

RESINS

(Colophony, Ginger and Asafoetida)

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. COLOPHONY

- Syn: Rosin, Amber resin, Coloponium, Abietic anhydride
- Source: Solid residue obtained after distillation of volatile oil (turpentine) from the oleo-gum-resin of various species of *Pinus* like *P.palustris*, *P.pinaster*, *P.halepnsis*, *P.caribaceae*
- Family: Pinaceae
- GS: North America, North Europe, Pakistan, India (Himalaya)

Synonyms-

- Rosin
- Rosina
- Colophonium
- Amber-resin
- Pine-resin



Biological Source

- It is mainly obtained from the species of *pinus* belonging to the family Pinaceae



Geographical Source

- Its prepared in North America, Northern Europe, Pakistan and India.

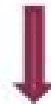


◉ Cultivation & collection:-

The plant is injured by making a long groove / blaze in the bark.



A metal / earthen ware cup is attached below the groove to collect the exudate.



The resin is collected at different intervals & sent for processing.



*Largest colophony and derivatives
manufacturer in Brazil.*

◉ Structure:-

◉ Macroscopy:

color - pale yellow - yellowish brown

odour - faint

taste - turpentine

shape - angular

solubility - insoluble in water,
soluble in alcohol, CS₂.



◉ Chemical constituents:-

Contains resin acid 90%(isomeric α , β , γ -abietic acid; 10% mixture of dihydroabietic acid, dehydroabietic acid)

volatile oils 0.5%

resenes 5-6%



COLLECTION

normal physiological process for pinus species to secrete resin but amount is increased by injuring the plant

tree remains dormant in winter and during this period a sloping cavity is made on the base of the trunk.

the sloping cavity is also known as box, which is made in such a manner that they are going inward and downward.

To prevent incision on the plant trunk now Copper & Tin plates are inserted

the oleo-resin flows into the box and after a week time, more barks are hacked away

after each slice is removed, oleo-gum-resin exudes and when sufficiently hardened, is collected.

this process is continued till autumn or till the flow of oleoresin decreases.

heated with water on furnace.

impurities like wood float on water and they are skimmed off.

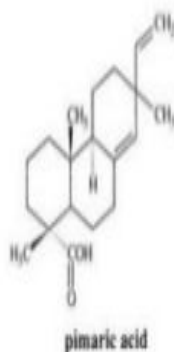
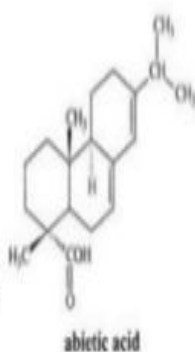
Standards

- Melting point- 75°C - 85°C
- Acid value- 130 to 180
- Saponification value- 188 to 192
- Ash value- Not more than 0.125%



Chemical Constituents

- 90% Resin acid,
- esters of fatty acid,
- Resene
- α , β , γ -abietic acids, pi acid, sipinic acid, hydrocarbon.



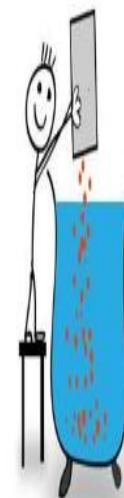
Solubility



Insoluble in water

BUT

Soluble in alcohol, chloroform, ether, acetic acid and many volatile and fixed oil



SOLUBILITY

HOW MUCH WILL IT DISSOLVE?

surgeon.com

◉ Chemical tests:-

- Powdered resin + acetic acid + conc. H_2SO_4 \longrightarrow purple \longrightarrow violet colour
- Alc. Solution of colophony + water \longrightarrow milky white

◉ Identification tests:-

- 1g colophony + 10ml acetic anhydride & \blacktriangle + H_2SO_4 \longrightarrow bright red to violet
- Alc. Solution of colophony is acidic to litmus



