

## Optimization of Ultrasound-assisted Extraction conditions for Bioactive Compounds from Safflower seed using Response surface method

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In this study, bioactive compounds with skin-whitening and anti-wrinkle effects were extracted from Safflower seed using ultrasound-assisted extraction (UAE) and extraction conditions were optimized by a central composite design (CCD). The independent variables including extraction time, extraction temperature, and ethanol concentration were selected for the maximization of tyrosinase inhibition activity (TIA), collagenase inhibition activity (CIA), and radical scavenging activity (RSA). Extraction time of 23.2 min, temperature of 47.4°C, and ethanol concentration of 50.7% were found to be optimum, under which TIA, CIA, and RSA were 53.2%, 91.4% and 27.6% respectively. The UAE process showed its potential to the extraction of skin-whitening, anti-wrinkle, and antioxidant effects from Safflower seed. Through this experiment, it was confirmed that raw materials for natural cosmetics that are effective in whitening and wrinkle improvement can be produced from Safflower seed.