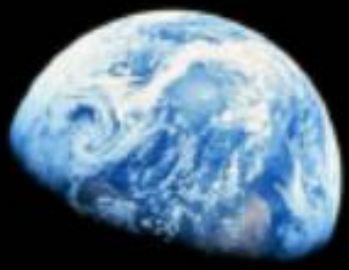
The 16th International Symposium on Advanced Technology

I S A T 16th

- Advanced Technology to Open a New Era -

Nov. 1 – Nov. 2, 2017
Hachioji, Kogakuin Univ.



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Optimization for extrating isoflavones from soybean by stirring method using ethanol

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Abstract

This study presents optimization results of conditions for soybean-extracted isoflavones from Quangnam (Vietnam) by applying stirring extraction using ethanol solution 80% with neutral pH. Total isoflavones concentration was determined with 6 isoflavone standards: daidzin, glycitin, genistin, daidzein, glycitein and genistein by RP-HPLC method [1]. The result of examining the effect of the following factors: temperature, time, ratio of solution/material on isoflavone content allowed to use experimental planning method with full element 2^3 and optimization with Box-Wilson model [2]. Hence, the optimal condition of isoflavones extraction was temperature of 72.5°C, extracting time of 68.5 minutes, and solvent/dry soybean ratio of 25.5/1 (ml/g). At this condition, the concentration of total isoflavone was 1932.44µg/g over dry initial matter. The result of thin layer chromatography (silicagel 60 F_{254}) using chloroform/methanol as mobile phase indicated the presence of four components of total isoflavones (daidzein, genistein, daidzin and genistin) from dry extract. These compounds had positive reactions on 2,2-Diphenyl-1-picrylhydrazyl (DPPH) reagent. This shows potential applications of soybean-extracted isoflavones in food industry.

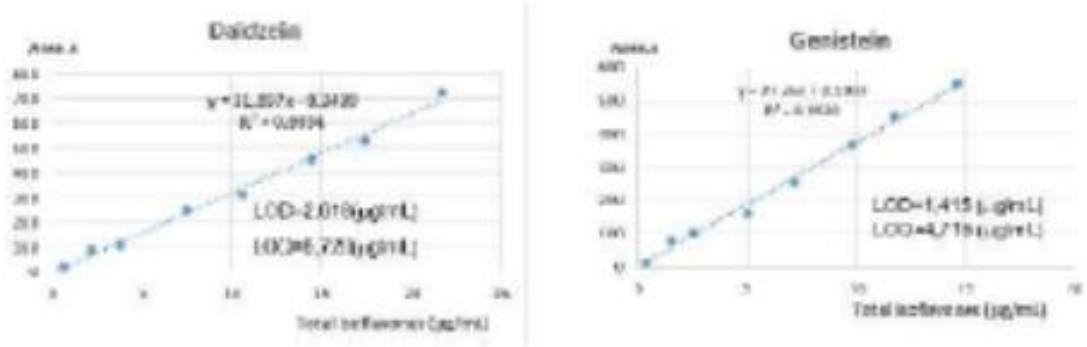

Fig. 1: Linear equation of the daidzein and genistein standard

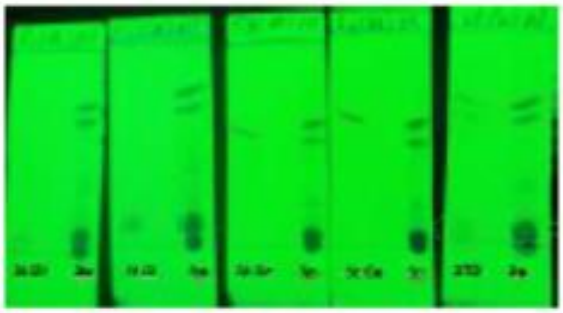

Fig. 2: Isoflavones in TLC (St Di: Daidzin; St Gi: Genistin; St De: Daidzein; St Ge: Genistien; STD: mix standard, Sp: dry extract)

References:

[1]. Mark W. Collison (2008), Determination of Total Soy Isoflavones in Dietary Supplements, Supplement Ingredients, and Soy Foods by High-Performance Liquid Chromatography with Ultraviolet Detection: Collaborative Study, J AOAC Int, 91(3): 489–500.

[2]. Zivorad R. Lazic (2004), Design of Experiments in Chemical Engineering, ISBN: 3-527-31142-4.