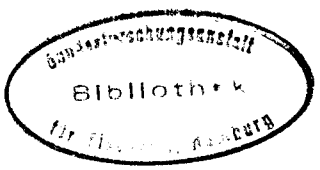
International Council for the Exploration of the Sea

C.M.1977/P:10
Baltic Fish Committee



ABUNDANCE OF SPRAT LARVAE IN THE NORTHERN BALTIC IN 1976

by

V. Sjöblom and R. Parmanne

Finnish Game and Fisheries Research Institute,
Fisheries Division, P.O. Box 193, SF-00131 Helsinki 13,
Finland

Abstract

In July - August of 1976 samples were taken with the modified Gulf V sampler. In the northern Baltic Sea proper the mean number of sprat larvae was 4.9 per m^2. The abundance of larvae was smaller in 1976 than in the preceding year, and in addition the larvae were smaller in size. Thus according to the larval samples the sprat year class 1976 is smaller than that of 1975 in the northern Baltic.

Résumé

En juillet - août 1976, échantillons ont été prélevés au moyen de Gulf V modifié. En moyenne 4.9 jeunes sprats au m^2 dans la partie nord de la mer Baltique proprement dite. Les larves des sprats étaient moins nombreux que l'annee précédente et ils étaient, de plus, plus petits, si bien que le nombre des sprats nés en 1976, sur la base des échantillons prélevés dans le nord de la mer Baltique, plus petit qu'en 1975.

Introduction

The main spawning areas of sprat in the Baltic Sea are the Gotland Deep, the Bay of Gdansk, the Stolpen Deep and the Bornholm area (GRAUMAN 1965). In the Bay of Gdansk, the spawning of sprat may begin as early as March and usually ends in July (ELWERTOWSKI 1960). In the northern Baltic, spawning occurs from the beginning of May to the end of September (MORAWA 1955). Sampling to estimate the abundance of sprat larvae in the northern Baltic was initiated by us in 1975 (SJÖBLOM & PARMANNE 1976). This report presents the results of sampling in 1976.

Material and methods

From July 27 to August 4, 1976, altogether 30 samples were taken from the northern Baltic Sea proper, the Åland Sea and the Gulf of Finland. Sprat larvae were obtained in 15 samples. The samples were taken with the modified Gulf V sampler (NELLEN & HEMPEL 1969) equipped with the "baby hai" for zooplankton sampling (cf. SCHNACK 1974). The mesh size of the larval net was 300 µm. Double oblique hauls were made at a towing speed of 5 knots from the surface to 5 - 10 m above the bottom. When the depth was more than 100 m, the sampler was lowered to 90 m only. The maximum towing time was 30 min. The sampling technique is described in our earlier report (SJÖBLOM & PARMANNE 1976).

Results

The 10 samples taken in the Gulf of Finland (ICES subdivision 32) yielded only one sprat larva. The samples from the northern Baltic Sea proper (29) contained 140 in all. The distribution of larvae is shown in Fig. 1. On the average, 4.9 larvae per m^2 were obtained in the northern Baltic Sea proper (5.4 in 1975). The maximum abundance, 13 larvae per m^2, was recorded on August 2 at $58^{\circ}45$ N $20^{\circ}00$ E.

The length distribution (%) of the sprat larvae in 1975 and 1976 was as follows:

length group (mm)	< 10	10 - 15	15 - 20	> 20
August 5 - 14, 1975	0	13.6	21.8	64.6
July 27 - August 4, 1976	12.1	52.5	25.5	9.9

Discussion

The results agree with the picture of the distribution of sprat larvae in the northern Baltic given by sampling in 1975 (SJÖBLOM & PARMANNE). The occurrence is insignificant in the Gulf of Finland and in the Åland Sea, while the northern Baltic Sea proper as far as the latitude 59°30 N is an important area of sprat larval production.

North of Gotland (58°N - 59.5°N), the abundance has generally been 1 - 5 larvae per m^2 (GRAUMAN 1972, GRAUMAN & POLIVAIKO 1975). However, comparison with the present results is hampered by differences in the sampling gears (cf. STEVENSON 1962, BLAXTER & HOLLIDAY 1963).

In the samples from 1975 most larvae were over 20 mm in length. In 1976 the length group 10 - 15 mm dominated. As, in addition, fewer larvae were obtained in 1976, the sprat year class 1976 appears to be smaller than the year class 1975 in the northern Baltic. Estimates of the abundance of young fish have also indicated that the sprat year class 1976 is poorer in that area than the year class 1975.

References

BLAXTER, J.H.S. & HOLLIDAY, F.G.T. 1963: The behaviour and physiology of herring and other clupeids. - In: Advances in marine biology (F.S. Russel, ed.) 1: 261-393. London and New York: Academic Press.

ELWERTOWSKI, J. 1960: Biologische Grundlagen der Sprottenfischerei in der Östlichen und mittleren Ostsee. - Fishereiforschung, Informationen für die Praxis 3(4): 1-19.

GRAUMAN, G.B. 1965: Some data on the reproduction of sprat in the southern part of the Baltic Sea in the period 1958 - 1964. - ICES, C.M. 1965, Baltic-Belt Seas Committee, No. 121: 1-8. (mimeo).

GRAUMAN, G.B. 1972: Studies of sprat spawning in the Baltic Sea in 1970. - Annls biol., Copenh., 27: 168-169.

