

EFFECTS OF POLLUTION ON ABUNDANCE AND DISTRIBUTION
OF SARDINE EGGS (*Sardina pilchardus* WALBAUM) IN
IZMIR BAY (Aegean Sea, TURKEY)

by

Savaş MATER

Department of Biological Oceanography and Institute
of Hydrobiology, University of Ege, İzmir-Turkey

Résumé

Au cours de ce travail, effectué entre Octobre 1980 et Aout 1981, nous avons suivi l'influence de la pollution sur la fréquence et la distribution de 3814 oeufs de Sardine dans le Golfe d'Izmir. Si nous avons trouvé les oeufs aux stations se trouvant en zones pures, nous n'en avons par contre trouvé aucun en zones polluées et tres polluées. La mortalité totale se décompose comme suit: 86.4 % pour les zones polluées et 52.8 % pour les zones pures.

Summary

In this investigation, the effects of pollution are studied on abundance and distribution of 5819 sardine eggs collected from the Bay of Izmir during the period of October 1980-August 1981. No sardine eggs were found in maximally polluted and polluted zones. Maximal number of eggs have been collected from the clear zone. Total mortality of the eggs was 86.9 % in polluted regions and 52.8 % in clear waters.

Introduction

In Izmir Bay, one of the fishing centers of Turkey in the Aegean Sea, Sardines constitute quite a great stock and are heavily fished upon (according to the 1980 records, yearly catch is 240.000 kgs).

In recent years, gradually increasing pollution, especially in the inner Bay region, effect the survival of sardines, together with the other teleosts. In investigations carried out, from 1974 onwards (Mater 1976,1979,1980) it is understood that the abundance and distribution of teleost eggs and larvae gradually accumulate in progressively smaller areas.

This investigation is a continuation the previous ones.

Methods

During the period of October 1980 - August 1981, our studies have been carried-out at the 10 stations, their selection was based on the geographical position of the Bay, and especially in the inner Bay region, the gradually decreasing effects of pollution from east to west, could be seen.

A one-meter diameter Hensen-type plankton net was used in horizontal hauls. Each haul was carried out for 10 minutes.

Results

During a period of nearly one year, 3814 eggs have been collected. In 1st, 2nd and 3rd stations situated in the maximally polluted and polluted zones no sardine eggs were found, and 154 eggs were collected from the 4th and 5th stations which are situated in the subnormal zone.

The number of eggs collected from the 6th station in the intermediate zone is 45, the remaining 3615 eggs were collected from the other 4 stations.

The total mortality of the eggs collected from the polluted zone was 86.4 %, that of the clear zone was 52.8 %.

The mortalities have been seen especially in 4th and 5th stage eggs, before the closure of the blastophore. The majority of the dead eggs belongs to the 5th stage. Mortality ratios were examined according to the different months of the year and it has been found that during May and June there is a decrease in mortality in all stages, on the other hand, during the cold months of the year, there has been an increase in mortality, especially in later stages.

The spawning period of sardines in Izmir Bay is from late November until the end of July, with the most dense spawning between December and March.

As a result we can say that with every passing day there is an increase in pollution of the waters of Izmir Bay and a decrease in the dimensions of the spawning region of sardines. This of course effects the new generations which will join the main population. As a result, a decrease in the size of the stock should be expected. The records of Izmir fisheries support our findings and views. Furthermore, in contrast to the decrease seen in the sardine stock in the Bay, there is an increase in the stock of anchovies, which is more resistant toward the effects of pollution.

