Al-Nahrain University
College of pharmacy

Practical pharmacognosy
3rd stage 1st term

Tannins

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Lab 9



Tannins

- Tannins are a large group of complex substances that are widely distributed in plant kingdom ,in many plants and in different parts of the plants like leaves , fruits and barks.
- Chemically they are very complex of high m.wt, they are a mixture of **poly-hydroxyl-phenols.**

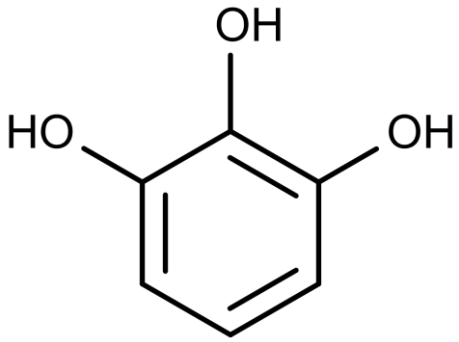
Classification of tannins

Hydrolysable (pyrogallol)
Having a sugar part

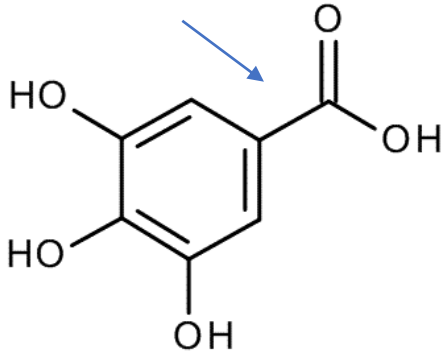
Non -hydrolysable (condensed) (catechol) only polyhydroxyphenol with carbohydrates or proteins

Hydrolysable tannins (pyrogallol)

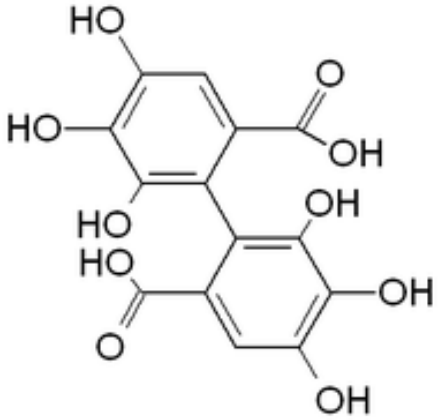
- This class consist of Gallic acid and ellagic acid (**poly phenolic part**) esterified on the hydroxyl groups of the **sugar.**
- The are called hydrolysable due to the ease of **ester linkage** to be hydrolyzed by acid and enzymes to phenolic acids and sugar
- They are called pyrogallol tannins.



Pyrogallol



Gallic acid



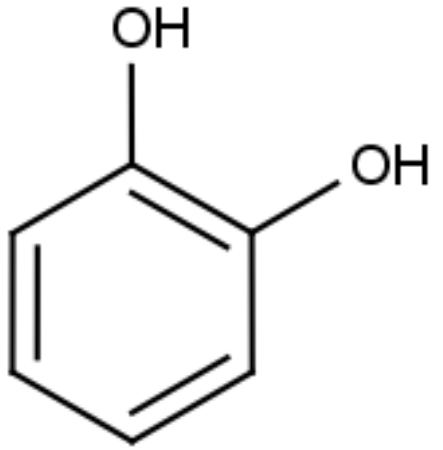
Ellagic acid

Nut gall *Quercus infectoria F:fagacea*

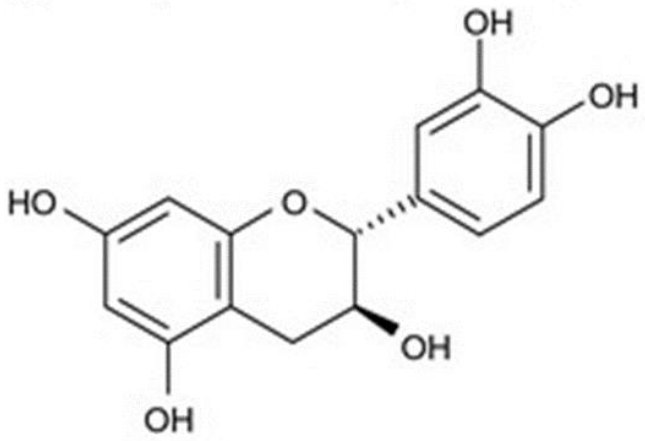




Non- hydrolysable/condensed (catechol)



- This class contain only phenolic nuclei but frequently linked to **carbohydrates or proteins** not a sugar.
- They resist hydrolysis by acids or enzymes ,however upon hydrolysis they tend to polymerize and give insoluble red-colored products (**phlobaphene**)
- The are basically **flavan3-ols** basic structure attached to protein or carbohydrate.
- They are called catechol tannins.
- It’s the type of tannins found in green tea and cinnamon



General Properties Of Tannins

- Tannins are non crystallizable that with water form colloidal solutions possessing acid properties and sharp puckering taste.
- They bind to and precipitate proteins and various other nitrogen containing organic compounds including amino acids and alkaloids.
- They cause precipitation of solutions of gelatin and alkaloids.
- They form dark blue (pyrogallol) ,greenish black (catechol) soluble compounds with ferric salts.
- They are precipitated by salts of copper ,lead and tin by strong aqueous potassium dichromate.

Uses of Tannins

- Astringents , used in the gastrointestinal tract and on skin abrasion.
- In the treatment of burns , the proteins of the exposed tissue are precipitated and form a mildly antiseptic and protective coat under which the generation of a new tissue may take place.
- Used in the tanning process which converts animal hides to leather (leather industry).
- Antidote in the treatment of alkaloid poisoning.
- Ink industry due to deep colored compounds resulting from tannins reaction.

Extraction

Extraction : by **decoction**

Plant used:

Nut gull

Experimental work:

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Take 2.5 gm of your powdered plant material in 30 ml of water.

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Boil (decoction) for 5 minutes.

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Filter

Identification
Tests to Detect Tannins

Take 2ml of filtrate and add:

- 0.5 ml of Ferric chloride solution.
- 0.5 ml of Lead acetate solution.
- 0.5 ml of Potassium dichromate solution.
- 0.5 ml of Gelatin solution.
- 0.5 ml of caffeine solution.

Record the result from each test

Assis. Lec. Pharmacist Ayah AlQrimli