

ABSTRACT

Nowadays, dried edible flowers have become one of the eating habits of a healthy lifestyle. The most common way to consume dried flowers is infused water (tisane). In addition, many published studies of floral tea contain antioxidant substances mainly due to their phenolic compounds. This work had developed new extraction using ultrasound technology to determine phenolic compounds in 15 most consumed edible flowers in Indonesia. Several extraction factors including pulse duty-cycle (0.2, 0.6, 1.0 s⁻¹), temperature (10, 40, 70 °C), solvent to sample ratio (10:1, 20:1, 30:1 mL of solvent/g of sample), and solvent composition (0, 25, 50% methanol in water) had been optimized based on a Box-Behnken design coupled with response surface methodology. UHPLC-PDA had been employed to quantify 12 major phenolic compounds (2,4,6-trihydroxy benzoic acid, protocatechuic acid, protocatechuic aldehyde, *p*-hydroxybenzoic acid, caffeic acid, vanillic acid, epicatechin, *p*-coumaric, ferulic acid, quercetin-3-rutinoside, iso-ferulic acid, and quercetin-3-glucoside) in the extracts. The optimum extraction conditions for the 1 g sample were 30 mL of solvent (28% methanol in water) at 42 °C with 1.0 s⁻¹ of pulse duty-cycle. Based on the kinetic study, the optimal extraction time was 10 min. The method was validated with high precision (CV less than 7%) and accuracy (82% of flavonoids, 83% of cinnamic acid derivatives, and 91% of benzoic acid derivatives). Additionally, the proposed ultrasound-assisted extraction had been successfully applied to determine the levels of phenolic compounds in 15 dried edible flowers.

Keywords: Box-Behnken design, method development, UHPLC, tisane, validation