ORIGINAL RESEARCH PAPER
Volume - 13 | Issue - 01 | January - 2024 | PRINT ISSN No. 2277 - 8179 | DOI : 10.36106/ijsr
INTERNATIONAL JOURNAL OF SCIENTIFIC RESEARCH

ASSESSMENT OF FREQUENCY OF MICRONUCLEATED CELLS IN DIFFERENT GROUPS OF FISHES FROM CHAUR HAWELI KHARAGPUR, MUNGER.

Zoology

Dr. Madhav Kumar
P.G. Department of Zoology, T.M.B.University, Bhagalpur, Bihar

ABSTRACT

Aquatic pollution may affect the human health through consumption of contaminated fishes. The release of domestic, industrial and agricultural pollutants into water sources without adequate filtering and their accumulation lead to water pollution. In present investigation micronucleus test were done in Fish Anabas testudineus from chairs of Haweli Kharagpur in 3 groups of Fishes. The result showed that in all three groups micronuclei formation were 0.4%, 0.25% and 0.5% respectively and number of micronuclei formation were not significantly higher than control level.

KEYWORDS

Pollution, Fishes, Chaurs, Micronucleus.

INTRODUCTION:-

Due to chemical pollutants the low amount of DNA per cell, the large numbers of small chromosomes, and the low mitotic activity in many fish species impaired the metaphase analysis of chromosomal damage and sister chromatid exchanges are demonstrate (Pavlica et al., 2000). Genotoxic effects as main biomarkers in assessment of the pollution-related toxicity. Large-scale bio-monitoring programmed in marine environments have demonstrated the associations between genotoxicity and chronic health effects at the population level (Hughes and Hebert, 1991). Genotoxicity is a property possessed by some substances that makes them harmful to the genetic information contained in organisms.

Pesticides and pollutants in aquatic environment induce several chromosomal abnormalities. Chromosomal studies have received considerable attention in recent years, in part from a growing interest in the evaluation of genotoxicity of environmental toxicants and carcinogens. The most common abnormalities are categorizing as chromosome and chromatid break, acentric fragments, chromatid and sub-chromatic exchanges, chromatid gaps (achromatic lesions), heterochromatic regions and sister chromatid exchanges at metaphase and also chromatid and chromosome bridges and side arm bridges and fragments at anaphase.

Several workers (Das and Nanda, 1986; Al-Sabi and Metcalfe, 1995; Kushwaha et al., 2003) have reported genotoxic effects in different species of fish using cytogenetic analysis. Exposure of fish to pollutants and toxicants for prolong period, even at low levels, leads to chromosomal aberrations including gene changes (Klingerman et al., 1975; Barker and Rackam, 1979).

Mutagenesis and Genotoxicity studies employed in this methodology to evaluate possible genotoxic risk due to exposition to hazard xenobiotics in aquatic organisms. The analysis of chromosomal aberration and / or the micronucleated erythrocytes in vivo is acceptable for routine detection of clastogenes therefore the present work is designed to investigate the incidence of micronuclei in fishes of chours of Haweli Kharagpur, Munger.

MATERIALAND METHODS:-

Three species of fishes were used in this study. Fish species, 100 - 130 g for Channa punetatus, 80-100g for Anabus testudineus and 100-150g for Calrius batrachus species were collected from natural local Chaur of Kharagpur Haweli (Munger) and transferred to glass aquaria in P.G. Department of Zoology, Bhagalpur.

Blood samples were directly collected from chaur fishes. The peripheral blood smears were obtained through the gills and makes a blood smear on the clean slide from the gills. The slides were air-dried for 24 h, fixed in methanol for 10 min, followed by 10% Giemsa staining. Each fish had 2000 erythrocytes were examined in each species of fishes from peripheral blood (Ali,et al., 2008).

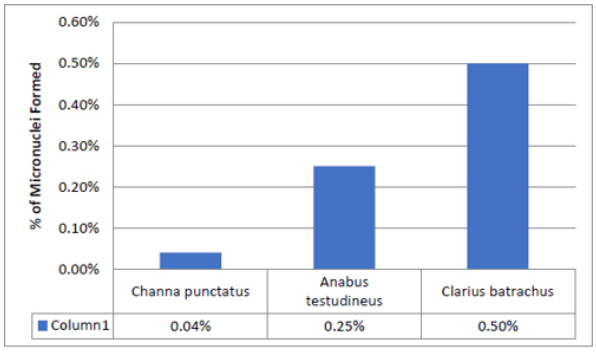
Statistical Analysis:-

Student's *t* test was applied for statistical analysis of data.

Table-1 Frequency of micronucleated cells in different groups of fishes from chaur Haweli Kharagpur, Munger.

S.No.	Groups	NO. of scored cells	Micron No.	ucleus %	obtained + S.E.
1	Channa punetatus	2000	8	0.04	+ 0.04
2	Anabus testudineus	2000	5	0.25	+ 0.11
4	Calrius batrachus	2000	10	0.5	+ 1.15

Graphical representation



Graph -1. Represents the percentage of micronuclei induction in the different three groups of fishes in chaur Haweli Kharagpur, Munger.

RESULT & DISCUSSION:

The obtained results are summarized in Tables 1 and graph 1 Results reveal that the three fish species represent various degrees of sensitivity in monitoring genetic damage especially genotoxic effect. This is indicated by variations in averages of the micronucleated cells among different species.

The percentages of micronuclei found in group first, second and third were 0.04%, 0.25% and 0.5% respectively.

Among all three groups of fishes, the first group has minimum number of micronuclei formations whereas third group has maximum micronuclei formation has been obtained.

The numbers of micronuclei formation in all groups of fishes in the chaur of Haweli Kharagpur (Munger) but not significantly higher than control level. This result shows that chaur water of Haweli Kharagpur, Munger could not cause genotoxic effect. In the second group, total chromosomal abnormalities were found 32 (10.6% + 1.77) in which structural abnormalities were 15 and number of gross types of abnormalities were 17.

The third group of fishes contains total abnormalities were 22 (7.3 + 1.5) among these number of structural abnormalities were 10 and number of gross types of abnormalities were 12.

When compared genotoxicity among all groups of fishes, The second groups Anabas testudineus shows maximum genotoxic effect than other three groups (Table-1).

The numbers of abnormalities in all groups were found more or less as control level. This result shows that fishes of chaur from Kharagpur Haweli, Munger could not show genotoxic.

Erythrocyte MN test in fish was also widely applied for genotoxicity assessment of freshwater and marine environments. Micronuclei and other nuclear anomalies are biomarkers of genotoxic events and chromosomal instability. These genome damage events can be measured in laboratory by simple technique micronucleus test. Mn can originate during anaphase from lagging acentric chromosome or chromatid fragments caused by misrepair of DNA breaks or unrepaired DNA breaks or at anaphase malsegregation of whole chromosomes may also lead to MN formation.

CONCLUSION:-

The present work shows that these all groups of fishes are edible and not genotoxic or carcinogenic for human.

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