

PRELIMINARY NOTES ON THE EGGS, LARVAE,
AND SPAWNING OF THE SPANISH MACKEREL
[*SCOMBER COLIAS* (GMELIN)] IN THE SEA OF MARMARA

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The spanish mackerel (*Scomber* or *Pneumatophorus colias*) has a wide distribution. It is found in the Mediterranean Sea and the Atlantic Ocean as well as in the Pacific Ocean where the populations are usually separated specifically or subspecifically (*P. diego*, *P. peruannus*, *P. japonicus*, *P. australasicus*).

Little is known about the eggs, larvae, and spawning of this fish except for *P. diego* AYRES (FRY, 1936, ROEDEL, 1945). Present knowledge concerning *S.* or *P. colias* which is found in the Mediterranean Sea and the Atlantic Ocean, is confined to the post-larvae in the 9,1 mm and 11 mm stages. These were caught by R. V. «Thor» in the Mediterranean and were attributed with question marks to *S. colias* by EHRENBAUM (1920) who examined them.

Our ichthyoplanktonic researches carried out in the Sea of Marmara during the period 1954-1959 enabled us to identify the eggs and larvae and to show clearly the spawning habits of the Spanish mackerel in that Sea.

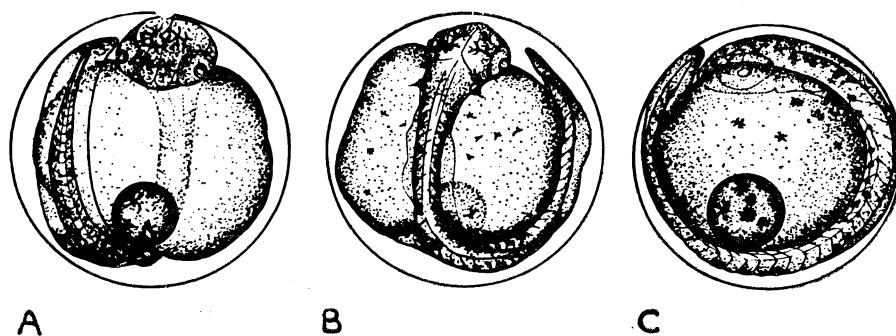


FIG. 1. — The eggs of the Spanish mackerel from the Sea of Marmara (in A, B the diameter of egg 1,15 mm, the diameter of oil droplet 0,265 mm; in C the diameter of egg 1,10 mm, the diameter of oil droplet 0,29 mm).

As it will be shown in the following description, the eggs and larvae of the Spanish mackerel examined from the Sea of Marmara closely resemble the eggs and larvae of the Pacific mackerel (*P. diego*) and they are also similar in some respects to the eggs and larvae of the Common mackerel (*Sc. scomber* L.) which is the closest ally of the Spanish mackerel in the Sea of Marmara.

The eggs of the Spanish mackerel caught in the plankton of the Sea of Marmara are spherical, transparent, and, with the exception of their oil droplets, colourless. The shell of the egg is elastic and smooth and it protects a homogeneous yolk with an oil droplet at its upper surface. From the measurement of 1430 eggs, their diameters were found to vary between 0,92-1,21 mm TUGGAÇ's (1957) figure for the diameter of the unfertilized but ripe eggs extracted from the ovaries of spawning fishes from the Sea of Marmara is 0,92-1,25 mm. A comparison of these values with the data given for the eggs of the Pacific mackerel by FRY (1936) and AHLSTROM (1956) shows that the latter eggs have a little wider size variation and larger mean size.

LISSNER (1939) discussing the size of the Common mackerel eggs from the Mediterranean compared with the eggs from the north Sea suggests that the eggs from the Mediterranean

