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IMPACT OF BIOPESTICIDE *(AZADIRACHTA INDICA)* ON THE (SDH) SUCCINATE DEHYDROGENASE OF *HETEROPNEUSTES FOSSILIS*

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ABSTRACT: An investigation on the effect of the *Azadirachta indica* on the Succinate dehydrogenase of liver muscle and intestine of fresh water catfish *Heteropneustes fossilis* was carried out in the laboratory. Fishes were exposed to sub-lethal concentrations of *Azadirachta indica* for 24,48,72 and 96 hrs. The LC50 values of *Azadirachta indica* calculated for *Heteropneustes fossilis.* Succinic Dehydrogenase in liver, muscle and intestine tissues were showed significant decreasing trend in experimental groups as compared with the controlled group.

Key words: - Azadirachta indica, Heteropneustes fossilis, Sub-lethal concentrations, Succinate dehydrogenase, Liver, Muscle and intestine.

INTRODUCTION:

Nowadays, pesticides are being used extensively in the control of crop pests. Synthetic insecticides are used widely for the control of various insect pests because they can be applied whenever and wherever needed, economical and most important thing is the reliability of control method. Hence, the production and consumption of pesticides has greatly increased in recent years. The contribution of pesticides to increase agricultural production cannot be denied, but synthetic pesticides have also caused unprecedented ecological damage, also induced serious health hazard among workers during manufacture, formulation and field applications1. To overcome the problems of synthetic chemical, To overcome the problems of synthetic chemical hazards, one of the best control measures is the use of plant origin products. The popularity of the plant products increasing day by day because of their biodegradability, least persistence and least toxic to non-target organisms, economic and easy availability.

Today about 200 plants with insecticidal activities are known . Among the natural products, one of the most promising natural compound is Azadirachtin, an active compound extracted from the *Azadirachta indica* A. Juss (neem) tree (Family Meliaceae) whose antiviral, antifungal, antibacterial and insecticidal properties have been known for several years The pecticides derived from the neem tree (*Azadirachta indica)* are considered to be relatively safe and promising biopesticides (Anon, 1992). Azadirachtin is a secondary plant product of the neem tree (*Azadirachta indica* A. Juss). It is the main active component of neem seeds and a prime example of biobotanical insecticides that disturb an insect's development rather than the biochemical or metabolic activity of enzymes that are found more ubiquitously in nature (Schmutterer, 1990). However, these pesticides have been found to be toxic to fish (Mondal *et al.*, 2007 and Winkaler *et al.*, 2007).

MATERIALS AND METHODS:

For the experiment fresh water catfish *Heteropneustes fossilis* were selected and divided into two groups with 10 fishes in each aquarium. Each group was exposed to sublethal concentration of the *Azadirachta indica* similar set up was also maintained as control. During sublethal studies, fish were fed by locally available marketed food. The animals were scarifies for optimal concentration of biopesticide for different exposure of 24, 48, 72 and 96 Hrs. For SDH (Succinate dehydrogenate) studies, fishes were scarified during the exposure period of 24, 48, 72 and 96 Hrs respectively. The toxicant was renewed after fixed period.

RESULT & DISCUSSION:

Succinic Dehydrogenase

During the course of experiments, *Heteropneustes fossilis* was exposed to sub lethal concentration of *Azadirachta indica*. The mean (±SE) values mentioned enzyme parameter for selected tissues was observed to be significantly lower for the experimental groups compared with the controlled group. It is expressed in µg / mg / wt / hr

Succinic Dehydrogenase in liver, muscle and intestine tissues were showed significant decreasing trend in experimental groups as compared with the controlled group. It is the only enzyme that participates in both the citric acid cycle and the electron transport chain. The higher activity of succinic dehydrogenase (SDH) in liver than muscle is due to higher distribution of mitochondria, since SDH is mitochondrially localized enzyme (Harper *et al.* 1979). Hence it can be concluded that reduced level of SDH may because of reduced mitochondrial function or increased ruptured mitochondria in tissue. The suppression of SDH activity in Oreochromis mossambicus indicates impairment of oxidative metabolic cycle and hence relies on anaerobic glycolysis to meet its energy demands (James et al. 1992).

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Table 3.3.4: Effect of *A. indica* on tissue Succinic Dehydrogenase of *H. fossilis*

Sr .	Tissue	Control	24 Hr	48 Hr	72 Hr	96 Hr
1	Liver	74.41 ± 2.908	59.83 ± 4.411	64.19 ± 3.610	51.42 ± 3.016	50.23 ± 4.030
2	Muscle	62.22 ± 3.072	54.56 ± 5.006	55.83 ± 4.226	48.24 ± 4.012	45.26 ± 5.157
3	Intestine	50.42 ± 2.461	49.24 ± 4.305	45.08 ± 4.067	41.04 ± 3.776	37.11 ± 3.602

± SE, * Significant at P< 0.05, ** Significant at P< 0.01 and P< 0.05 both

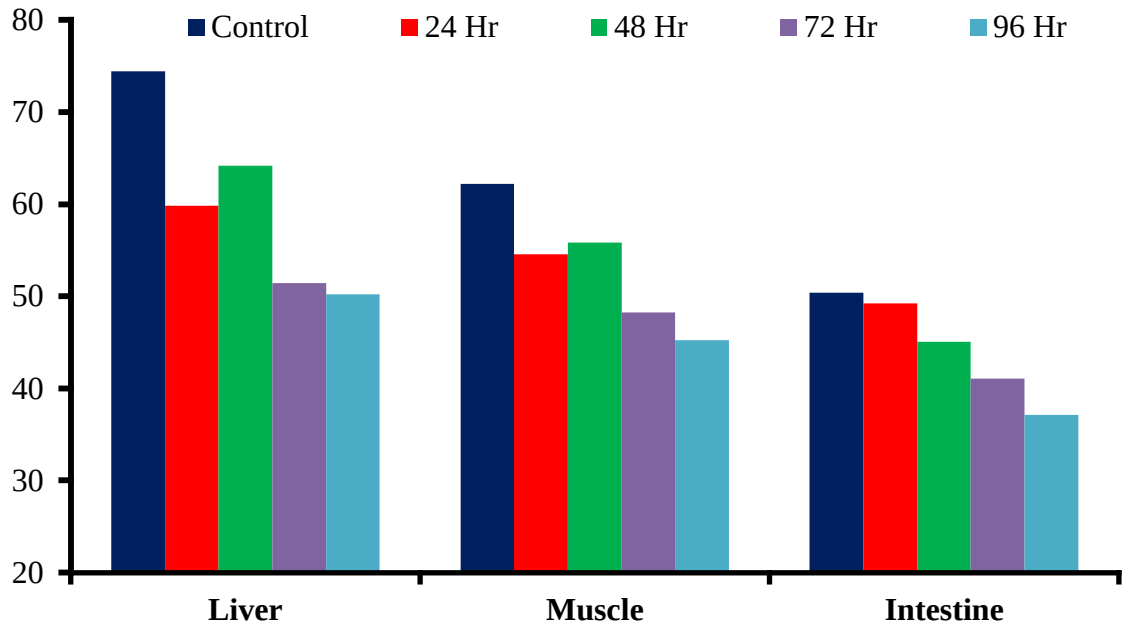

Figure 3.3.4: Effect of *A. indica* on tissue Succinic Dehydrogenase of *H. fossilis*Table 1: *Pre-sown and post-harvest soil analysis in the Turmeric field.*