Resins

Benzoin, Guggul, Ginger, Asafoetida, Myrrh, Colophony

Glycosides

Senna, Aloes, Bitter Almond

Presented By;-

Mr. Samarpan Mishra

Resins

Resins are natural plant products that have medicinal value and are studied in Pharmacognosy as important crude drugs and active constituents.

Resins: Benzoin, Guggul, Ginger, Asafoetida, Myrrh, Colophony

Mr. Samarpan Mishra (Assistant Professor) Specialization-Pharmaceutical Chemistry

Benzoin

Benzoin is a balsamic resin obtained from the trunk of *Styrax* species. It contains aromatic compounds and is mainly used as an **expectorant, antiseptic, and protective agent**.

Biosources

Biological Name	**Styrax benzoin Dryand and Styrax tonkinensis Craib ex Hartwich**
Family	**Styracaceae**
Part Used	**Balsamic resin obtained from the trunk/bark**
Type of Drug	**Pathological secretion**
Geographical Distribution	**Indonesia (Sumatra), Thailand, Laos, Vietnam, and Cambodia**

Chemical Constituents

1. **Benzoic acid**
2. **Cinnamic acid**
3. **Benzyl benzoate**
4. **Benzyl cinnamate**
5. **Vanillin**

Therapeutic Uses

1. **Expectorant** – Helps in relieving cough.
2. **Antiseptic** – Helps prevent microbial infection.
3. **Protective agent** – Used to protect skin and mucous membranes.
4. **Anti-inflammatory** – Helps reduce minor inflammation.
5. **Fragrance and flavouring agent** – Used in pharmaceutical and cosmetic preparations.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Compound Benzoin Tincture	Benzoic acid, cinnamic acid	Used as an inhalation for respiratory congestion and cough.
2	Benzoin Tincture	Benzoic acid	Used as a topical antiseptic and protective agent.
3	Cough Syrups	Benzoin resin constituents	Used as an expectorant.
4	Inhalation Preparations	Benzoic acid, volatile aromatic compounds	Used for relief of respiratory congestion.
5	Perfumes	Vanillin, aromatic esters	Used as a fragrance fixative.
6	Cosmetics and Soaps	Benzoin resin	Used for fragrance and skin-care preparations.
7	Adhesive Preparations	Benzoin resin	Used as a protective coating and to improve adhesion on skin.

Guggul

Guggul is an oleo-gum-resin obtained from the plant *Commiphora wightii*. It is an important crude drug used in traditional medicine, especially for its **anti-inflammatory and lipid-lowering properties**.

Biosources

Biological Name	**Commiphora wightii (Arn.) Bhandari**
Synonym	**Commiphora mukul**
Family	**Burseraceae**
Part Used	**Oleo-gum-resin obtained from the bark/stem**
Common Name	**Guggul / Indian Bdellium**
Geographical Distribution	**India, Pakistan and adjoining dry regions.**

Chemical Constituents

1. **Guggulsterone E**
2. **Guggulsterone Z**
3. **Guggulsterols**
4. **Guggulsterones**
5. **Diterpenes**
6. **Sesquiterpenes**
7. **Essential oil**
8. **Gum and resin**

Therapeutic Uses

1. **Hypolipidemic** – Helps reduce elevated cholesterol and lipid levels.
2. **Anti-inflammatory** – Used in inflammatory conditions.
3. **Anti-arthritic** – Helps relieve symptoms associated with arthritis.
4. **Antioxidant** – Helps protect against oxidative damage.
5. **Cardioprotective** – Traditionally used to support cardiovascular health

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Guggul Tablets/Capsules	Guggulsterones E & Z	Used for lipid management and general cardiovascular support.
2	Guggul Extract	Guggulsterones	Used in herbal and pharmaceutical formulations.
3	Yogaraj Guggulu	Guggul resin and other herbal ingredients	Traditionally used for joint and musculoskeletal conditions.
4	Kaishore Guggulu	Guggul resin and polyherbal ingredients	Traditionally used in inflammatory and joint-related conditions.
5	Triphala Guggulu	Guggul + Triphala constituents	Used in traditional digestive and metabolic formulations.
6	Joint Care Products	Guggulsterones	Used in supplements and formulations for joint health.
7	Herbal Ointments	Guggul resin	Used in topical preparations for minor pain and inflammation.

