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

14 JUNE to 3 JULY, 1989

CENTRAL MARINE FISHERIES RESEARCH INSTITUTE

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COCHIN - 682 031.

CMFRI/SI/1989/Th.XV

PRESENT STATUS OF WORK ON MARINE FISH EGGS AND LARVAE IN INDIA AND OUTLOOK FOR THE FUTURE

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In India, interest on a study of marine fish eggs and larvae is found to have begun only in the first decade of the present century, when Bhattacharya (1916) has identified the larvae of a few estuarine fishes. Although there has been a steady increase in the output of research thereafter, most of the publications till the end of the thirties are on estuarine species only. It may also be seen that in the initial period many identifications are based on those made elswhere, more so from Indonesia (formerly Java) by Delsman (1922-1938). An analysis of the quantum of publications made recently by Bensam (in press) shows that the main stay so far is from the fifties through the seventies, with the peak during the fifties (30%), followed by sixties (24%) and the seventies (22%). Species-wise also, the maximum coverage is during the fifties (30%), followed by sixties (20%) and seventies (19%). As already pointed out in one of the previous lectures, the total number of species whose one or more developmental stage has been identified so far is 29% of the known total number of species; and the number of species of which most of the vital stages are known at present is only 8% of the marine bony fishes present in Indian Waters. Hence, there is urgent need to intensify the studies on marine fish eggs and larvae in India.

In India, the"hatching method" of identification (vide lecture No.5) of marine fish eggs is possible only in the cases of a few estuarine and inshore fishes such as mullets. But, this method cannot be followed in the vast majority of inshore and offshore fishes because their oozing ovarian ova are difficult to collect. Thus, for a country like India, with the existing facilities, the hatching method of identification is not possible at present and hence the workers have to depend upon the "series method" of identification (vide lecture No.5). For this method to be effective, the whole series of stages should be available, in order to follow the vital changes in the developmental characters. But, a perusal of publications from India shows that only in some cases the whole series are available and that in most cases collections are not adequate to document all the important stages. It may be noted in this connection that the same body of water which contains one developmental stage need not necessarily contain one or more of the other developmental stages (Nellen and Hempel, 1970; Bailey, 1974; Russell, 1976). Hence it has become essential to make future collections of marine fish eggs and larvae much more extensively and intensively in space and time, so that as complete series of stages as is possible are collected for the series method of identification.

Apart from making extensive and intensive collections, as drawn attention to by Ahlstrom and Moser (1981), it is essential to enhance the quality of the specimens collected. Although it is desirable to study live eggs for their characters, in cases where it is not possible to do so, it is essential to improve the quality of the specimens. The value of the material becomes very much lesser if their condition does not facilitate accurate measurements and scrutiny of characters. One method to overcome poor preservation may be to narcotise the material before preserving in formalin. As drawn

attention to by Ahlstrom and Moser (1981) there is need for some basic research on ship-board handling and preservation techniques of marine fish eggs and larvae.

One factor that has been causing some difficulty for effective comparison and contrast of the developmental stages is the ambiquity prevailing in the definition and standardisation of the stages. In this connection, it is worthwhile to follow the division of developing eggs proposed by Ahlstrom and Counts (1955), such as (i) the early egg, (2) the middle egg and (3) the late egg. Also, it would be advantageous to standardise postlarval developmental sequences into three as followed by Moser and Ahlstrom (1970), Ahlstrom et al (1976) and Moser et al (1977), viz., (1) Preflexion, (2) Flexion and (3) Postflextion one is the longest period, involving a gradual development into the juvenile phase. These and other stages standardised are given in Table L

Besides, as seen in an earlier lecture, drawing skills have to be employed for documenting and presenting the figures in a manner, suitable for comparison and contrast (Fig. 1 and 2). Such a procedure has not been followed in most of the descriptions in India; and needs adoption in future work in this country.

A perusal of literature shows that in many instances, except for some prominent diagnostic features, certain subtle or clusive characters are not given due attention for tangible separation of the developmental stages of allied species. The fact that such subtle characters are valuable has been observed in recent studies (Bensam, 1984, 1986) on certain clupeids with overlapping number and disposition of myomeres. One such character is the difference in the pace or speed of development observed in the postlarvae of Sardinella clupeoides and S. sirm. Between two almost comparable

sizes, the 10.2 mm postlarva of S. clupeoides and the 10.4 mm postlarva of S. sirm . the former shows markedly lesser developmental sequence in its narrow body, truncated caudal fin and lesser developed dorsal and anal fins when compared with the broader body, forked caudal fin and more advanced dorsal and anal fins in the latter species. Although the former is 0.2 mm shorter than the latter in total length, it is rather insignificant to account for all the above differences. In this connection it is suggested that for segregating comparable and/or similar sized developmental stages of closely allied species and/or genera, a tabulation of the characters of the developmental stages on the model proposed in Table 2 may be carried out. By divising such a mechanism, it may be possible to overcome some of the identification problems.

Similarly, much more intensive studies are required on the variability of such characters of developing stages as the location of the oilglobule and pigmentation between allied species. It is observed in recent studies (Bensam, 1984) among the larvae of the grey mullets Liza tade and L. subviridis which have the same number of myomeres that although the oilglobule in the larvae of both the species is situated in the front aspect of the yolksac, the principal difference between the two is the presence of four narrow vertical streaks of pigments in L. tade but only a single prominent postanal band in L. subvivids

In addition to such character differences, it is also essential to discover new characters for identification. Osteological and anatomical features of the early stages of one species may be different from those of an allied species. The advent of scanning electromicroscopy has opened up the possibilities for solving such intricate identification problems. By this method, Sumida et al. (1980) have found out differences between the chorion structure of the eggs of flatfishes. Similarly,

electrophoretic techniques may also be employed for discovering new distinguishing characters.

By adopting such techniques it will be possible to identify, distinguish and document the early developmental stages of such of the species and/or genera which are posing problems still.

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