- Use:
- preparation of Zinc oxide, adhesive plaster, ointment
- much rosin is artificially modified by hydrogenation or polymerization-products involving printing inks, rubber, linoleum, thermoplastic floor tiles and surface coating.
- the abietic acids shows antimicrobial, antiulcer and CVS activity.
- Stimulant and diuretic
- Adulterants: black resin or apic resin (confirmed by solubility)



GINGER

- Syn: Adarak, Zingiber, Sunthi
- Source: Scraped or unscraped rhizomes of *Zingiber officinale*
- Family: Zingiberaceae
- Specification:
- Size: 7-15 cm long, 1-1.5 cm broad
- Colour: Buff
- Odour: Agreeable
- Taste: Pungent

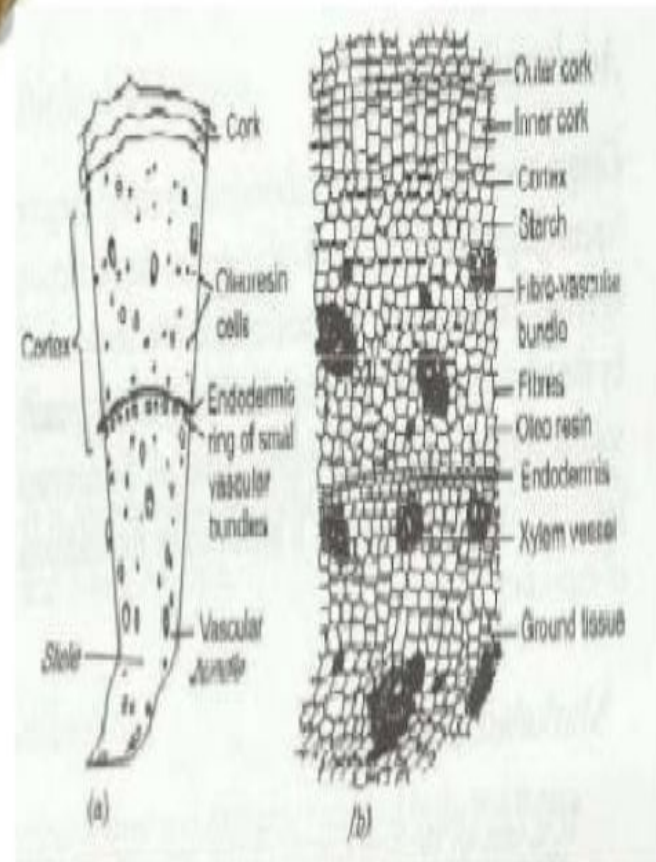


PHARMACOGNOSTIC FEATURES:-

- ✗ BOTANICAL ORIGIN : ZINGIBER OFFICINALE
- ✗ FAMILY : ZINGIBERACEAE
- ✗ COMMON NAME : GINGER, GINGER ROOT, BLACK GINGER, ZINGIBERIC RHIZOMA
- ✗ URDU NAME : ADRAK
- ✗ PART USED : RHIZOMES
- ✗ CHEMICAL CLASS : LILOPSIDA



Microscopy



(a) Schematic diagram (T.S) & (b) Transverse section of ginger rhizome

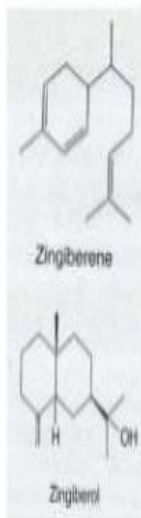


Chemical Constituents:

Ginger consists of volatile oil (1-4%), starch (40-60%), fat (10%), fibre (5%), inorganic material (6%), residual moisture (10%) and acrid resinous matter (5-8%), Sesquiterpene: zingiberene, ar-curcumene.

Uses:

- Stomachic, Aromatic, Carminative, Stimulant & Flavouring agents.
- Mouth washes, Ginger beverages & Liquors.
- It is effective in motion sickness.



