Screening of Potential *Aspergillus* spp. for Production of Fermented Soybean with High Antioxidative Activity

Chirtchai Punjaisee[1], Wonnop Visessanguan[2*], Suchart Punjaisee[3] and Chaiyavat Chaiyasut[1]

[1]*Department of Pharmaceutical Science, Faculty of Pharmacy, Chiang Mai University, Chiang Mai 50200, Thailand*
[2]*Food Biotechnology Research Unit, National Center for Genetic Engineering and Biotechnology (BIOTEC), 113 Thailand Science Park, Pathumthani 12120, Thailand*
[3]*Department of Clinical Microbiology, Faculty of Associated Medical Sciences, Chiang Mai University, Chiang Mai 50200, Thailand*

*Corresponding author: E-mail: wonnop@biotec.or.th

ABSTRACT

Thirty two strains of Aspergillus spp. were screened by their ability to increase antioxidative capacity of fermented soybean broth. Among all strains tested, soybean inoculated with A. oryzae BCC 3088 exhibited the highest $ABTS^+$ scavenging activity, followed by those inoculated with A. terricola BCC 3026, A. ornatus BCC 3101 and A. oryzae BCC 3083, respectively. The similar results were observed when these strains were inoculated in solid-state fermentation of soybeans as shown by both $ABTS^+$ scavenging activity and ferric reducing ability power (FRAP). Analysis of aglycone isoflavones in fermented soybeans after fermentation suggested that the proportion of aglycones in total isoflavones was highest in soybeans inoculated with A. oryzae BCC 3088, followed by A. terricola BCC 3026, A. ornatus BCC 3101, A. oryzae BCC 3083 and non-inoculated fermented soybeans, respectively. Assay of ß-glucosidase activity indicated that the high ß-glucosidase activity was related to the high antioxidative activity which was a culture- dependent characteristic of starter organisms. The results indicated the potential of A. oryzae BCC 3088 for production of fermented soybean with high antioxidative activity.

Key words: Fermented soybeans, *Aspergillus*, β-Glucosidase, Antioxidative activity, ABTS radical- scavenging activity, Ferric reducing ability power, Isoflavone substances