

**OPTIMIZATION OF PHENOLIC EXTRACTION
AND ANTIOXIDANT ACTIVITY FROM THE
ROSELLE SEED OIL BY USING RESPONSE
SURFACE METHODOLOGY (RSM)**

Library Services
UCSI Education Sdn. Bhd. (185479-U)
No. 1, Jalan Menara Gading, UCSI Heights,
56000 Kuala Lumpur, Malaysia.
Tel: 603-9101 8460 Fax: 603-9102 3606
Website : www.ucsi.edu.my

MOOI NGAN LING

**B.Sc (Hons) FOOD SCIENCE & NUTRITION
FACULTY OF APPLIED SCIENCE
UCSI UNIVERSITY**

2010

ABSTRACT

Roselle (*Hibiscus sabdariffa* L.) seed contained different phenolic acids and tocopherol. Hence, the aim of this study was to investigate the antioxidant activity of roselle seed oil with different parameters of extraction (solid to solvent ratio (w/v), extraction time (hours) and extraction temperature (°C)) of single factor experiments. Total phenolic content (TPC), 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity and β -carotene bleaching (BCB) assay were used to determine the antioxidant activity of roselle seed oil. While, response surface methodology (RSM) was performed to optimize the extraction condition. A central composite rotatable design (CCRD) was then applied to investigate the best possible combination effects of solid to solvent ratio, extraction time and extraction temperature on total phenolic content (TPC), 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical scavenging capacity and β -carotene bleaching (BCB) assay of roselle seed oil. The best combination of the TPC, DPPH and BCB were solid to solvent ratio at 2:46, extraction time 5 hours and extraction temperature at 85°C. Under the optimized conditions, the experimental value for TPC, DPPH and BCB were 37338.2 mg GAE/100g DW, 3748.24 mg TEAC/100g DW and 57.41% antioxidant activity, respectively. It was reasonably close to the predicted value 37323.9 mg GAE/100g DW, 3938.92 mg TEAC/100g DW and 60.59% antioxidant activity. Hence, it showed the model obtained from the experimental design provided by RSM was able to optimize the extraction conditions of phenolic antioxidants and antioxidant activities from roselle seed oil.

Jalan Menara Utama, UCSI Heights,
4000 Kuala Lumpur, Malaysia.
Tel: 603-9101 8860 Fax: 603-9102 3606
Website: www.ucsi.edu.my