

Starvation and its impact on biochemical aspects of fresh water fish *Oreochromis mossambicus*

R.P. MALI AND P.N. CHAVAN

Received : April, 2011; Accepted : May, 2011

See end of the article for authors' affiliations

Correspondence to :

P.N. CHAVAN

P.G. Department of Zoology,
Yeshwant College, NANDED
(M.S.) INDIA

ABSTRACT

In present investigation, the biochemical changes in different tissues viz., liver, gill and muscle of freshwater fish, *Oreochromis mossambicus* during starvation was performed. Starvation is experienced in most species of fish during certain period of every year largely due to environmental conditions and it affects on different organs in different ways. The body weight reduction and a decrease in protein and glycogen content of 30 and 60 days starved fish as compared to normal set was observed.

Key words : *Oreochromis mossambicus*, Biochemical constituents, Starvation

Under natural conditions numerous fish species face long periods of starvation associated mainly with seasonal changes in food availability, spawning migrations, preparation for spawning or seasonal changes in water temperature. Starvation is experienced in most species of fish during certain periods of every year largely due to environmental conditions and it affects on different organs in different ways. Starvation induce changes in biochemical constituents in fishes.

The problem concerns how the glycogen and protein are metabolized and transferred to storage depots and converted to energy. Starvation also affects the physiology and other constituents of fish (Rajyasree and Naidu, 1989; Mukhopadhaya *et al.*, 1991 ; Lie and Huse, 1992; Chin and Shin, 1992). Reduced energy requirements due to low metabolic rates have also been demonstrated by starvation experiments with *Trematomus eulepidotus* (Wohrmann, 1998). Prolonged starvation effects on red and white muscles of two freshwater teleost fishes have been studied by Kiran and Talesara (1985). Borah and Yadav (1996) worked on the biochemical and haematological response to starvation in *Heteropneustes fossilis*. They reported the decrease in the activity of lactate dehydrogenase in both liver and muscles as a function of starvation. The amount of protein and glycogen also decreased as the period of starvation increased. Letcher *et al.* (1996) showed the size dependent effect on starvation and mass loss in yellow perch larvae and juveniles. There is increasing evidence that starvation may

be a major cause of mortality in both immature and adult fishes. Fasting also affects metabolic enzymes, RNA/DNA and proteins in fish. It has a great impact on fish growth. The present study was on effect of starvation on freshwater fish, *Oreochromis mossambicus*.

MATERIALS AND METHODS

The freshwater fish, *Oreochromis mossambicus* having weight 50 g to 60 g were collected from the Godavari river (Nanded region) with the help of local fisherman. The investigation was carried out from October 2010 to December 2010. Fishes were brought to the laboratory and acclimatized to laboratory conditions and fed with tubifex. After acclimatization, the fishes were divided into two groups *i.e.* control and fasting groups. Each group contained five individuals and control was fed with tubifex. However, the food was withheld from the fasting group. After that the fishes were sacrificed and tissues viz., gill, liver and muscle taken for the estimation of biochemical aspects. The results were compared with the values of estimated biochemical aspects in the tissues of starved fish and control fish.

Protein content was estimated using Folin-Cioalteau reagent and its concentration calculated with the help of a calibration curve prepared by relating the optical density to micrograms of bovine serum albumin. The Glycogen content was estimated calorimetrically by the method described by Seifer *et al.* (1950).

RESULTS AND DISCUSSION

It is evident from the starvation studies that the fasting decreased significantly the various biochemical activities.

Mali, R.P. and Chavan, P.N. (2011). Starvation and its impact on biochemical aspects of fresh water fish *Oreochromis mossambicus*. *Asian J. Animal Sci.*, **6**(1): 71-73.