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Optimization of bioactive compounds of horehound extracts obtained using ultrasound and microwave assisted extraction: anti-hyperglycaemic activity

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White horehound (*Marrubium vulgare* L.) is a grey-leaved perennial herb, belonging to Lamiaceae family, distributed in Eurasia and northern Africa zones [1]. According to the recent literature, horehound shows several *in vivo* and *in vitro* activities including antihypertensive, antioxidant, antiinflammatory, antidiabetic, effects on respiratory system, digestive stimulant, antiasthmatic, hypolipidemic, antibacterial and antifungal effects [2,3,4,5,6,7]. Having a scarce information about ultrasound assisted extraction (UAE) of horehound and several articles focusing on intensification of marrubiin content by microwave assisted extraction (MAE), the idea to compare these modern extraction techniques imposed. UAE and MAE were confronted in reference to extraction yield, polyphenols content, antioxidant potential and antidiabetic activity. Response surface methodology was used for optimization of process parameters in UAE and MAE. The optimal UAE parameters for maximized polyphenols and antioxidant activity were temperature of 73.6 °C, extraction time of 40 min and ultrasound power of 30.3 W/L, while in case of MAE the optimal parameters were 63.8% ethanol, extraction time of 15 min and microwave power of 422 W. The optimal UAE and MAE extracts were subjected to α-amylase and α-glucosidase inhibitory assays to determine their anti-hyperglycaemic potential.

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