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Ultrasound assisted extraction of bioactive enriched fractions from button mushroom stalks waste

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E edible mushrooms possess interesting functional components like homo- and hetero- β -glucans [$\alpha(1\rightarrow3)$, $\alpha(1\rightarrow4)$ and $\alpha(1\rightarrow6)$ glycosidic linkages], chitins, ergosterols, bioactive polysaccharides and peptides imparting health beneficial properties to mushrooms. Some of the proven biological activities are antioxidant, antimicrobial, immunomodulatory activities and cholesterol lowering activity by 3-hydroxy-3-methyl-glutaryl CoA reductase (HMGCR) inhibition. Application of novel extraction technologies like high power ultrasound offers clean, green, faster and efficient extraction alternatives with enhanced and good quality extracts. Ultrasound assisted extraction (UAE) was applied to recover bioactive enriched fractions from industrial white button mushroom (*Agaricus bisporus*) stalk waste using environmentally friendly and GRAS solvents i.e., water and water/ethanol combinations. The UAE treatment was carried out by placing 50 g of chopped fresh mushroom stalks and 75 ml of 80% ethanol using ultrasonic-water-bath (USB) of two frequencies (25 KHz and 35 KHz) for various treatment times (10, 20 and 30 min) at room temperature followed by 3 hours of agitation at 25°C at 50 rpm in incubator shaker. The collected supernatant was filtered and characterized for its total proteins and phenolic content (TPC). USB with 25 KHz frequency with 30 min pre-treatment time had the highest TPC (15.65 mg GAE/g dry extract) with highest protein content of 1.65%. The freeze dried mushroom stalk powder was characterized for its compositional parameters (dry weight basis) showing 19.12% total protein, 7.21% total fat, 31.2% total dietary fiber, 7.9% chitin (as glucosamine equivalent) and 1.02% α -glucan content. Effect of ultrasonication on the recovery of crude polysaccharides and protein content with amino acid profile in different fractions will be presented.

Biography

Bibha Kumari holds a degree in Food Processing and Technology from Central Food Technological Research Institute (CFTRI), Mysore, India. She has done her BSc in Agricultural Sciences. She is currently pursuing her PhD in Agriculture and Food Science from University College Dublin (UCD), Ireland. She is involved in a project titled, "The effect of novel processing on the levels of phytochemicals in brewer's spent grains, mushroom stalks and potato peels". Her research focuses on application of novel extraction technologies like ultrasonication and pulse electric field in bioactive extraction from plant sources. She has research interests in the area of Food Biotechnology.

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