PharmacognosyII

Lec. 8 **3rd stage 1st semester** **Year 23-24**

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Classification of volatile oils

Hydrocarbon, alcoholic, Ketonic, aldehyde, phenolic, phenolic ethers, oxides, esters and miscellaneous volatile oils containing plants.

Hydrocarbon volatile oils: Cubeb oil and turpentine oil

- Hydrocarbons occur practically in all volatile oils.
- "Limonene" is considered as most widely distributed of monocyclic terpenes.

1) Cubeb Oil

Synonyms: Java pepper and in Urdu, Kabab Cheeni.

Botanical origin: *Piper cubeba*, Fam: Piperaceae.

Part used: Dried, fully grown but unripe fruit.

Isolation of oil: Oil is isolated from crushed, dried, unripe fruit by steam distillation.

Constituents:

Volatile oils including:

Sabinene

Beta-elemene

Cubebol

Epi-cubebol

In addition, it also contains:

Cubebic acid

Gabebin

Cubeb resin

Uses:

1. As a mild stimulant, expectorant and carminative.
2. As a flavoring agent.
3. To treat gonorrhea.
4. Smoking cubeb helps to treat nasal catarrh and hay fever.

2) Turpentine oil

Synonyms: Spirits of turpentine.

Botanical origin: *Pinus palustris*, Fam: Pinaceae.

Part used: Volatile oil distilled from oleoresin obtained from all parts.

Isolation of oil:

- Crude oleo resin is obtained by making incision in stem of trees.
- Oleoresin is purified by heating in steam.
- Oil is obtained by water distillation.
- Purified oleo resin is introduced in distilling chamber.
- It is subjected to heat until all volatile matter, both oil and water, are condensed in condensing chamber.
- It is collected and then separated by separating funnel.

Constituents:

Alpha pinene

Beta pinene

Camphene

Limonene, etc

Uses:

1. As counter-irritant and Rubefacient.
2. Manufacture of insecticides, disinfectants, paints and varnishes, etc.
3. Rectified turpentine oil and turpentine hydrate is used as expectorant.

Alcoholic volatile oils: Peppermint, coriander and cardamom

Alcoholic volatile oils are classified into:

- **Acyclic:** E.g. geraniol, linalool, citronellol etc.
- **Monocyclic:** E.g. menthol, alpha-terpineol.
- **Dicyclic:** E.g. borneol.
- **Higher aliphatic alcohols:** E.g. zingiberol which is sesquiterpene.

1) Peppermint oil

Synonyms: Mint and In Urdu, Podena

Botanical origin: *Mentha piperita*, Fam: Labiatae.

Part used: Dried leaves and flowering tops.

Isolation of oil: Oil is obtained by steam distillation of dried leaves or flowering tops.

Constituents: Volatile oil with active principle, menthol.

Uses:

1. As analgesic, anesthetic, antiseptic, antispasmodic and astringent.
2. Stimulant, carminative and stomachic properties.
3. As a flavoring agent in syrups, lozenges, chewing gums, tooth pastes, mouth washes and candies.
4. To relieve pain and reduce headache and migraine.

2) Coriander oil

Synonyms: Chinese parsley and In Urdu, Dhanya.

Botanical origin: *Coriandrum sativum*, Fam: Umbelliferae.

Part used: Dried, ripe fruits.

Isolation of oil: Oil is obtained by steam distillation of dried ripe fruits of coriander.

Constituents:

Coriandrol and pinene

Also contains:

Cineol

Cymene

Terpineol

Terpinolol

Uses:

1. To relieve mental fatigue, migraine, and nervous weakness.
2. As carminative and diuretic.
3. As culinary spice.
4. As a flavoring agent.

3) Cardamom oil

Synonyms: Grain of paradise and In Urdu, Ilaychi.

Botanical origin: *Elettaria cardamom*, Fam: Zingiberaceae.

Part used: Dried, ripe seed.

Isolation of oil: Steam distillation of dried, ripe seed.

Constituents: Volatile oils containing:

Cineol

Terpenyl acetate

Limonene

Also contains:

Fixed oils

Starch

Uses:

1. Aromatic, stimulant, stomachic, carminative and diuretic.
2. Expectorant properties.
3. As a condiment.

4. As a flavoring agent in pharmaceutical syrups.

Aldehydic volatile oils

Aldehydes provide a soapy-waxy-lemony- floral effect to the formula and are used to classify a fragrance as "aldehydic".

Ex:

1. Cinnamon - Cinnamic aldehyde
2. Lemon peel - Citral
3. Orange peel - Citral
4. Citronella - Citronellal
5. Lemon grass – Citronellal

Ketonic volatile oils

The ketones that invariably occur in volatile oils may be classified into the following two categories, namely:

(ii) Aliphatic ketones, and

(ii) Aromatic Ketones.

Ex: Caraway-Carvone, Spearmint-Carvone, Vetiver-Vetivone, Fennel-Fenchone

Phenolic volatile oils

The important drugs containing phenol volatile oils are, namely: **Clove oil, Myrcia oil (Bay oil), Organum oil, Pinetar, Thyme** etc. In fact, they essentially owe their value in the pharmaceutical domain almost exclusively by virtue of their antiseptic and germicidal properties of their *phenolic constituents*. A good many of them are employed as popular flavouring agents.

The phenols are classified into the following categories, namely:

(i) Monohydric phenols, and

(ii) Dihydric phenols.

Ex: Clove-Eugenol, Ajwon–Thymol

Phenolic ether volatile oils

Phenolic ether occurs in volatile oils such as anethol from anise and fennel, Safrole from sassafras etc.

Ex: Anise, Fennel-Anethol, Nutmeg-Myristicin.

Oxide volatile oils

It contains colourless or pale yellow oil which is about 6%, having an aromatic odour, spicy cooling taste, containing 70% of cineole $C_{10}H_{18}O$, d-pinene and other terpenes, resins, a bitter principle and tannin, eucalyptic acid, Ca-oxalate etc.

Ex: Eucalyptus-Cinole (eucalyptol).

Ester volatile oils

A wide variety of ester occurs in volatile oils. The most common are the acetates of terpineol borneol and geranial. Other examples of esters in volatile oils are allyl isothiocyanate in mustard oil and methyl salicylate in wintergreen oil.

Ex: Gaultheria (Wintergreen)-Methyl salicylate.

Chemistry

Chemical constituents of volatile oil may be classified into two groups.

a. Terpenes.

b. Phenylpropanoids.

Uses of volatile oils

Therapeutically (Oil of Eucalyptus).

Flavouring (Oil of Lemon).

Perfumery (Oil of Rose).

Starting materials to synthesize other compounds (Oil of Turpentine).

Anti-septic - due to high phenols (Oil of Thyme). Also, as a preservative (oils interfere with bacterial respiration).

Anti-spasmodic (Ginger, Lemon balm, Rosemary, Peppermint, Chamomile, Fennel, Caraway).

Aromatherapy.