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Gum arabic: An optimization of ultrasonic-assisted extraction of antioxidant activity (Article) [\(Open Access\)](#)

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Abstract

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Gum Arabic (GA), also known as Acacia seyal gum (ASG), is a dried exudate from trees of Acacia senegal and Acacia seyal. It provides a rich source of non-viscous soluble fiber with significant health benefits and high antioxidant properties. Tonnes of raw GA are exported annually at a high cost with limited utilization in extraction form. Techniques for the extraction of the bioactive components of GA are available but the high extraction time and the capacity and quality of extraction hinders these procedures. Ultrasonic-assisted extraction is one of the most effective techniques for the recovery of antioxidant and phenolic compounds from ASG. A comparatively low extraction time has been reported for ultrasonication, but the influence of several extraction conditions such as temperature, time and ultrasonic power on the yield of extraction has not been thoroughly studied. This study investigates the optimal ultrasonic extraction conditions for maximum recovery of antioxidant and phenolic compounds from ASG using Response Surface Methodology (RSM) under the Central Composite Design (CCD). Three ultrasonic parameters, namely time in the range of (1-3 hours), power in the range of (1-3 level or 12 to 40 kHz) and temperature from (25-60 °C) were tested for their impact on antioxidant activity. The capacity of the extracts was determined by the scavenging activity of 1, 1-diphenyl-2-picrylhydrazyl (DPPH) radical, ferric reducing antioxidant power (FRAP) assay, and total phenolic compounds (TPC). The results indicated that ultrasonic time, power and temperature had a positive impact on antioxidant capacity and phenolic compounds. The optimum ultrasonic conditions were found to be a time of 3 hours, a power of 40 kHz, and a temperature of 42.50°C, under which, forty-eight bioactive compounds from the ASG extract were separated by Gas Chromatography coupled to Tandem Mass Spectrometry (GC-MS/MS). © 2018, Universitatea Babes-Bolyai, Catedra de Filosofie Sistemtica. All rights reserved.

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