



Lindane Toxicity Effect on Thyroid and Corpuscles of Stannius Histology of Fish- *Heteropneustes fossilis*

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ABSTRACT

The Lc50 values of lindane for *H. fossilis* fish was estimated using the profit method used 0.028 mg/L observation of the tissues were showed that Lindane had profound of the experimental organs the kidney head constriction of the tubular lumen 'Lindane dose of sub lethal concentration is too harmful in *H. fossilis* the application of the this pesticides close and touched the animal body of water is harmful dangerous for Aquatic life because corpuscles of stannius (C.S.) in valued in calcium and ionic balance regulation and also thyroid is endoenine in nature and regulate to metabolic and physiochemical function for growth and developed. 96 hrs. Lc50 for 10 days histopathological studied necrosis and degeneration of tissue large vacuoles shown hyper activity and altered secretion function the presence of Lindane toxicity. Pathological changed due to the reason of endocrine balance osmoregulation. Metabolism and biological ecological environmental of survival conditions in Lindane nature in Neurotoxicogenic.

Key words: Lindane, water, fishes, exposed tissues, i.e. thyroid (Jaw), corpuscles of stannius (Kidney).

INTRODUCTION

C₆H₆CL₆ lindane discoursed four isomere, of the alpha, Beta, gamma and delta in (1912). The British group isolated the toxic gamma isomeres from the chemically product and named it is lindane in honour of Vander Lindane, molar mass : 290.83g/mol. Boiling point 323⁰C Lacerda et al. (2020) many paper published indicated highly mortality of Juvenile fish. Pradhan and Hota (1993) Lindane is broad spectrum organo chlorine insecticide that react an endocrine function. It used to controlled the insect and pest. Lindane is widely used on fruits vegetables crops and livestock forms of agriculture at last seven decades. As a result of their easy entry into aquatic ecosystem as run off, these types of insecticides caused dangerous for aquatic animals such as fishes and effect on seen aquatic biodiversity, instabilities such as food used changed, habit lost many organs dysfunction observed in poor working of many organisms. However recently exposure in fresh water, Marine and Terrestrial environment aquatic species are mixing enormous risk relation between terrestrial ecosystem since industries and agriculture waste discharge direct or indirect transfer to the aquatic

animals bodies. It is not biodegradable and tend to reside in the soil and water approx. 5 to 10 years the soil effect of Lindane add in food chain and accurate in the food chain and accumulate in fat tissue in man and animals and significant health issued like mutagenic, genotoxic and Teratogenic effect. Verma et al. (1975) Roubal et al. (1977) effect on fisheries diseases.

The current study was based on toxicity of Lindane at sub lethal concentration on corpuscles of stannius (kidney) and thyroid of *H. fossilis* fish histopathological parameters to urgently considered to hazardous issues of this pesticides toxicant. *H. fossilis* is a carnivorous fish in order cypriniformes the accessory respiratory organs which have quite and hard usually found in muddy water. It also gland in estuarine water Srivastava (1968), fish have rich fatty acid protein, minerals to did meal in *H. fossilis* the thyroid gland is scattered in a group ground. The ventral aorta and efferent branches belong to inter mediate stage between compact and scatted type in *H. fossilis* hypo function of thyroid during reproductive phase Oliveria et al. (2011). Toxicity and behaviour responses in cat fish Mahijabi Khan (2025) effect of lethal concentradic in cat fish. The younger follicles are more dominant than the older ones of thickness of thyriodalepethedium wall flat to cuboid forms. Oliveria et al. (2011). Mishra et al. (2003).

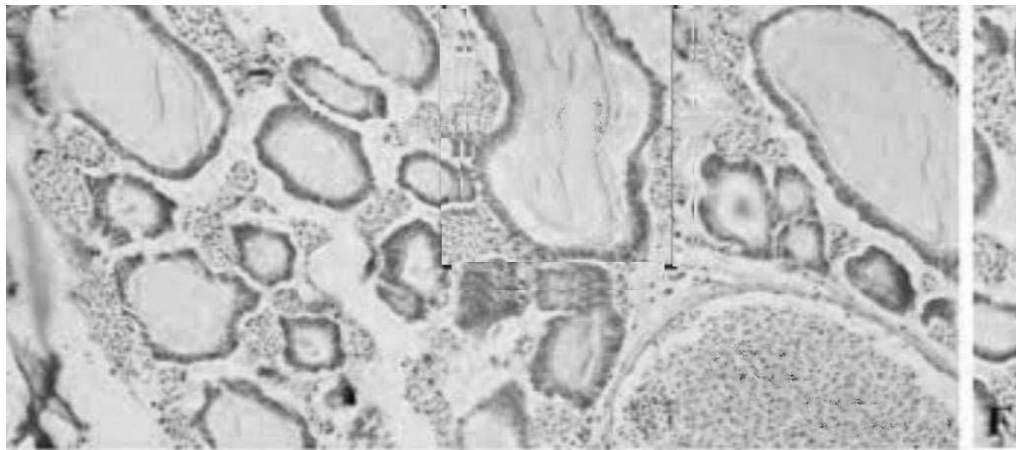
The sexes of *H. fossilis* are widely distributed and also in the kidney ranging from anterior distal part to posterior distal part the present of maximum corpuscles of stannius mid position in the kidney and same time extended back as water. It has been common several corpuscles of stannius young various location dossal and ventral in position lateral in margins of kidney the toxicant effect of Lindane on corpuscles of stannius ware *larged* damaged like cells cords was protein were swollen most have not seemed fine grain. Basobhilia are regression was observed the chords of corpuscles cell wall damaged at the ventral part of kidney.

