

ALKALINE PHOSPHATASE ACTIVITY IN OVARIES OF SOME CLUPEOIDS

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ABSTRACT

The alkaline phosphatase activity has been determined in the three different stages of growth of the ovary of *Stolephorus heterolobus*, *Stolephorus commersonii*, *Thryssa mystax*, *Thryssa setirostris*, *Thryssa vitirostris* and *Sardinella jussieu*. The phosphatase activity rises to a peak in the maturing stage (Stage II) and declines in the mature stage (Stage III) to about the same level or slightly higher level than in the immature stage (Stage I).

It is well known that phosphomonoesterase enzyme play a vital role in the developing fish ovaries. Arvy (1955) studied histochemically the distribution phosphatase in *Perca fluviatilis*, *Cyprinus carpio*, *Tina vulgaris*, *Trutto fario*, *Trutto viridus*, *Anguilla anguilla* and *Lebistes tetaculatus*. Krishnamurthy (1959) determined alkaline phosphatase in different stages of maturity of ovary of *Labeo fimbriatus*, *Mystus seenghata*, *Boleophthalmus bodderti*. Jafri and Khawaja (1967 a) and Shaffi and Jafri (1974) estimated acid and alkaline phosphatases in the

eggs of some fresh water teleosts. In this note, the results of quantitative study of alkaline phosphatase activity in different stages of maturity of ovary of six clupeoids viz., *Stolephorus heterolobus*, *Stolephorus commersonii*, *Thryssa mystax*, *Thryssa setirostris*, *Thryssa vitrirostris* and *Sardinella jussieu* are given.

Samples were collected from the commercial catches landed at Waltair. The fishes were dissected and the ovaries in three stages viz., Stage I (immature), Stage II (maturing) and Stage III (mature) were removed, blotted quickly and about 200 mg of ovary was homogenised with 10 cc of cold double distilled water saturated with chloroform and allowed to stand in refrigerator for 48 hours. The homogenate was centrifuged and 1 ml of the supernatant fluid added to 9 ml of glycerophosphate buffer (pH 9.4) and incubated for 2 hours at 37°C in an incubator. The reaction was stopped at the end of 2 hours and the proteins precipitated by adding 2 ml of 30% cold trichloroacetic acid solution. The alkaline phosphatase was determined by the method of Kind and Macchi (1952) with the modification by Hawk, Oser and Summerson (1954). For each species five determinations were made for each state of maturity and the mean was taken for comparison. The results are presented in table as alkaline phosphatase activity expressed in micrograms of inorganic phosphate released per gram of tissue. The values show that in all six species, the alkaline phosphatase activity is highest in maturing specimens and decreases in mature fish. Taking the activity in immature fish as unity, in *Stolephorus heterolobus*, the alkaline phosphatase activity in maturing fish rises to 3.16; in mature fish the activity is only

TABLE Alkaline phosphatase values (μ m/m) in ovaries of clupeoids

Name of species	Immature (Stage I)	Maturing (Stage II)	Mature (Stage III)	Ratio
1. <i>Stolephorus heterolobus</i>	635 (630-641)	2009 (2000-2060)	685 (660-690)	1 : 3.16 : 1.07
2. <i>Stolephorus commersonii</i>	800 (786-807)	2402 (2339-2382)	886 (878-898)	1 : 3.00 : 1.10
3. <i>Thryssa mystax</i>	425 (417-437)	1255 (1240-1262)	434 (417-437)	1 : 2.95 : 1.02
4. <i>Thryssa vitrirostris</i>	618 (607-624)	2016 (2000-2023)	810 (795-815)	1 : 2.64 : 1.31
5. <i>Thryssa setirostris</i>	452 (433-457)	1232 (1223-1235)	591 (581-593)	1 : 2.72 : 1.30
6. <i>Sardinella jussieu</i>	510 (489-517)	1098 (1082-1100)	516 (500-520)	1 : 2.15 : 1.01

slightly higher than in the immature fish. In *Stolephorus commersonii* the value in maturing fish is 3.00 and in mature specimens it is 1.1. In *Thryssa mystax* the value in maturing specimens is 2.95 and in mature fish it is only slightly higher than in immature fish. In *Thryssa vitirostris*, the value in maturing specimens is 2.64 and in mature fish it is 1.31. In *Thryssa setirostris* the alkaline phosphatase activity in maturing specimens is 2.72, and in mature forms it is 1.3. In *Sardinella jussieu* the value in maturing specimens is 2.15, the values of immature and mature ovaries show little difference.

Thus in all the six species under investigation, the maturing ovary has higher alkaline phosphatase than the mature ovary. This is due to the fact that the eggs during growth and maturation lose significant quantity of the alkaline phosphatase enzyme. Jafri and Khawaja (1967 a) and Shaffi and Jafri (1974) also observed similar decrease in the alkaline phosphatase enzyme with increase in the size of the eggs in the ovaries of fishes which they have studied. They also stated that the species with larger eggs usually possess low alkaline phosphatase.

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