



Antioxidant, antiproliferative, immunomodulatory, antimicrobial and functional properties of wild mushroom (*Coprinus atramentarius*) β -glucan extract as affected by β -irradiation treatment.

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Abstract:

This study was carried out to evaluate the effect of β -irradiation on the structural, thermal, antioxidant, antiproliferative, immunomodulatory, antimicrobial and functional properties of β -glucan obtained from the wild variety of mushroom, *Coprinus atramentarius*. The structural characterization of the irradiated *Coprinus* β -glucan was performed using attenuated total reflection - Fourier transform infrared spectroscopy (ATR-FTIR) whereby the β -linkage showed an increased shifting from 874 to 927 cm^{-1} . The thermal properties studied using DSC revealed that as the irradiation dose increases from 5-50 kGy; there was a corresponding increase in the gelatinization temperature from 25.61 to 58.96°C (TO) and 63.76 to 71.38°C (TP). Treatment with β -irradiation enhanced all related antioxidant properties like DPPH, reducing power, metal chelating ability of ferrous ion, ABTS & inhibition of lipid peroxidation ($p < 0.05$) in a dose dependent manner. The antiproliferative and the immunomodulatory activity of the *Coprinus* β -glucan also showed a corresponding increase with an increase in the irradiation dose. The antibacterial activity of *Coprinus* β -glucan against different pathogens was also enhanced with an increase in the irradiation dose from 5 to 50 kGy. Moreover, the functional properties of irradiated mushroom β -glucan were effectively influenced by the action of gamma irradiation wherein the swelling power decreases with an increase in the irradiation dose while fat binding capacity, emulsifying properties, foaming properties and bile acid binding capacity all increased with higher dose. Therefore, β -irradiation can be an effective strategy to enhance and improve the functional properties of mushroom β -glucan.



Biography:

Asma Ashraf Khan has her expertise in nutraceutical and functional foods. During her 5 years at University of Kashmir, she served as a research scholar with multi-disciplinary research goals and has several publications in high impacted journals. She is equipped with the skills required for the extraction of various bioactive compounds and studying various nutraceutical & technofunctional properties.

Publication of speakers:

1. Asma Ashraf Khan, Gani, A., Khanday, F.A., Masoodi, F. A. (2017). Biological and pharmaceutical activities of mushroom β -glucan discussed as a potential functional food ingredient. *Bioactive Carbohydrates & Dietary Fiber*, [Citations: 23 & impact factor 2.08].
2. Asma Ashraf Khan, Gani, A., Baba, W. N., Ahmad, M., Shah, U., Wani, I. A., Masoodi, F. A. (2016). Effect of ultrasound treatment on physico-chemical, nutraceutical and microbial quality of strawberry. *LWT - Food Science and Technology*, 66; 496-502 [Citations: 49 & impact factor 4.006]
3. Asma Ashraf Khan (2020), Gani, A., Masoodi, F. A., Baba, R. A. (2020). β -glucan from oyster mushroom (*Pleurotus ostreatus*) cultivated in himalayan region: effect of β -irradiation on structural, thermal, functional, antioxidant, antimicrobial, antiproliferative and immunomodulatory properties. *Canadian Journal of Clinical Nutrition*, 8 (2), 78-106.

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