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MEASUREMENTS AND DRAWING OF THE EGGS AND LARVAE OF
MARINE FISHES

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Measurements

In any description and identification of marine fish eggs and larvae, measurements and drawings are vitally important because if only improper measurements and drawings of eggs, larvae, etc. are made by any worker, it is likely to confuse the other workers and result in a doubt on the identity of the material reported and/or described. In view of this reason, exact and accurate measurements of the eggs, larvae, postlarvae etc., under study is an important and vital prerequisite in any study on fish eggs and larvae. The various measurements which are required for documentation are as follows:

- (a) Egg (Fig.8,1)
- (i) Total egg diameter in the case of spherical eggs or length and maximum width of the egg if the eggs are elliptical (eg. Stolephorus).
 - (ii) Diameter of the yolk in the case of spherical eggs or length and maximum width of the yolk if the eggs are elliptical (Stolephorus).
 - (iii) Width of the perivitelline space. If the perivitelline space is not of the same width all along, the measurement at the two poles of the egg as well as the middle region has to be recorded.

- (iv) Diameter(s) of the oilglobule if one is present and of all the oilglobules if more than one is present.

(b) Larva (Fig.8,2):

- (i) Total length, from tip of head to end of caudal finfold.
- (ii) Notochord length, from tip of head to end of the notochord.
- (iii) Head length, from tip of head to the hind margin of auditory vesicles.
- (iv) Preanal length, from tip of head to the anus (or vent).
- (v) Postanal length, from vent to the end of caudal finfold.
- (vi) Head width, dorso-ventral width at the widest part of head.
- (vii) Width of trunk, dorso-ventral width at the middle and widest axis of the yolksac.
- (viii) Width at vent.

(c) Postlarva (Fig.8,3):

- (i) Total length, from the tip of the head (or the snout) to the hind margin of caudal fin.
- (ii) Standard length, from the tip of the head (or the snout) to the hinder margin of the upper hypural plate of caudal region.
- (iii) Preanal length, from tip of snout to the vent.
- (iv) Postanal length, from the vent to the hind end of caudal fin.
- (v) Head length, from the tip of the snout to the opercular cleithrum.

- (vi) Width of head, at the level of the middle axis of the eye.
- (vii) Width of trunk, at the widest axis of the postcephalic part of preanal region.
- (viii) Width at vent.
- (ix) Postanal width, at its widest region.
- (x) Predorsal length, from the tip of the snout to the front margin of dorsal fin base if formed.
- (xi) Postdorsal length, from the hind end of the dorsal fin if formed to the hind end of caudal fin.
- (xii) Length of dorsal fin base.
- (xiii) Length of anal fin base.

(C) Juvenile: All the morphometric measurements required in ichthyotaxonomy, viz., total length, head length, prepectoral length, predorsal length, prepelvic length, width of caudal peduncle, etc., are necessary for documenting the juvenile stage in development.

While recording the above measurements, it is desirable to standardise the accuracy of each measurement, in order to facilitate easy comparison and comprehension of various stages. Workers on early developmental stages of fishes usually standardise the accuracy of measurement of the larger stages such as juveniles, postlarvae and larvae as well to the first decimal place. For smaller specimens such as eggs, the accuracy is usually standardised to the second decimal place. And, for still smaller parts of the developing stage, such as yolksac, oilglobule, etc., the accuracy is standardised to the third decimal place.

Drawings

Scientifically accurate drawings of early developmental stages are as much important as the measurements, while documenting them in literature. Larger specimens are usually drawn based on eye measurements of characters, practised in ichthyotaxonomy as well as by using a magnifying glass. But, smaller specimens the characters of which can be studied only under the microscope can be measured and drawn only by using a microscope. For recording measurements of eggs, larvae, postlarvae or certain parts of these stages, micrometers are used by inserting them in eye pieces of the microscopes and the calibrations of the micrometers are measured by tallying their calibrations with a stage micrometer. Microscopic drawings are usually made by using a camera lucida. After obtaining a scientifically accurate pencil drawing of the eggs, larvae, etc., as well as their characters, the drawings are finalised with Indian Ink.

Early workers on fish eggs and larvae have usually drawn the specimens, especially larvae and postlarvae such as these were, even if these were partly or fully curved upon preservation. But, over the years, this has been posing problems for subsequent workers in comprehending the accurate measurements for comparison and contrast. In view of this reason, it is desirable to avoid such partly or fully curved specimens in the case of such of the fishes, the early developmental stages of which are available in plenty. But, if the developmental stages are not available in adequate numbers and if it is absolutely essential to sketch partly or fully curved specimens of larvae, etc., drawing skills may be employed to present the sketches in an uncurved normal manner of the developing stage, without making any compromise on the various characters and measurements

thereof. Also, in order to make an easier comparison and contrast of the various sequences in the developmental process, it is desirable to present all the drawings of stages from larvae to the juveniles to an uniform final length for documentation. For instance, a postlarva of 5 mm when magnified to 10 times for the figure becomes 50 mm and a longer stage of 20 mm becomes 200 mm for its figure. Instead of presenting such figures, when the stages are magnified and drawn to the same final proportions for the figures, easier comprehension is possible. With the advent of magnifying and reducing the sizes of drawings this can be achieved quite easily.