Ginger

Ginger is an important aromatic medicinal plant widely used as a **spice, flavouring agent, and herbal medicine**. It is mainly used for its **digestive, antiemetic, anti-inflammatory, and carminative properties**.

Biological Name	**Zingiber officinale Roscoe**
Family	**Zingiberaceae**
Part Used	**Dried or fresh rhizome**
Common Name	**Ginger / Adrak**
Geographical Distribution	**India, China, Indonesia, Nigeria, Nepal, Thailand, Jamaica, and Sri Lanka.**

Chemical Constituents

1. **6-Gingerol** *(Major active constituent)*
2. **Zingiberene**
3. **8-Gingerol**
4. **10-Gingerol**
5. **β-Sesquiphellandrene**
6. **β-Bisabolene**
7. **Shogaols**
8. **Zingerone**
9. **Camphene**

Therapeutic Uses

1. **Antiemetic** – Helps prevent nausea and vomiting.
2. **Carminative** – Relieves flatulence and abdominal discomfort.
3. **Digestive** – Promotes digestion and appetite.
4. **Anti-inflammatory** – Helps reduce inflammation and pain.
5. **Antioxidant** – Protects against oxidative damage.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Ginger Capsules/Tablets	Gingerols, Shogaols	Used for nausea, digestion, and inflammation.
2	Ginger Tea	Gingerols, Zingiberene	Used for digestion, cold, and throat discomfort.
3	Ginger Syrup	Ginger extract	Used for cough and digestive discomfort.
4	Anti-Nausea Preparations	6-Gingerol, Shogaols	Helps control nausea and vomiting.
5	Ginger Oil	Zingiberene, Sesquiterpenes	Used in aromatherapy, flavouring, and cosmetics.
6	Pain-Relief Herbal Products	Gingerols	Used for their anti-inflammatory properties.
7	Food and Beverages	Ginger oleoresin, Gingerols	Used as a flavouring and spice.
8	Cosmetic Products	Ginger oil	Used in perfumes, soaps, and skin-care products.

Asafoetida

Asafoetida is an oleo-gum-resin obtained from the roots and rhizomes of *Ferula* species. It has a characteristic strong, unpleasant odour and is mainly used as a **carminative, antispasmodic, and flavouring agent**.

Biosources

Biological Name	**Ferula asafoetida L.**
Family	**Apiaceae (Umbelliferae)**
Part Used	**Oleo-gum-resin obtained from roots and rhizomes**
Common Name	**Asafoetida / Hing**
Geographical Distribution	**Iran, Afghanistan, India, Pakistan**

www.pharmrecord.com

Chemical Constituents

1. **Resin (40–65%)** – Major constituent
2. **Gum (20–25%)**
3. **Volatile oil (10–17%)**
4. **Ferulic acid**
5. **Asaresinotannol**
6. **Umbelliferone**

Therapeutic Uses

1. **Carminative** – Relieves flatulence and abdominal discomfort.
2. **Antispasmodic** – Reduces gastrointestinal spasms and cramps.
3. **Digestive** – Helps improve digestion.
4. **Expectorant** – Helps in relieving cough and respiratory congestion.
5. **Antimicrobial** – Shows activity against certain microorganisms.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Asafoetida Powder (Hing)	Volatile sulphur compounds, resin	Used as a spice and digestive aid.
2	Digestive Tablets	Ferulic acid, resin	Used for indigestion and flatulence.
3	Ayurvedic Digestive Preparations	Oleo-gum-resin	Used as a carminative and digestive.
4	Herbal Cough Syrup	Volatile oil, resin	Used as an expectorant for cough.
5	Antispasmodic Formulations	Ferulic acid and resin constituents	Used to relieve abdominal cramps.
6	Food Products and Pickles	Volatile oil and resin	Used as a flavouring and seasoning agent.

