



Acacia

Non-proprietary Names

BP: Acacia; **JP:** Acacia; **PhEur:** Acacia; **USP-NF:** Acacia.

Synonyms

Gum acacia, gum sudani, acacia gum, Arabic gum (Senegal gum), Indian gum.

Biological Source and Photo

Acacia is the dried gummy exudation obtained from the stems and branches of *Senegalia senegal* (L.) Britton, belonging to family Fabaceae.

Chemical Constituents and Molecular Weight¹

L-arabinose

Molecular formula: $C_5H_{10}O_5$

Molecular weight: 150.13g/mol

D-Galactose

Molecular formula: $C_6H_{12}O_6$

Molecular weight: 180.16 g/mol

D-Glucuronic Acid

Molecular formula: $C_6H_{10}O_7$

Molecular weight: 194.14 g/mol

L-rhamnose

Molecular formula: $C_6H_{12}O_5$

Molecular weight: 164.16g/mol

HIGHLIGHTS

- Natural emulsifying and stabilizing agent.
- Demulcent and soothing effects.
- Used as a binder, suspending agent, and viscosity enhancer.



Fig. 1.1: Gum acacia
(For colour version see Plate 1)

Structural Formula

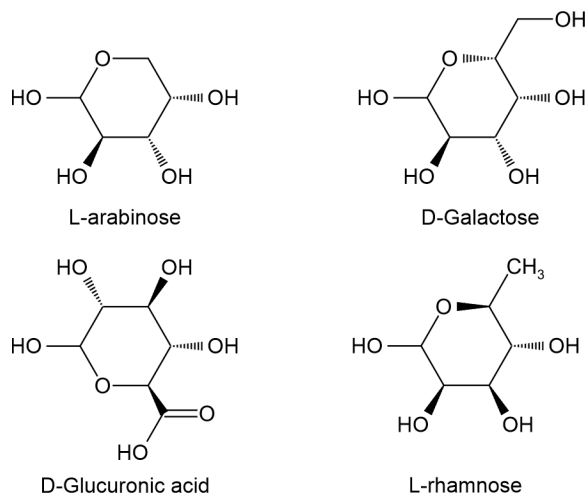


Fig. 1.2: Structure of L-arabinose, D-galactose, D-glucuronic acid and L-rhamnose

Functional Uses^{1,2}

Emulsifier, thickening agent, viscosity enhancer, and binder.

Applications in Pharmaceuticals²

It is used as emulsifier and stabilizer, viscosity-increasing agent, and as a tablet binder.

Description¹

It is light brown in colour having insipid and mucilaginous taste with characteristic odour. Gum Arabic or gum acacia is a tree exudate obtained from the stems and branches of *S. senegal*. Acacia consists mainly of high molecular weight polysaccharides and their magnesium, calcium and potassium salts which upon hydrolysis yield galactose, arabinose, glucuronic acid and rhamnose.

Quality Control and Standardisation

TABLE 1.1: Standardisation parameters for acacia gum³

Parameter	Specification
Acid-insoluble ash	≤0.5%
Arsenic	≤3 ppm
Heavy metals	≤20 ppm
Lead	≤2 ppm
Microbiological quality	<i>Salmonella</i> spp.: Absent, <i>Escherichia coli</i> : Absent in 1 g
Loss on drying	≤5.0% for granular material (105°C, 5 h) and 10.0% for spray-dried material (105°C, 4 h)
Iodine test	1:50 w/v aqueous solution shows no blue or reddish colour
Tannin-bearing gums	1:50 w/v aqueous solution, no bluish-black or green coloration with ferric chloride
Total ash	≤4.0%

Solubility

It is soluble in hot and cold water but insoluble in ethanol³.

Stability and Storage Conditions

Acacia gum powders are generally packed in sound clean, dry and unused polythene bags placed inside gunny bags or multiply craft paper sacks and stored in a cool dry place away from heat and sunlight⁴.

Incompatibilities

Gum acacia is incompatible with a number of substances including amidopyrine, apomorphine, cresol, ferric salts, morphine, phenol, physostigmine, tannins, thymol, and vanillin. An oxidizing enzyme present in acacia may affect preparations containing easily oxidizable substances⁴.

Safety

No adverse effects were reported in subchronic and carcinogenicity studies at the highest dose tested and there is no concern with respect to the genotoxicity⁵.

Handling Precautions

Adequate ventilation should be maintained in the lab and avoid formation of dust. Handling should be in accordance with good occupational hygiene and safety practices. Should be kept away from food, drink, and animal feed⁴.

Regulatory Status^{6,7}

Gum acacia is generally recognized as safe by the US FDA for use as a thickener, emulsifier, and stabilizer in food and pharmaceutical applications, including certain alcoholic beverages, in accordance with applicable regulatory limits (maximum use level of 20%).

Manufacturing Companies

Nexira, VRV Chemicals, Opera Chemisol, and Imtiyaz Gums Industries.

CAS number: 9000-01-5.

Related Substances

Ghatti gum, Talha gum, gum combretum, gum karaya, gum tragacanth.

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