

**Effect of Malathion on RNA of Fresh Water fish,  
'Macrones Cavasius'**

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**Abstract:-**

*Out of various sources of water pollution the enormous use of insecticide pollutes the river and major water sources. Malathion is one of the organophosphorous insecticide widely used throughout the world. However, limited efforts have made to study its toxic effect in different fish tissues. The present research work was aimed to study the effect of sublethal concentration of Malathion on ribose nucleic acid, Content in different tissues like muscle, kidney, stomach and heart of fresh water fish 'Macrones Cavasius'. The fishes were exposed up to 96 hours period of exposure. The result reveals the total RNA content in heart and stomach decline in experimental group as compared with control.*

**Keywords:-** Malathion, Ribose Nucleic acid, 'Macrones Cavasius'

**Introduction:-**

Today the uses of pollutants are of wide use in modern agriculture for production of high quality food. The use of insecticides has increased Manifolds to get immediate relief from various indoor, outdoor and agricultural pests, ignoring devastating effects of these insecticides on fish life. These insecticides ultimately reach the aquatic system through different pathways, affecting various aquatic organisms. The pollution of water due to pesticides, insecticides is one of the various pollutants in the aquatic biota which causes affect on living organisms.

Malathion is one of the earliest developed organophosphate insecticide. Earlier findings have indicated toxic potentials of technical and commercial grades malathion on different non target organisms including fishes (Barat et.al. 1998; Giri et.al., 2002). The fresh water fish 'Macrones Cavasius' was selected for the present study which is widely available in Udgir region Dist. Latur. Scanty reports were available regarding nucleic acid content in Macrones Cavasius under toxic stress. Therefore present investigation was under taken to investigate the ribose nucleic acid contents in vital tissues like muscle, kidney, heart and stomach of macrons cavasius under Malathion induced stress.

**Materials and Methods:-**

The fish Macrones Cavasius were collected from Pimpri dam water at Tq. Udgir and brought to Laboratory. Only healthy fishes having hear same weight were selected for the present experiment. Then they are placed in 0.1% potassium permagnate solution for 1 minute so as to avoid any dermal infection. The fishes were then washed with water and acclimatized in laboratory conditions for two weeks The fishes were provided with live earthworms. The supply of food was stopped prior to experimentation. A commercial grade of pesticide malathion 50% EC was used for bioassay test. A stock solution of toxicant was prepared and few concentrations from stock solution were prepared as per the dilution technique (APHA 1998).

The experimental fishes were divided in to two groups having 10 fishes per aquarium. The sub lethal concentration is about 4ppm for 96 hours period of exposure. Another set was maintained as control group without the stress of pesticide. The sublethal concentration i.e. 1/5<sup>th</sup> of LC50 of 96 hours i.e. (0.8 ppm) concentration of Malathion solution was selected for the present study.

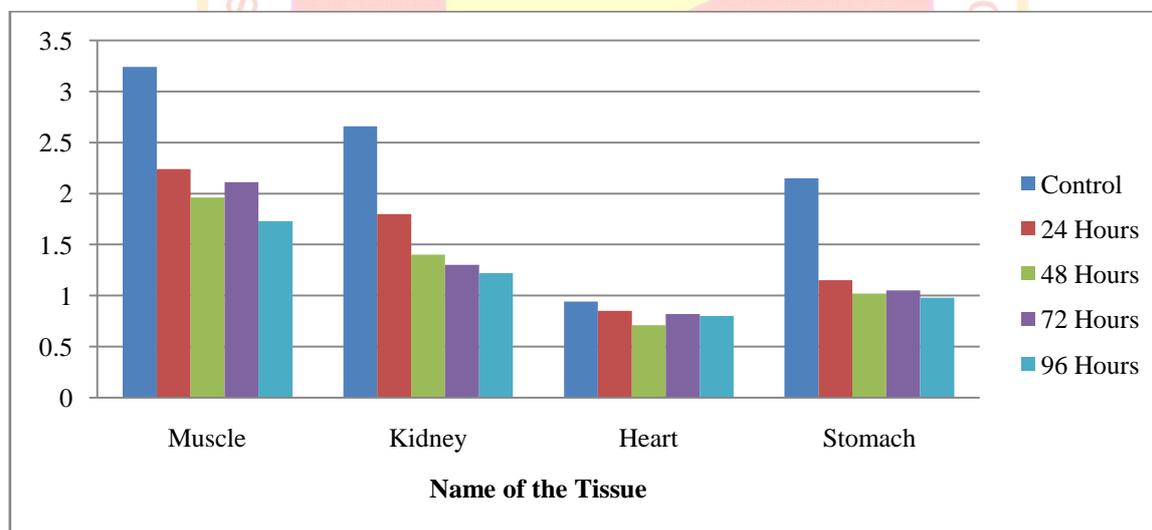
The fishes were sacrificed immediately at the end of 24, 48, 72 and 96 hours period of exposure in experimental as well as control set. Tissue like Muscle, Kidney, Heart and stomach were excised rapidly and processed for the biochemical estimation. RNA content was estimated by orcinol method (Bail M., 1902)