References

- Bensam, P. (in press) Identification of the early developmental stages of marine Osteichthyes in India - Present status and suggestions for future research. MBAI, Proc. symp. trop. mar. living resources (in press)
- Jones, P.W., F.D. Martin and J.D. Hardy Jr. 1978. Development of fishes of the Mid-Atlantic Bight. An Atlas of egg, larval and juvenile stages. I Acipenseridae through Ictaluridae. U.S. Dept. Int., Fish and Wildl. Serv.

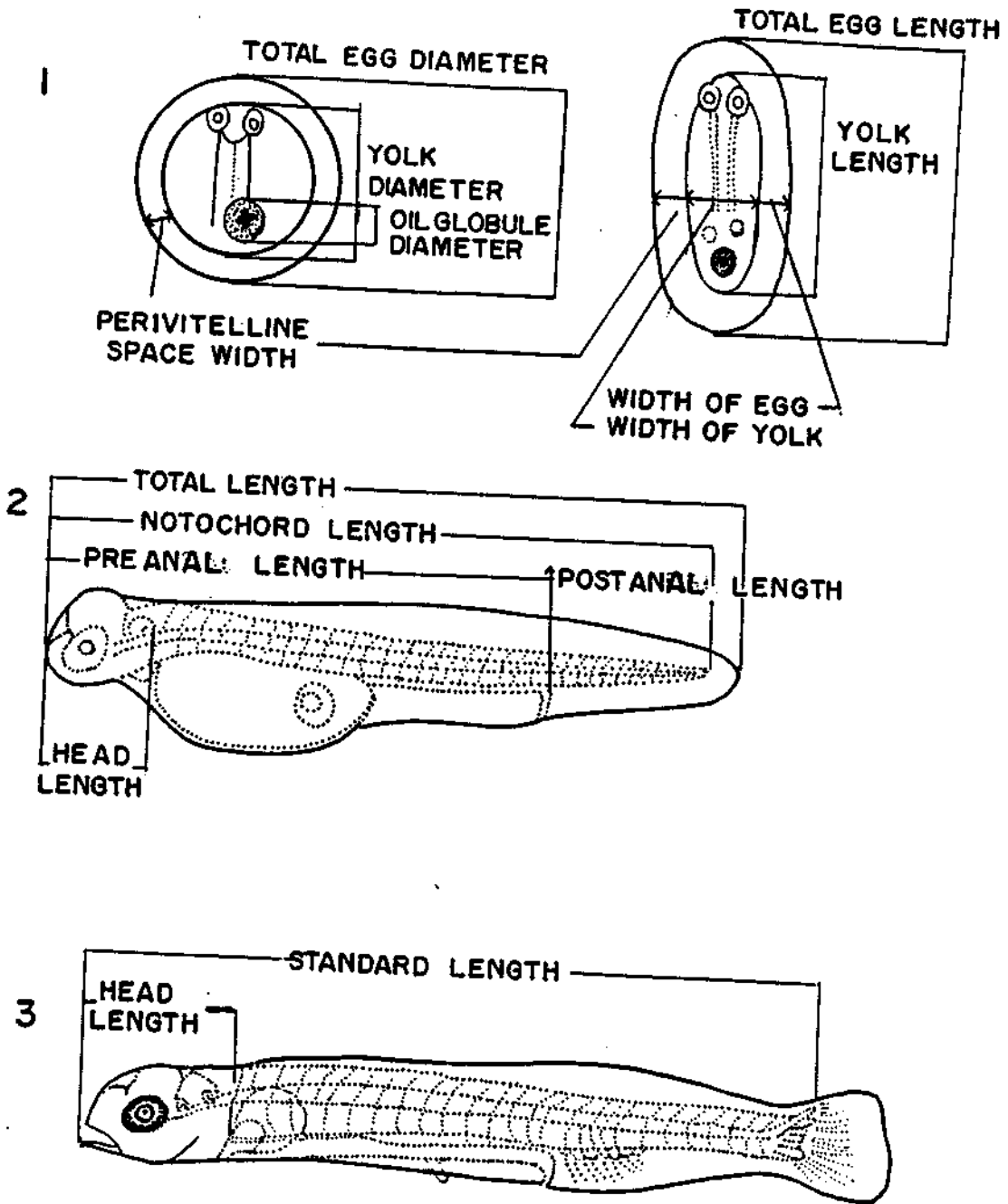


Fig-8