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Engraulidae eggs from Parangipettai waters

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ABSTRACT

It is important to study the abundances of eggs have been demonstrated to be a good indicators of the Engraulidae spawning population and size of the adults. Determining the abundance of eggs and larvae in Parangipettai water is less expensive to do than sampling the adults.A total of 8 fish eggs which comprising the order Clupeiformes and the family Engraulidae,were collected from Parangipettai, southeast coast of India. Eggs ofSetipinnataty, Stolephorus tri, S. heterolobus, S. punctifer, S. macrops,Thryssadussumieri,T. mystax, T. hamiltonii, were identified. These 8 species were taxonomically described. Among these eggs, Stolephorus tri eggs were observed as dominant. Maximum number of Engraulidae egg was collected during summer season.

Keywords: Taxonomy, Engraulidae, Parangipettai.

INTRODUCTION

Fishes are major part of the human diet [5]. Engraulidae fishery is a commercially important fishery due to the food value and industrial uses for oil, fertilizers and canning. Its contribution was significant to the marine fish landings of and it forms the foundation of pelagic fisheries along the study area. Majority of aquaculture production in worldwide is devoted for food production [8].

Distribution patterns of fish eggs in any region of the ocean are related to the reproductive activity of the adult population and to topographic and hydrographic features that affect the dispersal of the eggs. This survey information's may assist to management measures that are particularly urgent, as in the case of quickly declining communities of this coastal region.

However ichthyoplankton survey conducted over a period of one year along Parangipettai waters, few embryonic and early stages of fin fishes were collected and they have been described below.

Study area

Parangipettai (Lat. 11°29'25.55"N, Long. 79°45'38.62"E)situated on the Southeast coast of India is towed with a variety of biotopes and with rich biodiversity (Fig. I). The river vellar originates from the Servarayan hills in Salem (Tamil Nadu, South India) and flows east for about 480 km before joining Bay of Bengal at Parangipettai. The vellar estuary is a positive estuary as it has connection with the adjoining sea throughout the year. It is also subjected to semidiurnal tides. It is a dynamic estuarine environment influenced by the tidal ebb and flow, and biotic and abiotic exchanges that constantly occur between the estuarine and the adjoining neritic realms of the Bay of Bengal. It is also subjected to variations in salinity and other typical estuarine hydrographical processes resulting from seasonal variations in the amount of fresh water flow or monsoonal rainfall. This estuarine environment serves as a good nursery area for many commercially important marine organisms and also supports a rich fish and shell fish fishery.

Fig. I. Study area

MATERIALS AND METHODS

Eggs were collected between January 2010 to December 2010 along two transects. For identification of Enraulidae fish eggs, the earlier investigations made by [4], [2],were consulted. The eggs were expressed in No/m^3. The photographs were taken by using a Sony Camera Measurrment was taken micrometer fixed in the microscope.

Guidelines Used for the Identification Engraulidae eggs

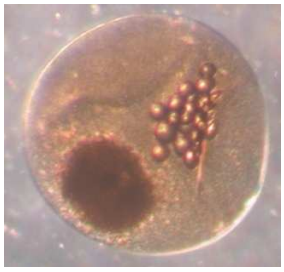
Majority of the planktonic marine finfish eggs are spherical in shape. For example, fishes belonging to the orders Clupeiformes, Mugiliformes, Aulopiformes, Atheriniformes, Perciformes, Pleuronectiformes and Tetraodontiformes have spherical eggs. Engraulidae the eggs are both spherical and ellipsoidal in shape. Few eggs of Engraulidae are ellipsoidal in shape; for example, fishes belonging to the genus Stolephorus. Eggs of *Stolephorus indicus* and

*S. commersoni*are provided with a knob-like structure at one pole. The eggs genus Thryssa and Setipinna are spherical in shape.

RESULTS

Descriptions of the Species

*Setipinnatata*eggs (Fig. II) are pelagic, rounded, colorless and transparent. The average diameter of the egg is 1.50 mm. Yolk is spherical, segmented, transparent and colorless; the average diameter is 1.301 mm. 12 to 17 uneven sized oil globules were observed, the size ranges between 0.039 - 0.076 mm. Oil globules are aggregated at the centre of the yolk mass. Perivitelline space is narrow.