**Result:-**

The RNA content in different organs of *Macrones Cavasius* exposed to Malathion is given in table. The amount of RNA content in experimental set were found to be in Malathion exposed fish varied from different tissues. The RNA contents expressed in mg/gm wet weight of tissue respectively. The obtained data is shown by graphical representation.

**Table:**  
**Effect of Malathion on total RNA content (mg/gm wet weight of tissue) of fresh water fish, *Macrones cavasius* for 24, 48, 72 & 96 hours period of exposure)**

Sr. No.	Name of Tissue	Control Set	Sublethal Concentration			
			24 hours	48 hours	72 hours	96 hours
1	Muscle	3.24±0.09	2.24±0.09	1.96±0.10	2.11±0.04	1.73±0.06
2	Kidney	2.66±0.02	1.80±0.04	1.40±0.04	1.30±0.05	1.22±0.05
3	Heart	0.94±0.04	0.85±0.03	0.71±0.05	0.82±0.07	0.80±0.05
4	Stomach	2.15±0.04	1.15±0.04	1.02±0.06	1.05±0.06	0.98±0.07



**Discussion:-**

Nucleic acid play the key role in protein synthesis nucleic acid content is considered as an index of capacity of an organism for protein synthesis. Hence any variation in RNA content reflects on protein synthesis and there by protein level in body on an animal. Malathion pesticide appears as a potential inhibitor of DNA synthesis, which might result in reduction of RNA level. Because of electrophilic nature the organophosphorus compound may attack many enzymes responsible for normal metabolic pathway. Thus, it is possible that the enzyme necessary for DNA synthesis might

have been inhibited by Malathion. Thus ultimately the disruption of DNA synthesis affected RNA synthesis (Tripathi and Verma 2004). Similar result had been showed by many authors. Asfia Parveen et.al., (1986) showed decrease in nucleic acid content in fresh water fish *clarius batrachus* when exposed to molathion. Tripathi et.al., (2000) reported that RNA and protein content was decline by 26-30%. Narayanram et.al., (1986) studied effect of Mercuric compound on RNA content in the brain, liver and ovary of the fish and reported marked decrease in RNA. Hence under toxic stress both nucleic acid and protein content depleted. The obtained results were supported by present investigation.

In present study decrease in the nucleic acid content was observed in all tissues of *Macrones Cavasius* exposed to Malathion. Similar observation were made by Durai Raj and Selvarajan, 1992; Abou Dania et.al., 1988. The nucleic acid plays a major role in all biological activities and is regulator of all biological synthesis. All the enzymes activities are controlled by the process of transcription. When the transcription process is curtailed, absence of RNA and protein synthesis occurs; as a result Metabolism is impaired. Farhana Zahir et.al., (2006) reported depletion of RNA content in different parts of brain of rat exposed to 1 mg/kg body weight during seven day exposure, highest reduction observed in cerebellum in case of methyl mercury toxicity. They concluded the reduction of DNA as well as free Radical damage to DNA and inhibit the RNA synthesis. Shah and Dubale, (1985) reported that molathion induced biochemical changes in liver, kidney of fresh water teleost *channa punctatus*. They showed significant depletion in glycogen, protein and RNA content due to toxic effect of Malathion.

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