



Impact of temperature variations on Amino Acid content of fresh water fish *Oreochromis mossambicus*

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ABSTRACT

The present investigation was carried out on free amino acid content of different tissues of Fresh water fish *Oreochromis mossambicus*. The fishes were exposed to different temperature such as 20°C, 24°C, 28°C, 32°C, 36°C & 40°C for 96 hours respectively. The results reveals that amount of free amino acid content in the tissues like liver and muscle of fish were decreased at high temperatures compared to control set. The results obtained plotted graphically and discussed in detail.

Keywords : Temperature, Amino acid, *Oreochromis mossambicus*.

INTRODUCTION

Temperature has significant influence on the habitat of aquatic animals and on its physic-chemical responses. It is also known to affect the chemical composition of aquatic animals (Krogh 1916, Landu, 1992 and Brown *et al.* 1994, Shillewar and Totawar, 2019). Free amino acids are the catabolic products of proteins which plays an important role in many physiological phenom-ena. They are the essential components of all living cells. Amino acids play a key molecule in cellular metabolism (Babsky 1989), fish reacts physiologically not only to physical but also to environmental factors such as change in water temperature. Many fish experience large seasonal fluctuation in environmental temperature (Mcwhinnie 1972). Hence the aim of present study was to examine the temperature variations on the amino acid content of fresh water fish *Oreochromis mossambicus*.

MATERIAL AND METHOD

The fresh water fish *Oreochromis mossambicus* were collected from Godavari River at Nanded with the help of local fisherman. They were acclimated for 8 days and used for experimentation. *Oreochromis mossambicus* of varying size 50-55 gm were used for experimentation.

The free amino acid content was estimated by the method of Moore and Stein (1948). The values were expressed in mg of amino acid/ gm wet wt. of tissue.

RESULT AND DISCUSSION

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

A significant depletion in the amino acid content in the liver was observed at low temperature (20°C) and at high temperature (40°C) as compared to control temperature. The amino acid content slightly increased at 24°C and 36°C in the muscle and gill of fish. The increased free amino acid content in the liver and muscle at high temperature i.e. at 36°C may be due to increase of proteolysis and reduced incorporation into the protein synthesis. While the decreases in amino acid content in low temperature i.e. at 20°C may be due to utilization of energy in the other metabolic

pathways. The increase in amino acid level in fish *Channa striatus* in muscle tissue at temperature range 35°C to 15°C was observed might be due to enhanced proteolysis activity (Tantarpale et al. 2011). In the present study the amino acid content decreased in liver at low and high temperatures, decrease in FAA (free amino acid) may be due to tissue hydration. The decrease in amino acid content in common mud crab, *Panopeus herbstii* on the effect of low salinity on amino acid metabolism reported by Boone and Claybrook (1977). Kandula (1961), were studied increase in amino acid content in the water mussel *Lamellidens marginalis* and also found to be decreased content of amino acid in freshwater field crab, *Paratelpusa* sp., after acclimatization to high temperature. Karanova et al. 2006 reported that variations in the amino acid content in body fluids of freshwater mollusk *Lymnaea stagnalis* during low temperatures. The seasonal variations in free amino acid contents also observed by Damberge 1964; Masurekar et al. 1977 and Pamptwar et al. 2006. It showed that temperature play important role in the biochemical architecture of all life activities in the world including aquatic biota.

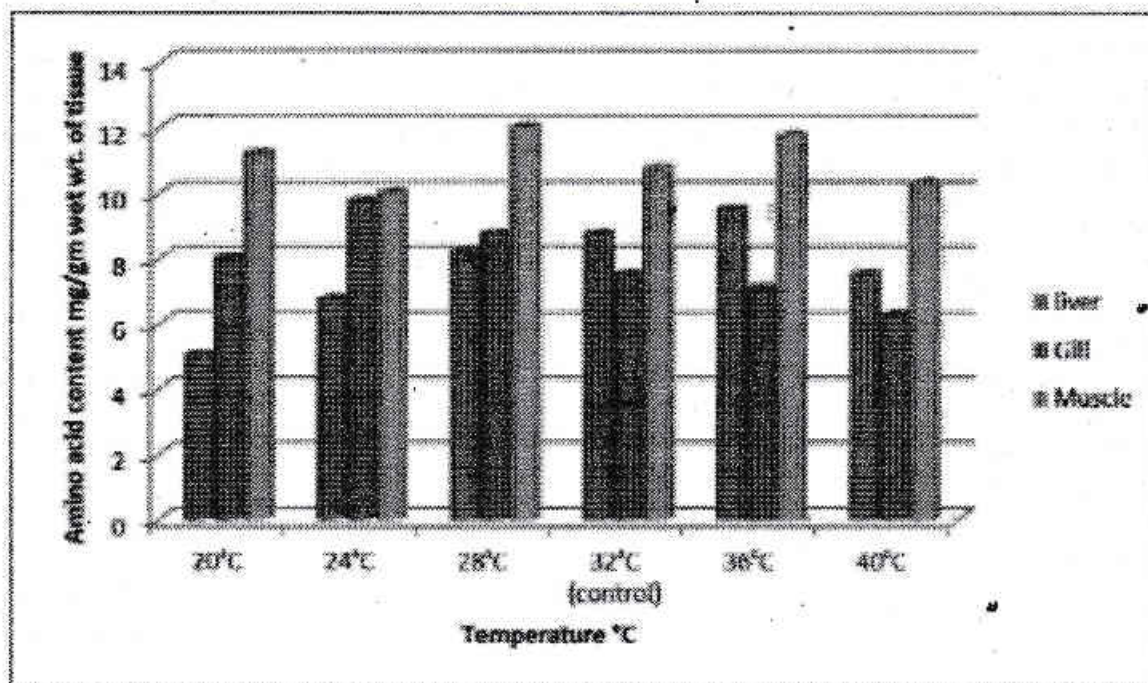


Figure: Effect of temperature on Amino acid content of freshwater fish *Oreochromis mossambicus*

Conflicts of Interest: The authors declare no conflict of interest.

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