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Baltic Fish Committee

The peculiarities of flounder spawning in the Baltic Sea

by Grauman G.B.

ANNOTATION

Sur la base des prises des échantillons d'ichtyoplancton de plusieurs années / 1969-1976 / dans la mer Baltique / dans les régions, situées entre Bornholme et l'île Saaremaa / il étaient déterminés les distinctions entre les delais de la ponte massive du flet / Pleuronectus flesus / . On note les differences incontestables des dimentions des larves du flet, pechés sur les profondeurs differentes / Voir tabl.4, bibl.2 /

Les recherches sur la réproduction du flet étaient faites dans la mer Baltique dans les régions entre Bornholme et l'île Saaremaa. Les oeufs et les larves étaient pris par le filet standart ichtyoplanctonique IKC-80. Il est fait les prises verticales du fond à la surface ainsi que les prises horisontales avec la circulation de bateau pendant 10 minutes.

Comme la ponte du flet est très étendue sur le plan d'eau de mer, les recherches étaient menées à part dans les régions

suivantes: Bornholme, Chtolpen, Gdagnsk, Gotland sud / entre 50°20′ et 56°oo N / , Gotland moyen / entre 56°oo et 58°00′ N / et Gotland nord / entre 58°00′ et 58°20′ N / . Les pontes notées se distinquent selon morphologie du fond, régime hydrologique et delais de la fraye. Il est déterminé les differences dans les delais de la fraye de flet meme entre les parties sud et nord du Creux de Gotland. Ces differences et l'isolation du flet pendant la période d'ontogén*ese peuvent stimuler la formation des stocks locals partiquliers.

Il est montr'e que dans la mer Baltique existent quelques populations isolées du flet avec les pontes dans les creux de grande profondeur / 1 / .

International Council for the Exploration of the Sea

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The peculiarities of flounder spawning in the Baltic Sea

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The investigations on flounder reproduction were carried out in the Baltic Sea from Bornholm area to the island Saaremaa. Eggs and larvae were sampled by the standard ichthyoplankton net IKS-80. Vertical sampling from the bottom to the surface and horizontal sampling at vessel circulation during 10-minutes were carried out.

Since flounder spawning takes place on vast sea aquatory the following areas were studied separately: Bornholm, Slupsk, Gdansk, Southern Gotland / from 55°20′ to 56°00′ N / , Middle Gotland / 56°00′-58°00′ N / and Northern Gotland / 58°00′-58°20′ N / . The mentioned spawning grounds differ according to bottom

x/ BaltNIIRH,
Daugavgrivas
Riga-49,
USSR.

morphology, hydrological regime and spawning periods. There are differences in spawning periods of flounder even between the southern and northern parts of Gotland Deep. The mentioned differences on the spawning grounds and isolation of flounder during ontogenesis may stimulate the formation of separete local stocks. It was stated that there are some isolated flounder populations in the Baltic Sea spawning in deep-water hollows / 1 / .

Flounder is the least abundant among main Baltic fishes having pelagic eggs; low percentage of its eggs and larvae in plankton testifies to it. / Table 1 /

Flounder eggs are observed in plankton from February to June in near-bottom layers of deep-water hollows. Their maximum abundance below $1m^2$ is observed in Bornholm area, minimum -in the area of the northern part of Gotland Deep / Table 1 / . With the advancement from the south-west / Bornholm and Gdansk areas / to the north / the middle and northern parts of Gotland Deep / the duration of spawning season is shorter by 1-2 months and mass spawning shifts to later periods: in the west in March-April and in the east in April-May / Table 2 / . Longer spawning period and higher abundance of eggs in western areas is apparently connected not only with better hydrological conditions / higher salinity, North Sea waters influxes and aeration of near bottom layers are more regular / but also with more abundant spawning stocks.

