

Functional Properties of Polysaccharide Extracts from Cultivated and Wild Mushrooms: Swelling, Fat Absorption, Emulsifying, and Foaming Characteristics

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Abstract

In this study, the functional properties of polysaccharide extract from wild mushrooms *Suillus luteus* and *Tricholoma equestre* were compared with those extracted from cultivated mushroom *Agaricus bisporus*. Mushroom polysaccharides were evaluated to understand their potential application in food formulations. The analysed properties included swelling power, fat absorption, emulsifying activity, emulsifying stability, and foaming characteristics. One-way ANOVA followed by Tukey's HSD test was used to determine significant differences among samples. The wild mushroom *T. equestre* exhibited the highest significant swelling capacity of 7.67 g/g, followed by 3 g/g for *S. luteus*, and no water absorption for the cultivated mushroom *A. bisporus*. Fat absorption varied significantly among wild and cultivated mushrooms, with *T. equestre* and *S. luteus* exhibiting superior fat absorption (7 g/g) compared to *A. bisporus* (5.33 g/g). There is no significant difference in emulsifying activity between the two types, which ranged from 49 to 53%, with lower activity observed for the cultivated mushroom. However, *A. bisporus* achieved the highest significant stability of 90%, and foaming capacity of 300% compared to both wild mushrooms. There was no significant difference in foaming stability (95-100 %) between different types. These findings indicate that mushroom polysaccharides possess distinct functional properties that vary according to mushroom origin and species. Wild mushrooms have higher swelling power, fat absorption, and emulsifying capacity than cultivated mushrooms, while cultivated mushrooms have higher foaming capacity, highlighting that polysaccharides from both mushroom origins can be used in product fortification to improve the technological properties of different classes of food products.

Index Terms

Wild Mushroom; Cultivated Mushroom; Mushroom Polysaccharides; Functional Properties