

Extraction process and applications of mushroom-derived protein hydrolysate: A comprehensive review

ABSTRACT

Significant attention is focused on mushrooms and mushroom protein hydrolysates owing to their sustainability and nutritional profile with different uses in diverse industries. This review examines the composition, functional properties, production methods and applications of mushroom protein hydrolysates. It commenced with a brief overview of protein hydrolysates where their importance and applications in food, pharmaceutical, cosmetic, and agricultural industries were explored. The significance of mushrooms as alternatives to animal proteins applicable to producing protein hydrolysates was discussed. Methods including conventional (chemical and enzymatic) extraction, ultrasound-assisted and microwave-assisted extractions used to extract proteins during protein hydrolysates production were discussed. Using enzyme-assisted-ultrasound-extraction to enhance protein extraction efficiency is exclusively highlighted as a promising technique. To obtain enhanced protein yield and quality, and protein hydrolysates with desired characteristics, crucial factors consisting of pH, temperature, extraction time, solvent type, enzyme concentration and ratio-of-substrate-concentration need to be optimized. The physicochemical and functional properties of mushroom protein hydrolysates are summarized. Variability of mushroom species, extraction efficiency, enzyme selection and cost, standardization, and consumer perception which constitute challenges and limitations for production and application of mushroom protein hydrolysates are addressed. Research should be conducted to optimize extraction and hydrolysis processes and explore new mushroom species.