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Antioxidant Activity and Total Phenolics Content of ethanolic extracts from *Elateriospermum tapos* Blume: seed and seed skin

Naengnoi Sangsane[*1], Paweena Porrawatkul, Namtip kotcharin[1], Thanawan Srikan[1], Siwaporn Buakaew[1], Nareerat Jommala[1] and Nichapa Rattanakomol[1]

[1]*Nanomaterials Chemistry Research Unit, Department of Chemistry, Faculty of Science and Technology, Nakhon Si Thammarat Rajabhat University, 80280, Thailand.*

[*]*Corresponding author. e-mail :* s.saengsane@gmail.com; *Tel. +66-7537-7443, Fax +66-7537-7443*

Abstract

The local plants in Euphorbiaceae family, *Elateriospermum tapos* Blume (Pra) was traditionally used in local cuisine and herbal medicines in Thailand. In this study, ethanolic extracts prepared from, seed and seed skin of these plants were tested for antioxidant properties using DPPH assay and total phenolic content also were screened. Pra are a domestic of various regions of Thailand including Nakhon Si Thammarat. The part of them; fruit, root and peel stems have an effect of herb. The results were calculated as an inhibitory concentration at 50% (IC_{50} mg/L ± S.D.) using ascorbic acid as a reference compound (IC_{50} = 39.71±2.14 mg/L). As the result, in the seed exhibited the higher antioxidant activity with $IC_{50}$of 43.52±2.06mg/L than seed skinwith IC_{50} = 58.62±1.20 mg/L. Total phenolic content of the ethanolic seed and seed skin extractsshowed the closely total phenolic content (11.06±2.11 and 11.27±1.16 mg GAE/100 g of dry weight, respectively). The results suggest that *Elateriospermum tapos* Blume. is a good source of natural antioxidants and further studies should be undertaken for their pharmacological properties

Introduction

Elateriospermum tapos Blume, locally known in Thai as Pra, Kra, or Perah, is a plant in the family Euphorbiaceae, distributed across the national highland rain forest or the high humidity mountain located in the southern part of Thailand especially in the Bantad Mountain Range in Trang and Nakhon Si Thammarat provinces [1]. *E. tapos*is a large

deciduous tree about 20 to 40 meters in height which grows in the highland rain forest, locally known as Pra. Pra fruits are oval, approximately 5 to 6 centimeters long and grow in strands. Each fruit has brown skin, which wrinkles at ripening. It is filled with pale brown pulp containing 3-5 seeds, which separate readily with each segment containing brown oval seeds. The seeds are used as flavoring agent for curries, sweet and are used in the preparation of snacks. The eatable seeds are cooked. The raw seeds are hazardous because they contain cyanide. The ground seeds are rich in nutrients containing considerable amounts of protein, carbohydrate and fat high in unsaturated fatty acids [2], therefore it has been used in the nutrition area. Inthis study, we aimed to compare the antioxidant activity and total phenolic content from different extracted part of this species in green ethanol solvent. The characteristicsof *Elateriospermum tapos* Blume seed and seed skin shown in Fig 1.

Seed Seed Skin

Fig1. Appearence of *Elateriospermum tapos* Blume seed and seed skin.

Materials and Methods

Phytochemical screening of extract

Quantitative phytochemical tests for the identification of anthraquinones, flavonoids, steroids, terpenoids, saponins, cumarins, cardiac glycoside and tannins were carried out for the extract [3,6].

Samplepreparation

The parts of *Elateriospermum tapos* Blume. were collected from Ban Maireang Amphoe ChawangNakhon Si Thammarat province. Theseed and seed skin of*Elateriospermum tapos*

Blume were cleaned to remove any residual compost. The ethanolic crudes were studied DPPH radical-scavenging activity and total phenolic compound.

DPPH radical-scavenging activity

The antioxidant activity was determined using DPPH radical scavenging model with a slight modification. Various concentrations of test compounds in methanol were mixed with a ethanolic solution having a final DPPH radical concentration of 0.1 mM. The mixture was shaken vigorously and left to stand for 30 min in the dark. Scavenging capacity was measured spectrophotometrically at 515 nm [4].

The percent DPPH inhibition was calculated from the following equation:

$$\%\text{DPPH Inhibition} = \frac{(\text{Abs}_{\text{control}} - \text{Abs}_{\text{sample}}) \times 100}{\text{Abs}_{\text{control}}}$$

Total phenolic compound analysis

The amount of total phenolic in the herb extracts was determined with the Folin-Ciocalteu reagent according to the method of AOAC on using gallic acid as a standard. Samples 0.1 mL were introducing to test cuvettes, and then 0.3 mL of Folin Ciocalteu's reagent and 2 mL of Na_2CO_3 (15 %) were added. The absorbance of all samples was measured at 765 nm using the PerkinElmer UV–VIS Spectrometer lambda12. Results were expressed as milligrams of gallic acid equivalent (GAE) per 100 gram of dry weight.

Results and discussion

Table 1 Chemical composition of *Elateriospermum tapos* Blume seed and seed skin.

Chemical compositions	**Seed skin**	**Seed**
Saponins	A	A
Tannins	P	P
Terpenoids	P	P
Steriods	P	P
Anthraquinones	A	A
Flavonoids	P	P
Alkaloids	P	P

Cardiac glycoside	P	P
Cumarins	P	P

A=Absent P=Present

The quantitative chemical composition analysis of seed and seed skin extracts showed the presence of tannins, terpenoids, steroids, flavonoids, alkaloids, cardiac glycoside and cumarins, but both extracts not present of saponins and anthraquinones that results showed in Table 1.

Table 2 Antioxidant activities on DPPH free radical and concentration of total phenolic compound of *Elateriospermum tapos* Blume seed and seed skin.

samples	IC_{50})mg/L(	Total phenolic content mg GAE/ 100 g of dry weight
Ascrobic acid	39.71±2.14	-
Seed skin	58.62±1.20	11.27±1.16
Seed	43.52±2.06	11.06±2.11

Table 2 showed the antioxidant activities and and concentration of total phenolic compound of*Elateriospermum tapos* Blume seed and seed skin extracts. The result indicated that seed had higher an antioxidant activity with a lowest IC_{50} value = 43.52±2.06 mg/L and had significantly closely antioxidant activity with ascorbic acid (IC_{50} = 39.71±2.14mg/L). Total phenolic content of the ethanolic seed and seed skin extractsshowed the closely total phenolic content (11.06±2.11 and 11.27±1.16 mg GAE/ 100 g of dry weight, respectively).

Conclusions

The antioxidative activity and total phenolic content from the part of*Elateriospermum tapos* Blume seed and seed skin extracts exhibited high antioxidant activity especially *Elateriospermum tapos* Blume seed which had closly IC_{50} value with ascrocic acid. The results suggest that*Elateriospermum tapos* Blumewas a good source of natural antioxidants and further studies should be undertaken for their pharmacological properties [5].

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