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Nutritional and in vitro antioxidant potential of Cheonggukjang with the various concentrations of Bacillus subtilis (KCTC 13241) during fermentation

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[Introduction]

A traditional Korean fermented soybean, *Cheonggukjang* (CKJ) is famous in Korea due to its health benefits. The aim of current study was to evaluate the impact of different concentrations (0, 1, 3, 5 and 7%) of *B. subtilis* (BS) for enhancing antioxidants, metabolites and nutritional value of CKJ and their role against oxidative stress.

[Materials and Methods]

Previously isolated strain *Bacillus subtilis* (KCTC 13241) was used for the preparation of CKJ. Changes in total phenolic contents (TPC), amino acids, fatty acids, minerals, reducing power, DPPH radical scavenging activity and ABTS assays were investigated. Total polyphenol content was measured by tking 1 gram of powder CKJ, extracted with 10 mL methanol and incubated at 25 °C for 24 h at 150 rpm. The antioxidant activity of CKJ extracts was assayed based on the scavenging activities of the stable 2,2-diphenyl-1-picrylhydrazyl free radical. The amino acid composition in all treatments was determined with a Hitachi Amino Acid analyzer (L-8900, Hitachi, Japan) after hydrolysis of 100 mg protein with 6 M HCl at 110 °C for 24 h.

[Results and Discussions]

Among all samples, the levels of DPPH radical scavenging activity, ABTS assays, reducing power, TPC, fatty acids and amino acids were maximum in CKJ prepared from 1% BS. CKJ prepared from 1% BS showed 94.24%, 86.03%, 5.99 mg/g, and 7.43 mg/g DPPH radical scavenging activity, ABTS assays, TPC, and amino acids respectively. In the case of minerals, CKJ prepared from 5% BS showed the highest value (13.82 mg/g). CKJ prepared from 7% BS revealed the lowest value of functional and biochemical capacity. In conclusion, the present results divulge that CKJ is the source of natural antioxidants, metabolites and nutrients. Such natural antioxidants could be used in food and drug industries.

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