

Distribution of antioxidant enzyme SOD in Gomti and Ganga river in liver and skin of *Cirrhinus mrigala* (Ham.)

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SUMMARY

Laboratory experiments were carried out to expose the activity of superoxide dismutase in the liver and skin of fresh water teleost fish, *Cirrhinus mrigala* (Ham.) from sample of water collected from river Gomti at Ramghat, Jaunpur and river Ganga at Ghazipur. The fishes were acclimatized in both types of water sample for 14th days. The superoxide dismutase activities were significantly higher in the sample of water collected from river Gomti than river Ganga and control. The physico-chemical parameters of four samples indicated that sample from Ganga river had high biological oxygen demand in comparison to Gomti river, chemical oxygen demand and pH where as the same samples was low in dissolved oxygen when compared with control sample.

Key words :

Antioxidant Enzyme (SOD), Water and fish, *Cirrhinus mrigala*, Superoxide dismutase.

Oxygen is an essential element required by all aerobic forms of life; Recently, this essential gas has become a focus of controversy which has resulted from observations by several laboratories that oxygen though essential for aerobic form of life can be hazardous and deleterious to biological system (Bert, 1978).

The oxygen toxicity effect lies in chemical reaction between oxygen and other molecules with in both the living body and environment; which generates harmful reactive oxygen species (ROS) or Free radicals that have been implicated in hundreds diseases from arthritis to haemorrhagic shock to AIDS (Southern, 1988; Halliwell and Gutteridge, 1989; Halliwell and Cross, 1991 and Risberg *et al.*, 1991). There few comparative studies of vertebrates antioxidant defense (AD) in the literature specially in the case of fresh water teleost fish.

In 1969 biomedical community was introduced new enzyme conceived in mystery and dedicated to the an boliation of superoxide free radicals (McCord and Fridovich, 1969). The mechanism is the production of Superoxide radical and its dismutation reaction catalysed by enzyme superoxide dismutase (SOD) (Halliwell and Gutteride, 1989 and Otto and Moon, 1995).

Superoxide dismutase SOD is metalloenzyme playing a key role in the defense against the toxic effect of reactive oxygen species by disproportionating superoxide anion (Fridovich, 1988).

The fishes are exposed to daily or seasonal

changes in both temperature and oxygen availability. The fishes posses antioxidant defense system (AD) which utilizes enzymatic and non-enzymatic mechanisms. It can be expected that fish antioxidant defense system depends on oxygen consumptions. The antioxidant defense system of fish we have detected Cu-Zn SOD and Mn-SOD activities in fish metabolic tissues.

MATERIALS AND METHODS

Fishes were collected from Gomti river at Jaunpur and Ganga river at Ghazipur. They were stacked in earthen container (Capacity about 20 lit) in the water of site from where they were collected. Fishes were acclimatized to laboratory conditions under normal photoperiod and temperature for three days. They were fed adlibitum.

Preparation of homogenate:

10% (W/V) homogenate of tissues liver and skin were prepared with aid of Yorks homogenizer fitted with Teflon plunger in potassium phosphate buffer (0.05 M pH 7.0). The homogenate was first centrifuged at 2500 xg for ten minutes in a refrigerated centrifuge (Electric Rc 4100). The pellete consisting of a nuclear fraction and cell debris was discarded. The clear supernatant was taken for enzyme studies.

For the assay of Superoxide dismutase (SOD) was estimated by the method of McCord and Fridovich (1969).

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