

**Proceedings of the Summer Institute in Recent Advances  
on the Study of Marine Fish Eggs and Larvae**

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IMPORTANCE OF THE STUDY OF EGGS AND LARVAE IN  
FISHERIES DEVELOPMENT

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Research in Fisheries biology of commercially important species have assumed importance only during the 19th and 20th centuries in different parts of the world. With progress of the above work over the years, it was realised that an absolute knowledge on the early developmental stages of marine fishes is required to assess their distribution and abundance in space and time (Ahlstrom, 1954; 1966). Such a study is also an essential prerequisite in undertaking the spawning surveys of target species, monitoring the changes in exploitable stocks and yields and forecasting the trends of their production (Ahlstrom and Moser, 1976). For instance, in the European Plaice, a correlation has been found to exist between the abundance of the early developmental stages in the plankton and the subsequent recruitment of the year - classes to the fishery. For the herring, a similar relation has been found between the spawning stock and egg production (Russell, 1976). The rate of survival from newly spawned eggs to the end of planktonic phase of life in the Pacific sardine was found to be about one in one thousand (Ahlstrom, 1954). From the above facts it is obvious that only if and when proper identities of eggs, larvae, postlarvae of the target species are established, will it be possible to determine the above events as well as to manage the respective fisheries in space and time. Hence, as drawn attention

to by Smith (1974) among many others, the above aspects constitute the most important objectives in the study of fish eggs and larvae.

The general practice has been to collect fish eggs and larvae from the natural environment and identify them. This method is often beset with a number of problems and uncertainty to a great extent. The alternate and sure method of identifying the eggs and larvae of fishes is to artificially fertilize the eggs of known species through induced breeding or stripping (parents are precisely known) and follow the development to describe later stages. There is great need for such work to solve many other problems related to study of fish eggs and larvae.

Apart from these, studies on marine fish eggs and larvae are important in the identification of new fish stocks of commercial potentialities, as explained by Ahlstrom (1968) and in the evaluation of fish resources, as drawn attention to by Ahlstrom and Moser (1976). Also, in order to correlate the distribution and abundance of early developmental stages of target species in relation to prevailing environmental parameters (physical, chemical and biological), the studies are important (Ahlstrom, 1954, 1966).

In coastal aquaculture operations, one of the basic requirements is to collect young stages, popularly called "Seeds", of fishes from natural seed-resources centres for stocking in grow-out ponds, cages etc.,. For this purpose, it is imperative that the characteristic features of the early life history stages of the target species are known accurately. Only if and when the above condition is fulfilled, will there be certainty with regard to the identity of the species stocked in culture and released in ranching. Character variability of young stages such as pigmentation, morphometric features and meristic

characters occurring in different areas should be understood properly through an indepth study of characters. This helps to avoid any confusion in the separation of the young stages of the target species from those of undesirable species. Also, the distinguishing characters of different developmental stages should be studied and properly documented, in order to segregate the most desirable stage for bestowing adequate attention in nursery practices. This is also essential to determine the effect of certain ecophysiological factors on a particular developmental stage, in order to explore the possibilities of undertaking remedial measures. Besides, character differences between developmental stages occurring in natural state and those obtained by artificial means (induced breeding) should be known, in order to assess the role of such difference in subsequent development.

Ahlstrom and Moser (1976, 1981) have elucidated that accurate identification and documentation of fish eggs, larvae and other developmental stages form a basis in fish taxonomy such as for clarification of taxonomic characters based on ontogenetic differences. The study is important for delimiting, spawning grounds, breeding seasons, migrations etc.,

From the study of eggs and larvae and their distribution and abundance, it is also possible (if fecundity of the species is known) to estimate the females in a population and thereby also the males (if sex ratio is known) and hence the strength of total spawning population which is essential for studies on recruitments mortality and fish stocks, that are vital in the rational exploitation, management and conservation of the resources. In order to make an assessment of the quality and quantity of Ichthyoplankton as an important component of the planktonic biomass and to gather information to determine

the whole spectrum of ichthyofauna in an area, a study of the early life history stages of fishes is important.

As a biological indicator brought by certain water masses, eggs and larvae have to be identified and documented. For use as a general study material, as an experimental organism in bioassays, in aspects of fish toxicology, embryology and other areas, a study of the early developmental stages of fishes is important.

In view of these compelling reasons, it has become imperative to study the early developmental stages of marine fishes with accuracy as well as to document them in different geographical areas. Publications such as those of Uchida, Imai et al. (1958) and Mit (1966) from Japan, Russell (1976) from Britain, Jones, Martin and Hardy Jr (1978), Hardy Jr (1978 a, b), Johnson (1978), Fritzsche (1978) and Martin and Drewry (1978) all from the Mid-Atlantic Bight and Ozawa (ed., 1986) from Western North Pacific are contributions in this direction and need emulation in other parts of the world as well. Realising these facts, an international training course on fish eggs and larval studies was conducted during 1973 (FAO, 1974) as well as two international symposia were held, one in 1973 (Blexter, Ed. 1974) and another in 1979 (Lasker and Sherman, 1981).

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