

CYTOGENETIC STUDY OF CHROMOSOMAL ABERRATIONS INDUCED BY 0.8 Gy GAMMA RAYS IN FRESH WATER TILAPIA FISH *Oreochromis mossambicus*

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ABSTRACT

- Clastogenic effect of 0.8 Gy gamma-rays in tilapia fish *Oreochromis mossambicus*
- Study on mitotic chromosomes from gill cells, for 2 weeks.
- Seven different types of chromosomal aberrations were encountered.
- Aberrations were studied w.r.t. time intervals also.

INTRODUCTION

- About 10 million people died due to cancer in 2020 worldwide (WHO). In India, 0.91 million of death is due to cancer in 2022.
- Physical mutagens (X-rays, γ -rays) cause cancer.
- Pioneering discovery of Muller, H.J., (1927) on artificial mutagenesis in *Drosophila*
- Genotoxic effect of ethylmethane sulphinate (EMS) on *Oreochromis mossambicus* and protection by β -carotene had been worked out by Guha B. *et al.* (2003).
- Sur, Das & associates had extensively studied effect of various physical & chemical mutagens on different animal models.
- Here we report effect of γ -rays (0.8 Gy) on fresh water fish *Oreochromis mossambicus*.

Fig 1: EXPERIMENTAL PROTOCOL

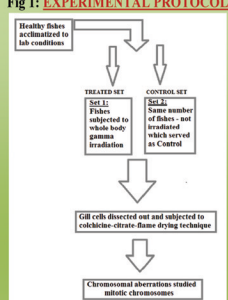


Fig 2: Experimental Fish Model Tilapia- *Oreochromis mossambicus*



RESULTS

Fig 3: Bar diagram to compare the effect between Control and Treated fishes

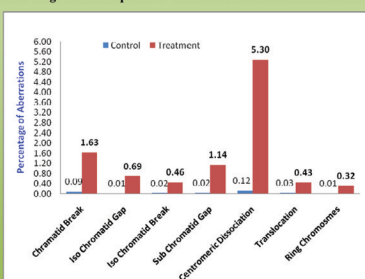
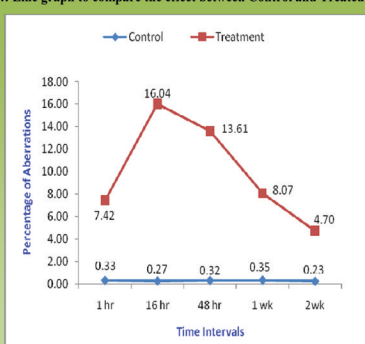


Fig 4: Line graph to compare the effect between Control and Treated fishes



DISCUSSION

- Present study- γ -rays were able to induce seven types of structural chromosomal aberrations in the fish.
- Highest aberration- centromeric dissociation, lowest- ring chromosome (Fig-3).
- Treated Series - chromosomal aberrations increased, highest at 16 hr.
- After that it decreased and became the lowest at 2 week after radiation (Fig 4).
- Therefore, Centromeric regions of chromosomes are most vulnerable to gamma radiation.
- The effect is somewhat time dependent.

REFERENCE

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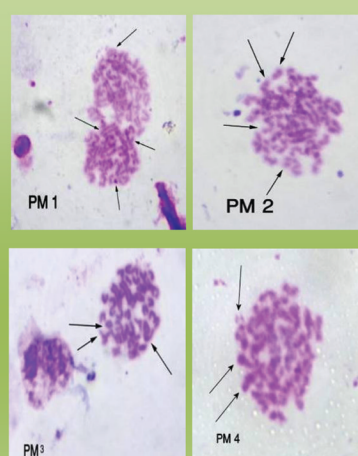


Fig 5: Photomicrographs (PM) showing various types of structural chromosomal aberrations in Treated fishes

- PM 1: Ring chromosome, sub chromatid gap, translocation
- PM 2: Sub chromatid gap, chromatid break centromeric dissociation
- PM 3: Ring chromosome, translocation
- PM 4: Translocations