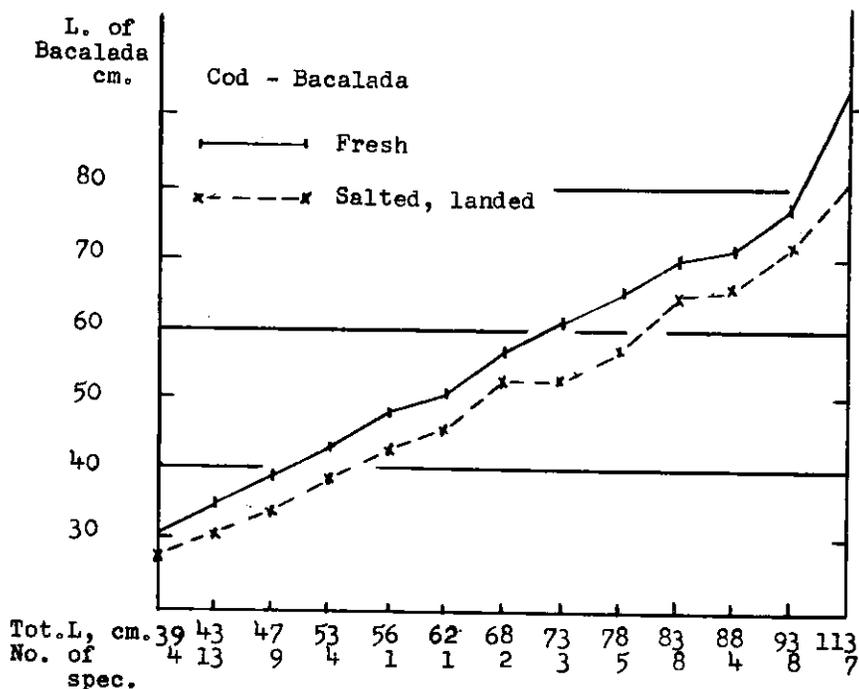
RELATION BETWEEN THE LENGTH OF THE FISH AS FRESH ROUND AND THE

DIMENSIONS OF THE BACALADA FRESH AND LANDED

The curves in the figure below give an idea of the relation between the length of the fish as fresh round and the dimensions of the bacalada (split cod) fresh and landed. It is seen that the total length of the bacalada suffers a notable decrease during salting. This decrease in length amounts to 3-5 cm. according to the length of the fish.

...../2.

- 1) The trawl used equals in dimensions and in mesh sizes that used during the Spanish researches in the year 1954.
(Executive Secretary)



SIZE OF FISH COMMERCIALY USED. CULLINGS.

In culling are used terms as large cod, medium cod and small cod. However, generally the length corresponding to each of these size categories is not defined.

As the cruise was carried out on board one of the vessels belonging to PYSBE we shall here deal with the categories for culling used by that firm. The control of the cullings is carried out by means of metallic sheets in various sizes and formed as a bacalada. Bacalada (verbally that which comes from the cod) is the Spanish name used for split cod (or other species of the cod group) as it appears from the stage when ready for salting. From measurements carried out we can give here the length of the fish as fresh round, corresponding to the dimensions of the metallic sheets used in the culling.

	<u>Dimensions of sheet</u>		<u>Length of fish fresh round</u>
	a	b	
Big	80	42	From 95 cm.
Big-medium	70	37	80-94 cm.
Medium	60	29	70-79 cm.
Small	50	27	60-69 cm.
Barajilla (Smallest)	45	26	50-59 cm.

...../3.

As a rule this classification is simplified to cover only three categories:

Big	80	42	from 95 cm.
Medium	60	29	from 70 cm.
Small			those below 69 cm.

The lowest minimum size of fish used varies around 40 cm., somewhat depending on personal judgement. However, the large experience of the crew hardly leaves room for personal deviations in cullings.

COD - SIZE

In March-April 1953, the cod captured was in general small. We have measured from the point of the snout to the hind margin of the tail fin, (600 specimens). The dominating sizes are from 36-55 cm., the most common size being from 41-50 cm.

In June-July 1954, the measurements were taken from the extreme anterior point of the snout to the central point of the hind margin of the tail fin (2,590 specimens).

If the observations from 1954 are compared with those from 1953 an increase of 10 cm. is observed in the average size of the cod caught. The real difference is a little more than the 10 cm. found, because in 1953 the measurements were taken to the extreme posterior margin of the caudal fin, whereas in this cruise the measurements were made to the central point of the hind margin, in order to comply with the norms used by the member countries of ICNAF.

In June-July 1955, the measurements were taken as in 1954. 2,475 specimens were measured. The maximum frequencies of sizes are found within the 55-65 cm. group (Figure 1).

If these observations are compared with those from the cruise in March-April 1953, and June-July 1954, a remarkable increase is observed in the average size of the cod caught (Fig.2).

The minimum commercial size of the cod is around 40 cm.

