

ON THE EGGS AND LARVAE OF THE *TRACHURUS TRACHURUS* (L.) AND *TRACHURUS MEDITERRANEUS* (STDHNR.) FROM THE SEA OF MARMARA AND THE BLACK SEA

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The identification of the species of the genus *Trachurus* C. V. are rather difficult, and many conflicting reports appear in the literature. The identification of the eggs and larvae of the known species are much more difficult. However, the following information has been helpful in our distinguishing the eggs and larvae of *Trachurus trachurus* and *Trachurus mediterraneus*.

The species of *Trachurus* found in the Black Sea is only *Tr. mediterraneus*, while both *Tr. trachurus* and *Tr. mediterraneus* have been found in the Sea of Marmara. Thus, the eggs and larvae of *Trachurus* which appear in the plankton of the Black Sea must belong to *Tr. mediterraneus*. On the otherhand, if there are some differences between the eggs and larvae of *Tr. trachurus* and *Tr. mediterraneus*, the eggs and larvae of *Trachurus* which appear in the plankton of the Sea of Marmara should be separable into two groups. The eggs and larvae of the group which resemble those from the plankton of the Black Sea must belong to *Tr. mediterraneus*, and the parent of the eggs and larvae of the second group must be *Tr. trachurus*.

The eggs and larvae we have caught in the plankton of the Sea of Marmara are separable into two groups, one of which is similar to the eggs and larvae of *Trachurus* from the Black Sea.

In the following pages, we shall try to show the distinctive characteristics of the eggs and larvae of *Tr. trachurus* and *Tr. mediterraneus*. The details of the specific characteristics which we have observed on the eggs and larvae are either explained below or shown in the figures (fig. 1 and 2).

The egg of *Tr. trachurus* and *Tr. mediterraneus* caught in plankton is spherical in shape. An unsculptured elastic eggshell protects a completely segmented yolk with usually one oil-droplet at its upper surface. The eggshell and yolk are transparent and colourless. The oil-droplet is a light copper colour in living material. There are melanophores on the oil-droplet and body of the embryo after blastopore closure. The perivitellin space is narrow. However, we have found the following principal differences between the eggs of the two species :

1^o) The egg of *Tr. trachurus* is a little larger than the egg of *Tr. mediterraneus*, because the diameters of the eggs we have measured have varied between 0,789 - 0,947 mm in the former species, while between 0,71 - 0,895 mm in the latter species. That difference cannot be attributable to the parental sizes, because the individuals of *Tr. trachurus* appearing in the catches have a size never more than 26 cm of length, while the individuals of *Tr. mediterraneus* up to 40 cm in length are not scarce especially in the Black Sea. It is also neither attributable to the mesh sizes of collecting nets, nor to the environmental conditions in which the eggs have been found, because we have used nets of the same mesh sizes, and the salinities of the waters in which most of the eggs of *Tr. trachurus* have been caught have varied between 25-38,5 ‰, while the waters in which the eggs of *Tr. mediterraneus* have been caught have had a salinity varying between 14-26 ‰. However, the temperature of the waters in which we have come across the eggs of *Tr. mediterraneus* were higher (14-24°C) than the temperature of the waters in which we have caught the eggs of *Tr. trachurus* (14-15°C).

