

## **EVALUATION OF MICROTRON-ACCELERATED ELECTRON BEAM RADIATION INDUCED TISSUE DAMAGE AND THE RADIOPROTECTIVE EFFECT OF *PIPER BETLE* AND *PIPER NIGRUM* IN SWISS ALBINO MICE**

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### **ABSTRACT**

*Ionising radiation has vast applications in medical diagnosis and therapy. Radiation has both stochastic and delayed type of effects and the sensitivity of different organs and tissues vary enormously, wherein the hematopoietic and rapidly proliferating cells being the most sensitive of all. In our present study we aimed at detecting the tissue damage induced by microtron-accelerated high energy electron beam radiation and the protective effects of Piper betle and Piper nigrum extracts in Swiss albino mice. To assess the histological damage induced by e-beam radiation and to detect the protective effect of Piper extracts against radiation induced tissue injury we used intestinal jejunum as target tissue. Haematological parameters were also carried out to study the toxicity of e-beam radiation and the protective effect of the selected plants. The experimental animals were divided into groups and were treated with different doses of the extracts prior to irradiation and analysis of haematological and histological parameters were carried out at different time intervals. E-beam radiation markedly decreased the TEC, TLC and Hb content which was significant compared to the sham control. There was a gradual decline in all these blood parameters which was found to be time dependent. The blood parameters were normal in CMC and extract alone treated animals. Piper extract pre-treatment improved the blood counts and Hb content in a dose dependent manner in the animals exposed to e-beam radiation. The sham control group did not show any change in the intestinal histology, as evidenced by the presence of a large density of crypts at the base of the villi. In the irradiated group, the villus height and mucosal length were found to be significantly shorter compared to the sham control, demonstrating the damaging effects of radiation on the intestinal mucosa. Irradiation reduced the number of surviving crypts significantly and mucosal thinning was also observed. The extract treated groups showed a significant increase in the number of surviving crypts compared to the radiation alone group. The villus height, crypt depth and mucosal length in the combined treatment group were found to be greater than those of the radiation alone group.*

**KEYWORDS:** *Electron Beam Radiation, Piper Extracts, Intestinal Injury, Haematology*

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