

黑豆與黃豆個別類抗氧化物含量對其抗氧化力之灰關聯分析

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摘要

本文運用灰系統理論，以分析青仁黑豆、黃仁黑豆、與黃豆的有機相萃取物中，個別類抗氧化物含量對其抗氧化力之貢獻程度，並與傳統的逐步迴歸分析做比較，結果顯示灰關聯分析確比逐步迴歸分析優越。被檢測含量之抗氧化物有花青素(anthocyanin)、genistein、與維生素 E(vitamin E)三大類。抗氧化力以抑制低密度脂蛋白(low density lipoprotein, LDL)過氧化產物丙二醛(malonyldiadehyde, MDA)生成量而定。原始數據分為五種組合運算以代表不同樣品數，包括青仁黑豆組(八個品系)、黃仁黑豆組(五個品系)、黃豆組(四個品系)、青仁及黃仁黑豆組(十三種品系)、與青仁及黃仁黑豆及黃豆組(十七種品系)，經灰系統均質化(mean value normalization)後得到五組數列，再經灰關聯運算後得到五組個別類抗氧化物對抗氧化力之灰關聯度值(grey relational value)。每組結果都顯示，不論黑豆或黃豆之有機相萃取物，其個別抗氧化物含量對其抗氧化力之灰關聯序(grey relational order)都是維生素 E、genistein 及花青素。亦即，維生素 E 最重要，其次是 genistein，最後是花青素。

關鍵詞：灰關聯分析、抗氧化力、黑豆、黃豆、花青素、genistein、維生素 E

ABSTRACT

This research applied grey system theory to doing grey relational analysis on the contribution of individual antioxidant to total antioxidative capacity in the organic extract of 8 cultivars of black bean with green cotyledon, 5 cultivars of black bean with yellow cotyledon, and 4 cultivars of soybean. The data showed grey relational analysis is better than stepwise regression analysis. The antioxidants detected were anthocyanin, genistein, and vitamin E. The low density lipoprotein (LDL) system was used to determine the antioxidative capacity of each cultivar. All the original data were mean-value-normalized according to grey system theory. Five combinations, including green-cotyledon black bean, yellow-cotyledon black bean, all black beans, and all black beans and soybean, were calculated their grey relational grade after mean value normalization. All grey relational grades in five combination indicated that the grey relational order or the degree of contribution of individual antioxidant to the antioxidative capacity of organic extract is vitamin E, genistein, anthocyanin.

Key words: grey relational analysis, antioxidative capacity, black bean, soybean, anthocyanin, genistein, vitamin E