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EFFICIENT EXTRACTION OF GLYCYRRHIZIC ACID FROM LIQUORICE POWDER (*GLYCYRRHIZA GLABRA* L.) USING MICROWAVE-ASSISTED EXTRACTION

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Abstract

Liquorice (*Glycyrrhiza glabra* L.), also known as "Mulhatti" is known for various bioactive constituents, such as glycyrrhizin, starches, amino acid gums, sterols, essential oils, and various sugars. Glycyrrhizic acid (G.A.) is the main active ingredient in liquorice. Traditional or solvent-based extraction methods to obtain GA and phenolic compounds from liquorice roots need a significant amount of solvent, a relatively high temperature during the extraction process and have relatively low yield. The microwave-assisted extraction (MAE) method was developed for the isolation of glycyrrhizic acid (GA) from liquorice (Glycyrrhiza glabra L.) root powder. The effects of various operational parameters, such as microwave power, extraction time, solvent type, and powder size, on the extraction yield, extraction efficiency, and GA concentration were evaluated using response surface methodology. The experiments were done with a high-performance liquid chromatography (HPLC) unit, a customized microwave system, and a rotary evaporator. The study results indicated that ethanol was a more effective solvent for extracting GA than methanol, with GA extraction percentages of 2.139% to 2.186% and 0.285% to 0.307%, respectively. Furthermore, the GA extraction yield increased with a decrease in powder size, and the highest yield was obtained with a powder size of 0.15 mm. The microwave power of 352.68 W and extraction time of 4.53 min was found optimal with extraction yield and GA was 24.37% and 2.158%, respectively. The optimized parameter was close to microwave power of 350 W and an extraction time of 4 minutes which resulted in an extraction yield of 24.54% and GA concentration of 2.164%.

Key words: extraction time, glycyrrhizic acid, HPLC, liquorice powder, microwave-assisted extraction

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