Colophony

Colophony, also known as **Rosin**, is a natural resin obtained as the solid residue remaining after the distillation of **turpentine oil** from the oleoresin of *Pinus* species.

Biosources

Biological Name	**Pinus palustris Mill. and other species of Pinus**
Family	**Pinaceae**
Part Used	**Oleoresin obtained from the trunk of the tree**
Geographical Distribution	**India, United States, China, Portugal, Spain, France, and other temperate regions**

www.pharmrecord.com

Chemical Constituents

1. **Abietic acid *(major constituent)***
2. **Levopimaric acid**
3. **Palustric acid**
4. **Neoabietic acid**
5. **Dehydroabietic acid**
6. **Pimaric acid**
7. **Isopimaric acid**

Therapeutic Uses

1. **Counterirritant** – Used in topical preparations for muscular and joint pain.
2. **Mild antiseptic** – Used in some topical preparations.
3. **Protective agent** – Forms a protective layer in ointments and plasters.
4. **Adhesive agent** – Helps improve adhesion in medicated plasters.
5. **Pharmaceutical excipient** – Used in the preparation of ointments and other topical formulations.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Main Constituent(s)	Uses
1	Medicated Plasters	Abietic acid, resin acids	Improves adhesion and acts as a protective base.
2	Pain Relief Balm	Resin acids	Used in topical counterirritant preparations.
3	Adhesives and Tapes	Colophony resin	Improves stickiness and adhesion.
4	Varnishes and Paints	Abietic acid and related resin acids	Used in protective coatings.
5	Printing Inks	Resin acids	Improves texture and adhesion of ink.
6	Soap and Paper Industry	Rosin acids	Used in soap manufacture and paper sizing.
7	Soldering Flux	Colophony	Removes oxidation during soldering.

Glycosides

When a **sugar molecule** combines with a **non-sugar molecule**, the compound formed is called a **glycoside**.

Glycoside = Glycone (Sugar) + Aglycone (Non-sugar)

In pharmacognosy, glycosides are important secondary metabolites responsible for many of the therapeutic properties of medicinal plants and crude drugs.

Glycosides: Senna, Aloes, Bitter Almond

Senna

Senna is an important medicinal plant used mainly as a **stimulant laxative**. It contains **anthraquinone glycosides**, especially **sennosides**, which promote bowel movement and help in the treatment of constipation.

Biosources

Biological Name	**Senna alexandrina Mill. (syn. Cassia angustifolia Vahl and Cassia acutifolia Delile)**
Family	**Fabaceae (formerly Caesalpiniaceae)**
Part Used	**Dried leaflets and pods/fruits**
Common Name	**Senna / Indian Senna**
Geographical Distribution	**Mainly cultivated in India, Sudan, Egypt, Pakistan, and other tropical and subtropical regions.**

www.pharmrecord.com

Chemical Constituents

1. **Sennoside A** – Major constituent
2. **Sennoside B** – Major constituent
3. **Sennoside C**
4. **Sennoside D**
5. **Rhein**
6. **Aloe-emodin**
7. **Emodin**

Therapeutic Uses

1. **Laxative** – Used for the short-term treatment of constipation.
2. **Purgative** – Promotes evacuation of the bowel.
3. **Bowel Preparation** – Used before certain diagnostic or surgical procedures.
4. **Stimulant Laxative** – Stimulates intestinal peristalsis.
5. **Helps in Softening Stool** – Facilitates easier bowel evacuation.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Senna Tablets	Sennoside A & B	Treatment of constipation
2	Senna Syrup	Sennosides	Used as a mild laxative
3	Senna Tea	Sennosides	Helps promote bowel movement
4	Senna Capsules	Standardized senna extract	Used for short-term constipation
5	Herbal Laxative Powder	Sennosides	Promotes bowel evacuation
6	Bowel Preparation Products	Sennosides	Used for bowel cleansing before medical procedures

Aloes

Aloes is a dried juice obtained from the leaves of certain species of *Aloe*. It is mainly used as a **stimulant laxative** due to the presence of **anthraquinone glycosides**, especially **aloin**.

