

POLLUTION EFFECTS ON THE DISTRIBUTION AND  
ABUNDANCE OF TELEOST FISH EGGS IN  
IZMIR BAY (Aegean Sea , TURKEY)

by  
Savaş WATER

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

### Résumé

Avec ce travail effectué au cours de 1978-1979, nous avons étudié l'influence de la pollution et la distribution des oeufs de poissons Teleost dans le Baie d'Izmir, dont on a recueilli 22454 oeufs appartiennent à 46 espèces. Pour ce but, nous avons choisi 5 stations de pêche et nous avons utilisé de filet de type Hensen.

### Summary

In this survey, the effect of pollution on the distribution and abundance of 22454 Teleost eggs belonging to 46 species collected from the Bay of Izmir between 1978 and 1979, is investigated. Hensen type plankton nets were used at the 5 stations chosen for this investigation.

### Introduction

The Bay of Izmir, the biggest of the Aegean Bays and the most densely populated, is in recent years under the effect of gradually increasing heavy pollution.

In the Bay, which includes many fisheries (Homa, Çakalburnu, Ragıppaşa), many teleost fish species have a good opportunity to feed, grow and reproduce. In our survey beginning in 1974, we are investigating the teleost fishes spawning in the Bay, their spawning regions and the effects of pollution on spawning.

The same survey also includes the qualitative and quantitative distribution of teleost eggs, based on an ichthyoplanktonic investigation done in Izmir Bay in 1978 and 1979.

### Methods

From the 5 stations established in the Bay in 1978 and 1979, Ichthyoplankton samples were collected monthly.

The samples were collected by means of a Hensen type plankton net of 1 m diameter, with an approximate mesh - size of 400  $\mu$ . Surface hauls were made.

### Results

In the two years survey of Izmir Bay 22484 eggs belonging to 42 Teleost species were collected. From our 1st. station situated at the halkapınar stream which is the most polluted zone, only 837 eggs were collected belonging to 3 species. When we looked upon the seasonal distribution of those eggs we found that there were none in the winter period and samples were present in spring, summer and autumn periods. Maximal density was observed in summer and autumn periods. Of the collected eggs 95.2% were *E. encrasicholus*, 3.2% *B. luteum*, 1.6% *Arnoglossus* sp.

The second station situated in the polluted zone includes 8574 eggs belonging to 5 species. Maximum number of eggs were obtained in summer. 98.6% of the collected eggs belong to *E. encrasicholus*. The remaining 1.4% includes *B. luteum*, *Arnoglossus* sp., *D. annularis*, *Callionymus* sp. eggs.

The 3rd. station was selected from the subnormal zone. 2380 eggs belonging to 10 species were collected between Karşıyaka and Konak, 43.6% of the eggs belong to *Callionymus* sp., 34.1% to *E. encrasicholus*, etc.

From 4 th. station at the lighthouses of Yenikale, which is situated in the intermediated zone, 4854 eggs belonging to 24 teleost species were collected. 56.2% of the eggs belong to *E. encrasicholus*, 12.2 % belong to 3 species of family Soleidae, etc.

The clean zone consists of quite a wide spread area. Almost the whole outer harbour is included in this zone. It was possible to collect eggs samples from the Gülbahçe ray, which was chosen as a pilot area, during every season of the year. 5839 eggs were collected belonging to 36 species; 29.7 % of the sample belongs to 11 species of the Sparidae family, 20.6 % belongs to *E. encrasicholus*, 16.7 % belongs to 5 species of the Serranidae family, etc.

#### Discussion

The results of the annually collected samples from 5 different zones of the Bay of Izmir show that there is an increase in the number of spawning species from the inner bay towards the outer bay. In the inner bay, especially at the maximal polluted and polluted zones, it was possible to find eggs of 3 and 5 species respectively. The most tolerant species to pollution is apparently anchovy. We can say that *Callionymus* is an other species which is also tolerant to pollution to some degree.

Compared with an economically important anchovy, *Callionymus* sp. is an economically unimportant fish which reach a maximum length of 6-7 cm. and dwell on the bottom. It was possible to collect eggs of economically important pelagic and semipelagic fishes belonging to the families Sparidae, Serranidae, Soleidae, Mugilidae, and Mullidae as soon as the effects of the pollution decreased.

However, the unexpected abundance observed on the number of eggs, especially in the polluted zone was significant. 98.6% of the egg samples collected from this zone belong to Anchovy. This is quite normal, as also well known from literature that Anchovy eggs are very tolerant to pollution. However, their mortality rate at this locality was quite high at 78.3%.

It is also possible to connect the gradual quantitative decrease of the Izmir Bays most important pelagic species sardine and the increase of anchovy to the effects of pollution. As can be seen from our results, only a little number of sardine eggs were recorded from the intermediary zone and the clear zone.

#### Bibliography

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