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Physicochemical Properties of *Acacia polyacantha* Gum

AHMED ADAM ELNOUR¹, MOHAMED E. OSMAN ELSAYED¹, K.E.A. ISHAG¹, ABDALLA
ABDELSAMAD ABDALLA²

¹University of Kordofan, Gum Arabic Research Centre, Department of Biochemistry & Gum Processing.,
Sudan

²University of Kordofan, Department of Biochemistry & Food Science, Sudan

Abstract

Although there are more than 1100 species of *Acacia* botanically, known distributed throughout the tropical and subtropical areas of the world, the Sudanese major gums of economic importance are gum Arabic, gum talha and *Acacia polyacantha* gum. These gums are used worldwide as food additives in confectioneries, beverages, pharmaceuticals and cosmetics as well as adhesives materials due to their emulsifying, foaming, flavor fixing properties. Most of the research work is directed towards hashab gum of *Acacia senegal* trees and to a lesser extent towards gum talha of *Acacia seyal* trees. Regrettably, *Acacia polyacantha* gum received very little attention.

The main objective of this study was to determine the physico-chemical properties of *Acacia polyacantha* gum.

From Kadogli and Eldamazine areas in Sudan, forty samples of gum nodules were collected from *A. polyacantha* trees (season 2005/2006).

The specific rotation of Kadogli samples was -19.6° , while that of Eldmazine was -14° . Intrinsic viscosities were 9.9 and 10.2 ml g. for Kadogli and Eldamazine samples, respectively. Refractive indices of all samples from the two different locations showed the same value of 1.3354. The two samples gave approximately the same moisture (10.5%) and ash (3.4%) contents. Nitrogen content of Kadogli samples ranged from 0.30 to 0.42% (1.88 to 2.63% protein content), while that of Eldamazine samples varied from 0.36 to 0.48% (2.30 to 2.90% protein content). The pH value for Kadogli samples and Eldamazine samples was 4.96 and 5.23, respectively. The concentration of reducing sugars was 0.23 and 0.16% for Kadogli and Eldamazine samples, respectively. Uronic acid contents of Kadogli samples ranged from 12.02% to 17.30% and that of Eldamazine samples ranged from 12.10% to 19.48% and significantly ($P \leq 0.05$) affected by location.

Due to the remarkable similarity in the physicochemical properties of gum exudates from *A. senegal* trees and *A. polyacantha* trees more investigations are needed to study the functional properties of *A. polyacantha* gum so as to be considered as one of the main substitutes of gum produced by *A. senegal* trees.

Keywords: *Acacia polyacantha*, ash, moisture, nitrogen, pH, physicochemical properties, protein, refractive index, specific rotation, uronic acid, viscosity