MATERIAL & METHOD

Live and mature specimens of both sexes of the fish *H. fossilis* were obtained from the local fish market and put for the acclimatization for duration of 4 weeks the animal fed only boiled egg albumin and kept in well aerated glass and bath in 1% of KMNO_4 solution the size of glass Aquaria was 75x75x18 cm that contained in the laboratory at the water ambient long $26\pm 2^\circ\text{C}$ at the water in period value of water $\text{PH}=7.1$ both group of male and female were selected for the experiment evolving exposed to LC_{50} value found to for Lindane dissolving 0.028 mg/lit. Obtained a pesticides solution at a rate of 10ppm/lit. of LC_{50} values and completed the exposure the fishes were anesthetized to MS 222 (0.01%) or from an aldehyde (1.5%) solution and such specimens were dissected and to take out the organs such as corpuscles of stannius (Kidney) thyroid (jaw) which were in 10% naturals formalin or bouins fluid solutions cell at 4.7 mm μ thickness the paraffin section of (Kidney) corpuscles of stannius and thyroid were stains the Harish Haemotoxyline eosin, OFG Durey et. at. (1987).

HISTOPATHOLOGY OF THYROID

Thomas Addison is father of Endocrinology. It is messenger system of hormones released by internal gland direct connect into blood circulatory system hypothalamus is the neural control centre for all end ovine system the Thyroid gland and its associated endocrines hormones is growing area of regulatory toxicant due to the important role of metabolism low potential for thyroid hormone affect from exposure to Lindane Toxicity Interference with hormones synthesis and section for enzymatic function affected by endocrines generated to reactive oxygen toxicity damaged cellular membrane due to lipid causes regulation is low regulatory studies for most chemical do not inducts.

