



Effect of Malathion and Thiodon on Ovary in Fresh Water Fish: *Clariasgariepinus*

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Abstract:

The study was conducted to determine the effect of pesticides on different developmental stages on *Clariasgariepinus* during 2005-2007 from market of Chandrapur, Dist: Chandrapur (M.S.). Lethal and sublethal effect of Malathion and thiodon on ovary was carried out. In acute test after 96 hrs exposure with 0.0217 ppm of malathion and thiodon respectively, does not showed much difference, However in chronic test after 20 days exposure with the concentration 1/10 shows destruction of epithelial layer, damage to proliferation and disappearance of nucleus and nucleolus were observed.

Key words: Effect, Malathion, thiodon, *Clariasgariepinus*

Introduction:

Fish is a valuable source of protein and occupies significant position in the socio-economic fabric of south Asian countries. In last 25 years, unprecedented population growth and rapid industrialization coupled with intensive agricultural activities have exerted intolerable stress over the aquatic ecosystem. Pesticides are mainly used to control the pest in agricultural field. These pesticides are drawn into the lake, river by surface runoff and bring damage to different organs and disturb the developmental, physiological and biochemical processes within the organism. In recent years this environment is being threatened by a number of pollutants which may alter the reproductive capacity of the animals. Thus the main function of the reproduction is to replace population losses due to death and emigration (Warren, 1971).

In the present investigation tests were made for determining the separate toxicity of two pesticides, Malathion (an organophosphate) and Thiodon (organo-chloride) to test a fish *Clariasgariepinus*. Selection of pesticides was due to their extensive use in agriculture for pest control and selection of fish was made due to easy availability and survival capacity under laboratory conditions. The histopathological changes in gonads of fishes when exposed to pesticidal pollutant was observed by many workers. (Sivarajah *et.al.*, 1978, Wani and Latey 1982, Pawar and Katdare, 1983 and Shukla *et.al.*, 1984)

Since the work over fishes is still in infancy and there is a lack of information concerning the impact of pesticides on the reproductive mechanism of fishes. Therefore this trial was undertaken with the purpose to observe the histological changes in the ovary of the fish to take essential steps for increasing its productivity.

Material and Method:

The freshwater *Clariasgariepinus* were Purchased from Market of Chandrapur in Maharashtra and transported to the laboratory and maintained in





the large plastic containers containing tap water. The animals were acclimatized to laboratory conditions for a period of seven days. The water in the plastic containers was changed every day without disturbing the fishes. After starving them for three days they were fed twice a week with boiled eggs.

The pesticide Malathion (Organo Phosphate) and Thiodon (Organo chloride) was dissolved in tap water and required concentration was used from the stock solution. Acute toxicity test for Maturing female were conducted up to 24 and 96 hrs. The test medium was changed every 24 hrs to maintain the pollutant concentration. Simultaneously control fishes were also maintained throughout the Experiment. The ovary of control and test fishes was dissected out and fixed in aqueous Bouin's. The tissues were dehydrated through graded series of alcohol, embedded in paraffin wax (58-60 c), sectioned at 7-8 u. Stained with Harris haematoxylin and counter stained with eosin. Photographed were taken while using the camera SONY cyber-Shot DSC-S2000.

Result and Discussion:

In control maturing fish the ovary was covered by a thin outer layer of connective tissue and a inner epithelial layer from which oocytes proliferate and showing immature oocyte. In control mature fish the ovary was covered by a thin outer layer of connective tissue and a inner epithelial layer from which oocytes proliferate, and showing different stages of oocyte was covered with a thin layer of follicular cells. This cell completely filled with yolk globules and granules.

Effect of Malathion: Immature and Mature ovary:

In acute test after 96 hours exposure with 0.0217ppm of Malathion, discoloration of ovary and histological observation showed that ovary were inactive and had less number of oocytes and more amount of tissue moreover destruction of epithelial layer was observed. However, in chronic test after 20 days exposure to the concentration of 1/10 of 96 hrs of Malathion, destruction of epithelial layer .Seviour damage to proliferation.

