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Survey of Haddock Eggs and Larvae in
the Northern Part of the North Sea
1969 and 1970

by

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Summary

Since the fluctuations in the brood strength depend on conditions of fish propagation and their survival at the earlier stages, it is necessary to study the abundance of these earlier stages (eggs and larvae)

In the North-East Atlantic Laboratory such studies were made on haddock in 1969 and 1970 in the North Sea. This included ichthyoplankton surveys in the spring period in the northern part of the sea, an area that holds the highest concentrations of spawning individuals.

These studies are aimed at determining the periods and efficiency of the spawning in the said area.

Our investigations have shown that the mass spawning of haddock in 1970 began later than in 1969. The estimate of the spawning efficiency of haddock by means of the number of eggs in April and larvae in May 1969 and 1970 suggests that the 1970 brood of haddock is much stronger than the 1969 brood.

In 1969 and 1970, AtlantNIRO made a survey of the abundance and distribution of haddock eggs and larvae in the northern part of the North Sea.

Ichthyoplankton observations were conducted in the area from 57°40'N to 61°00'N and from 04°30'W to 04°00'W.

Samples were taken by an egg net made of nylon (capron) gauze no. 140 with a mouth diameter of 80 cm, fishing in the layer of 100-0m and from bottom to surface at small depths.

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From 8 April to 12 June 1969 a total of 500 ichthyoplankton samples were collected and 204 samples were taken during the period of 28 March to 12 May 1970.

Table 1 gives data on the number of eggs and larvae sampled. The whole spawning area was divided into several subareas (Figure 1).

As can be seen from the Table, the highest number of eggs and larvae in the catches was observed in Subareas I and II. Consequently, both in 1969 and 1970 they were the main spawning grounds of haddock.

To determine the periods of mass spawning, the stages of egg development described by Rass (1949) were used (see Table 2).

The data in Table 2 indicate that in May 1969 the spawning intensity began to weaken (eggs of III stage prevailing), while in May 1970 a peak of spawning was observed (eggs of I-II stage made up 43%).

Studies of the size frequency of the eggs enable us to specify the periods of haddock spawning.

In April 1969, larvae of 7-8 mm in size were caught in great numbers (Figure 2). It should be noted that the incubation period of the eggs is three weeks on average and haddock larvae in the first month increase their length by 4-5 mm (Saville, 1956 and 1959). Therefore, it can be suggested that larvae of 7-8 mm in size hatched early in March.

The presence of large larvae (11-12 mm) in April 1969 indicates that the spawning of haddock had taken place as early as in February.

In the 1970 samples, larvae of 4.1 - 6.0mm prevailed, while large larvae of 8.0 mm were not found at all.

All these data suggest that the mass spawning of haddock took place earlier in 1969 than in 1970.

Comparing number of eggs and larvae caught in 1969 and 1970 (Tables 1 and 3), it should be noted that the abundance of eggs and larvae in 1970 was considerably higher than in 1969 and, consequently, we may suggest that the 1970 brood of haddock is stronger than the 1969 brood.

Thus, based on the above material, we can draw the following conclusions :

1. The main spawning of haddock took place in the Subareas I and II.
2. The mass spawning of haddock in 1969 was earlier than in 1970.
3. The estimate of the spawning efficiency made by means of number of eggs caught per station, suggest that the 1970 brood of haddock is considerably stronger than the 1969 brood.

References

- RASS, T.S., 1949. Ways of taxonomy of fish eggs and larvae and a nomenclature of their stages of development. Materials on propagation and development of fishes of the North Sea.
- SAVILLE, A., 1956. Eggs and larvae of haddock (Gadus aeglefinus, L.) at Faroe. Mar.Res. No. 4.
- SAVILLE, A., 1959. The planktonic stage of the haddock in Scottish waters. Mar.Res. No. 3.

