

Impact of toxic sediment on stomach and intestine of *Channa punctatus*

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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 *Channa punctatus* to test the toxicity of the sediment in the lab to find the NOEC for their stomach and intestine.

Aim of the experiment: To find the NOEC for stomach and intestine of *Channa punctatus*

Introduction

Stomach and intestine are sensitive to toxic external environment in fishes. Intestinal villi act as absorption organ of nutrition and water in digestive tract.

Method

The organs like stomach and intestine were taken out from the fish *Channa punctatus* at three different concentrations on 0, 5th, 10th, 20th and 30th days, in triplicate, to observe gross structural

degeneration. 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 minutes each and mounted on a slide with DPX. Prepared sections were examined

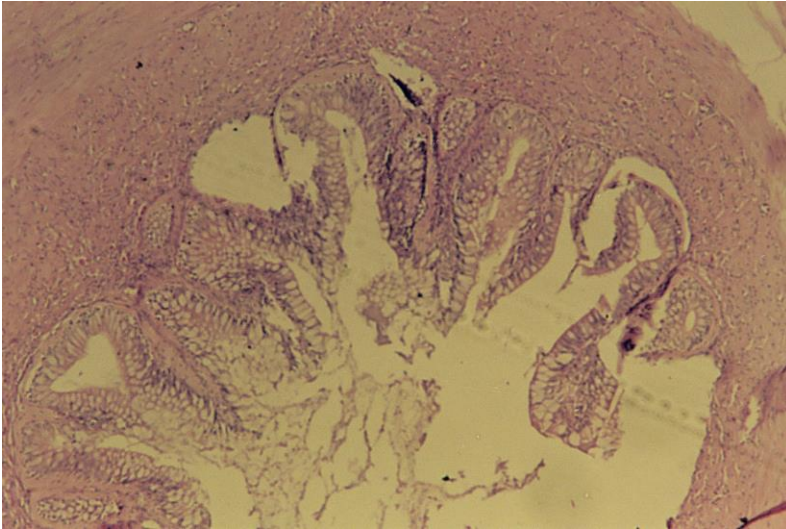
and photographed under a light microscope.

Result

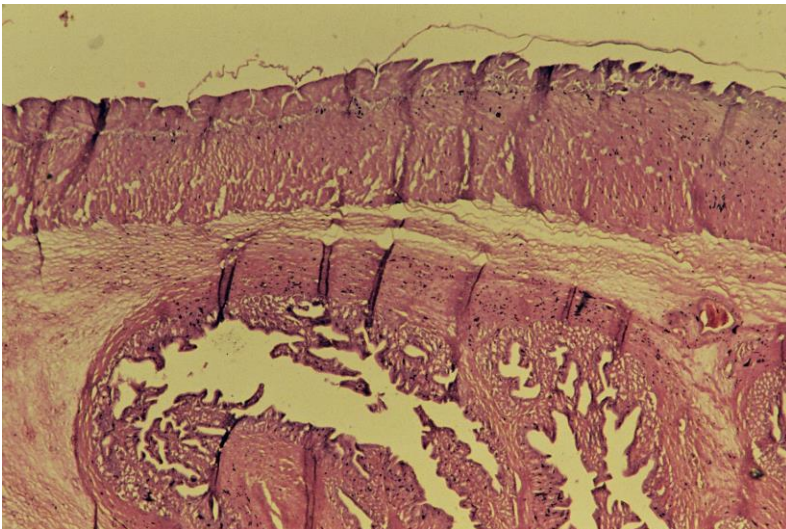
There was structural degeneration of stomach and intestinal tissues in the highest concentration i.e. 1.2 gm/l for *Channa punctatus*. Moderate changes in architecture of tissue were found in medium concentrations, i.e. 0.8 gm/l for *Channa punctatus*. Lower concentration i.e. 0.5 gm/l for *Channa punctatus* showed no alteration in structure at all

Table . Nutrient, Organic Load and Heavy Metal Concentrations in Composite Sediments from Amlakhadi water Channel

