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OCCURRENCE OF MACKEREL EGGS IN ISHIKARI BAY, HOKKAIDO, IN JUNE, 1954, AS INVESTIGATED BY UNDERWAY PLANKTON CATCHER *

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Mackerel fishery is commonly carried on from June to July in the Ishikari Bay and the adjacent area off the west coast of Hokkaido when mackerels (*Scomber japonicus HOUTTUYN*) are concentrated there to spawn. In order to figure the distribution of mackerel eggs in this region the present brief research was undertaken in late June, 1954. The underway plankton catcher, model II, (Motoda, 1954) was towed from fishing boat while underway at about 9 knots for convenient duration ranging from 13 minutes to one hour along the course between each pair of hydrographic stations. It is proved from this brief trial tow that this method is useful for determining the distribution of the pelagic eggs in the surface water.

Counting the number of mackerel eggs was done by classifying them into two groups, viz., the eggs in blastodisc stage and those in more advanced stage (Motoda, 1955). Table 1 and figures 1 and 2 give the occurrence of those two stages of mackerel eggs in the collections. In the table and figures the number of occurrences was in all cases converted to the number in 100 cubic metres of water. The underway catcher used can filter 100 cubic metres of water during a tow of three hours and a half, assuming that the water passing through the mouth opening of catcher has completely filtered through the net inside.

It is shown from the figures that the eggs of early stage were abundant along the Takashima-Hamamasu line, particularly concentrated near Takashima, while the eggs of more advanced stage were present in considerable number off the northeast coast of the Shakotan Peninsula, and in small number along the Takashima-Hamamasu line. This indicates that, if there was no drift of the eggs by currents during the period of the present observations, the spawning of mackerels must have early taken place off the Shakotan Peninsula, and later near the Takashima and on the eastern coast of the bay. No eggs at all were found in the offing of the central region of the bay where the water was comparatively warmed up.

Takeuchi (1955) has counted the mackerel eggs in the samples taken by one metre fry net towed at the surface during the same cruise as the present sampling. He got less than 17 mackerel eggs per about 100 m^3 of water at the most at any one station, and even if the allied eggs were counted together, the largest number at anyone station was about 30. The present data show comparatively high value as compared with those

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data obtained by him.

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Table 1. Results of collections of mackerel eggs by underway catcher in Ishikari Bay in June, 1954

Date	Time	Range	Number of eggs in 100 m³ of water	
			Stage I	Stage II
20 June 1954	1 : 00 p.m.- 1 : 30 p.m.	Takashima-St. 1	246	28
21 June 1954	7 : 35 a.m.- 8 : 15 a.m.	Takashima-St. 1	127	102
〃	9 : 00 a.m.- 9 : 25 a.m.	St. 1 — St. 2	25	145
〃	10 : 20 a.m.-10 : 40 a.m.	St. 2 — St. 3	11	158
〃	11 : 50 a.m.-12 : 10 p.m.	St. 3 — St. 4	0	11
〃	12 : 57 p.m.- 1 : 15 p.m.	St. 4 — St. 5	0	0
〃	2 : 25 p.m.- 3 : 05 p.m.	St. 5 — St. 6	7	39
〃	4 : 00 p.m.- 4 : 35 p.m.	St. 6 — St. 7	0	0
〃	5 : 33 p.m.- 6 : 10 p.m.	St. 7 — St. 8	0	0
〃	7 : 05 p.m.- 7 : 33 p.m.	St. 8 — St. 9	0	0
〃	8 : 25 p.m.- 8 : 47 p.m.	St. 9 — St.10	0	0
〃	9 : 40 p.m.-10 : 05 p.m.	St.10 — St.11	7	0
〃	10 : 53 p.m.-11 : 30 p.m.	St.11 — St.12	0	0
22 June 1954	0 : 15 a.m.- 0 : 50 a.m.	St.12 — St.13	32	0
〃	7 : 25 a.m.- 7 : 46 a.m.	Hamamasu-St.14	21	0
〃	8 : 27 a.m.- 8 : 59 a.m.	St.14 — St.15	60	0
〃	9 : 42 a.m.-10 : 00 a.m.	St.15 — St.16	0	0
〃	11 : 03 a.m.-11 : 16 a.m.	St.16 — St.17	0	0
〃	12 : 03 p.m.-12 : 30 p.m.	St.17 — St.18	7	0
〃	1 : 18 p.m.- 1 : 43 p.m.	St.18 — St.19	42	0
23 June 1954	9 : 28 a.m.- 9 : 58 a.m.	Takashima-St.20	507	56
〃	10 : 03 a.m.-10 : 33 a.m.	St.20 — St.21	218	35
〃	10 : 45 a.m.-11 : 45 a.m.	St.21 — St.22	81	21
〃	12 : 00 m.-12 : 30 p.m.	St.22 — St.23	0	7
24 June 1954	9 : 30 a.m.-10 : 00 a.m.	St.23 — St.24	39	0
〃	10 : 10 a.m.-10 : 40 a.m.	St.24 — St.25	113	14
〃	10 : 45 a.m.-11 : 15 a.m.	St.25 — St.26	267	56
〃	11 : 20 a.m.-11 : 50 a.m.	St.26-Takashima	134	35

