

Thesis Title	The optimization of the process for antioxidant and fiber extraction from lotus rhizome and seed
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#### Abstract

Rhizome and Lotus seed (*Nelumbo nucifera*) are edible parts consumed by Asean people for their nutritional and medicinal values. Antioxidants especially phenolic compounds in lotus seed and rhizome are active ingredients that can lower blood cholesterol. Aqueous extract of lotus rhizome is a popular drink for Chinese people. In this research, the best methods for extraction of antioxidants from lotus seed and rhizome were studied. It was found that soaking lotus seed in the cold water (4°C) for 3 hours before extraction gave significantly higher yield of phenolic compounds as well as higher antioxidant activity (DPPH method) than the extraction with hot water (100°C) for 2 min ( $p < 0.05$ ). The seed aqueous extract has phenolic compounds (Gallic acid equivalent)/l at  $111.2 \pm 2.14$  mg GAE/l, antioxidant activity  $80.4 \pm 0.84\%$ , pH  $7.1 \pm 0.10$ , total soluble solid  $0.46 \pm 0.05^\circ\text{Bx}$ , crude fiber  $0.08 \pm 0.02$  g / 100 ml and soluble protein  $2.9 \pm 0.12$  mg/ml. The preparation process of the rhizome prior to the extraction was compared between blanching and non-blanching with and without citric acid treatment. The non-blanching with 0.1% citric acid treatment gave the best result. The aqueous extract of lotus rhizome has phenolic compounds (Gallic acid equivalent)/l at  $123.33 \pm 3.30$  mg GAE/l, antioxidant activity  $62.30 \pm 1.79\%$ , pH  $6.30 \pm 0.04$ , total soluble solid  $1.40 \pm 0.03^\circ\text{Bx}$ , crude fiber,  $0.14 \pm 0.05$  g / 100 ml and soluble protein  $0.40 \pm 0.11$  mg/ml. The shelf life of the aqueous extract of seed and rhizome after storage at 4, 14 and 24 °C was determined. The amount of phenolic compounds and antioxidant activity did not significantly changed, while pH, cloud stability, and color significantly decreased

( $p < 0.05$ ). The lotus seed and rhizome extracts can be added to increase nutritional value in healthy foods and drinks.

**Keywords:** Lotus seed/ Lotus rhizome/ Antioxidant/ Dietary fiber