TABLE 1. Number of eggs and larvae per station in April-May, 1969 and 1970

Date	Areas	1969							Date	1970							Relation of the 1969 - 1970 catches
		No. of stations			Eggs		Larvae			No. of stations			Eggs		Larvae		
		Total	with eggs	with larvae	Mean no.	Max.no.in catches	Mean no.	Max.no.in catches		Total	with eggs	with larvae	Mean no.	Max.no.in catches	Mean no.	Max. no.	
8-22 April	I	17	7	8	14.0	64	14.5	54	28 Mar. to 10 Apr.	18	13	4	39.4	248	0.7	6	1:3
	II	19	8	8	17.4	168	2.2	14		20	8	0	68.0	536	0	0	1:4
	III	18	11	3	11.5	132	2.0	46		24	8	3	33.8	500	0.4	6	1:3
	IV	20	2	0	1.0	18	0	0		27	15	3	35.2	186	0.4	6	1:35
3-13 May	I	17	1	5	0.23	4	2.0	30	30 Apr. to 12 May	18	14	14	11.1	84	20.8	88	1:20
	II	19	0	8	0	0	2.3	8		20	8	7	11.1	76	4.3	42	1:11
	III	18	6	6	3.2	10	1.6	12		24	12	6	27.7	216	5.4	102	1:9
	IV	20	7	0	4.1	2.4	0	0		27	10	16	1.6	20	3.3	30	4:1

TABLE 2. Quantity of haddock eggs (in numbers and %) by stages of development, April and May 1969-1970

Date	Stage of development	I-II	III	IV	Total
8-22 April 1969	No. of eggs	356	384	126	866
	%	41.0	44.5	14.5	100
3-13 May 1969	No. of eggs	36	92	12	140
	%	25.6	65.4	9.0	100
28 March- 10 April 1970	No. of eggs	1 146	614	260	2 020
	%	57.0	30.0	13.0	100
30 April- 12 May 1970	No. of eggs	274	186	176	636
	%	43.0	30.0	27.0	100

TABLE 3. Mean number of eggs and larvae per haul, 1969 and 1970

Time of observation	1969		Time of observation	1970	
	eggs	larvae		eggs	larvae
8-22 April	9.4	5.6	28 March- 10 April	43.0	0.3
3-13 May	1.7	1.6	30 April- 12 May	11.5	7.0