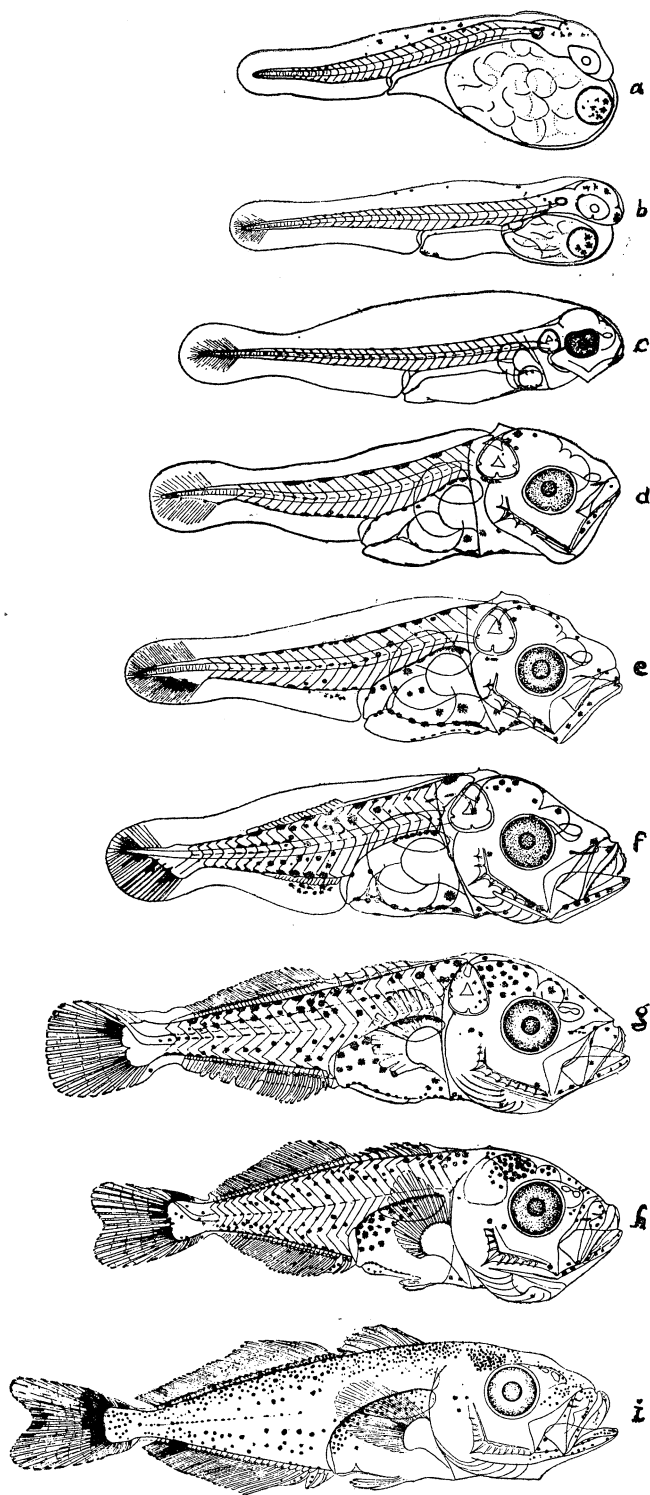


FIG. 1. — *The larvae of Tr. trachurus*,
(length mm).
a) 1,95, b) 2,8, c) 3,21, d) 4,6, e) 5,8, f) 7,0,
g) 10,5, h) 14, i) 20,5.