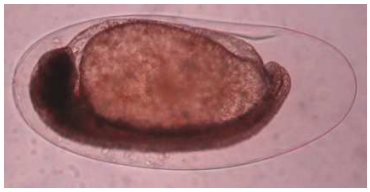


1.50 mm

Fig.II. *Setipinnataty*

0.71mm

Fig.III. *Stolephorustri*



0.52mm

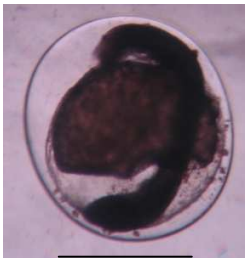
Fig.IV. *Stolephoruspunctifer*

0.55 mm

Fig.V. *Stolephorusheterolobus*

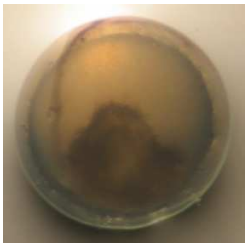
0.62mm

Fig.VI. *Stolephorusmacrops*



0.92mm

Fig.VII. *Thryssadussumieri*



0.98mm

Fig.VIII.*Thryssamystax*

1.20mm

Fig.IX.*Thryssahamiltonii*

Nature of the Chorion is smooth, unpigmented. Eggs of *Stolephorustri*(Fig. III) are pelagic, colorless, transparent and elliptical in shape, measuring 1.38 - 1.57 mm in length and 0.56 - 0.71 mm in breadth. Yolk is elliptical and clearly segmented. Perivitelline Space is narrow. Single oil globule, pale yellow in color, measuring 0.07 - 0.15 mm in diameter situated at the posterior end of the yolk. Nature of the chorion is smooth. Egg is unpigmented in nature. Embryo indicated with few anterior myoseptemberta.

The eggs of*Stolephoruspunctifer*(Fig. IV) are pelagic, elliptical, colorless and transparent. Average length is 1.15 mm and breadth 0.52 mm. Yolk is pear shaped, colorless, transparent and segmented. Oil globules are absent. Perivitelline space is Narrow. Nature of the Chorion is smooth. Egg is unpigmented. *Stolephorusheterolobus*eggs (Fig. V) are pelagic, elliptical, colorless and transparent. The average length of the egg is 1.04 mm and average breadth is 0.55 mm. Yolk is colorless, transparent, segmented. Oil globules are absent. Perivitelline space is narrow. Nature of the chorion is smooth. Pigmentation is absent. In developing embryos, eyes, head and trunk regions are well developed. Tail does not extend in the developing embryo.

*Stolephorusmacrops*eggs (Fig. VI) are pelagic, elliptical, colorless and transparent. Length is 1.108 - 1.554mm and breadth is 0.62 - 0.72 mm. Yolk is elliptical, plainly vacuolated, colorless

and transparent. Perivitelline space is very narrow. Single, yellow colored and transparent oil globule present at the posterior end of the yolk. Just above the oil globule, a small vacuole like structure is present. The size of the oil globule ranges between 0.06 - 0.128 mm. Nature of the chorion is smooth and without knob like structure. There is no pigmentation on any part of the egg.

The eggs of *Thryssadussumieri*(Fig. VII) are pelagic, rounded, colorless and transparent. Egg diameter ranges between 0.92 - 0.99 mm. Yolk is spherical, vacuolated, colorless and transparent. Yolk diameter ranges between 0.89 - 0.99 mm. Oil globules are absent. Perivitelline space is Narrow. Nature of the chorion is smooth. Few myoseptemberta could be seen in the yolk. *Thryssamystax*eggs (Fig. VIII) are pelagic, rounded, colorless and transparent. Egg diameter ranges between 0.98 - 1.03 mm. Yolk is spherical, segmented, colorless and transparent. The size of the yolk ranges between 0.92 - 0.99 mm. Oil globules are absent. Perivitelline space is very narrow. Pigmentation is absent in the envelop. Eggs of *Thryssahamiltonii*(Fig. IX) are pelagic, rounded, colorless and transparent. The average egg diameter is 1.20 mm. Spherical, colorless, transparent and segmented yolk is present. Oil globules are absent. Perivitelline space is narrow. Chorion is smooth with no pigmentation. Developed head, trunk, tail and myoSeptemberta are seen in the developing embryo and heart also developed.

The distribution of Engraulidae eggs were high during summer season followed by monsoon, post monsoon and pre-monsoon (Fig. X).

