

Thesis Title Evaluation of Microwave–assisted Extraction of *Naringi crenulata* Leaves for Utilization in Skincare Essence
Author Khine Mon Yee Hlaing
Degree Master of Science (Creative Innovation in Cosmetic Science)
Advisor Naphatsorn Ditthawutthikul, Ph. D.
Co-Advisor Assistant Professor Nuntawat Khat-udomkiri, Ph. D.

ABSTRACT

Naringi crenulata, or Thanaka, is a medicinal plant possessing antioxidant, astringent, and anti-inflammation properties, making it a promising ingredient for cosmetic formulations. This study investigated the extraction of bioactive compounds from *N. crenulata* leaves, using microwave-assisted extraction with ethanol at varying concentrations (50%, 70%, and 95%). Bioactive compounds such as total phenolic content (TPC), total flavonoid content (TFC), total tannin content (TTC), and astringent activity, antioxidant activity by DPPH radical scavenging, and the ferric reducing antioxidant power (FRAP) assays of the extracts were assessed using colorimetric assays.

Among the tested solvents, 50% ethanol achieved the highest extraction yield (16.81%) and maximized bioactive compound recovery (TPC 11.76 ± 0.38 GAE mg/g dry plant, TFC 19.35 ± 0.32 QE mg/g dry plant, 11.51 ± 0.07 TAE mg/g dry plant), along with maximized antioxidant properties (3.35 ± 0.04 AAE mg/g dry plant by DPPH and 3.57 ± 0.05 AAE mg/g dry plant by FRAP method) with IC_{50} value of 624.6 ± 28.95 μ g/mL for DPPH radical scavenging activity. In contrast, 95% ethanol demonstrated the highest astringency $64.94 \pm 0.13\%$. These findings highlight the critical importance of solvent polarity in enhancing the extraction of phenolics, flavonoids, and tannins.

The 50% ethanol extract was selected to further formulate into cosmetic formulation because it has the highest antioxidant potential and its integration into essence cosmetic formulations were assessed through heating-cooling cycles and one month of storage at different temperatures (room temperature, 4°C, and 45°C).

This study emphasized the overlooked potential of *N. crenulata* leaves within the field of cosmetic science. Future research may concentrate on techniques to improve stability, evaluate clinical effectiveness, and expand its cosmetic uses.

Keywords: *Naringi crenulata*, Antioxidant, Microwave-assisted Extraction, Astringent

