

## **Aloe vera Prevents Injuries Induced by Whole Body X-ray Irradiation in Rodents**

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**Abstract :** Purpose: The present study was designed to evaluate the radioprotective efficacy of Aloe vera from whole body X-ray exposure in rodents. Materials and Methods: For this purpose, after one week's acclimatization, male balb/c mice procured from Central Animal House, Panjab University, Chandigarh (India), were divided into four groups: Group I mice served as control. Group II mice were orally administered Aloe vera pulp extract (50 mg/ kg body weight) on alternate days for 30 days. Group III mice were subjected to whole body X-ray irradiation to cumulative dose of 2Gy (0.258Gy twice a day for four days in the last week). Group IV animals were pretreated with Aloe vera pulp extract on alternate days as in Group II and in the last week of the study, they were exposed to X-ray as in Group III. Results: Spleen of X-ray irradiated mice showed histopathological alterations accompanied with enhanced activity of lactate dehydrogenase (LDH) in serum. Elevated levels of reactive oxygen species (ROS), lipid peroxidation (LPO), enhanced activities in Glutathione based enzymes such as Glutathione peroxidase (GSH-Px), Glutathione reductase (GR), Catalase (CAT), Superoxide dismutase (SOD) associated with depletion in reduced Glutathione (GSH) concentration were observed after X-ray exposure in blood plasma and spleen. Pro-inflammatory cytokines like tumor necrosis factors (TNF- $\alpha$ ) and Interleukin-6 (IL-6) levels were also found to be enhanced in serum of irradiated mice. Irradiation-induced significant elevation in Total leucocyte counts (TLC), neutrophil counts and decline in platelet counts, associated with unaltered levels of red blood cell counts (RBC's) and haemoglobin (Hb) in various treatment groups. Clastogenic damage and apoptosis was also found to be increase in splenic tissue of X-ray exposed mice as assessed by micronucleus and TUNEL assay. However, X-ray irradiated animals administered with Aloe vera revealed significant improvement in levels of ROS/ LPO, LDH activity, and antioxidant mechanism. Aloe vera pretreated animals exhibited less severe damage, and early recovery in micronucleated cells, hematological parameters, apoptotic cells and inflammatory markers as compared to X-ray exposed mice. Conclusion: These results indicate that the radioprotective potential of Aloe vera against X-ray induced damage. This may be due to its free radical scavenging, antioxidant, anti-apoptotic and anti-inflammatory properties.

**Keywords :** aloe vera, antioxidant defense system, lactate dehydrogenase (LDH), micronucleus assay, x-ray

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