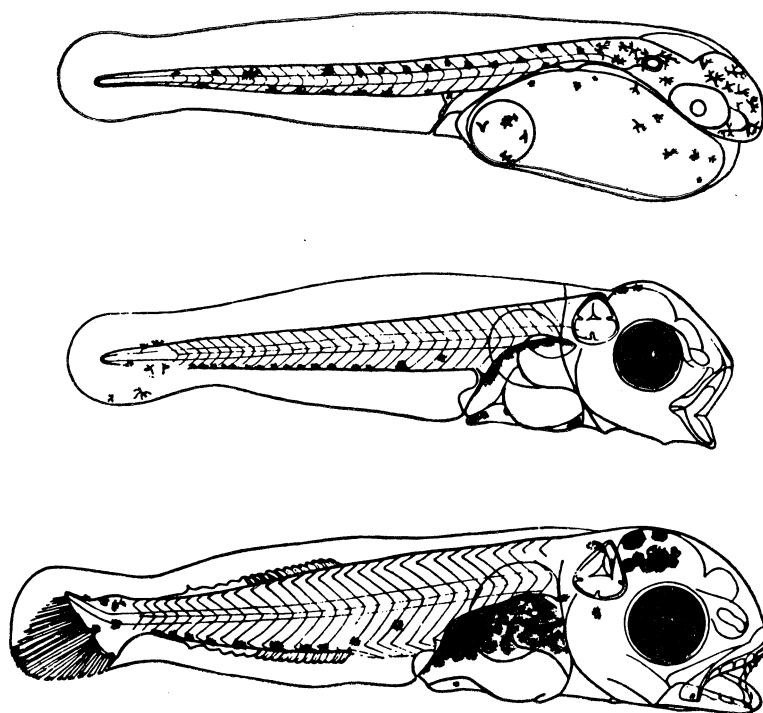


FIG. 2, 3 et 4. — Spanish mackerel from the sea of Marmara. Fig. 2 (upper): the prelarva, 2,74 mm in length; Fig. 3 et 4 (lower): post-larva, 5,2 and 7,8 mm in length.

may be confused with the eggs of the Spanish mackerel. This author must have been under the impression that the eggs of the Spanish mackerel are smaller than the eggs of the Common mackerel. However, we know that the eggs of the Common mackerel of the Sea of Marmara have diameters varying between 0,87-1,20 mm. (ARIM, 1957, DEMIR and ARIM, 1957). So we can say that the eggs of the Spanish mackerel are never smaller than the Common mackerel eggs, at least in that Sea. The diameters of the oil-droplets vary between 0,27-0,316 mm in the eggs of the Spanish mackerel and between 0,25-0,35 mm in the eggs of the Common mackerel. However, the diametric differences between both eggs and oil-droplets of the Spanish and Common mackerel are so minute. They can never serve to distinguish the eggs

of these two species. The only reliable differentiation is the development of some melanophores on the yolk sacs of the eggs of the Spanish mackerel with advanced embryo (fig. 1), while none develop on the yolk sacs of the Common mackerel.

The smallest prelarva we caught had a length of 2,74 mm and a yolk sac oval in shape. The oil-droplet was located at the posterior end of the yolk sac (fig. 2). These characteristics are also peculiar to the young prelarvae of the Common mackerel and even of some other fishes, but the prelarvae of the Spanish mackerel, like the prelarvae of Pacific mackerel, have chromatophores on their yolk sacs (fig. 2).

The smallest post-larva in our collections has a length of 4,2 mm. In figure 3, however, there is presented a slightly larger one, the length of which measures 5,2 mm.

The largest post-larva we could obtain was 7,8 mm in length (fig. 4). The appearance at this stage of buds which are the initial stages in the growth of the pelvic (ventral) fins is worthy of note because they do not appear in the Common mackerel before the larva has reached a length of 13 mm.

As the yellow pigmentation has disappeared from our preserved specimens we are unable to discuss this characteristic. All the other characteristics we have observed on the eggs and larvae of the Spanish mackerel but not mentioned in the text are shown in the figures.

The Spanish mackerel which appears to be plentiful, especially in the summer months, in the Sea of Marmara, reproduce in that Sea. According to TUGGAÇ (1957), who examined the sexual maturity of this fish, the spawning takes place from the beginning of June to the end of July. ATLI's opinion is that spawning usually begins to intensify in June and lasts until the middle of August (1959), spawning begins at the end of June and lasts until the middle of August (1960). During our planktonic researches, begun in 1954, the earliest date on which we caught the Spanish mackerel eggs in the plankton of the Sea of Marmara was 16th. June, 1955, and the latest date was 14th. August, 1958.

So we can conclude from the above statements that the spawning period of the Spanish mackerel in the Sea of Marmara is June-August. As to the exact beginning of the spawning in June, and ending of which in August are probably dependent to the years, and they may vary between the beginning and ending of these months.

The spawning areas cover the neritic waters where the total depths vary between 15-250 m. However, the largest numbers of eggs and larvae per haul were caught in those areas having a depth of 40-100 m.

We have not yet detailed knowledge concerning the ranges of the vertical distributions of the eggs and larvae. We have observed, however, that the vertical hauls which were made from the depths of 80-100 m up to the surface contained more eggs and larvae than the hauls which were made from the 30-40 m depths up to the surface at the same regions.

ABSTRACT

- 1^o) The Spanish mackerel which appears to be plentiful, especially in the summer months, in the Sea of Marmara, reproduce in that Sea.
- 2^o) The eggs and larvae we have observed from the Sea of Marmara, have been described.
- 3^o) The spawning period of the Spanish mackerel in the Sea of Marmara is June-August.
- 4^o) The spawning areas cover the neritic waters where the total depths vary between 15-250 m.

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