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Analytical study on secondary metabolites extraction and characterization from Acacia gums (AGs)

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Elnour, Ahmed A.M.^{a, b} ; Al-Assaf, Saphwan^c ; Kabbashi, Nassereldeen Ahmed^d ; Osman, Mohammed Elmubark^e; Abdelgadir, Abdelgadir Elfadil^f

^a Faculty of Chemical and Process Engineering Technology, Universiti Malaysia Pahang Al-Sultan Abdullah (UMPSA), Pahang Gambang, Malaysia

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Abstract

Acacia gums (AGs), derived from *Acacia senegal*, *Acacia seyal*, and *Acacia polyacantha* trees, are widely used in various industries, including food, pharmaceuticals, and cosmetics. They serve as emulsifiers, stabilizers, thickeners, and soluble dietary fibers. This study aimed to optimize the extraction process of secondary metabolites extracted (SME) from AGS to enhance their efficiency

and quality for industrial applications. Gum arabic, primarily composed of D-galactose, L-arabinose, L-rhamnose, D-glucuronic acid, and 4-O-methyl-D-glucuronic acid with a small fraction of proteins, is a multifunctional ingredient known for its emulsifying activity, attributed to its amphiphilic nature. Its effectiveness as an emulsifier stems from its high water solubility, low-viscosity, good surface activity, and ability to form a protective film around emulsion droplets. AGS in Sudan play crucial ecological roles by providing fodder, freewood, gums, and soil erosion control, which are essential for gum arabic production. Sudan's diverse biodiversity hosts many plant species traditionally used for medicinal purposes, with extensive knowledge of medicinal plant species stemming from their widespread use among different ethnic groups. This study highlights the importance of optimizing the extraction of secondary metabolites from AGS for industrial applications, and the significance of AGS in Sudan's ecological balance and economic stability. © The Author(s), under exclusive license to Springer Nature Singapore Pte Ltd. 2025.

Author keywords

Extraction techniques; Gum arabic; Optimization; Secondary metabolites

Indexed keywords

Engineering controlled terms

Algae; Emulsification; Vegetation

Engineering uncontrolled terms

Acacia gum; Acacia senegal; Analytical studies; D-Glucuronic acid; Extraction techniques; Gum arabic; Metabolite extraction; Optimisations; Plant species; Secondary metabolites

Engineering main heading

Metabolites

Corresponding authors

Corresponding
author

A.A.M. Elnour

Affiliation

Faculty of Chemical and Process Engineering Technology, Universiti Malaysia
Pahang Al-Sultan Abdullah (UMPSA), Pahang Gambang, Malaysia

Email address

adamhassan@umpsa.edu.my

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