PHARM.D • YEAR 2

Pharmacognosy & Phytopharmaceuti

CHAPTER 11

# Detailed Study of Carbohydrate-Containing Drugs

PPT CHAPTER COVER



DOCTOR OF PHARMACY

# Acacia: Source and collection

Acacia is the dried gummy exudate from stems and branches of *Acacia senegal* and related species, family Fabaceae.

Synonyms: gum arabic; gum acacia.




Trees grow in tropical and semi-arid regions, notably the African gum belt including Sudan and Nigeria.

Gum exudes naturally or after controlled bark tapping, then hardens in air.



The commercial drug occurs as tears, fragments, granules or powder.



Collection is followed by cleaning, sorting, grading and drying.



Removal of bark, sand and other foreign matter is essential before pharmaceutical use.

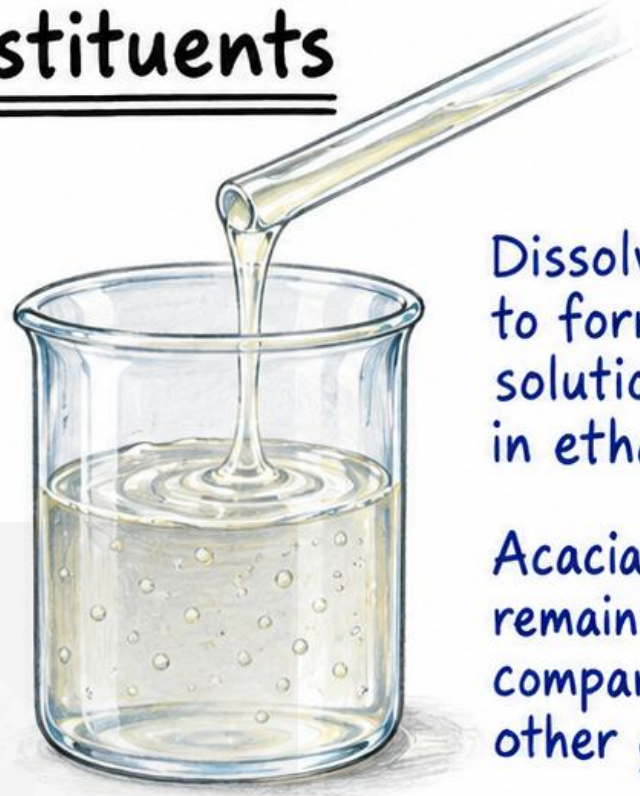
# Acacia: Characters and constituents

## Macroscopy

Pale yellow to amber tears or fragments; brittle when dry, with a glassy fracture.

Odourless; bland or slightly sweet and mucilaginous.



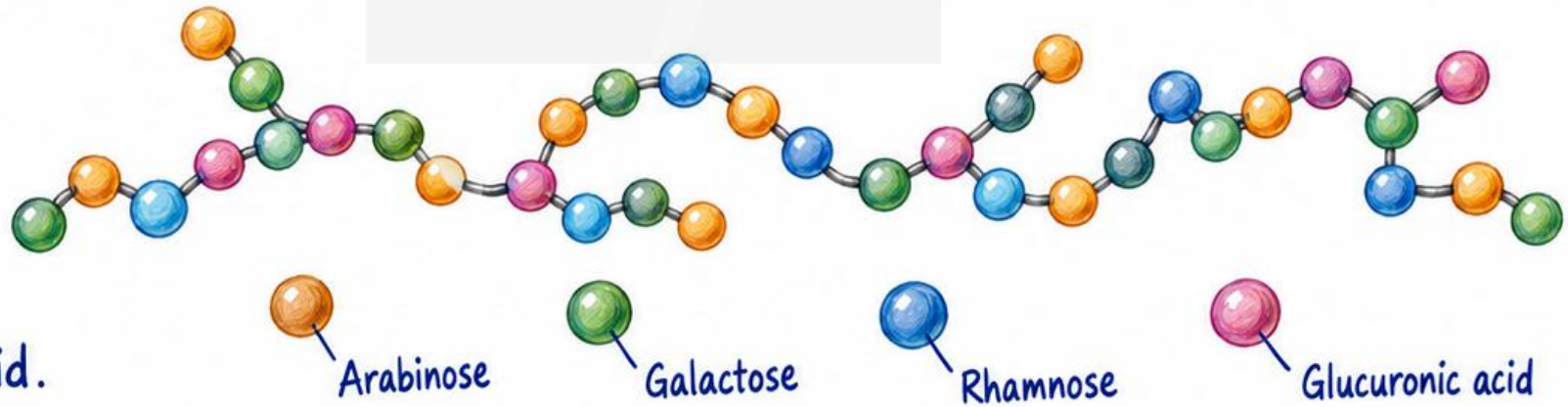
Dissolves in water to form a colloidal solution; insoluble in ethanol.