CHEMICAL CONSTITUENTS:

- ✗ GINGEROL
- ✗ SHAGOL
- ✗ ZINGIBERINE
- ✗ ZINGIBEROL
- ✗ PHELLANDRENE
- ✗ BISABILONE
- ✗ STARCH
- ✗ TRACE AMOUNT OF Ca, Mn, Fe, Cu, K

MEDICINAL USES

- Anti-Bacterial
- Anti-Emetic effects
- Anti- Inflammatory
- Decrease joint pain from arthritis
- Decrease cholesterol level
- Used in cold, cough & Bronchitis
- Used in treatment of motion sickness, nausea, vomiting and arthritis

SIDE EFFECTS

- Mild GIT effects such as heartburn, diarrhoea, irritation of mouth and stomach discomfort.

INTERACTIONS:

- ✦ ANTICOAGULANT: anticoagulant interacts with ginger. Ginger might also slow blood clotting. Taking ginger along with this might increase chances of bleeding.
- ✦ WARFARIN: warfarin interacts with ginger. Warfarin is used to slow blood clotting. Taking with ginger might increase the chances of bleeding.
- ✦ ANTIDIABETES DRUGS: they interact with ginger. Ginger might decrease blood sugar. Diabetes medications also used to lower blood sugar. Taking ginger along with diabetes medication might cause your blood sugar to go too low.

INTERACTIONS:

- ✦ MEDICATIONS FOR HIGH BLOOD PRESSURE: interacts with ginger. Ginger might reduce blood pressure. Taking ginger along with these medication cause your blood pressure to drop too low or an irregular heart beat. Examples include nifedipine, verapamil

CONTRAINDICATIONS:

- ✘ DURING PREGNENCY AND BREAST FEEDING: It's use is controversial. Not enough known. Stay on the safe and don't use it.
- ✘ BLEEDING DISORDER: taking ginger may increase your increase of bleeding.
- ✘ DIABETES: ginger might lower your blood sugar. As a result your diabetes medications might need to be adjusted .
- ✘ HEART CONDITIONS: high doses of ginger might worsen some heart conditions.

ASAFOETIDA

- Syn:** Hing, Devil's dung, Gum asafoetida
- Source:** Obtained from incision of rhizome & root of *Ferula foetida* & other species of **Ferula**.
- Family:** Umbelliferae
- Characteristics:**
 - Colour:** Golden yellowish brown
 - Odour:** Strong
 - Taste:** Bitter & acrid
 - Forms:** 2 types- Tears & Masses. Tears are rounded or flattened.



ASAFOETIDA - Crude

- Its odour, when uncooked, is so strong that it must be stored in airtight containers; otherwise the aroma will contaminate other spices stored nearby.
- However, its odour and flavor become much milder and more pleasant upon heating in oil.

CHEMICAL CONSTITUENTS

- It contains 4-15% volatile oil, 45-65% resin and 20% gum.
- Volatile oil contains pinene and organic disulphide including isobutyl propenyl disulphide responsible for the alliaceous odour.
- The resin consists of asaresinotannol, ferulic acid, umbelliferone and galbanic acid.
- There are three sulphur compounds that have been isolated from the asafoetida resin, namely:
 - a) 1-Methylpropyl-1-propenyl disulphide
 - b) 1-(Methylthio) propyl-1-propenyl disulphide
 - c) 1-Methylpropyl-3-(Methylthio)-2-propenyl disulphide.

Chemical Tests

1. Power + water \rightarrow Trituration \rightarrow Milky white emulsion
2. Fractured surface + HNO_3 \rightarrow Green colour

Uses

1. Asafoetida used as a carminative, as an expectorant, as an antispasmodic, as a laxative.
2. It is used as a repellent against dogs, cats, deer and rabbits etc.
3. It is also used as a powerful nerving stimulant especially in nervous disorders related to hysteria.
4. Galbanic acid (GBA) is the active constituent present in the asafoetida having anti cancerous activity.
5. It is used as a flavouring, food preservative and fragrance.

THANK YOU