



# Impact of temperature variations on Glycogen content of freshwater fish, *Oreochromis mossambicus* from Nanded (MS) Region

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## ABSTRACT

The present work deals with the effect of temperature on glycogen content of freshwater fish *Oreochromis mossambicus*. The fishes were exposed to different temperatures such as 20°C, 24°C, 28°C 32°C, 36°C and 40°C for 96-hour exposure. The result reveals that the amount of glycogen content in the tissues like liver and muscles of fish were steadily decrease at higher temperature as compared to control set. It might be due to excess energy is utilized as anaerobic glycolysis enhanced due to temperature stress. The results obtained plotted graphically and discussed in detail.

**Keywords:** Temperature, Glycogen, *Oreochromis mossambicus*.

## INTRODUCTION

Temperature is an important factor which affects the chemical composition of various tissues of aquatic organisms. The temperature is directly conducted with life activities of living organisms (Krogh 1916, Brown *et al.*1994). Several variations in biochemical constituents of tissues have been associated with differences in environmental temperature. In the natural process of temperature acclimation, most of the Poikilotherms adjust their metabolic rates to maintain physiological activity at constant level, thus these animals attain a measure of independence of temperature (Prosser and Brown 1961).

## MATERIALS AND METHOD

The fresh water fish *Oreochromis mossambicus* were collected from Godavari River at Nanded region with the help of local fisherman. They were acclimated for 10 days and used for experimentation. *Oreochromis mossambicus* of varying size 40-50 gm were used for experimentation. The estimation of glycogen content was carried out by the method of Anthrone (Seifter *et al.* 1950).

## RESULT AND DISCUSSION

In the present investigation, the fresh water fish *Oreochromis mossambicus* were exposed to variable temperature up to 96 hours. The significant changes in glycogen content were recorded in table A. The results were graphically represented by bar charts.

A significant depletion in the glycogen content in the tissues such as liver and muscle was observed in *Oreochromis mossambicus* at low temperature (20°C)

and at high temperature (40°C) as compared to control temperature. The depletion in glycogen content may be due to temperature stress leads to anaerobic glycolysis. Similar results were reported in fresh water crab *Barytelphusa guirini* (Khagokpam *et al.*, 2011). The depletion in glycogen content is due to stress and strain (Tilak *et al.*, 2005). Murugaian *et al.* (2008) reported that the glycogen content in catfish *Mystus gulio* decreased with increasing temperature because of stress. Fish make more suitable adjustments for which stored energy was utilized (Anonymous 2005).

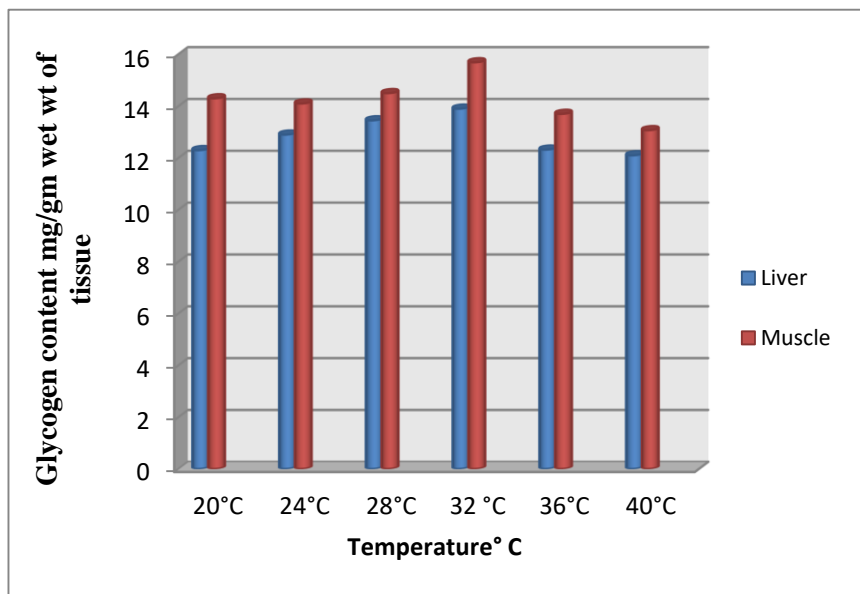


Figure 1 : Effect of temperature on glycogen content of freshwater fish *Oreochromis mossambicus*

As the temperature increases the glycogen content decreases due to temperature stress fish was under the stress condition. The temperature stress causes the disturbances in the normal physiological activities of fishes. The glycogen content also decreases in the tissue of freshwater fish *Oreochromis mossambicus* in low temperature as compared to control set. In the low temperature food intake, energy consumption decreased, reproduction and swimming ability slowed down. Fish has more tolerance against hypoxic conditions (Nilsson 2004; Randall *et al.* 2004). Harun wijaya *et.al.* 2019 showed temperature treatment at 32°C glycogen level decreased due to prolonged stress up to 14 days in Uceng Fish (*Nemacheilus fasciatus*).

It showed that temperature play important role in the biochemical architecture of all life activities in the world including aquatic biota.

**Conflict of interest:** The authors declare that they have no conflict of interest.

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