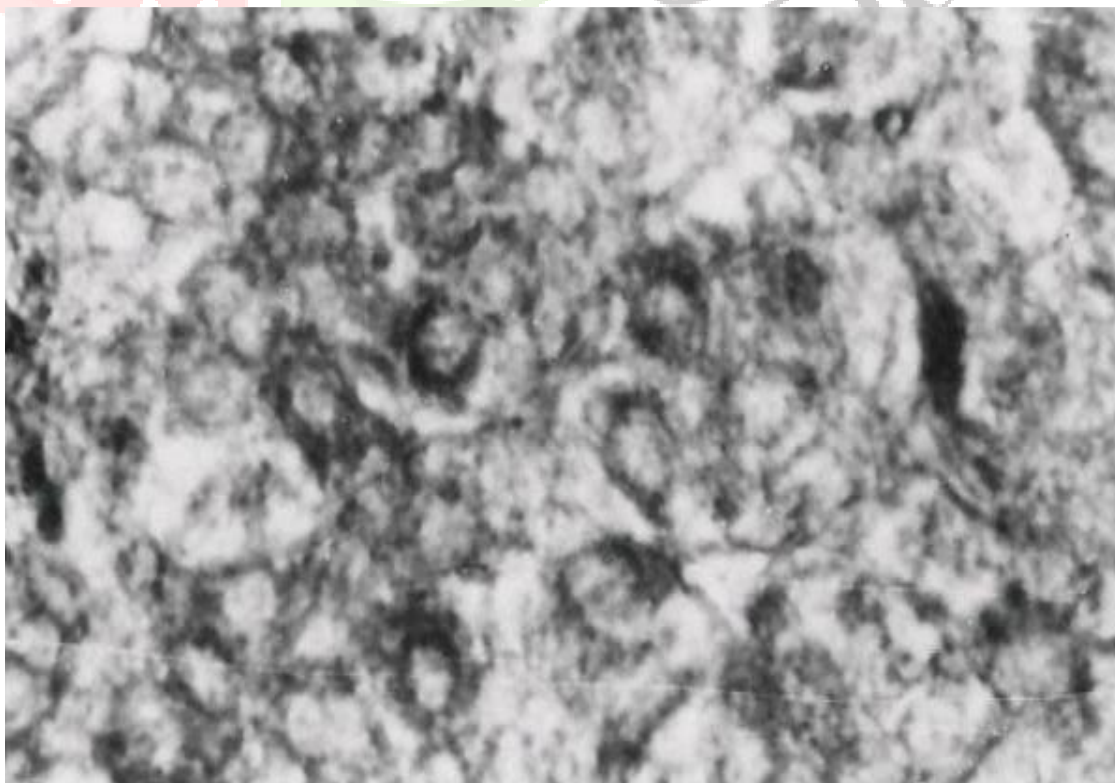


T.S. of Fish Thyroid under the exposure of Lindane (10PPM) 100X

In *H. fossilis* the thyroid gland is scattered in patches around the ventral aorta and afferent branches it belonged intermediate stage in between compact type and scattered type. Through very small numbers of follicle gene rare not exceeding that follicles enclosing the colloid of highly variable histochemical nature were record. Some of the appeared that reabsorption vacuoles which actually they were not close to closer examination revealed. That on the colloidal mass of such follicles were only patches of different standings some time producing a short mosaic vision suggested that due to coming colloid as was caused by outgoing quanta the thyroid has been given an department place for the purpose of judgement of the toxicological interference Chung et al. (2019), Gupta (2018) Sexes specific effect hormones and their function. Simon, J. (1944) comparative anatomy of the gland. Giles et al. (1968) effect of hyper and hypocalcemia in the thyroid calcitonin. Haya (1989) toxicity of parathyroid in fishes the colloid was vacuolated but in the both case epithelium remained flat, these vacuoles were close to epithelial laying and most of the follicles were stained uses the orange, G.

HISTOPATHOLOGY OF CORPUSCLES OF STANNIUS (CS)

The C.S. of fish are widely distributed on and also in the kidney ranging from anterior to posterior ends the large concentration of the C.S. was usually restricted to middle kidney.



T.S. of Fish Corpuscles of Stannius under the exposure of Lindane (10PPM) 100X

The toxicant effect on kidney the renal vasculature was too much filled up with the blood i.e. indicating an extra ordinary rise in the renal blood supply implicating to the fact of the rise blood pressure many of blood vessels had come in usually thick, Swaroop et al. (1980) responses of calcitonin cells administrate, the cells were shurken to that extent that instead of appearing as normal chords at time there was sufficient loss of staining property and such features mean the loss of cytoplasmic content as possible for such strong concentration cell and places the cell cord were broken the C.S. in these roles had a weak and reduced fibrous covering and weak staining of nucleus of their corpuscular cells were more prominent there in earlier case of female i.e. is toxicity of Lindane was indicating to be less effective on male then in female. Nand Karni et al. (1966) structure of C.S. in normal and Thyroparathyroidectomized because disorganization of tissue or circulation hormonal secretion because impaired.

DISCUSSION AND RESULT

All vertebrates and invertebrates perform all of Terrestrial ones respire a serially and so the aquatic concentrate that it has live an water to respire through water excrete in water which head to peculiar situation of being contacted with chemicals which contaminate the only medium being used and inhabited by the fish both physically and physiologically for the such reason *H. fossilis* was selected for the present study because the under present experiment Nand Karni et al. (1966), Tiwari (1993) endocrinal regulation Correa et al. (2021) occurrence of contaminates. If there were clear cuts chances of double exposure the complete influences of the toxicant could be noticed as the responses of different organs system in present course for the *H. fossilis*. Srivastava et al. (2005) effect of Mercuric chloride in reproductive cycle in teleost fish Green Wood et al. (2002) coted the corpuscles of stannius is calcium sensing receptors. The basic principal of toxicology is that one compound seeks entry into the body of an animal. It is containely in corporated into the blood and ones it has reached the circulatory stream. Roberts (2012) It circulate throughout body as per general rate that compound have higher affinity with lipids through the plasma membranes as well as the Lindane compound easily get a transfer from blood to the tissue they cannot remain with in blood also for the reason that a opposed to blood proteins tissue. Like brain which is such in phospholipids can be larger entry. It has been noticed to during hypophitic substances as Lindane induced enlargement of mitochondria both in liver and other tissue. Hinton et al. (1990).

CONCLUSION

Histopathological Indication of exposure toxicant are most for the variation of the thyroid follicles regarding their staining was highly effected activity of thyroid for the reason of all the follicles were effected. Follicle of thyroid has responded in different way behaviour of thyroid follicles epithelium started secretion the colloids the development of the vascular very appeared at the periphery of the colloidal mass.

Table : Toxicity Accumulation mean value of few fishes.

Fish	Toxicant mean value mg/kg	W.H.O. Permissible limit mg/kg.
<i>H.fossilis</i>	1.79	0.5
<i>C. catla</i>	1.61	0.5
<i>L. rohits</i>	1.5	0.5
<i>C.mrigala</i>	1.77	0.5

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