

## Glucose level influences breeding cycle in catfishes

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### ABSTRACT

The effect of sub-lethal concentration of paper mill effluents on glucose level in blood of *Heteropneustes fossilis* has been recorded. The glucose content of blood was measured. The changes were observed to be statistically significant ( $P < 0.05$ ,  $P < 0.01$  in all the three phases of breeding cycle)

**Key words** – Effluents, Catfish, Blood, water pollution.

### INTRODUCTION

Blood parameter of fishes is very sensitive indicator of stress, water pollutants and toxicants. The biochemical disturbances caused by environmental toxicants has been accepted as a major research framework concerning fish toxicology. Effect of industrial effluent on blood of catfish have been well

described by many workers (Grant and Mehrle 1973, Sastry and Sharma 1980, Bhaleroa *et al* 1986, Dhanapakiam and Ramasamy 2001). The present work has been undertaken to observe the change in the blood-glucose level due to exposure in different concentration of mill effluents for 96 hours in *Heteropneustes fossilis*.

### MATERIALS AND METHODS

The common catfish *Heteropneustes fossilis* ( $125 \pm 0.25$  gram/  $6.8 \pm 0.15$  inch) were collected locally and were acclimatized to laboratory conditions for 10 days in a large aquaria containing 125 Litres of tap water under natural photoperiod and temperature. Fishes were fed daily with wheat flour pellets and dried shrimps. Mill effluents of Sanjay paper mill,

maghar, santkabir Nagar, UP, India, was selected as a test toxicants for biochemical studies. Fishes were put in the group of 50 animals.

GROUP A – Control were placed in tap water  
GROUP B – Fishes were exposed to 0.5 and 0.8 sub-lethal concentration of effluents

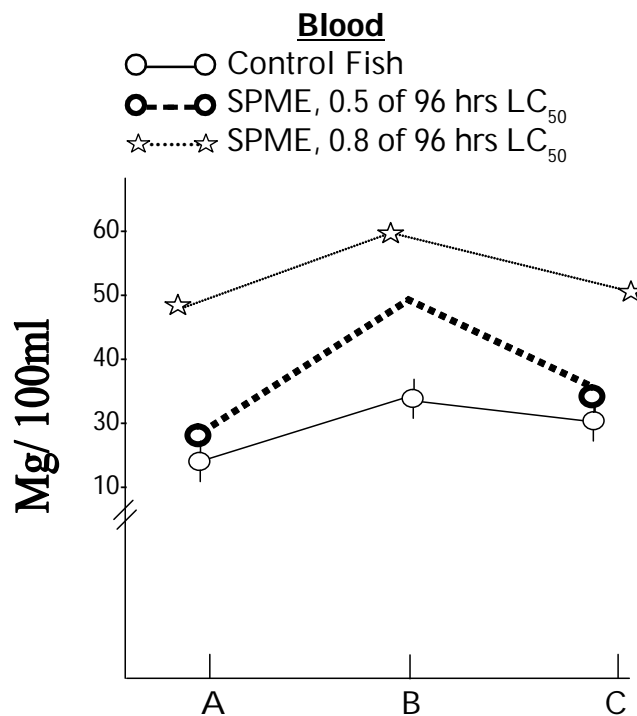
The glucose level in the fish blood plasma was estimated by standard method of TOLLIN WU as suggested by Oser (1976).

In the present study SD, SE, Confidence Limit and Regression Correlation Coefficient were calculated and tested properly by statistical method of Snedecor (1961)

## RESULT AND DISCUSSION

Control Group (A) of test fish showed the maximum value in the spawning phase as compared to the pre and post spawning phase of the breeding cycle (fig 1) but in Experimental Group (B) of test fish the estimation of glucose content in the blood were observed to be increased very significantly in all the phases of breeding cycle and changes were observed to be statistically significant ( $P < 0.05$ ,  $P < 0.001$ ).

The spawning phase is the most active phase of the life cycle because in this phase rapid growth and proliferation of gonadal tissue occurs resulting in the formation of gametes therefore higher supply of nutrients material is required. Under stress condition the fishes requires extra energy for this purpose, gluconeogenesis and glycogenolysis induced to meet out the energy demand of stressed



**Fig.1-** Glucose content of blood of control and experimental *H. fossilis* during Pre-spawning (A), spawning (B) and post spawning (C) phases values represent mean  $\pm$ SE of monthly observation through the concerned phase. All experimental values significantly different from corresponding control value [ $p < 0.05$ ].

fishes (Wedmeyer *et al*, 1967, Love 1980, Pandey *et al*, 2003, Mishra *et al*, 2003, Upadhyay *et al*, 2005, Achyutha *et al*, 2006).

In the present study the hyperglycemia appears to be the main reason for the increase glucose level under the stress of toxic effluents. This increasing is due to glycolysis and this

took place as a response to stress and transformations to glucose for energy requirement by fish. Various workers have been reported the increase in blood sugar content in variety of fishes under environmental contaminants (Lockhart *et al* 1972, Dalela *et al* 1981, Pandey *et al* 2010).

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