In the following these specimens are arranged as to length in 5 cm. groups:

cm.	freq.	%
26-30	4	0.16
31-35	44	1.17
36-40	184	7.4
41-45	227	9.1
46-50	277	11.1
51-55	359	14.5
56-60	416	16.8
61-65	402	16.2
66-70	235	9.7
71-75	147	5.9
76-80	79	3.2
81-85	40	1.6
86-90	20	0.8
91-95	13	0.52
96-100	4	0.16
101-105	10	0.4
106-110	6	0.24
111-115	8	0.32
2,475		

.....A.

COD - AGE

The otoliths were used for the study of age. When grouped by year classes it appears that in the fishing campaign of 1955, the 6 year old fish are dominant, making up 29% of the total catch. The 6 years old are those born in 1949. (Figure 3)

In 1954 the 5 year old fish were dominant, making up 32.7% (born in 1949).

In 1953 this year class was second in importance, making up 18% of the total catch.

The fact that this year class is the abundant one in the three years (1953-1954-1955) explains the increase in average size of the cod caught.

COD - STAGE OF MATURITY

By the end of June a significant part of the large cod had already spawned; all individuals of stage V. are cod of a size of 50 cm. or more.

The spawning principally takes place in April and May.

In a sample of 292 specimens (Table 1) the proportions of males and females differed somewhat; respectively 133 and 159 specimens (45.5% and 54.5%).

COD - FOOD

In 1953 (March-April) the stomachs contained crustaceans, molluscs, and various species of fish, mainly haddock, flatfish and small cod.

In the small cod the stomachs were often filled with capelin.

In 1954 and 1955 (June-July), the stomachs of the cod were found to be filled with capelin, which at this season of the year are completely mature and in spawning schools. This is in contrast to what was found in March-April, 1953.

TEMPERATURE OF WATER

In the first Spanish research cruise (March-April, 1953) it was found that 2°-3° C. was the optimum temperature for the cod, and 5°-6° the optimum temperature for the haddock.

In the second cruise (June-July 1954) the temperatures varied between 3.9° and 4.2° C., that is, they varied only three tenths of a degree.

In the third cruise (June-July 1955), at the bottom, where the fisheries is carried out, the temperatures varied between 2.5° and 5° C.

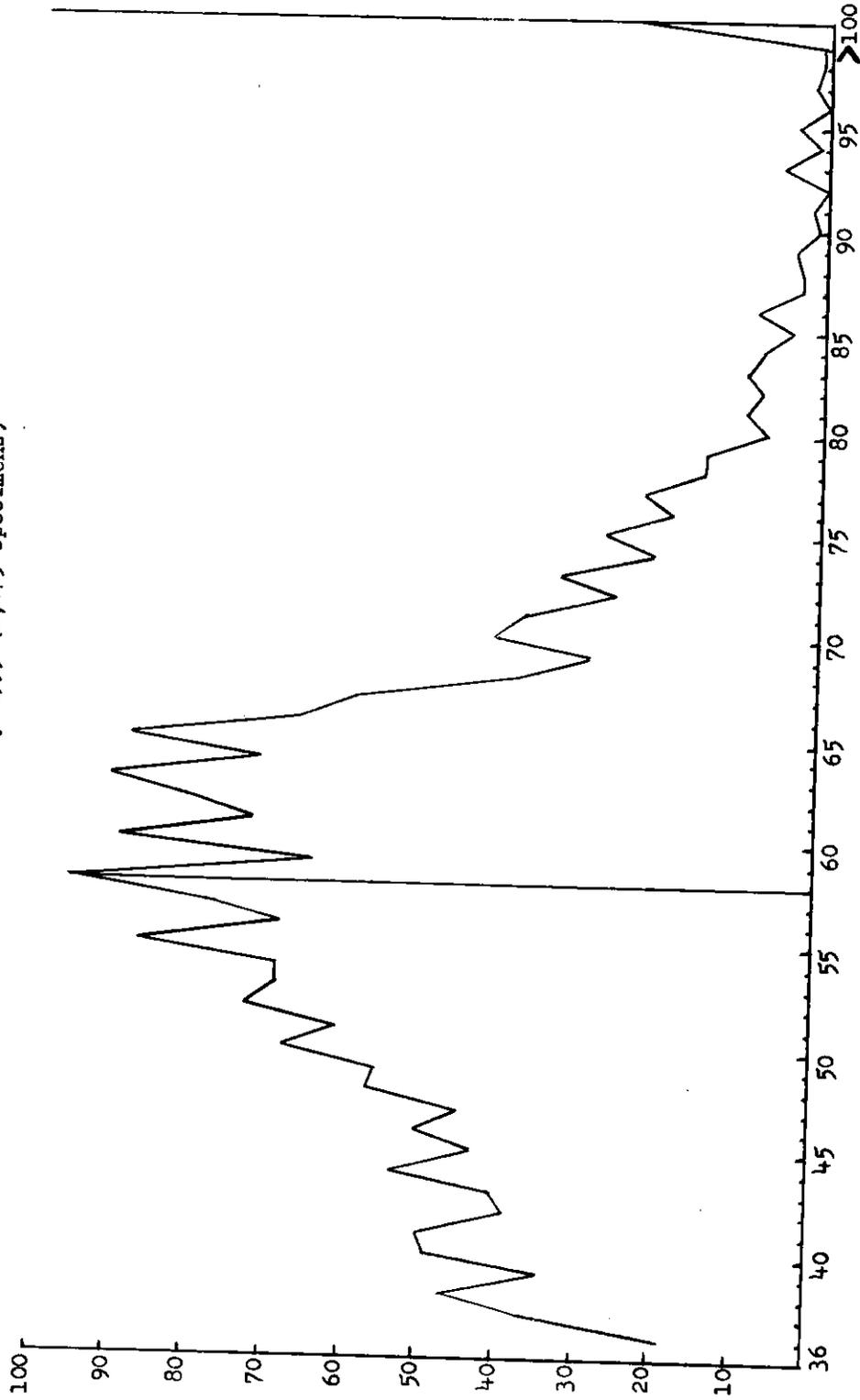
<u>Date</u>	<u>Temp°.</u>
1953 (March-April)	0.1°--6.2° C.
1954 (June-July)	3.9°--4.2° C.
1955 (June-July)	2.5°--5°

