

Impact of Toxic Sediment on Liver and Kidney of *Tilapia Mossambica*

Dr. Kalpana Verma Naraynkar

Abstract:- In this study we procured toxic sediment from Amlakhadi water channel in Bhuj where paper, dye and textile industries were dumping their toxic wastes. We took *Tilapia Mossambica* to test the toxicity of the sediment in the lab to find the NOEC for their liver and kidney.

I. AIM OF THE EXPERIMENT

To find the NOEC for liver and kidney of *Tilapia mossambica*.

II. INTRODUCTION

Hepatocytes are most common cells in liver of fish. They remove nutrients and xenobiotics from blood that circulates through the sinusoids. Kidney is filter organ which removes toxic wastes from blood thus purifying it.

III. METHOD

The organs like liver and kidney were taken out from the fishes *Tilapia Mossambica* at three different concentrations on 0, 5th, 10th, 20th and 30th days, in triplicate, to observe gross anatomical changes, such as, hemorrhages, congestion, dropsy, necrosis, depigmentation and textural changes. These tissues were fixed in 10% formalin for 48 hours. They were then dehydrated in 90% alcohol for an hour and three times in absolute alcohol for 45 minutes separately. The samples were then cleaned two times in xylene for 30 minutes and embedded in paraffin thrice each time for 45 minutes. The samples were then blocked, allowed to cool, cut on a rotary microtome at 7 μ m and mounted sections were dewaxed in xylene and dehydrated serially in alcohol and then stained sections were washed in tap water, dipped in 2% acid alcohol and washed in tap water, followed by Scotts for water substitute. The sections were dehydrated through 50%, 70%, 90% alcohol for 2 minutes each. Then stained in eosin for 4 minutes and dipped in absolute alcohol for one minute each. Finally, stained sections were cleaned in xylene for 5 minute each and mounted on a slide with DPX. Prepared section were examined and photographed under a light microscope.

IV. RESULTS

Liver shows infamation, hepatocyte necrosis, enlarged vacuoles and fibrosis in the highest concentration i.e. 0.8 gm/l for *Tilapia mossambica* Spotty necrosis is also seen. Showed no alteration In medium concentrations, i.e. 0.5 gm/l for *Tilapia mossambica* and lower concentration i.e. 0.3 gm/l for *Tilapia mossambica*.

Kidney showed architectural disturbances as well as exhibits myxobolus cysts in highest concentrations. It exhibits no abnormality in medium concentration as well as in lower concentration.

Nutrient & Organic Load	
Organic carbon (%)	2.72
Organic matter (%)	4.7
Total Nitrogen (mg/100 gm)	245
Total Phosphorus (mg/100 gm)	49.5
Heavy Metal Concentration (in mg / 100 gm)	
Cadmium	6.0
Chromium	7.18
Copper	58.27
Lead	6.19
Iron	2763.5
Manganese	47.4
Zinc	109.75

Table 1:- Nutrient, Organic Load and Heavy Metal Concentrations in Composite Sediments from Amlakhadi Channel

➤ Histopathological Studies *Tilapia Mossambica*

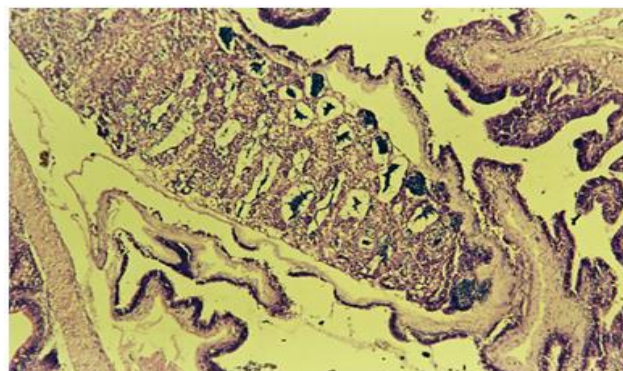


Fig 1:- 10 Day *Tilapia* 0.8 gm/l. Liver tissue showing unusual accumulation of grain like darkly stained bodies in pocket – like areas

