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Application of supercritical water oxidation process as a novel green technology for rapid soy protein hydrolysis

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Solution of solution is a traditional condiment for Asian cuisines. It has been made from a fermented paste of soybean. Basic taste (umami) of soy sauce is manifested by glutamates which are naturally occurred from soy protein hydrolysis. For hydrolysis of soybean, boiled soybean is fermented for more than 6 months and produced as commercial products. In the case of chemical soy sauce, strong acid (HCl) is applied to shorten the period of fermentation in 1-2 days. Toxic chloride compounds such as 3-monochloropropane-1,2-diol (3-MCPD) is limited the consumption of chemical soy sauce. Supercritical water oxidation (SWO) process is an alternative food processing technology that has been introduced to destruct hazardous organic wastes. Oxidative reactions caused by SWO process affect the primary structure of proteins, thereby causing a flash protein hydrolysis (within few seconds). In the present study, soy protein peptides prepared by SWO process were characterized. Based on gel electrophoresis, unique peptide bands of control soy proteins were not found in SWO treatment. Low molecular (Mw) compounds were generated after SWO process of which Mw distributions were predominant at 500 Da and 1,200 Da. SWO processed soybean had a typical flavor and taste as those of commercial soy sauce product. Considering high thermal stability of soy proteins, SWO process is an alternative technology to hydrolyze proteins of animal or marine waste and/or by-products.

Biography

Geun-Pyo Hong has completed his PhD from Konkuk University, Korea and conducted his postdoctoral research at the University of Kentucky, USA and at the University of Saskatchewan, Canada. Currently, he is an Assistant Professor at Jeju National University, Korea and expertized in novel food processing technology. He published more than 50 papers in the field of food processing technology and has been serving as an editorial board member of Korean Journal for Food Science of Animal Resources.

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