

Amelioration of Cadmium Chloride and Arsenic Trioxide Induced Genotoxicity in *Oreochromis Mossambicus* using Ocimum and Ascorbic Acid

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Abstract: *The genotoxic effects of cadmium chloride and arsenic trioxide was assessed singly and conjointly in Oreochromis mossambicus (tilapia) with end points such as chromosome aberration, red blood cell anomaly, anomalous nuclei determination and sperm head anomaly detection. The primary objective were to examine If cadmium chloride and arsenic trioxide as well as ascorbic acid (AA) and ocimum, had, any genotoxic effect of their own on non target aquatic organisms and secondly if ascorbic acid and ocimum had any ameliorating effect on cadmium chloride and arsenic trioxide induced genotoxicity in the fish, tilapia.*

Keywords: Chromosome aberration (CA), genotoxicity, mutation, cell anomaly, ocimum, AA, cadmium chloride, arsenic trioxide

1. Introduction (Summary)

Heavy metals are known to cause abundance of effects on all living organisms including fish (Olsson, 1996, Sorenson, 1991). The overall objective of study is to ascertain the level and quantum of genotoxic effects of cadmium chloride and arsenic trioxide as compared to DW treated controls and also to find out if certain antioxidants like AA and ocimum can nullify the oxidative metabolism of these chemical by producing electrophilic metabolites.

2. Methodology

Somatic chromosomes were prepared as the conventional colchicine citrate flame drying technique (Khudabukhsh, 1979) for both control and treated series.

For micronuclei testing, the procedure of Schmidt (1976) was followed.

For sperm head anomaly, procedure of Manna and Biswas was followed, further followed by microscopic analysis.

Experimental set up was provided by taking 18 to 22gms fish, collected from local pond and then acclimatized in concrete vats maintained under similar conditions.

3. Conclusion

Maximum amelioration have been found at 48hr interval for cadmium chloride and arsenic trioxide induced genotoxicity, when treated conjointly with either ocimum or with ascorbic acid, in tilapia.

However both AA and ocimum showed certain amount of genotoxicity when treated individually in the fish specimens.

The dose at which maximum amelioration could be found was noted, which was 0.02 percent for AA and 0.5 percent for ocimum.

The antioxidative property is mainly due to phenolic acid, flavonoids and anthocyanins present in vitamin C and basil (ocimum).

4. Data format

Table

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5. Abbreviations

CA.- chromosome aberration

MN- micronuclei

AA.- ascorbic acid

Dw.- distilled water

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