

Executive Summary of the findings of minor research project

"Investigation of enzyme β - glucuronidase in the reproductive cycle of female catfish, *Heteropneustes fossilis* (Bloch)"

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Heteropneustes fossilis is an air-breather and hardy fish. It is found to be annual breeder in this region (Nagpur region). Sexes are separate. It breeds in peak monsoon season from June to August.

The reproductive cycle is divided into five phases. These are: resting phase (November to January), preparatory phase (February-April), prespawning phase (May-June), spawning phase (July-August) and postspawning phase (September-October). The cyclic changes are determined by calculating the gonadosomatic indices (GSI) and histological details of the ovary. Ovarian changes are highly correlated with the GSI. GSI gradually increases from resting phase and as the prespawning approaches it exhibits significant increasing trend ($P < 0.0001$). This phase is characterized by recruitment of almost all the types of oocytes in the ovary. Highest GSI is achieved in the spawning phase when ovary is full of mature eggs and the increase is statistically most significant ($P < 0.001$). When the eggs are discharged out of the body, in the postspawning season, there is abrupt decrease in GSI.

Biochemical estimation and histochemical demonstration of β - glucuronidase are carried out in the ovary of *H. fossilis* throughout its annual reproductive cycle. Quantitatively, ovarian β -glucuronidase is quite less during the resting phase which subsequently goes on increasing and is highest in the prespawning season ($P < 0.0001$). Staining intensity also increases up to prespawning phase. It decreases slightly in the spawning phase. So also there is significant drop ($P < 0.05$) in its content in this phase. Staining is observed in the cortical alveoli and yolk granules in type III oocytes, particularly zona radiata in the prespawning phase is stained indicating its role in transportation of metabolites to number of proliferating oocytes in this phase. In the spawning phase, zona radiata is not stained, further confirming this role, as the oocytes are fully matured in this phase and transportation of metabolites is not required. During postspawning phase, enzyme activity increases many folds. The ovary has the leftover oocytes undergoing atresia which are absorbed by the lytic activity indicating role of β - glucuronidase in the lysis. These atretic follicles are intensely stained for the enzyme which is both in granular and diffuse form.