



Physicochemical Properties of *Acacia Polyacantha* Gum

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Objectives

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.

Material & Methods

From Kadogli and Eldamazine areas in Sudan, forty samples of gum nodules were collected from *A. polyacantha* trees (season 2005/2006). The moisture and ash contents were determined according to AOAC (1990). While protein content by Anderson (1986). The specific rotation was determined 1 % w/v according to FAO (1991). Viscosity was measured using U- tube viscometer (type Volac /BS.UC, serial No.1094) with the time for 1% aqueous solution of sample at room temperature (25°C). The molecular weight was calculated from the intrinsic viscosity using Mark-Houwink equation. (Mark, 1938; Howink,1940). The pH value was determined for 1% aqueous solution at room temperature, using a microprocessor pH meter, HANNA, (ROMANIA) Type 211. Apparent equivalent weight was determined according to (Encyclopedia, 1966). Minerals determined using UNICAM 8625 UV/VIS spectrophotometer. Emulsifying stability according to the method reported by Eltayeb (1999), a concentrated solution of gum sample 20% w/v in distilled water. Lastly the water holding capacity (W.H.C) measured according to Elamin (2001).

Results & Discussion

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 (P0.05) affected by location.

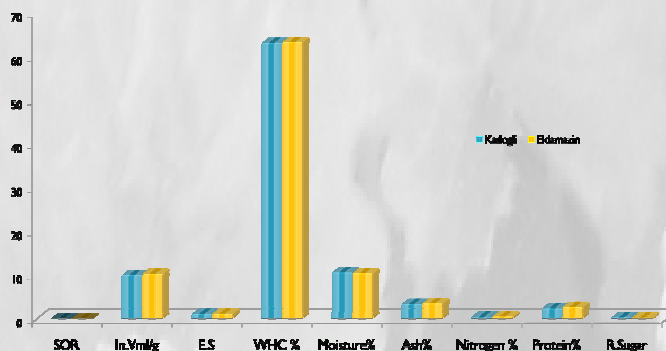


Figure (1): Effect of Locations in the physicochemical properties of *Acacia Polyacantha* gum.

Where:

SOR: Specific optical rotation
In. Vml /g : Intrinsic viscosity ml/g.
E.S; Emulsifying Stability
WHO%: Water Holding Capacity.
R.Sugar: Reducing Sugar

Conclusion

Due to the remarkable similarity in the physicochemical properties of gum exudates from *Acacia senegal* trees and *Acacia 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 *Acacia senegal* trees.