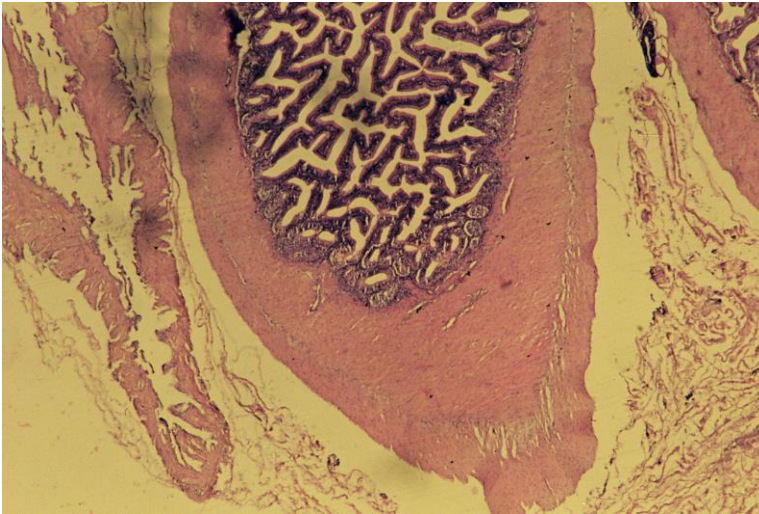
Nutrient & Organic Load	
Organic carbon (%)	2.72
Organic matter (%)	4.7
Total Nitrogen (mg/100 gm)	245
Total Phosphorus (mg/100 gm)	49.5
Heavy Metal Concentration (in mg / 100 gm)	
Cadmium	6.0
Chromium	7.18
Copper	58.27
Lead	6.19
Iron	2763.5
Manganese	47.4
Zinc	109.75



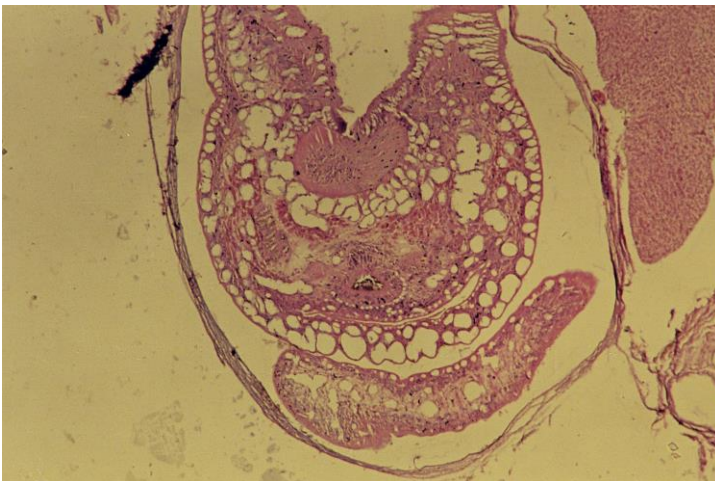
5 Day Channa 1.2 gm/l. Note marked degenerative changes within gastric mucosa. Detachment of mucosa from the basement membrane evident.



5Day Channa 1.2 gm/l. Loss of cells in the gastric mucosa with moderate thickening and oedema at the submucosa.



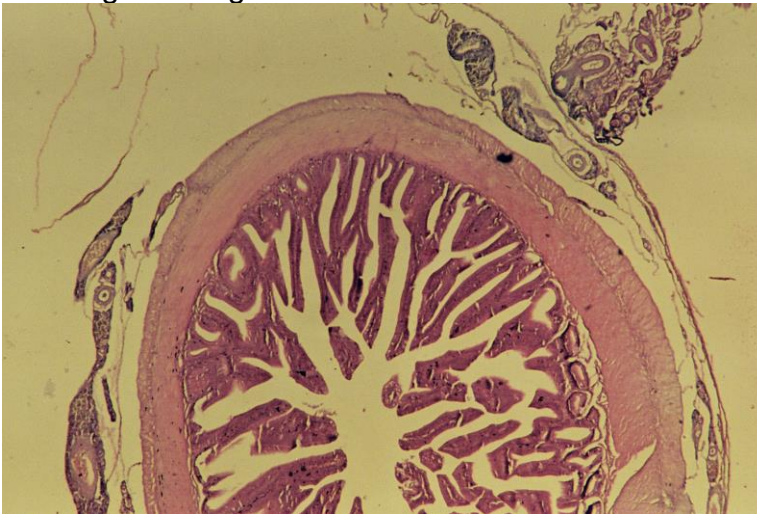
20 Day Channa 1.2 gm/l. Note empty stomach and thickening of the muscularis layer



5 Day Channa 0.8 gm/l. Cross section of peritoneal cavity showing portion of stomach (S), Intestine (I) and liver (L) within the peritoneum .



30 Day Channa 0.5 gm/l and control. Cross section of another empty stomach showing showing no lesions



30 Day Channa 0.5 gm/l and control. Nothing abnormality detected.

Discussion and Conclusion

There was structural degeneration in case of highest concentration (1.2 gm/l)

of toxic sediment in stomach and intestine of Channa. In medium



concentrations (0.8 gm/l) serosa was thickened, while no abnormality is

exhibited in lower concentration (0.5 gm/l) as well as in control.

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