

**EFFECT OF SUB-LETHAL TREATMENT OF ORGANOCHLORINE PESTICIDE THIODAN ON HEPATOPANCREAS OF FRESHWATER MOLLUSC *L. CORRIANUS* DURING WINTER**

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**ABSTRACT**

Pesticides have been found to be highly toxic not only to fish but also to the aquatic organism which contribute the food chain. Pesticides in general, are used very extensively in agriculture, forestry, public health and veterinary practices. With run off these pesticides hind their way in to the aquatic ecosystem. Hence, it is necessary to study the immediate and chronic effects of pesticides on aquatic biota. Present study was designed to study effect of Sublethal treatment of organochlorine pesticide thiodan (Endosulfan 35 EC) on hepatopancreas of freshwater bivalve mollusc *Lamelledens corrianus* during winter season and showed severe damage to the hepatopancreas

**Keywords:** Pesticide, hepatopancreas, organochlorine, Thiodan, *Lamellidens corrianus*

**INTRODUCTION**

Pesticides are hazardous to the animal, human and environment. Pesticides are responsible for the death of aquatic biota and resulted in reproductive failure. Organophosphorus pesticides like phorate, monochrotophos, quinolphos, ekalux, asataf, malathion, etc were used by farmers of drought prone area (Kamble et al., 2012). They further stated that use of such pesticide will cause neurological disorders among the farmers. Organophosphorus pesticides cause adverse effect on central and peripheral nervous system (Keifer, 1997). Pesticides causes severe damage to fishes and other aquatic organism (Herger et al., 1995; Omitoyin et al., 2007). Most of the study on induced cytoarchitectural changes due to

pesticide was carried out on fish and other invertebrate, while that of freshwater bivalve were still scanty (Rao and Mane, 1978; Akarte et al., 1986). Dalela et al; (1979) showed histological dimensions of gill of *Channa gauchua* after acute and sub acute exposure of endosulfan and Rogar. Jayantrao et al; (1983) studied the sublethal and lethal effect of malathion on gills of *Tilapia mossambica*, observed hypoxia and failure of respiratory mechanism resulted in the death of fish. Cope (1996) reported a sublethal effect of herbicide caused degenerative changes in liver and testis. Nagbhusanam et al; (1983) observed the acute exposure of Malathion and Demacron and Monochrotophos caused pronounced changes in gonad of the freshwater prawn *Macrobrachium lamerii*. Muley et al; (1996) observed hemorrhage in primary gill lamellae. Present study was carried out to study the effect of sublethal treatment of organochlorine pesticides on hepatopancrease of freshwater bivalve mollusc *Lamellidens corrianus* found near Sangola of Solapur district (MS) during winter season.

#### MATERIAL AND METHOD

Freshwater mollusc, *Lamellidens corrianus* were collected from Chincholi freshwater tank. Soon after collection they were brought to the laboratory and properly cleaned to remove the mud and algal biomass and stored in well aerated fresh water container for acclimatization. They were grouped in 20 and transferred to predetermined 1/10th of LC50 concentration of Thiodan® (Endosulfan 35 EC) during winter season. A control group without the pesticide was run simultaneously. The sub lethal toxicity experiment were conducted for 15 days and at the interval of 5, 10 and 15 days. Hepatopancreas were collected for histopathological studies from 5 animals from each group and fixed in to Bovine fluid for overnight and washing was done for 24 hr after fixation. The tissue was dehydrated using different alcoholic grades and cleared in xylene. Then the tissues were transferred to cold embedding followed by hot embedding at 58<sup>0</sup>C for 1 hr. The paraffin block of the tissues was made. The trimmed blocks were used for sectioning. The section of six micron thickness was selected for staining. Double staining was done by using Delafield's hematoxylene and eosin. Stained sections were used for microphotography.

#### RESULT AND DISCUSSION

According to Thompson et al., (1974) Hepatopancreas act as depot tissue of metabolic reservoir, provide a source of energy during stress. The histopathological changes due sub-lethal treatment of to Thiodan (Endosulfan 35 % EC) on *Lamellidens corrianus*, during

winter season showed (Fig No.1) pronounced effect leads necrosis of parenchyma, hyperplasia and major damage to the basement membrane and sever vacuolization to the hepatopancreas during winter season. In control, the digestive cells were prominently stained. The digestive cell is responsible for the absorption and intracellular digestion of food. Due to Thiodan toxicity the basement membrane and digestive cells got ruptured at certain places, digestive and secretory cells observed shrunken. Toxicity of organophosphate for different fish species varies with age, Length and sex of the animals (Gill et al., 1988). Tilak (2005) while studying histopathological changes exposed to sublethal concentration of Butachlor and Machete observed gill filament and fusion of secondary gill filament. Muley and Mane (1986) while studying endosulfan toxicosis to the hepatopancreas of *Lamellidens marginalis* and *Lamellidens corrianus*, from Godavari river, Paithan observed similar histopathological changes and stated that, *L. marginalis* was more sensitive than *L. corrianus*. Kamble and Mane (2012) studied effect of organophosphorus pesticide on female gonad of freshwater bivalve mollusc *Lamellidends corrianus* and reported sever damage to female gonad during winter season. Robert (1992) while studying chronic toxicity of endosulfan to a mussel *Mytilus eduleus* noticed changes in the digestive gland. In present study similar might be the case where sever damage to the hepatopancreases due to organochlorine pesticide thiodan during wither season.

Fig-1. Showing effect of sub lethal treatment of organochlorin pesticide, Thiodan on hepatopancease of *L. corrianus*

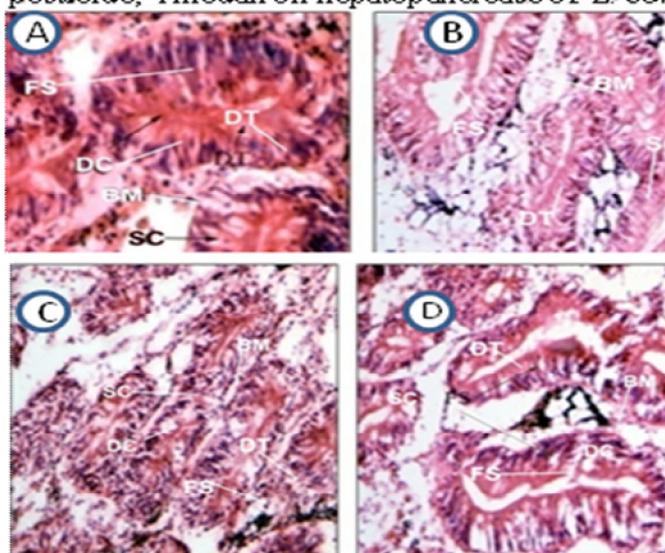


Fig- A- control;

Fig-C- after 10 days;

Fig- B- after 5 days;

Fig-D- after 15 days

DT- Digestive tubule ; SC- Secretory cells; DC- Digestive cell  
FS- Fragmentation spherule ; BM- Basement membrane

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