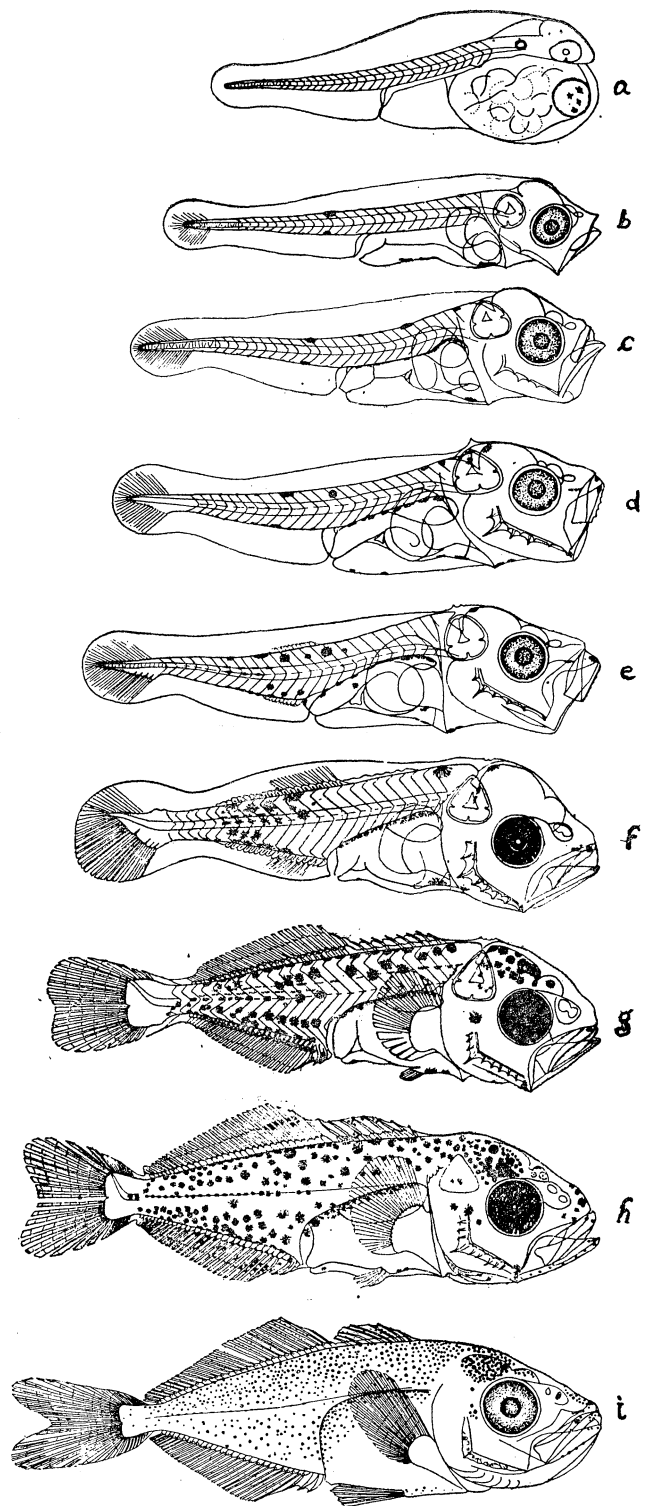


FIG. 2. — *The larvae of Tr. mediterraneus*
(length mm).
a) 2,1, b) 2,6, c) 3,2, d) 4,55, e) 5,1, f) 7,
g) 10, h) 14, i) 20,2.

2^o) The egg of *Tr. mediterraneus* is lighter than the egg of *Tr. trachurus*, because the eggs of *Tr. mediterraneus* which we have caught were buoyant in waters of salinity less than 14 ‰, and completely superficial in waters of salinity higher than 25 ‰, while the eggs of *Tr. trachurus* have always been found in depths of 25-80 m in the Sea of Marmara where the salinity increases downward from 28 ‰ to 38.5 ‰.

3^o) The eggs of *Tr. mediterraneus*, both in the plankton of the Sea of Marmara and in the Black Sea, appear in may and continue up to the end of august in the latter sea, while the appearance of the eggs of *Tr. trachurus* in the plankton of the Sea of Marmara begins in march and lasts up to the end of july.

The early prelarva both of *Tr. trachurus* and *Tr. mediterraneus* has segmented and oval yolk-sac. The anterior edge of the yolk-sac slightly passes beyond the anterior point of the head. Its maximum height is usually on the level of the mesencephalon. The oil-droplet is located at the anterior part of the yolk-sac. The anus is well behind the yolk-sac, and the part of the body anterior to the anus is longer than the part of body posterior to the anus (fig. 1, 2, a). Since all observations were made on preserved material, we have not been able to determine the sizes at hatching. It might be expected that the size of the prelarva of *Tr. trachurus* should be larger than that of *Tr. mediterraneus*. The most reliable characteristic which differentiates the prelarvae of *Tr. trachurus* and *Tr. mediterraneus* is the melanophores which develops on the primary dorsal fin in the prelarvae of *Tr. trachurus*, while none develops in the prelarvae of *Tr. mediterraneus*. In that respect, there is a resemblance between the yolk-sac stage in the prelarvae of *Tr. mediterraneus* and the prelarvae of *Tr. symmetricus* (AYRES) presented by AHLSTROM (1954, 1956). HOLT (1899) comparing his larvae of *Caranx trachurus* from Plymouth and Marseille, states: "Il arrive que l'alevin dessiné à Plymouth (fig. 54) a moins de pigment que les Marseillais (fig. 55, 56). Cela n'est rien qu'un fait de hasard; j'en ai vu à Plymouth aussi pigmentés que leurs confrères méditerranéens". From our point of view, what is important in the different pigmentations in HOLT's alevins from Plymouth and Marseille is the presence of melanophores on the primary dorsal fin of the alevin from Plymouth, while none are shown on the primary dorsal fin of the alevins from Marseille. It seems very possible to us that the prelarvae drawn by HOLT from Marseille are belong to *Tr. mediterraneus* (or to *Tr. picturatus* if this latter species is synonymous of *Tr. symmetricus* as it is supposed by LETACONNOUX 1951).

The larval size at the end of the yolk-sac stage of *Tr. mediterraneus* is smaller than that of *Tr. trachurus* (compare fig. 1, c and fig. 2, b), and all the other subsequent larval developmental stages, for exemple the first appearances of jugal spines, fins, the upward inclination of the posterior part of urostyl ect. are reached earlier by the larvae of *Tr. mediterraneus* than the larvae of *Tr. trachurus*. Besides, the melanophores on the larvae of *Tr. mediterraneus* are lesser in number but are larger in size than the melanophores on the larvae of *Tr. trachurus*. However, the distinction characteristic of the postlarvae of *Tr. trachurus* and *Tr. mediterraneus* are the melanophores which develop on the preanalventral primary fin, on the ventral of the belly posterior to ventral fin, and on the jaws in the postlarvae of *Tr. trachurus*. Corresponding chromatophores are either never found or they are unimportant in number and in size in the postlarvae of *Tr. mediterraneus* (compare fig. 1 and 2).

I would like to thank Miss. Necla DEMIR for assistance in the preparation of this paper.

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