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Interfacial properties at oil/water interfaces and emulsifying properties of Acacia gum: *Acacia senegal* vs. *Acacia seyal*

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Statement of the Problem: *Acacia* gum, also called gum arabic, is a dried plant exudate obtained from the trunk and branches of *Acacia senegal* and *Acacia seyal* trees. The gummosis is a protection mechanism of tree against insects and molds invasion and of healing of wounds. Gum is found in arid regions of the sub-Saharan belt, from Senegal until East Africa, and beyond until Pakistan and India. *Acacia* gum is unique among the natural gums because of its properties, including high solubility. Gum *Acacia* is conventionally used to form and stabilize emulsion but the relationship between the gum composition and their efficiency as emulsifier is not well established.

Objective: The objective of this work was to understand better the relationship between the gum structure, composition, the nature of different macromolecules and oil/water interfacial and emulsifying properties of gum.

Methodology & Theoretical Orientation: The interfacial properties of *Acacia* gums (*A. senegal* and *A. seyal*) adsorption layers at the oil/water of hexadecane, limonene and octanol interface was investigated using rising drop tensiometer. In addition, their emulsifying properties to form the limonene emulsions using microfluidic technology were assessed in function of emulsification conditions and gum type.

Findings: Base on the interfacial properties measurements, we found the difference in kinetic of the dynamic interfacial tension and viscoelastic modulus in function of oil phase used and gum type. The interfacial layer formed was elastically predominant for two gum types and all oil phases. In addition, the emulsions stabilized by different gum type and concentration showed the pronounced difference in term of droplet size and emulsion stability.

Conclusion: Since, *A. seyal* has lower protein content and lower viscosity with less branched and higher compact structure than *A. senegal*, the relationship between interfacial properties in function of oil phase, emulsifying properties and *Acacia* gum type was established.

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