

Thesis Title	Extraction and Evaluation of Active Compounds from <i>Areca catechu</i> Linn. Fruit for Cosmetic Application
Author	Sarita Sangthong
Degree	Master of Science (Cosmetic Science)
Advisor	Dr. Phanuphong Chaiwut
Co-Advisor	Dr. Punyawatt Pintathong

ABSTRACT

This study was aimed to extract and evaluate phenolic compounds from betel nut (*Areca catechu* L.) in order to develop it as cosmetic multifunctional agent. Stabilities of the betel nut extract obtained from various conditions as well as cosmetic formulation are also investigated. Sample part and ripening stage, extraction method and solvent influencing the extraction efficiency were studied. Extractable phenolics content (EPC), extractable flavonoids (EFC), extractable catechin (ECC) content, DPPH and ABTS radicals scavenging capacities, ferric reducing antioxidant power (FRAP), lipid peroxidation, tyrosinase, and elastase as well as anti-bacteria inhibitory activity assays were employed to assess the extraction achievement. The HPLC elution profiles and UV-absorbability of the extracts were also investigated.

The raw betel nut seed obviously exhibited higher values of all assessments than those of the ripe seed, ripe pericarp and raw pericarp, respectively. Microwave assistance in extraction showed its significantly greater potential than the conventional shaking method. The raw betel nut crude extract from 50% ethanol extraction provided highest EPC, EFC, and ECC of 226.58 mg GAE/g sample, 140.79

mg QE/g sample, and 67.23 mg CE/g sample, respectively. This extract also exhibited the greatest antioxidant capacity of 495.51, 908.39 and 383.17 mg TEAC/g sample when determined by DPPH, ABTS and FRAP assays, respectively. The furthestmost lipid peroxidation and tyrosinase inhibitory activity of 60.51 mg BHTE/g sample and 348.81 mg KAE/g sample, respectively, were obtained.

Sequential solid-liquid fractionation of bioactive agent from raw betel nut seed by 6 different polarity of organic solvents, including hexane, ethyl acetate, acetone, 95% ethanol, 50% ethanol and water were accomplished. Amongst all fractions, acetone extract possessed the highest EPC, EFC, and ECC of 82.39 mg GAE/g sample, 12.71 mg QE/g extract, and 1.51 mg CE/g sample, respectively. The most powerful antioxidant capacity was also obtained from the acetone fraction exhibiting 20.76 and 14.31 mg TEAC/g extract when assayed by DPPH and FRAP method, respectively. The first fraction of hexane and the last fraction of water exhibited lowest bioactive compounds and activities. The HPLC chromatogram showed the major components of raw betel nut seed were catechin-like compounds with the remarkable highest peak area in acetone fraction.

Stability of raw betel nut seed was investigated for its application in cosmetic products. The raw betel nut seed extract retained residual EPC and radical scavenging activity at pH 4-6 and 8-10, especially when storing at low temperature. The formula containing 0.5% raw betel nut seed extract retained residual EPC of 93.50 and 96.27% after 3 cycles of freeze/thaw and heating/cooling, respectively. The residual antioxidant activity of 90.78 and 102.35% were investigated. The storage at 4°C and room temperature showed better EPC and antioxidant stabilized than 50°C storage.

Keywords: *Areca catechu* Linn./cosmetic/extraction/multifunctional/stability