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Ichthyoplankton of the Egyptian Mediterranean waters IV- Distribution and occurrence of Mullet Larvae

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The seasonal and spatial distribution and abundance of mullet larvae and fry along the Egyptian Mediterranean coast were studied during the period from January 1982 to October 1984. The stations sampled and the study area are described by El-Rashidy and Dowidar (1990) in this volume.

A total of 859 mullet larvae occurred in the ichthyoplankton samples collected throughout the period of study. The larvae of Mugil cephalus and Liza saliens were observed in plankton samples throughout the period from July to November. As judged from the length frequency of the recorded larvae, it may be concluded that spawning of both species may begin during June and ends in late October - early November. The surface water temperature during this period varied between 21.5° and 28.4° C. These results are in accordance with the spawning seasons determined for both species by various authors from the study of gonad maturation (Rafail, 1968; Abdel Hamid, 1969; Youssef, 1973). Figure (1-A) describes the abundance and spatial distribution of the larvae of M. cephalus and L. saliens which revealed that they mostly spawn in coastal waters particularly in the eastern area (Burullus - Arish), at depths ranging from 20 to 50 m, and a distance of 3.5 - 10 km from the coast.

The larvae of Liza ramada were recorded throughout the period from November to April, contributing about 94% of the mullet larvae recorded during November. The length frequency of the larvae may indicate that the breeding of L. ramada begins in November and probably ends in March with the peak in late November to early December. The surface water temperature varied between 17.7 and 21.5° C. This agrees with the spawning time given by other authors working on the gonad maturation of the fish (El-Sedfy, 1971; Youssef, 1973; El Maghraby et al., 1974). The pattern of distribution of L. ramada larvae (Figure 1 :B & C) shows that the small larvae up till 7 mm were dominant in the offshore and middle zones. This indicates that L. ramada spawns at a distance of 15 - 27 km from the coast covering depths from about 50 to 200 m, during November and December. At the end of the spawning season in February, the larger fry (19 - 29 mm) were recorded in the coastal waters of Damietta and El-Diba, i.e. attracted to shallower depths at drain outlets and estuaries with relatively lower salinities. Our study reveals that M. cephalus larvae were less abundant than those of L. ramada; the later species constituted about 90% of all mullet larvae recorded. Such depletion of M. cephalus larvae may be attributed to the intensive fishing of these larvae for raising in fish farms. Approximately 20 million fry are collected annually from the coastal waters adjoining fresh and brackish water outlets particularly from El-Mex area. This process, in addition to fishing of the sexually mature fish during their spawning migration from the delta lakes to the sea, has undoubtly exhausted the mullet stock in the Egyptian Mediterranean waters. Further more the increasing rate of pollution of the coastal waters particularly in the areas of larval attraction may affect the larval occurrence.

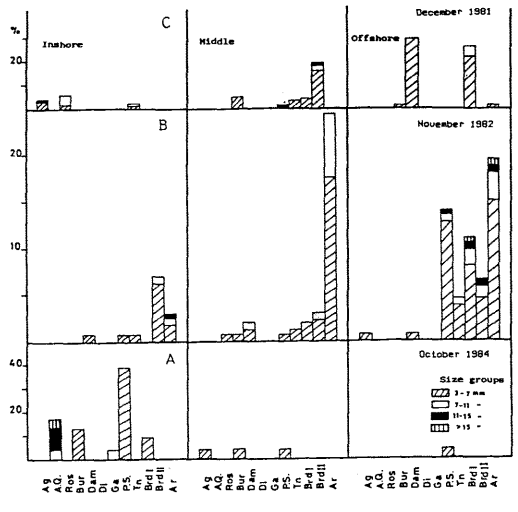

Figure 1 : Distribution and abundance of the different size groups of total mullet larvae.

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The Development Rates of European Pilchard (*Sardina pilchardus* Walb. 1792) Eggs

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Using a Bongo-Net, pilchards eggs were collected at the peak of the spawning in İzmir Bay in February 1990. The eggs were roughly seperated from plankton on board and transported to land laboratuary as soon as possible in 6°C. The eggs were sorted according to theirs stages under dissecting microscope in the laboratuary. The earliest stages were Ib 2 taken to three different temperature regimes (13 - 16 - 19 °C). It was estimated that the spawning time of pilchard is between 1900 and 2100 hours (PEREZ and RODRIGUEZ, 1988 ; CIHANGIR (in prep.)). Eggs have been sampled during twilight (1600 - 1900 h.), the sea water temperature was 14 °C at 20 meter depth. It was assumed that youngest captured eggs were 15-18 hours old. In laboratuary experiments, hatching occured in 75 h at 13°C, in 60 h at 16°C and in 55 h at 19°C (Fig.1) (the incubatores were fluctuated to 0.5 - 1.0°C during the experiment). These results are proximate to RUSSEL (1976).

Stages description were adapted from MOSER and AHLSTROM (1985) and ALHEIT et al. (1987).

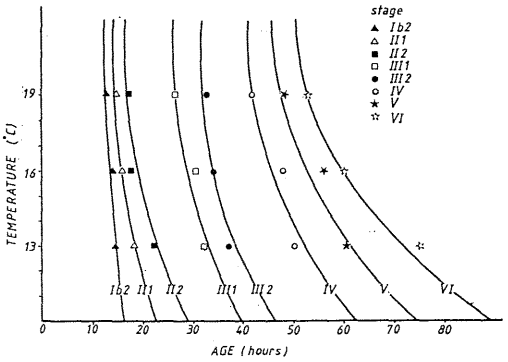
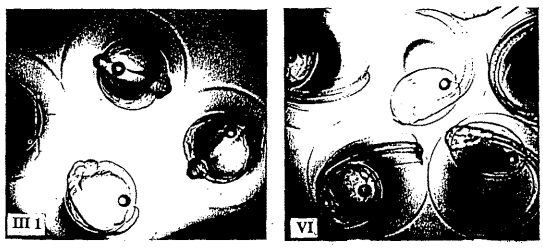


Figure 1. Development rates of pilchard eggs under different temperature regimes.



Various stages of pilchard eggs.

Description of Stages

Ia 1 From fertilization to 64-cell stages.
Ia 2 Formation of the blastodisc.
Ia 3 Formation of the blastodisc as a lense.
Ib 1 Progression of blastoderm until yolk is covered up by 1/2.
Ib 2 Progression of blastoderm until yolk is covered up by 3/4.
II 1 Progression of blastoderm until yolk is covered up by 3/4, blastopore open.
II 2 Blastopore closed. The head region of the embryo apparent.
III 1 Tail starts to seperate from the yolk. The length of the free tail is smaller or equal than 1/2 the head length.
III 2 The length of the free tail is greater than 1/2 the head length.
IV The tail extened 1/4 the length of the yolk sac.
V The tail extened 1/2 the length of the yolk sac.
VI The tail length greater than 3/4 of the length of the yolk sac and hatching.

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