

In vitro Screening of Antioxidant Activities of Four Thai Medicinal Flowers

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Introduction

Jasminum sambac L. Aiton, popularly known in Thai as "Mali",¹ belongs to the Oleaceae family. The different parts of this plant are important as sources of chemicals that are useful in the pharmaceutical industries with various pharmacological activities. In China and Thailand, the flowers of this plant are used as a folk remedy for the treatment of arthritis, hepatitis, gastritis and diarrhea.²

Mimusops elengi L. (Sapotaceae), locally in Thai as "Phi-kul",¹ is a medium-sized evergreen tree found in tropical forests in Southern and Southeast Asia and Northern Australia. This plant is well documented for several medicinal properties. Dried flowers are used in many recipes of Thai traditional medicine for cardiotoxic and stomachic.³

Nelumbo nucifera Gaertn, a perennial aquatic plant, belongs to the family Nelumbonaceae.¹ It is widely distributed throughout Asia including Thailand. In traditional medicine, the pollen of this plant was used as cardio tonic. The seed was used as anti-cough agent and the seed embryo was used to reduce high fever and increase blood circulation.⁴

Pandanus odorifer (Forssk.) Kuntze belongs to the family Pandanaceae.¹ The essential oil is well known in treating several diseases such as rheumatoid arthritis, certain skin diseases, headache, earache, smallpox, syphilis, leprosy, sterility, cardiac troubles and colic infections.⁵

The aim of this work was to determine the total phenolic content and in vitro antioxidant activities of the 95% ethanol extracts of four Thai medicinal flower extracts, *J. sambac*, *M. elengi*, *N. nucifera* and *P. odorifer*, using spectrophotometric methods.

Result, Discussion and Conclusion

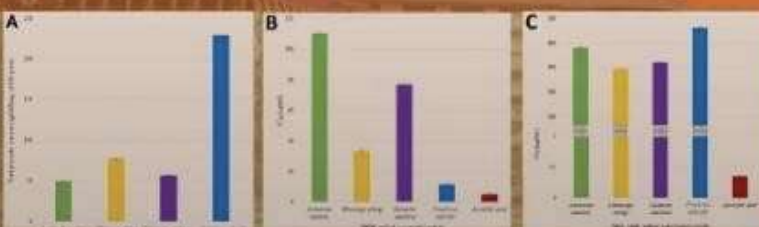
The 95% ethanolic extract of *P. odorifer* flowers showed the best antioxidant activities using the DPPH radical scavenging assay with an IC_{50} value of $11.70 \pm 1.063 \mu\text{g/mL}$ compared with the positive control, ascorbic acid (IC_{50} $5.15 \pm 1.039 \mu\text{g/mL}$). The *P. odorifer* flowers extract also had the highest total phenolic content using the Folin-Ciocalteu method ($229.31 \pm 0.015 \mu\text{gGAE/mg}$). The 95% ethanolic extract of *M. elengi* showed weak nitric oxide-scavenging activity with IC_{50} of $0.29 \pm 1.033 \text{ mg/mL}$, which was lower than that of the positive control, ascorbic acid (IC_{50} $0.35 \pm 1.247 \mu\text{g/mL}$). These flowers may be served as potential resources of natural antioxidants for use as functional food ingredient and cosmeceutical applications.

Table 1 Total phenolic content and antioxidant activity of selected Thai medicinal flower extracts

Sample	Total phenolic content ($\mu\text{g GAE/mg}$ of DW plant)	IC_{50} ($\mu\text{g/mL}$)	
		DPPH radical scavenging	Nitric oxide scavenging
<i>Jasminum sambac</i>	49.72 ± 0.005	110.50 ± 1.052	380.10 ± 1.067
<i>Mimusops elengi</i>	77.02 ± 0.003	33.16 ± 1.037	293.10 ± 1.033
<i>Nelumbo nucifera</i>	56.39 ± 0.009	76.99 ± 1.099	319.90 ± 1.209
<i>Pandanus odorifer</i>	229.31 ± 0.015	11.70 ± 1.063	462.90 ± 1.035
Ascorbic acid ^a	-	5.15 ± 1.039	0.35 ± 1.247

^aAscorbic acid was used as positive control.

Figure 1 Antioxidant activity of selected Thai medicinal flower extracts (A) total phenolic content, (B) DPPH radical scavenging activity and (C) nitric oxide radical scavenging activity



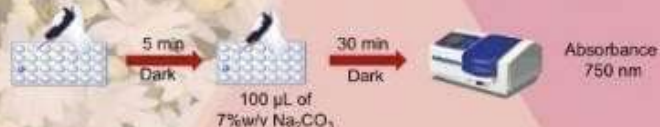
Methodology

Extraction



Total Phenolic Assay

130 μL DI water + 10 μL Gallic acid or crude extract in EtOH + 10 μL Folin-Ciocalteu reagent



DPPH Assay

75 μL of Ascorbic acid or crude extract in EtOH



NO Assay

60 μL 10 mM Sodium nitroprusside in PBS + 60 μL Ascorbic acid or crude extract in EtOH



Acknowledgements

This work was supported by The Thailand Research Fund under Grant no. DBG6180030, Ministry of Higher Education, Science, Research and the Center of Excellence for Innovation in Chemistry (PERCH-CIC), Ministry Innovation, and the Faculty of Science, Ramkhamhaeng University.

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