World Academy of Science, Engineering and Technology
International Journal of Nutrition and Food Engineering
Vol:10, No:11, 2016

Effect of Ethanol Concentration and Enzyme Pre-Treatment on Bioactive Compounds from Ginger Extract

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Abstract : Dried ginger was extracted and investigated the effect of ethanol concentration and enzyme pre-treatment on its bioactive compounds in solvent extraction process. Sliced fresh gingers were dried by oven dryer at 70 °C for 24 hours and ground to powder using grinder which their size were controlled by passing through a 20-mesh sieve. In enzyme pre-treatment process, ginger powder was sprayed with 1 % (w/w) cellulase and then was incubated at 45 °C for 2 hours following by extraction process using ethanol at concentration of 0, 20, 40, 60 and 80 % (v/v), respectively. The ratio of ginger powder and ethanol are 1:9 and extracting conditions were controlled at 80 °C for 2 hours. Bioactive compounds extracted from ginger, either enzyme-treated or non enzyme-treated samples, such as total phenolic content (TPC), 6-Gingerol (6 G), 6-Shogaols (6 S) and antioxidant activity (IC50 using DPPH assay), were examined. Regardless of enzyme treatment, the results showed that 60 % ethanol provided the highest TPC (20.36 GAE mg /g. dried ginger), 6G (0.77%), 6S (0.036 %) and the lowest IC50 (625 µg/ml) compared to other ratios of ethanol. Considering the effect of enzyme on bioactive compounds and antioxidant activity, it was found that enzyme-treated sample has more 6G (0.17-0.77 %) and 6S (0.020-0.036 %) than non enzyme-treated samples (0.13-0.77 % 6G, 0.015-0.036 % 6S). However, the results showed that non enzyme-treated extracts provided higher TPC (6.76-20.36 GAE mg /g. dried ginger) and Lowest IC50 (625-1494 µg/ml) than enzyme-treated extracts (TPC 5.36-17.50 GAE mg /g. dried ginger, IC50 793-2146 µg/ml).

Keywords : antioxidant activity, enzyme, extraction, ginger
Conference Title : ICFPST 2016 : International Conference on Food Processing Systems and Technology
Conference Location : Singapore, Singapore
Conference Dates : November 21-22, 2016