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RESEARCH PAPER

Effects of administration of adrenaline on glucose and glycogen in *Tilapia mossambica* (Peters) and *Macrones gulio* (Hamilton)

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ABSTRACT

This paper reports on the comparative study on the effects of adrenaline administration in fresh water, herbivore fish-*Tilapia mossambica* and a marine carnivore fish-*Macrones gulio*.The adrenal administration caused increase in the glucose contents in liver and blood of *T. mossambica* up to 4 hours and declined thereafter. While glucose contents in heart and body muscles showed decline up to 4 hours and thereafter a tendency to elevate. The glucose contents in liver and blood of *M. gulio* increased within 4 hours and then declined. The glucose contents in heart muscles of this fish exhibited decline up to 4 hours and then showed a tendency to elevate while glucose in body muscles declined up to 24 hours. The glycogen contents of liver, heart muscles and body muscles of *T. mossambica* and *M. gulio* reduced within 4 hours because of administration of adrenaline followed by tendency to elevate.

Key words : Glucose, Glycogen, adrenaline. *Tilapia mossambica, Macrones gulio.*

Chromaffin tissue produce adrenaline and this tissue are present in most of the groups of fishes. This tissue is located in the post cardinal venous drainage of kidney, hear and dorsal aorta (Hoar and Randall, 1969; Love 1980; Peter and Peter, 1985). West *et al.* (1970) reported that adrenaline belongs to catecholamine class of organic compound and they affect digestion, circulation, tissue metabolism, renal function, growth and resistance to stress. Horward (1979) also suggested that catecholamine stimulated glycogenolysis and have antiinsulin effects in mammals. Epinephrine or adrenaline causes glycogenolysis, hyperglycemia and glucoseurea in liver and muscles of mammals. It also augments oxygen consumption in an organism. Its action is faster as compared to that of thyroxin. Love (1980) has reported that in fishes, blood glucose rises due to mobilization of glycogen particularly from liver. Peter and Peter (1985) have concluded that in elasmobranches, catecholamine affects carbohydrate metabolism and this effect may be identical to that seen in mammals. Hayashi and Ooshiro (1975) observed that epinephrine stimulated glycogenolysis in eel. De Roos and De Roos (1972) found that adrenaline injection could mobilize glycogen from liver and muscles. Fabbris *et al.* (1998) expressed that the physiological role of catecholamine, adrenaline and nor adrenaline in fishes have been frequently reviewed but the metabolic consequences of these hormones received less attention. The present study, an effort is made to elucidate the effects of administration of adrenaline in a fresh water and herbivore fish–*Tilapia mossambica* and a marine, carnivore-*Macrones gulio.*

MATERIALS AND METHODS

Live specimens of *T. mossambica*, were collected randomly from local, fresh water pond called Bangaga at Walkeshwar, Mumbai. The fish collected were healthy, active, with no external injury and with no external parasites. These fish were stocked in glass aquarium, with no over crowding and acclimatized to laboratory conditions. The water of the aquarium was filtered, aerated and changed frequently. For experimental work, the fish were transferred to different glass aquaria. Temperature of water was 28^0 C and fish were not fed. Live specimens of *M.gulio* were procured from a dealer in Borivli fish market, in Mumbai. The fish were collected randomly from Bhayander and Vasai creeks, near Mumbai. The collected fish were healthy, active, with no external injury and with no external parasites. These fish were transported to the laboratory in well-aerated, filtered seawater and with minimum mechanical shock. The fish were stocked in glass aquarium and over crowd was avoided. The specimens were acclimatized to laboratory conditions, at water being at 28^0 C temperature. They were transferred to experimental tanks and were not fed. For the estimation of glucose contents, live specimens of *T. mossambica* with 28.10 gm mean body weight and 11.70 cm mean body length were administered 1.0 mg per 100.00 gm body weight, of adrenaline intraperitoneally