World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:9, No:01, 2015

γ-Irradiation of Oat β- Glucan: Effect on Antioxidant and Antiproliferative Properties

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Abstract : The present study was designed to evaluate the effect of γ-rays on the antioxidant and antiproliferative potential of β-glucan isolated from oats. The β-glucan was irradiated with 0, 2, 6, and 10 kGy by gamma ray. The samples were characterized by FT-IR, GPC, and quantitative estimation by Megazyme β-glucan assay kit. The average molecular weight of non-irradiated β-glucan was 199 kDa that decreased to 70 kDa at 10 kGy. Both FT-IR spectrum and chemical analysis revealed that the extracted β-glucan was pure having minor impurities. Antioxidant activity was evaluated by DPPH, lipid peroxidation, reducing power, metal chelating ability and oxidative DNA damage assays. Results revealed that the antioxidant activity of β-glucan increased with the increase in irradiation dose. Irradiated β-glucan also exhibited dose dependent cancer cell growth inhibition with irradiation doses. The study revealed that low molecular weight β-glucan with enhanced antioxidant and antiproliferative activities can be produced by a simple irradiation method.

Keywords : γ-irradiation, antioxidant activity, antiproliferative activity, β-glucan, oats
Conference Title : ICNFF 2015 : International Conference on Nutraceuticals and Functional Foods
Conference Location : Jeddah, Saudi Arabia
Conference Dates : January 26-27, 2015