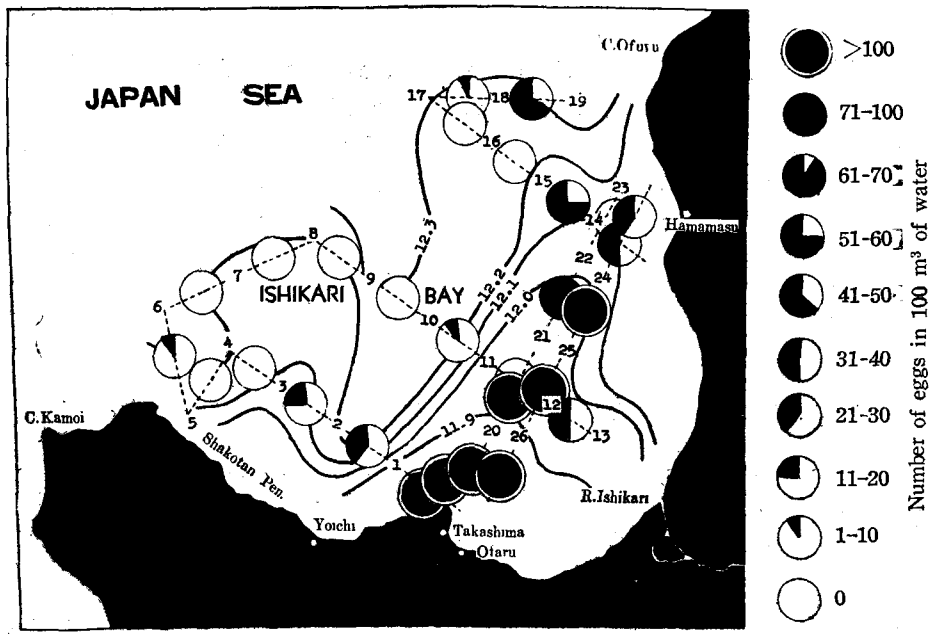

Fig. 1. Occurrence of mackerel eggs of early stage in Ishikari Bay in June, 1954. The number between the dashed lines indicates the hydrographic station and the black space in circle indicates the abundance of the eggs according to the rank given in the right. The isotherms (10 m layer) were provided by Prof. Inoue.

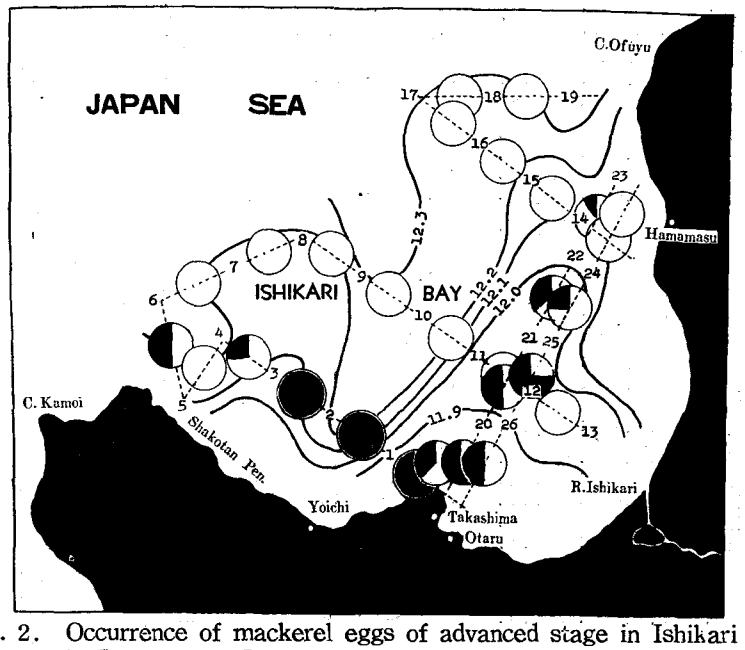

Fig. 2. Occurrence of mackerel eggs of advanced stage in Ishikari Bay in June, 1954. See the remarks in fig. 1.