In acute test after 96 hours exposure with 0.0311ppm of Malathion,discolourisation of ovary ,loss in epithelial layer and degeneration of proliferation. Vacuolization in oocytes and shrinkage in ooplasmic material were observed. However, in chronic test after 20 days exposure to the concentration of 1/10 of 96 hrs.ofMalathion, destruction of epithelial layer, seviour damage in oocytes and disappearance of nucleus and nucleolus were observed.

Effect of Thiodon: Immature and Mature ovary:

In acute test after 96 hours exposure with 0.0217ppm of Thiodon, the ovary did not show much difference as compare with control, slight change in colouration.. However, in chronic test after 20 days exposure to the concentration of 1/10 of 96 hrs of Thiodon, shows destruction of epithial layer and disintegration of proliferation zone.Theoogonigial cells were seen cluster, yolk material was completely disappear. However, in chronic test after 20 days exposure to the concentration of 1/10 of 96 hrs of Thiodon, major damage to ovarian structure, vacuolization towards the periphery of oocytes.





The present histological changes in the ovary of fresh water fish *Clarias gariepinus* reveals that, the ovary exhibit wide spread destruction of germinal elements following chronic exposure to pesticide, melathione (organophosphate) and thiodon (organochloride). This group of pesticides are known to have direct and indirect effect by slowing down the growth of the animal. Most of the pesticide caused more damage in the ovary during the lethal exposure. Mary (1984) reported that the pesticidal exposure caused changes in normal structure of ovary in freshwater prawn *Macrobrachium lamerrii*. Similar findings are also reported by yadav and sarojini (1989) after exposure to organ chlorine pesticide endosulfan and Abirami J. *et. al.*(2012)

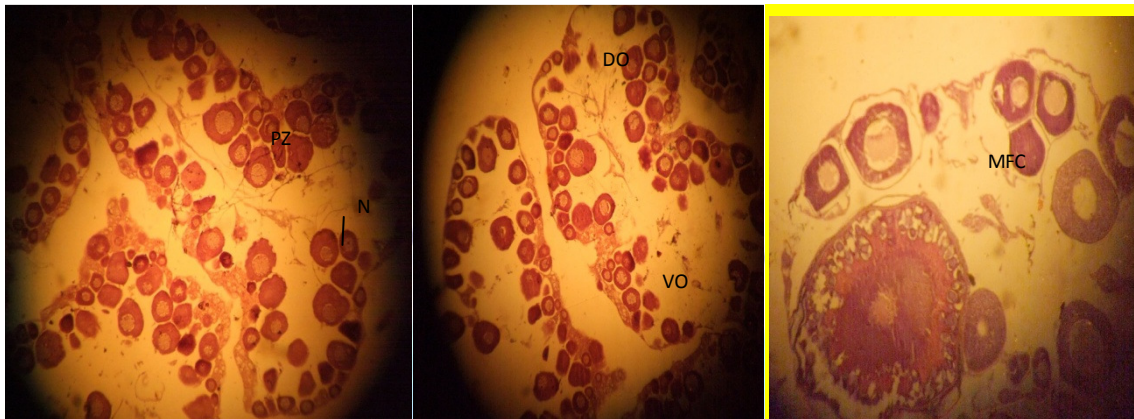


Figure. 1

Figure.2

Figure.3

Photo micrograph showing Histology of maturing ovary

Figure. 1 control ovary

Figure.2 and Figure. 3 After exposure

MFC: Maturing follicle

YG: Yolk granules

PZ: Proliferating Zone

N: Nucleus

VO: Vitellogenic oocytes

DO: Degenerating oocytes

Conclusion:

From above study, it may be concluded that pesticide caused adverse effect on the ovary of freshwater fish *Clarias gariepinus* due to the pesticide impact and also reduced the reproduction of a fish.

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