



TANNINS

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1. Tannins are secondary metabolites of plants, non-nitrogenous, phenolic in nature.
2. They have a property to tan animal skin to convert to leather or hide.
3. Conversion imparts resistance to water, heat, abrasives.
4. They can be extracted using water-acetone/alcohol mixture.
5. They have a property to precipitate gelatin & heavy metals.

Complex tannins are macro molecules with many sugar molecules.

3 major classes of tannins are:

1. hydrolysable tannins
 2. non-hydrolysable tannins (condensed tannins)
 3. pseudo tannins
- Hydrolysable tannins on heating with hydrochloric or sulphuric acids yield gallic or ellagic acids
Eg- myrobalon, bahera, witch hazel
 - Non-hydrolysable tannins on heating with hydrochloric acid yield phlobaphenes like phloroglucinol

Eg- black catechu, pale catechu, kinos

- Pseudo tannins are low molecular weight compounds associated with other compounds. They do not answer gold beater skin test unlike hydrolysable and condensed tannins.

Eg- tea, coffee

They have catechins which give rise to the peculiar odour.

Gold beater skin test:

When gold beater skin or ox skin is dipped in HCl & treated with 1% FeSO₄ solution, after washing with water it gives a blue / black colour.

CONDENSED TANNINS:

BLACK CATECHU

BIOLOGICAL SOURCE -. Heart wood of acacia catechu / acacia chundra
Family- leguminosae

Preparation:

Pieces of heartwood are boiled with water till the drug is exhausted & the resulting solution is stored in clay pits wherein the semi solid mass known as cutch gets absorbed & the liquid remaining behind is dried & cut into small pieces.

Chemical Constituents:

Contains acacia catechin & quercetin

Chemical Test:

1. it gives a pink colour with vanillin & HCl
2. aqueous extract of drug when treated with lime water gives a brown colour.

Uses:

Astringents, treatment of ulcers, diarrhoea, & in tanning industry.

PALE CATECHU

BIOLOGICAL SOURCE -. leaves of uncaria gambier

Family: rubiaceae

Preparation:

The leaves are boiled with water & resulting solution is concentrated to obtain pale yellow viscous solution which is further dried to obtain cylindrical pieces.

Chemical Constituents:

Pale catechu contains chlorophyll, catechu red & gambier fluorescein.

Chemical Test:

Alcoholic extract of drug when treated with NaOH & light pet ether shows green fluorescence.

Uses:

Same as black catechu

General test for condensed tannins is the MATCH STICK TEST:

When a match stick is dipped in tannin extract followed by HCl & warmed near a flame it turns pink in colour. The wood of the matchstick has lignin. Upon hydrolysis of the tannins due to HCl, phloroglucinol is formed which reacts with the lignin of the wood to produce the pink colour.

KINOS

BIOLOGICAL SOURCE -. juice obtained from trunk of pterocarpus marsupium
Family: leguminosae

GEOGRAPHICAL SOURCE -. S. America, Jamaica, East India

Occurs as small shiny reddish black pieces

Chemical Constituents & Uses:

Same as catechu

HYDROLYSABLE TANNINS

GALLS

BIOLOGICAL SOURCE -. obtained from gall wasps adleria gallaetinctoria
Family: fagaceae

GEOGRAPHICAL SOURCE -.: China, Turkey, Japan

Collection:

In the summer gall wasps lay eggs on the twigs.

It penetrates the soft epidermis of the plant & soon forms a larvae.

This larvae develops into galls.

Ideally galls should be collected before the mature insect comes out.

Morphology:

Globular, grayish green, odourless & have an astringent taste.

Also shows numerous projections on the surface

Chemical Constituents:

Chinese galls contain 75% tannic acid as compared to 60% in Turkish galls.

Extraction of tannic acid:

A mixture of alcohol-ether is added to galls.

When water is added to this extract the tannic acid enters the alcohol layer.
The ether layer can be discarded.
After precipitation with a non-polar solvent it occurs as a white shiny powder.

Use: Astringent

MYROBALON

BIOLOGICAL SOURCE -: fruits of terminalia chebula
Family: combretaceae

GEOGRAPHICAL SOURCE -: W. Bengal, Assam

Morphology:

Dark brown in colour, longitudinally wrinkled, ovate in shape with a bitter taste.
Smaller fruits are known as himaj.

Chemical Constituents:

Gallic acid, ellagic acid, glucose, fructose, sorbitol & active constituent chebulic acid.

Uses: Astringent, wound healing antiseptics & constituent of triphala churna.

BAHERA

BIOLOGICAL SOURCE -: fruits of terminalia bellerica
Family: combretaceae

GEOGRAPHICAL SOURCE -: W. Bengal, Assam

Morphology:

Greenish brown, globular with astringent & bitter taste.

Chemical Constituents:

Gallic acid, ellagic acid

Uses: Same as myrobalon

WITCH HAZEL / HAZEL NUT / SNAPPING NUT

BIOLOGICAL SOURCE: leaves of hamamelis virginiana

Family: hamamelidaceae

GEOGRAPHICAL SOURCE: Canada, America

Morphology:

The leaves are oval in shape with crenate margin, possessing astringent & bitter taste.

The bark occurs as quills & silvery grey in colour.

The nuts are black enclosing a white, oily edible seed

Chemistry:

Gallic acid, resins, fats & bitter principles

Uses:Astringent

PSEUDO TANNINS

COFFEE

BIOLOGICAL SOURCE -.: seeds of coffee arabica
Family: rubiaceae

GEOGRAPHICAL SOURCE -.: South India, Indonesia

Collection:

The unripe fruit is dark green & is collected when it turns red.
Each fruit has 2 locules containing one seed each.

Chemical Constituents:

Contains caffeine which is a salt of chlorogenic acid, volatile oil known as caffeol, enzymes & other phenolic principles.

Use: Stimulant, diuretic & source of caffeine

Chem. Test:

1. Murexide test- caffeine when heated with HCl & potassium chlorate gives a residue which on exposure to ammonia vapours gives purple colour.
2. Caffeine forms a white precipitate with tannin solution

TEA

BIOLOGICAL SOURCE -.: prepared leaves of thea sinensis
Family: theaceae

GEOGRAPHICAL SOURCE -. India, Srilanka

Chemical Constituents:

Caffeine, theobromine, theophylline, oxidase enzyme & tannins

Uses: & chem. Tests: Same as coffee