

OPTIMISATION OF THE EXTRACTION OF PHENOLIC COMPOUNDS FROM PLUM (*PRUNUS DOMESTICA* L.) FRUIT MESOCARPS USING RESPONSE SURFACE METHODOLOGY

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Plums contain significant amounts of biologically active compounds which have hypoglycemic, laxative, hypotensive and hepatoprotective activity. Plums have large amounts of phenolic compounds, mainly neochlorogenic and chlorogenic acids, which may contribute to the laxative action and delay glucose absorption [1]. Extraction is the first and very important step of analytical determination of phenolic compounds, which plays a decisive role in the final result. Qualitative and quantitative studies of bioactive compounds from plant materials mainly depend on the selection of an appropriate extraction conditions [2].

The ultrasound-assisted extraction of phenolic compounds from plum samples was modelled using response surface methodology. A three-level-three-factor central composite design using the response surface methodology was employed to optimise three extraction variables, including ethanol concentration, extraction time and ultrasonic power, for the achievement of the highest extraction yield of the phenolic compounds from lyophilised plum samples. Six replicates were used to evaluate the pure error. Experimental data showed that response variables were fitted to a linear model. “Design-Expert® 6.0.8” software (Stat-Ease Inc., Minneapolis, Minnesota, USA) was used to analyse the data, develop models and optimise the extraction conditions. The total phenolic content was determined using Folin–Ciocâlțeu spectrophotometric assay and expressed as gallic acid equivalent (GAE) [3]. All data were recalculated for absolute dry weight of plant material.

The maximum experimental yield of phenolic compounds was 12.58 mg GAE/g which was close to the predicted yield (11.52 mg GAE/g DW). The optimised extraction conditions were 70% ethanol concentration, extraction time 60 min, and ultrasonic power 904 W. These optimised extraction conditions were applied for the analysis of plum samples of seven different cultivars.

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