Flounder larvae can be caught during 5-6 months / Table 2 / . Their highest abundance in south-western areas is observed in May, in eastern -in June. Maximum abundance of small larvae / 3.5-4.0mm / in all areas, except the northern part of Gotland

Deep, is stated in March-April / Table 3 / . The Difference in larvae abundance between areas, as compared with eggs, is not considerable / Table 1 / . This testifies to a high dispersion of larvae on spawning grounds. After resolution of yolk sack larvae rise from near-bottom layers to surface where they can be observed from April to July. The lifting of larvae to surface layers is apparently connected with swimming bladder filling with air. Air was observed in swimming bladder of flunder larvae already on the 6^{th}-7^{th} day after hatching / 2 / . Prolonged inhabitting of flounder larvae in surface layers promotes their dispersion to great distances from the places of hatching. Surface currents determine the drift of flounder larvae after spawning. Small larvae inhabit not far from spawning grounds over great depths, bigger larvae-over smaller depths / Table 4 / . The difference in sizes of these larvae is statistically authentic.Larvae from 4 to 15mm are met in surface layers over the depth 50-150m. Bigger larvae inhabit shallow coastal areas.

References

1. Vitinsh M., Khoziosky S., Lishev M. Methods of research and dynamics of flounder stocks in the eastern and north-eastern parts of the Baltic and required measures of catch regulation.-"Fischerei-Forschung" , No.1, 1975.

2. Spectorova L. V., Doroshev S. I. , Popova V. P. The experiments on artificial reproduction of Black Sea flounder. -"Rybnoe khozyaistvo" , No. 5, 1975.

Summary

The differences in periods of flounder mass spawning were determined on the base of long-term ichtyoplankton samples / 1969-1976 / in the Baltic Sea / from Bornholm Area to the island Saaremaa/. Authentic differences in flounder larvae sizes sampled over different depths were observed.

Tables 4, Bibliogr. : 2 ref.

Table 1

Mean number of flounder eggs and larvae / spec./m^2 in 1969-1976

Spawning areas	Eggs number below $1m^2$/sp.	Larvae number below $1m^2$/sp.	Percentage of flounder eggs from the total number of eggs cought below $1m^2$	Percentage of flounder larvae from the total number of larvae below $1m^2$
Bornholm	14.0	6	5,3	23
Slupsk	11.0	5	3.0	18
Gdansk	6.0	6	0.8	13
Southern Gotland	4.5	3	2.5	14
Middle Gotland	5.0	4	4.0	21
Northern Gotland	2.0	2	3.9	36

Table 2

The number of flounder eggs and larvae /in % from the total number of eggs and larvae / in the areas from February to July 1969-1976

Areas	Eggs					Larvae				
	II	III	IV	V	VI	II	III	IV	V	VI	VII
Bornholm	8	28	48.5	11.5	4	0.6	1.0	17	46.2	34	1.2
Slupsk	-	48	32	20	-	-	6.3	3.5	70.6	18.2	1.4
Gdansk	-	31.5	42.5	26	-	-	0.7	4.0	49.0	37.6	8.7
Southern Gotland	-	14.4	42.8	42.8	-	-	3.8	11.6	21.6	60.0	11
Middle Gotland	-	17	58	25			0.9	14	21.7	57.3	6.1
Northern Gotland	-	-	40	50	10	-	-	1.6	3.8	59.5	35.1

Table 3

The number of flounder larvae 3.5-4.0mm in % from the number of all sizes larvae in different areas in 1969-1976

Months	Bornholm	Slupsk	Gdansk	Gotland		
				Southern	Middle	Northern
March	77	44		74	50	
April	53	40	6.1	57	48	40
May	9.5	14	7.5	15	24	43
June	3.5		3.5	8	3	4

Table 4

Mean sizes of flounder larvae / mm / over differnt depths

Areas	Depths	May, 1970		June, 1970		May, 1973		June, 1973	
		M	σ	M	σ	M	σ	M	σ
Bornholm	70-90	4.67	0.58			4.5	0.6	6.1	1.33
"	50-69	5.6	0.65			5.5	1.4	7.6	1.1
Gdansk	90-100	4.5	0.57	5.44	0.77	4.77	0.59	5.73	1.23
"	50-85	5.0	0.48	6.1	1.0	5.5	0.97	6.4	-
Southern part	90-110	4.6	0.64	5.28	0.72	4.7	-	7.0	1.4
of Gotland Deep	40-85	5.4	0.73	6.5	0.78	5.2	-	7.8	1.3
Middle part of	100-140	4.2	0.43	5.1	0.63	4.5	0.62	5.87	0.91
Gotland Deep	30-70	4.9	0.64	6.5	0.7	-	-	6.75	1.25

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