Biosources

Biological Name	**Aloe barbadensis Mill. (Aloe vera), Aloe ferox Mill., and other Aloe species**
Family	**Asphodelaceae (formerly Liliaceae)**
Part Used	**Dried latex/juice obtained from the leaf**
Major Source	**Aloe ferox and Aloe vera**
Geographical Distribution	**South Africa, Caribbean region, India, Mediterranean region, and other tropical and subtropical areas**

www.pharmrecord.com

Chemical Constituents

1. **Aloin (Barbaloin)** – Major active constituent
2. **Aloe-emodin**
3. **Aloinosides A and B**
4. **Emodin**
5. **Chrysophanol**
6. **Anthranol and anthraquinone derivatives**

Therapeutic Uses

1. **Stimulant laxative** – Used for the short-term relief of constipation.
2. **Cathartic** – Promotes bowel evacuation.
3. **Skin protective** – Aloe gel is used for soothing minor skin irritation.
4. **Wound healing** – Aloe gel is used in topical preparations.
5. **Cosmetic and moisturizing agent** – Used in skin and hair-care products.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent(s)	Uses
1	Aloe Latex Preparations	Aloin, anthraquinone derivatives	Used as a stimulant laxative.
2	Aloe Vera Gel	Polysaccharides, acemannan	Used for soothing and moisturizing the skin.
3	Burn and Skin Gel	Aloe polysaccharides	Used for minor burns and skin irritation.
4	Moisturizing Cream	Aloe vera gel	Used as a skin moisturizer.
5	Shampoo and Hair Gel	Aloe polysaccharides	Used for hair and scalp care.
6	Face Wash and Cosmetics	Aloe vera extract/gel	Used for cleansing and skin conditioning.
7	Aloe-based Health Drinks	Aloe gel constituents	Used as a functional beverage ingredient.

Bitter Almond

Bitter almond is a crude drug obtained from the dried seeds (kernels) of *Prunus amygdalus* var. *amara* (commonly treated as *Prunus dulcis* var. *amara*). It contains the cyanogenic glycoside **amygdalin**, which on hydrolysis can produce **benzaldehyde** and **hydrogen cyanide**. Bitter almond is therefore mainly important as a source of bitter almond oil and benzaldehyde.

Biosources

Biological Name	**Prunus dulcis var. amara**
Synonym	**Prunus amygdalus var. amara**
Family	**Rosaceae**
Part Used	**Dried seed/kernel**
Common Name	**Bitter Almond**
Geographical Distribution	**Mediterranean region, Iran, Turkey, Syria, Afghanistan and parts of Central Asia**

Chemical Constituents

1. **Amygdalin** – Major cyanogenic glycoside
2. **Fixed oil** – Mainly oleic and linoleic acids
3. **Emulsin** – Enzyme responsible for hydrolysis of amygdalin
4. **Benzaldehyde** – Characteristic almond odour
5. **Hydrogen cyanide (HCN)** – Formed during hydrolysis of amygdalin
6. **Proteins**
7. **Sugars and other minor constituents**

Therapeutic Uses

1. **Flavouring agent** – Used after suitable processing to obtain almond flavour.
2. **Aromatic agent** – Used in pharmaceutical and food preparations.
3. **Source of benzaldehyde** – Used for fragrance and flavour preparations.
4. **Traditionally used as an antitussive** – Historical/traditional use in cough preparations.
5. **Used in perfumery** – Bitter almond oil and benzaldehyde are used for their characteristic aroma.

www.pharmrecord.com

Commercial Applications

S.No	Commercial Product	Active Constituent	Main Use
1	Bitter Almond Oil (processed)	Benzaldehyde	Flavouring and fragrance preparations
2	Benzaldehyde	Benzaldehyde	Almond flavour in pharmaceutical and food products
3	Almond Essence/Flavour	Benzaldehyde	Used in confectionery and flavouring
4	Perfumes	Benzaldehyde and aromatic compounds	Provides a characteristic almond fragrance
5	Cosmetic Products	Benzaldehyde-based fragrance	Used as a fragrance ingredient

Thank you

www.pharmrecord.com