



Antioxidant properties of probiotic *Bacillus* strains isolated from tarhana

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Abstract

The presence of antioxidant capacity in a probiotic microorganism may provide an additional health benefit by reducing oxidative stress caused by free radicals. Furthermore, the use of probiotics with antioxidant properties in food systems can contribute to the preservation of product quality and the extension of shelf life by limiting oxidative deterioration. In this study, antioxidant capacities of twelve probiotic *Bacillus* isolates were investigated. The antioxidant activities (DPPH and ABTS radical scavenging activities) of cell-free supernatant, intact cells and intracellular extracts were determined. The isolates were grown in nutrient broth at 37 °C for 24 h. Subsequently, they were centrifuged to separate the supernatant and the cells. The supernatants were filtered through a 0.22 µm membrane filter, and the cells were washed three times with phosphate-buffered saline (pH 7.2). Some cells were separated for the analysis of the intact cells, and the rest were subjected to ultrasonication to disrupt the cells. After ultrasonication, they were centrifuged and the activity of the upper phases were determined. Antioxidant activities were determined using 96-well plates using a microplate reader. The results showed that DPPH radical-scavenging activities of the supernatants (47.4-65.6 %) were significantly higher than those of the intracellular (10.0-13.5 %) or intact cells (7.5-28.7 %). On the other hand, ABTS radical scavenging activities of the intact cells (16.3-49.1 %), and intracellular extracts (7.9-39.2 %) were higher than DPPH activities. In addition, the supernatants showed ABTS activity ranging from 50.4 to 57.1 %. In conclusion, probiotic *Bacillus* isolates exhibited antioxidant potential, particularly in their cell-free supernatants, suggesting that antioxidant compounds released by the isolates may contribute to their functional properties and support their use as probiotic cultures in food applications.

Keywords: *Bacillus*, probiotic, antioxidant, DPPH, ABTS

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