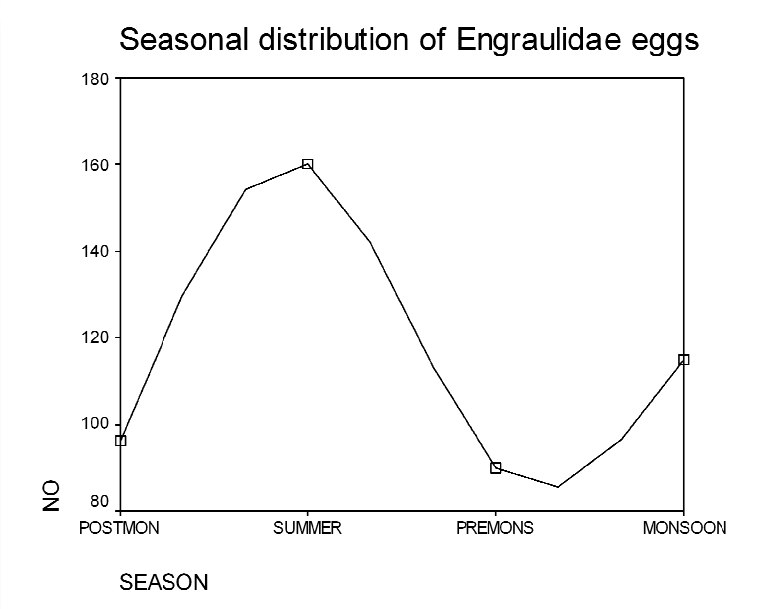


Fig.X. Seasonal distribution of Engraulid eggs

Among eight species, *Stolephorus tri* eggs observed dominantly observed during the study period(Fig. XI).

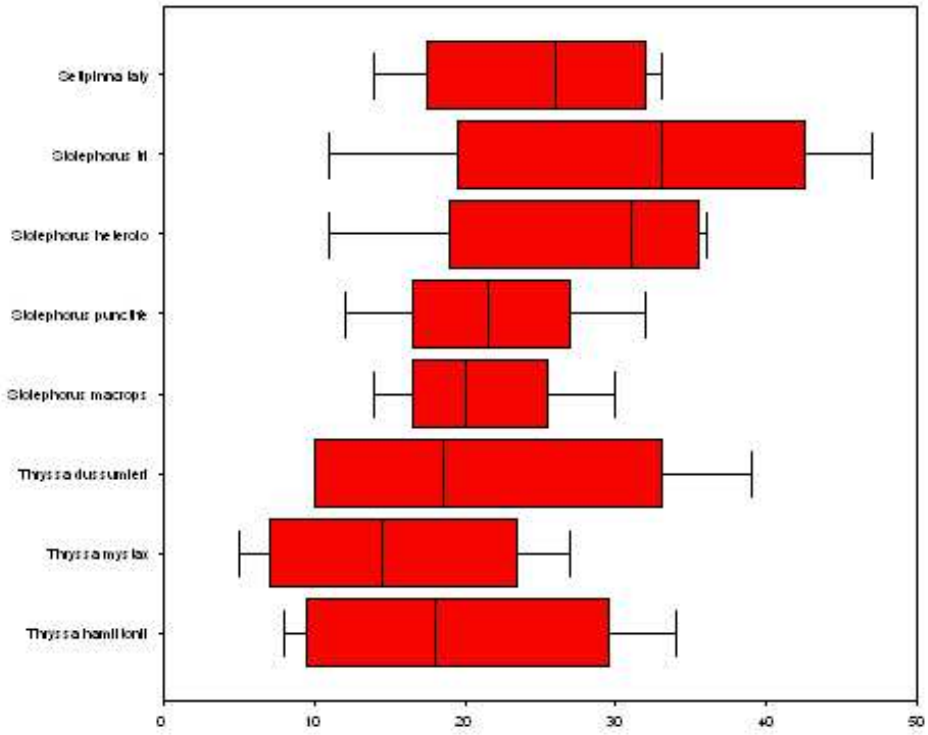


Fig.XI. Species distribution of eggs per year

DISCUSSION

Pattern of distribution and abundance of fish eggs is associated with environmental factors and the environment may act either as a favorable factor for successful spawning by fish and survival during eggs and larval stages. This study given a report about the availability of Engraulidae fishes at this study area. It will help to understand the seasonal composition of this eight species. Among Engraulids, *Stolephorus tri* was appeared as dominant species at Parangipettai waters.[1] Discussed that eggs appearence will mainly depending upon the oceanographic 'climate' rather than to geographically fixed preference period during the spawning season. According to [9] the heavy rainfall during monsoon considerably reduces the salinity of the estuarine water, which again increases during the post monsoon season. In addition [7] discussed about spawning of fishes may perhaps be controlled by the seasonal cycle of the environmental factors.

During present study, the maximum density of Engraulidae eggs was recorded during summer may be due to the high water temperature. We believe that the spawning was coupled with high temperature and fishing holidays. Similarly, [6] discussed that spawning is associated with high sea surface temperatures and low plankton biomass. The fishing holidays of east coast was declared during the summer season because, to avoid the catching of brooders and reduce disturbances during breeding. This may be good reason for a peak observation of engraulidae eggs during summer. [3] Found that vertical distribution of pelagic eggs is determined by the relationship between physical properties of the eggs, seawater density and degree of vertical

mixing of the water column. The distributions observed, with increasing numbers of eggs towards the surface, are as expected for passive buoyant particles under the dominant influence of wind mixing at the surface. By the present study a significant seasonal abundancy of engraulidae eggs was observed.

Acknowledgements
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