Acacia solutions remain relatively fluid compared with many other gums.

## Chemistry

Complex acidic polysaccharides and their calcium, magnesium and potassium salts predominate.

Hydrolysis yields arabinose, galactose, rhamnose and glucuronic acid.




Arabin is a traditional name for the gum carbohydrate fraction; minor protein components contribute to interfacial behaviour.

# Acacia: evaluation and uses

## Identification

Identification combines water solubility, expected hydrolysis sugars and appropriate monograph tests.

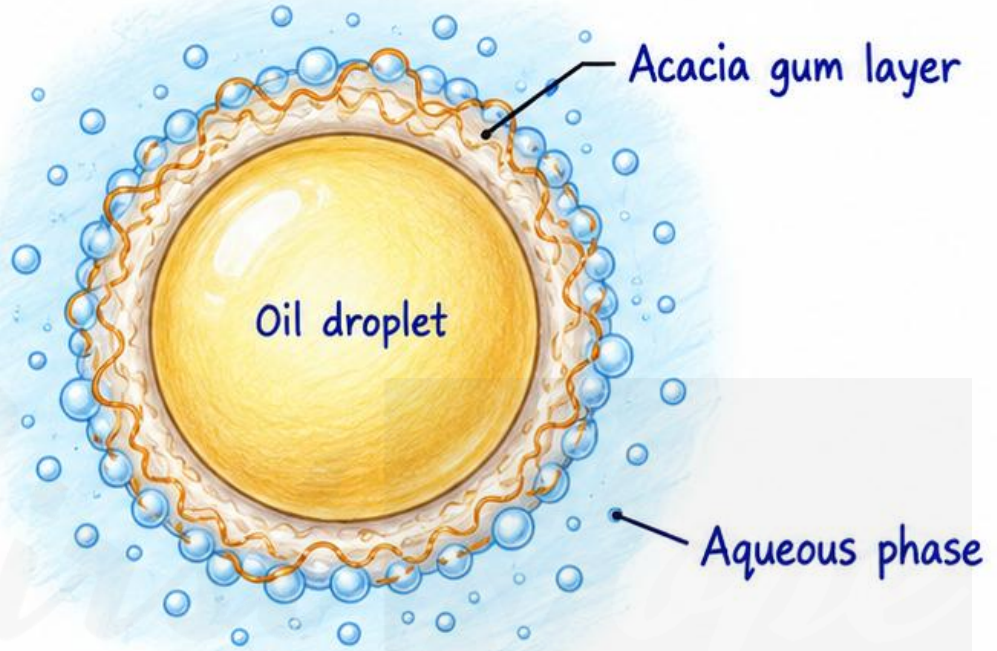
Molisch reaction supports carbohydrate identity; no single general gum test proves purity.

Viscosity, ash, moisture, foreign matter and microbial quality require specification-based assessment.





Molisch reaction




## Note

Its useful emulsifying behaviour should not be confused with exceptionally high viscosity: other gums thicken much more strongly at similar concentrations.

## Pharmaceutical roles

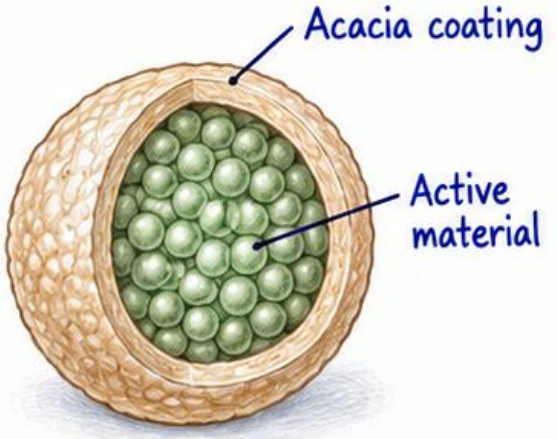
Emulsifying and stabilising agent; suspending aid; tablet binder; demulcent.

Acacia can coat particles and supports microencapsulation.

Other applications include food stabilisation, cosmetics and printing.



Tablet
(with acacia as binder)




Microcapsule
(coated with acacia)

# Tragacanth: source and two fractions

Tragacanth is gum exudate from Astragalus gummifer and other Astragalus species, family Fabaceae.



*Astragalus gummifer*



Exudate collected after tapping is dried, cleaned and graded into ribbons or flakes.

Whitish to pale-yellow, odourless and bland material may show ribbon, flake or vermiform shapes.

**Synonyms:** gum tragacanth, goat's thorn gum, Shiraz gum.



Ribbon Flake Vermiform

**Tragacanthin** dissolves in water.



**Bassorin** swells but remains insoluble.

Plants occur in dry mountainous regions including Iran and Turkey.

**Both** are complex acidic polysaccharide fractions; hydrolysis yields sugars including galacturonic acid, arabinose, xylose and fucose.

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