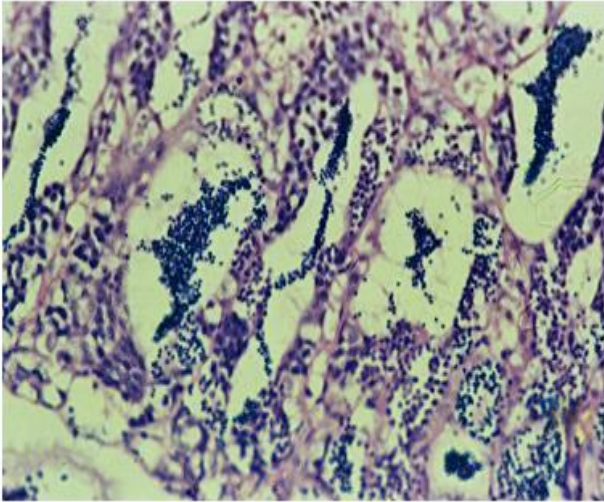


Fig 2:- Previous slide in higher magnification

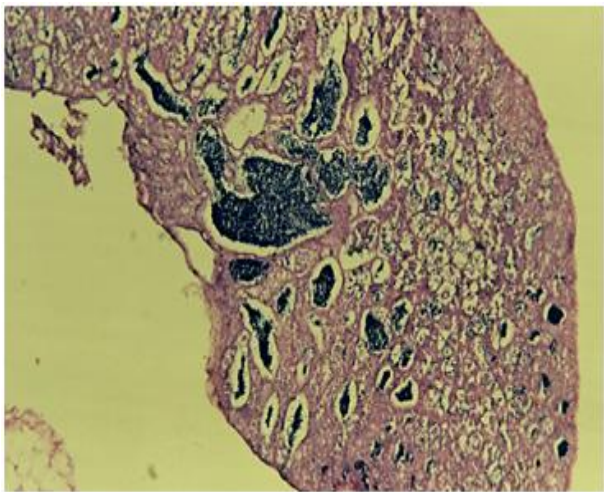


Fig 3:- 10 Day Tilapia 0.8 gm/l. Liver tissue exhibited pockets containing round organisms.

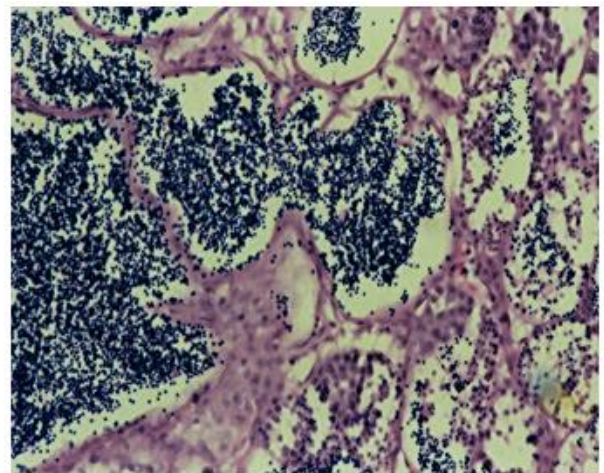


Fig 4:- Previous slide in higher magnification.

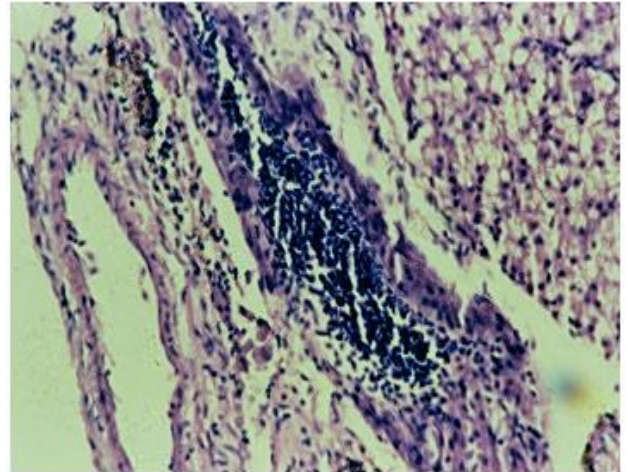


Fig 5:- 30 Day Tilapia 0.8 gm/l showing fatty liver with mononuclear cells.

