

Compositional Analysis and Antioxidant Activities of the Chocolate Fermented by *Lactobacillus plantarum* CK10

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Abstract : In this study, antioxidant properties and compositional analysis of fermented chocolate were examined. Chocolate was fermented with *Lactobacillus plantarum* CK10. As fermentation time went by, pH was decreased (5.26 ± 0.02 to 3.98 ± 0.06) while titratable acidity was increased (5.36 ± 0.19 to 13.31 ± 0.34). The total polyphenol contents were maintained through the fermentation. The contents of total polyphenol were slightly increased at 8 hr (6.34 ± 0.12 mg GAE (Gallic acid equivalent)/g), and it reached to comparable levels of the control at 24 hr (control, 5.47 ± 0.36 mg GAE/g); 24 hr, 5.19 ± 0.23 mg GAE/g). Similarly, the total flavonoid contents were not significantly changed during fermentation. The pronounced radical scavenging activities of chocolate, against DPPH-, ABTS-, and Alkyl radical, were observed. The levels of antioxidant activities were not dramatically altered in the course of fermentation. By gas chromatography-mass spectrometry analysis, the increase in lactic acid was measured and four major compounds, HMF, xanthosine, caffeine, and theobromine, were identified. The relative peak area of caffeine and theobromine was considerably changed during fermentation. However, no significant difference in the levels of caffeine and theobromine were observed by high-performance liquid chromatography analysis.

Keywords : antioxidant, chocolate, compositional analysis, fermentation, *Lactobacillus plantarum*

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