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CHANGES IN PROTEIN CONTENTS IN A FRESH WATER FISH, *CHANNA PUNCTATUS* DUE TO INDUSTRIAL EFFLUENTS

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ABSTRACT

The effect of mixing of effluents of sugar and other industries in river Gomati passing through Sultanpur district of Uttar Pradesh was studied on protein contents in fresh water fish, *Channa punctatus*. Protein contents in *Channa punctatus* decreased due to pollution caused by industrial effluents and variations in fishes collected in different months showed that this reduction was also dependent on seasonal changes.

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KEY WORDS : *Channa punctatus*, Gomati, Industrial effluents, Protein.

Introduction

Fish is very sensitive to changes in water due to addition of effluents and toxicants^{2,3,5,8} and changes occurring in the biochemical characteristics of fish provide a sensitive measure to know the wealth of fish fauna⁶.

Material and Methods

Channa punctatus collected from three sites, i.e. Sitakund, Hiyat Nagar and Madhuban in district Sultanpur (Uttar Pradesh) of river Gomati and brought to the laboratory in plastic containers. Fishes were sacrificed and their muscles were collected, weighed and homogenized in glass homogenizer. Homogenates were centrifuged in a refrigerated centrifuge zanetzki k-24 and

supernatants were collected for further experiments. The protein concentration was estimated in homogenates using bovine albumin as standard⁴.

Result

Data obtained from present investigations are given in Tables 1-4. The results indicate a significant impact of industrial effluents on protein contents of *Channa punctatus*. Data given in Table 1 are for the months October to December in which maximum decrease [34.05%] was observed in the fishes collected from Madhuban site in October. During January to march maximum change was only 10.77 % in the fishes collected from Madhuban site during the month February (Table-2). During April to June maximum change was also recorded

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TABLE -1 : Changes in protein contents ($\mu\text{g/g}$ wet wt.) in *Channa punctatus* due to industrial effluents.

Field/Month	I Field	II Field	III field
October 12	626.66 \pm 34.35	561.66 \pm 17.38 (10.68)	413.33 \pm 19.63 (34.05)
November 12	460 \pm 33.99	456.66 \pm 143.67 (0.73)	385 \pm 8.49 (16.31)
December 12	620 \pm 26.78	608.33 \pm 18.01 (1.89)	588.33 \pm 9.53 (5.11)

I field Sitakund (prior to mixing of industrial effluents)

II field Hiyat Nagar (after mixing of effluents from sugar and other industry)

III field Madhuban (after mixing of effluents from sugar and other industry)

Values given in parentheses are % changes due to mixing of effluents.

from fishes collected from Madhuban (13.02%) in June (Table-3). Maximum decrease during July to September was 25.32% in fishes collected from Madhuban site in September (Table-4)

Discussion

Protein concentration decreased in the fishes collected from both the sites polluted by the effluents of sugar and other industries in comparison to the fishes collected from unpolluted site.

The quality of protein depends on the synthesis of rna required for protein synthesis¹.

The depletion of protein in the animals

during stress period is the physiological strategy played by animal to adapt itself to the changed conditions. This leads to degradative processes like proteolysis and utilization of degraded products to alter metabolic conditions⁷.

The change was maximum in the fishes collected from Madhuban site where effluents from sugar and other industries were mixed in water. The effect of effluents was also dependent on seasons as there was variation in reduction in protein contents of *channa punctatus* collected in different months. Maximum changes were recorded in October while minimum in July.

TABLE -2 : Changes in protein contents ($\mu\text{g/g}$ wet wt.) in *Channa punctatus* due to industrial effluents.

Field/Month	I Field	II Field	III field
January 13	571.66 \pm 12.99	516.66 \pm 8.28 (9.63)	535 \pm 13.13 (6.42)
February 13	696.66 \pm 14.21	638.33 \pm 20.59 (8.38)	621.66 \pm 37.74 (10.77)
March 13	498.33 \pm 8.28	446.67 \pm 27.32 (10.37)	588.33 \pm 9.53 (5.35)

I field Sitakund [prior to mixing of industrial effluents]

II field Hiyat Nagar [after mixing of effluents from sugar industry]

III field Madhuban [after mixing of effluents from sugar and other industry]

Values given in parentheses are % changes due to mixing of effluents.

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TABLE -3 : Changes in protein contents ($\mu\text{g/g}$ wet wt.) in *Channa punctatus* due to industrial effluents.

Field/Month	I Field	II Field	III field
April 13	440 \pm 40.07	373.33 \pm 17.69 (15.16)	433.34 \pm 7.58 (1.52)
May 13	471.66 \pm 39.19	403.33 \pm 31.12 (14.49)	433.33 \pm 17.69 (8.13)
June 13	486.67 \pm 41.53	460 \pm 31.89 (5.49)	423.33 \pm 16.04 (13.02)

I field Sitakund (prior to mixing of industrial effluents)

II field Hiyat nagar (after mixing of wffluints from sugar industry)

III field Madhuban (after mixing of effluents from sugar and other industry)

Values given in parentheses are % changes due to mixing of effluents

TABLE -4 : Changes in protein contents ($\mu\text{g/g}$ wet wt.) in *Channa punctatus* due to industrial effluents.

Field/Month	I Field	II Field	III field
July 13	528.33 \pm 8.28	496.66 \pm 1.39 (5.99)	501.66 \pm 36.69 (5.05)
August 13	471.66 \pm 7.21	446.66 \pm 21.39 (5.31)	371.66 \pm 34.98 (21.21)
September 13	638.33 \pm 28.96	483.33 \pm 5.91 (24.28)	479.66 \pm 45.12 (25.32)

I field Sitakund (prior to mixing of industrial effluents)

II fiels Hiyat Nagar (after mixing of effluents from sugar industry)

III field Madhuban (after mixing of effluents from sugar and other Industry)

Values given in parentheses are % changes due to mixing of effluents

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