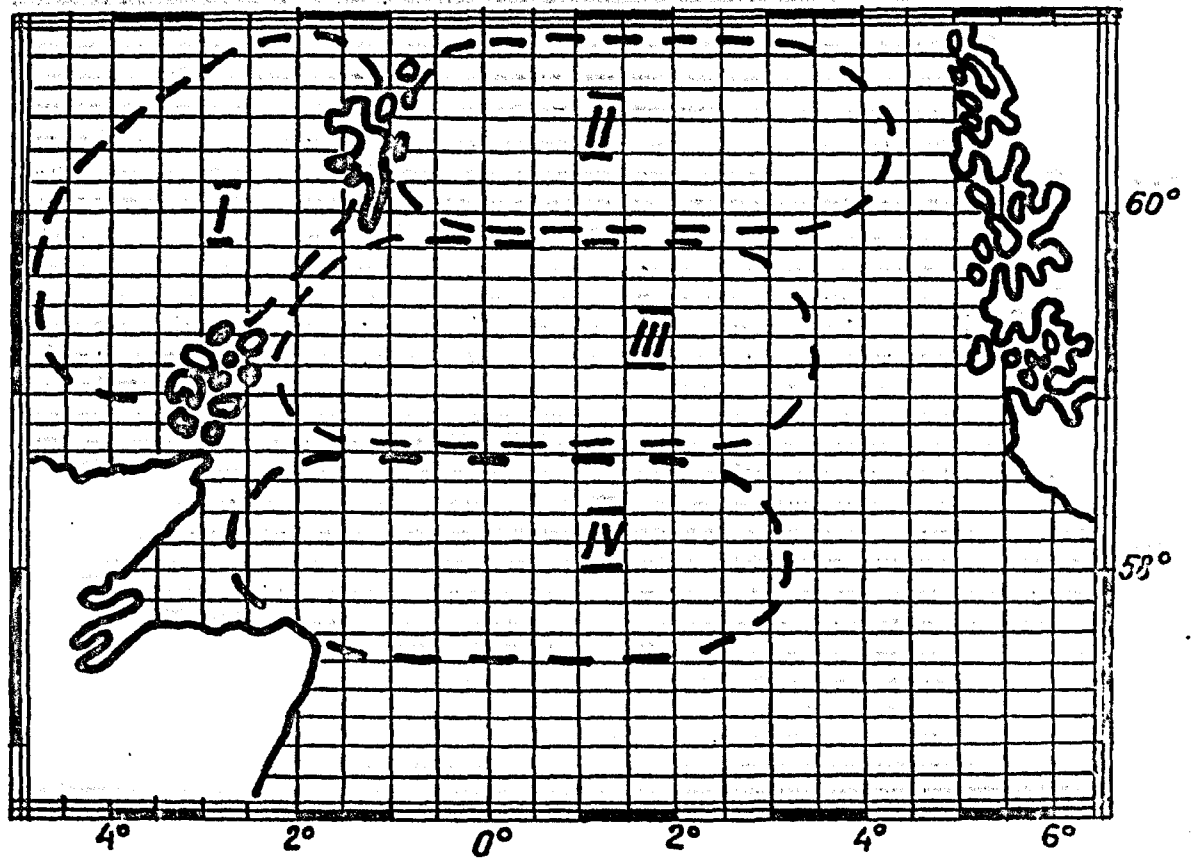


Figure 1. Division of the spawning area into subareas I, II, III, and IV.

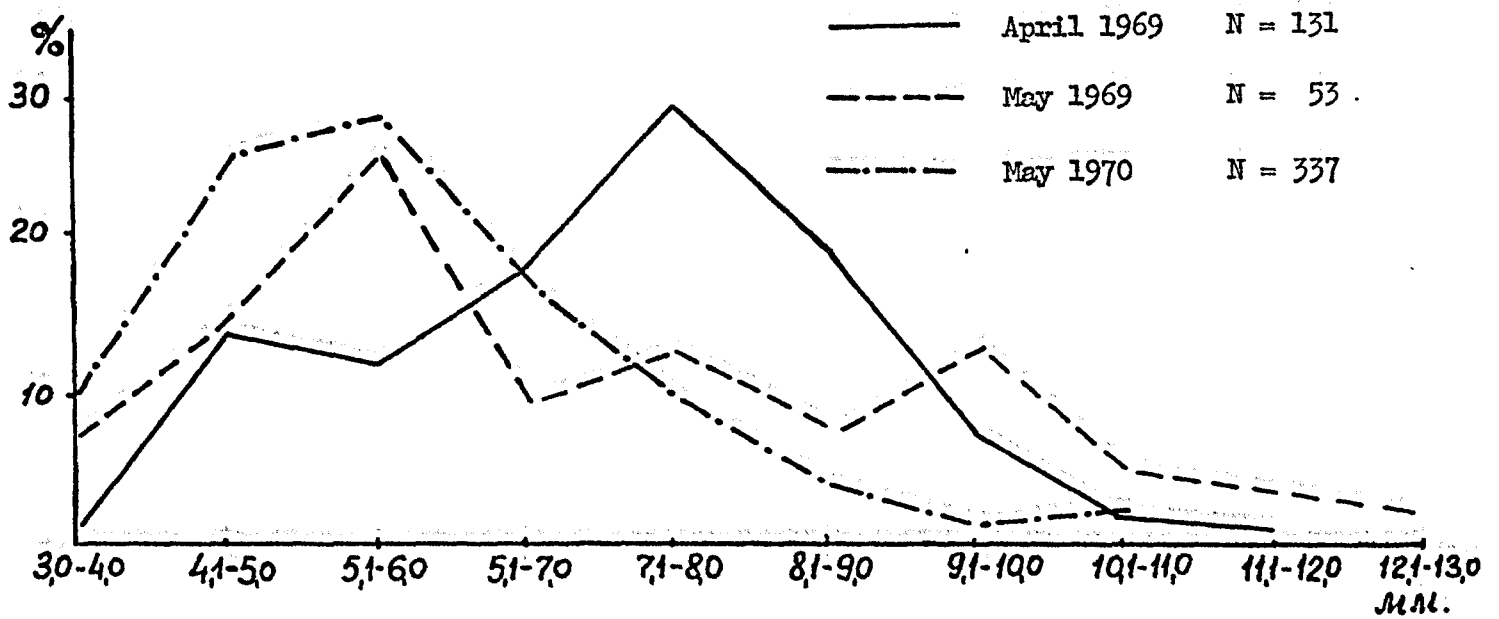


Figure 2. Size of haddock larvae in April-May 1969 and in May 1970.