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ON THE GROWTH OF THE LABRADOR COD

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The growth of fish greatly depends on the feeding conditions. The feeding conditions include not only the availability of food organisms but also the intensity of food digestion. The rise of temperature within the optimum norm results in a higher intensity of food digestion, and, consequently, in an increase of food consumption (Nikolsky, 1963). In other words, the temperature conditions influence the intensity of metabolism which accelerates or decelerates the growth of fish.

Ancellin was the first to pay attention to the fact that in 1935 the mean length of the southern Labrador cod at the same age was higher than that in 1952 (Ancellin, 1954). May (1966), studying the growth of cod in Subarea 2, came to the conclusion that in Div.2G and 2H the growth rate of cod did not change from 1959 to 1964. In Div. 2J the growth rate of cod in 1964 (particularly for ages above 7) was higher than that in previous years. Changes in the growth rate are explained by a higher intensity of fishing.

The present paper shows the growth of the Labrador cod from 1961 to 1966.

The age and growth of cod were studied by otholits. Age samples were collected by scouting and research vessels in areas of the Southern Labrador, nearer to the continental slope (depths from 250 to 320 m). The gear (bottom trawl) used by the vessels

were ahalogous to those used by the commercial trawlers.

To study the rate of growth of Labrador cod we used an actual mean length for age groups of the offshore waters of the Southern Labrador (Div. 2I) during April-May. Those data are representative of the whole Labrador cod, because in that period the cod spawning in the Northern Labrador mix with that part of the commercial stock which winters and spawns in the Southern Labrador (Postolaky, I964, I966).

As seen from Fig.I the mean length of cod of the same age changes by years. In April-May, I963 the mean length for ages 4-I0 was less than that in I962. On the contrary, in I966 the mean length for the same age increased as compared to that in I964, I965, but the length for ages above 6 did not reach the values of I962. The data cited above point out to asynchronous changes in the growth of different age groups. In I962 the length for ages below 7 was lesser and for ages 7-I0 was higher than that in I96I. Whereas in I964 the mean length for ages 4-7 increased and for ages 8-I0 declined as compared with that in I963.

The differencies in changes of growth of different age groups can be apparently explained by the fact that in the summer period elder age groups (7 or above) take food in the east coast of Newfoundland and south coast of the Labrador, and ages below 7 remain in the offshore areas of the Southern Labrador and the Northern Newfoundland Bank (Postolaky, I966), since the feeding conditions in the areas mentioned were apparently different.

Comparing growth of cod with the temperature conditions in the coastal and main streams of the Labrador Current one can see that the growth was the best in coastal and offshore waters of fattening area of cod.

The increase and decline in the mean linear sizes of cod caught in April-May are caused by growth in previous feeding season (Table 1). The characteristic of growth of cod in different years and the data on the thermal regime of the Labrador Current for July are given in Table 2.

Table I.

The mean linear sizes for April-May

Year	I96I		I962		I963		I964		I965		I966	
Age	M	n	M	n	M	n	M	n	M	n	M	n
4	36.00	6	3I.96	43	3I.37	8I	36.49	23	34.I5	30	39.55	I06
5	45.00	I7	42.9I	282	36.I0	95	38.03	I40	38.67	34	44.83	I85
6	48.20	54	47.2I	326	44.62	207	45.75	I50	45.30	82	47.89	II9
7	49.70	66	53.9I	I63	48.37	577	50.74	380	50.I5	77	52.I2	I0I
8	52.90	3I	55.94	I04	53.40	292	52.6I	327	53.75	I62	54.0I	39
9	54.90	32	59.30	76	56.62	I44	55.I2	75	55.90	I40	57.40	20
I0	57.40	7	6I.20	77	59.73	III	58.40	32	59.70	48	58.84	I8

As seen from the data cited growth of cod is in full agreement with the temperature regime.

Table 2.

Growth of cod and the temperature regime					
66	I96I	I962	I963	I964	I965
Main stream	cold	cold	warm	cold	warm
Characteristic of growth of 4-6(7) year olds	bad growth	bad growth	good growth	bad growth	good growth
Coastal stream	warm	cold	cold	warm	warm
Characteristic of growth of 7(8)-I0 year-olds	good growth	bad growth	bad growth	good growth	good growth

Thus, it can be noted that the temperature conditions in the feeding period resulting in the increase or reduction of metabolism are the main reason of the increase and decline in growth of the Labrador cod.

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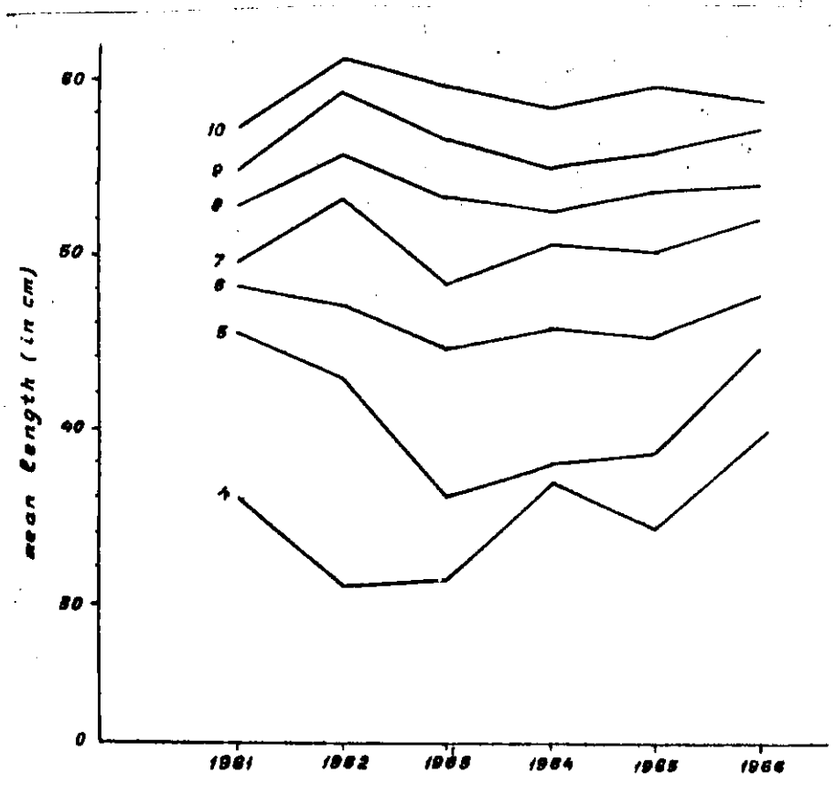

Fig.I - Growth of Labrador cod, I96I-I966.