GRAUMAN, G.B. 1974: Spawning of Baltic sprat in 1971 and 1972. - Annls biol., Copenh., 29: 154-155.

GRAUMAN, G.B. & POLIVAIKO, A.G. 1975: Composition of the spawning stock and spawning efficiency of Baltic sprat in 1973. - Annls. biol., Copenh., 30: 162-163.

MORAWA, F. 1955: Wachstum, Wachstumsbedingungen und Aufwuchsplätze des Sprottes (Clupea sprattus L.) in der Ostsee. - Xeitschr. f. Fischerei 4 N.F.: 101-136.

NELLEN, W. & HEMPEL, G. 1969: Versuche zur Fängigkeit des "Hai" und des modifizierten Gulf-V-Plankton-Samplers "Nackthai". - Ber. Dt. Wiss. Komm. Meeresforsch. 20: 141-154.

SCHNACK, D. 1974: On the biology of herring larvae in Schlei Fjord, western Baltic. - Rapp. P.-v. Réun. Cons. int. Explor. Mer 166: 114-123.

SJÖBLOM, V. & PARMANNE, R. 1976: Abundance of sprat larvae in the northern Baltic in 1975. - ICES, C.M. 1976, Baltic Fish Committee, Pap. P:13. (mimeo).

STEVENSON, J.C. 1962: Distribution and survival of herring larvae (Clupea pallasi Valenciennes) in British Columbia Waters. - J. Fish. Res. Bd. Can. 19: 735-810.

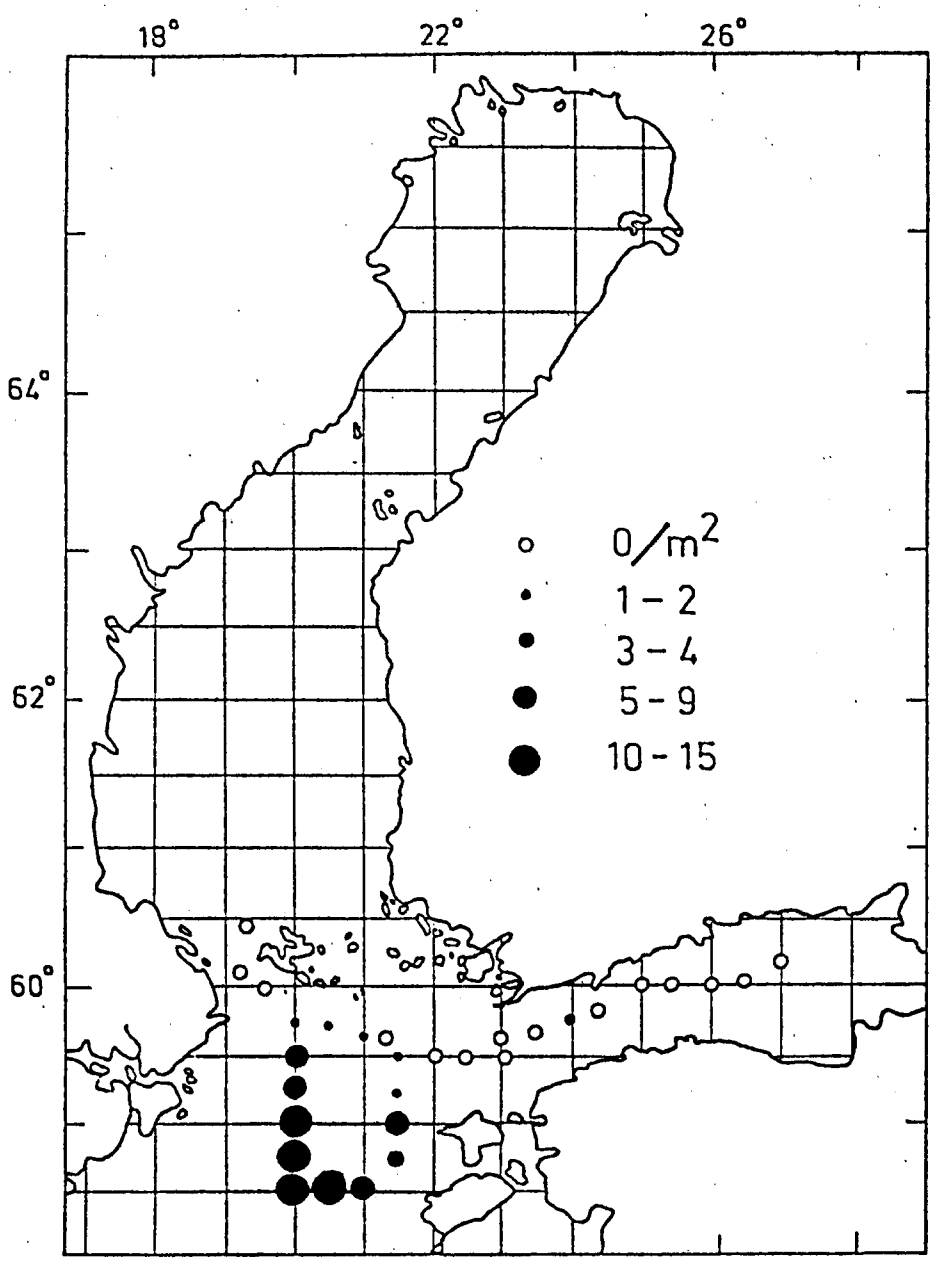


Fig. 1. Distribution of sprat larvae in the northern Baltic, July - August 1976.