- THE END -

TABLE 1. COD - SIZE, SEX AND STAGE OF MATURITY

Stage of Maturity and Sex Groups	I		II		III		IV		V		VI		T O T A L S	
	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀
	General													
26-30		3												3
31-35	2	6											2	8
36-40	8	9											8	17
41-45	13	13	1										15	28
46-50	9	21	3	3	1		1						14	38
51-55	16	15	4	4	1		1		1			4	27	51
56-60	4	3	4	11	4	3	1		3			7	23	55
61-65	1			1	3	2	3		6	3	8	13	21	40
66-70					1	1			5	1	1	10	7	19
71-75						1	1	1	4	3	2	4	7	16
76-80					1		2		1		3	1	7	8
81-85									1	1		4	1	6
86-90										1				1
101-105									1			1	1	2
T O T A L S	53	70	12	21	12	6	9	1	22	9	25	52	133	159
	123		33		18		10		31		77		292	

Figure 1. Cod. Length frequency curve (by cms.) Grand Bank.
"CIERZO" June-July 1955 (2,475 specimens)



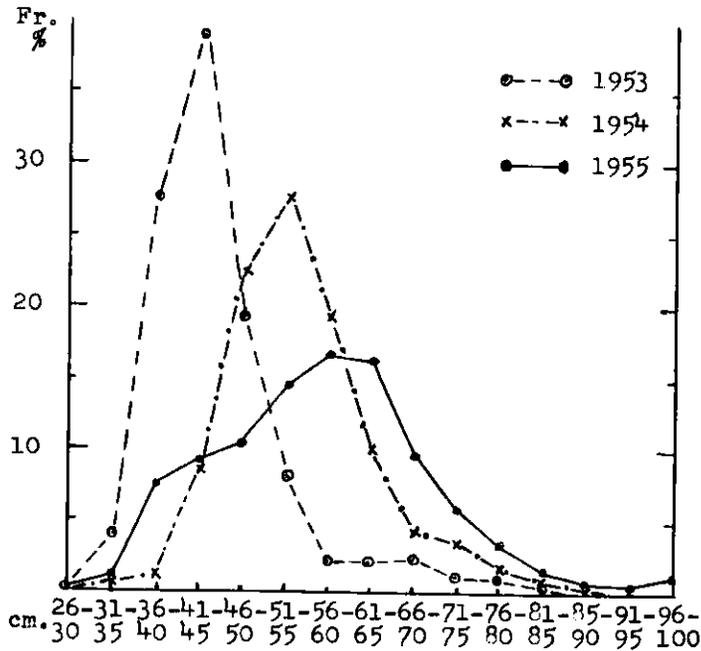


Figure 2. Cod. Length frequency curves for:
 1953 - March-April (600 specimens)
 1954 - June-July (2,590 ")
 1955 - June-July (2,475 ")

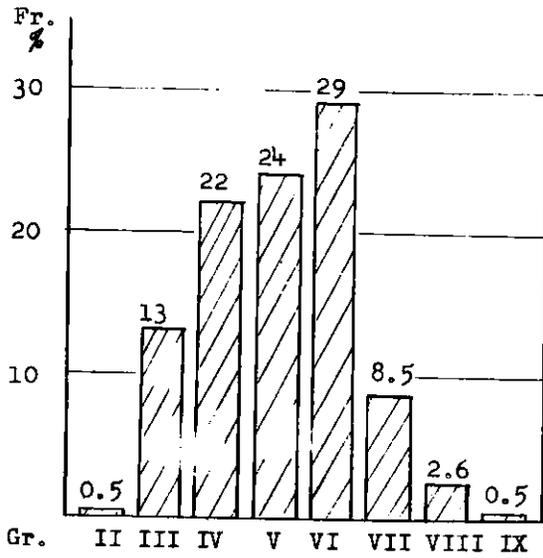


Figure 3. Cod. Age distribution in frequency percentages. Grand Bank, "Cierzo" June-July 1955 (187 specimens)

