RADIOPROTECTIVE PROPERTIES OF 50% WATERMELON JUICE AGAINST LOW DOSE IONIZING RADIATION (LDIR)-INDUCED OXIDATIVE STRESS IN LUNG

By

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DECLARATION

"I hereby declare that this thesis is based on my original work and has not has been submitted previously or currently for any other degree at UiTM or any other institutions."

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ABSTRACT

Radioprotective Properties of 50% Watermelon Juice against Low Dose Ionizing Radiation (LDIR)-Induced Oxidative Stress in Mice Lung

Low dose ionizing radiation (LDIR) may trigger oxidative stress which leads to generation of free radicals. There is lack of information about the capability of watermelon as a natural antioxidant that helps to scavenge LDIR-induced free radicals. This study was conducted to determine the radioprotective properties of 50% watermelon juice on biochemical and molecular changes against LDIR-induced oxidative stress in mice lung. A total of 18 ICR male mice were randomly divided into three groups (n=6); negative control group, radiation group and treatment group. Mice in negative control and radiation group were given filtered tap water while treatment group was supplemented with 50% watermelon juice for 14 days *ad libitum*. Mice in radiation and treatment group were then exposed to 100 µGy x-ray whole body irradiation on day 15. Liver tissues were excised immediately and assessed for the superoxide dismutase (SOD) activity (inhibition %), total glutathione (GSH), malondialdehyde (MDA) and DNA damage (Comet Assay). SOD activity (inhibition %) showed no significant difference between all groups. Treatment group showed increment SOD activity (inhibition %) compared to negative control and radiation group. GSH level in lung tissues showed significant diminish in radiation group versus negative control group ($p < 0.001$). Treatment group showed significant depletion in GSH level compared to negative control group ($p < 0.001$). MDA levels showed significant increment in treatment group compared to negative control group ($p < 0.005$). DNA damage of lung tissues in radiation group showed significant increased compared to negative control ($p < 0.001$). While treatment group showed significant decreased in DNA damage compared to radiation group ($p < 0.001$). In conclusion, this finding may postulate that radioprotective properties of 50% watermelon juice against LDIR-induced oxidative stress which supplemented to the mice for 14 days may reduce DNA damage but may be not give sufficient enough effect to biochemical changes in lung tissue.

Keyword: watermelon; low dose ionizing radiation (LDIR); DNA damage; oxidative stress.

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