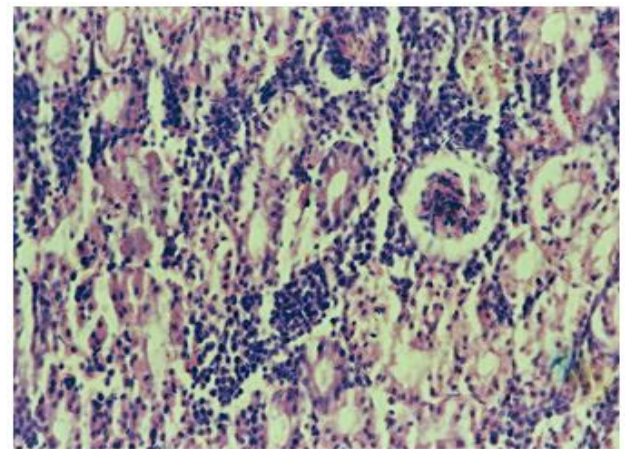


Fig 6:- 30 Day Tilapia 0.8 gm/l. Kidney tissue with widely scattered haemopoietic cells in the interstitium

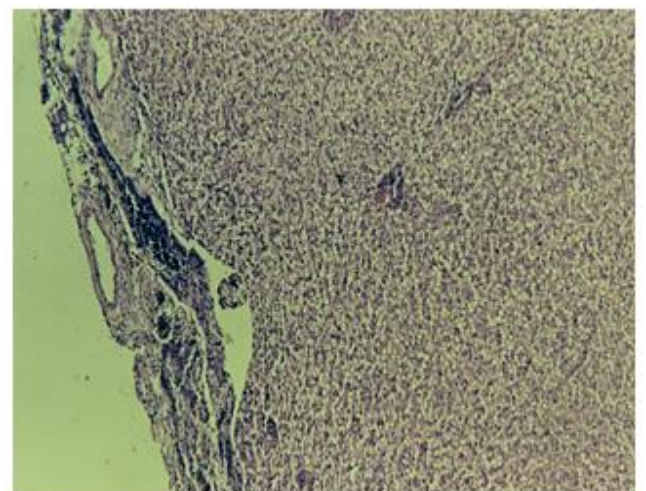


Fig 7:- 20 Day Tilapia 0.5 gm/l showing fatty liver syndrome with marked accumulation of mononuclear cells below the thickened capsules.

V. DISCUSSION & CONCLUSION

Tissues of both organs i.e. Liver and Kidney of fish *Tilapia mossambica* showed architectural disturbances in highest concentration of toxic sediment. But tissues of both organs i.e. liver and kidney exhibited no abnormality in medium and lower concentrations at all.

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Fig 8:- 30 Day Tilapia 0.5 gm/l. Liver tissue showing hepatocellular degeneration with eosinophilic cells and darkly stained nulei .

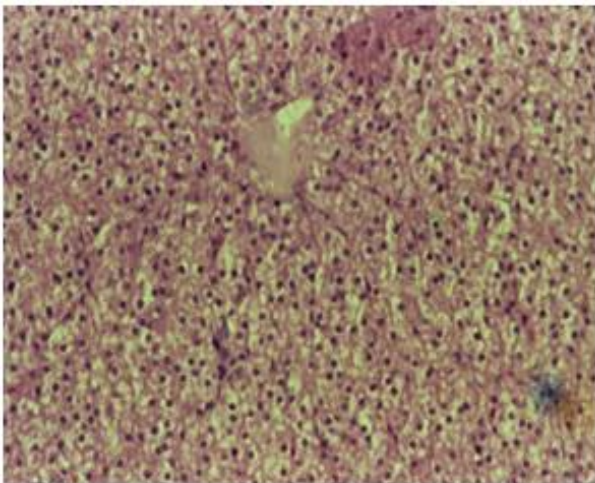


Fig 9:- 30 Day Tilapia 0.3 gm/l showing normal liver tissue

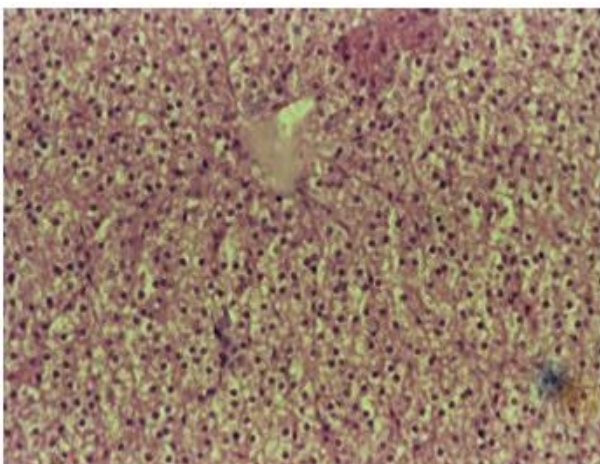


Fig 10:- 30 Day Tilapia control. Normal liver