Essential Oils

Pharmacognosy

3rd Class, 1st Semester
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DEFINITION OF ESSENTIAL OILS OR VOLATILE OILS

Volatile oils are secondary metabolic products which are generally complex in composition. Volatile or essential oils, as their name implies, are volatile in steam. They are called aromatic oils for their distinctive smell, are also called etheric oils; Because of its ability to dissolve in ether, and also called volatile oils because it is characterized by being volatile at high temperatures and does not decompose, unlike fixed oils that do not volatilize, but rather decompose at high temperatures. They differentirely in both chemical and physical properties from fixed oils.

They are liquids that come from plants. The oils are distilled from the flower, leaves, stems, roots, bark, and resins of plants or they are cold-pressed from the rinds of citrus fruits.

Think of them as the "immune system" of the plant: everything the plant needed to grow, thrive, and survive is what is extracted.

How are essential oils beneficial?

- **Essential oils are extracted from plants without any chemical manipulation and share very similar structure to human DNA. Because of that, our bodies easily recognize the oils and readily absorb them. Our body uses what it needs from the essential oil to support our health.**
- **Therapeutic Essential oils are taken by the bloodstream and carried to every cell within the entire body, in a matter of minutes.**
- **Essential oils are so small in molecular size that they can easily and quickly penetrate our skin tissue. They are different from fatty oils like coconut and olive oil, which have very large molecules.**
- **Essential oils detoxify cells and blood in the body.**
- **They are powerful antioxidants that create an unfriendly environment for damaged free radicals.**

In general, the active compounds of these volatile oils are the reason for the medical effect of these species, as they are characterized by:

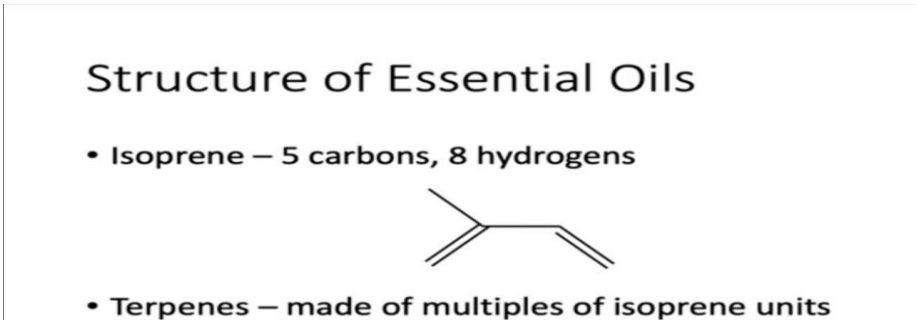
Their antioxidant, anti-fungal, anti-bacterial, anti-viral, anti-tumor activity, memory-enhancing activity, or regulator of sugar or cholesterol in the blood.

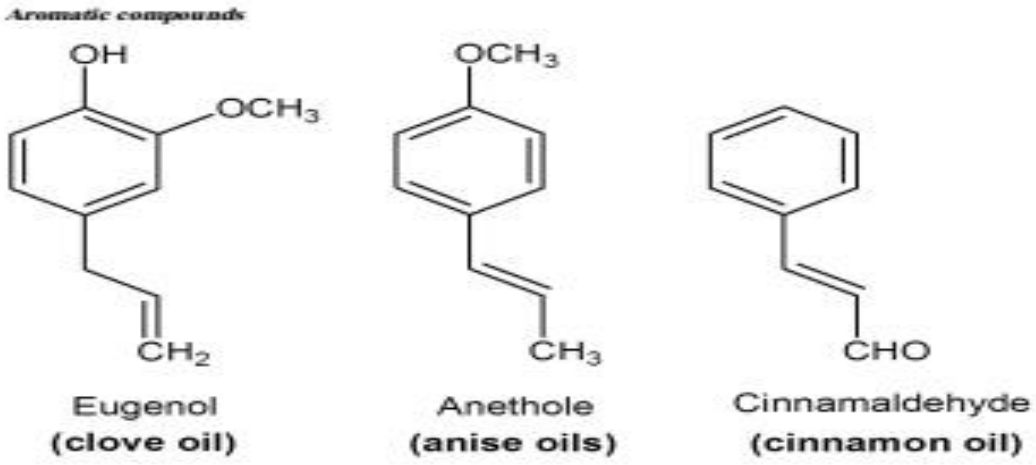
Biosynthesis and chemical composition

Depending on the type of drivative 2 broad classes, based on their biosynthetic origin:

1. Terpene derivatives formed via the acetate-mevalonic acid pathway.

2. Aromatic compounds formed via the shikimic acid-phenylpropanoid route.





The most important extraction methods:

1- Distillation methods

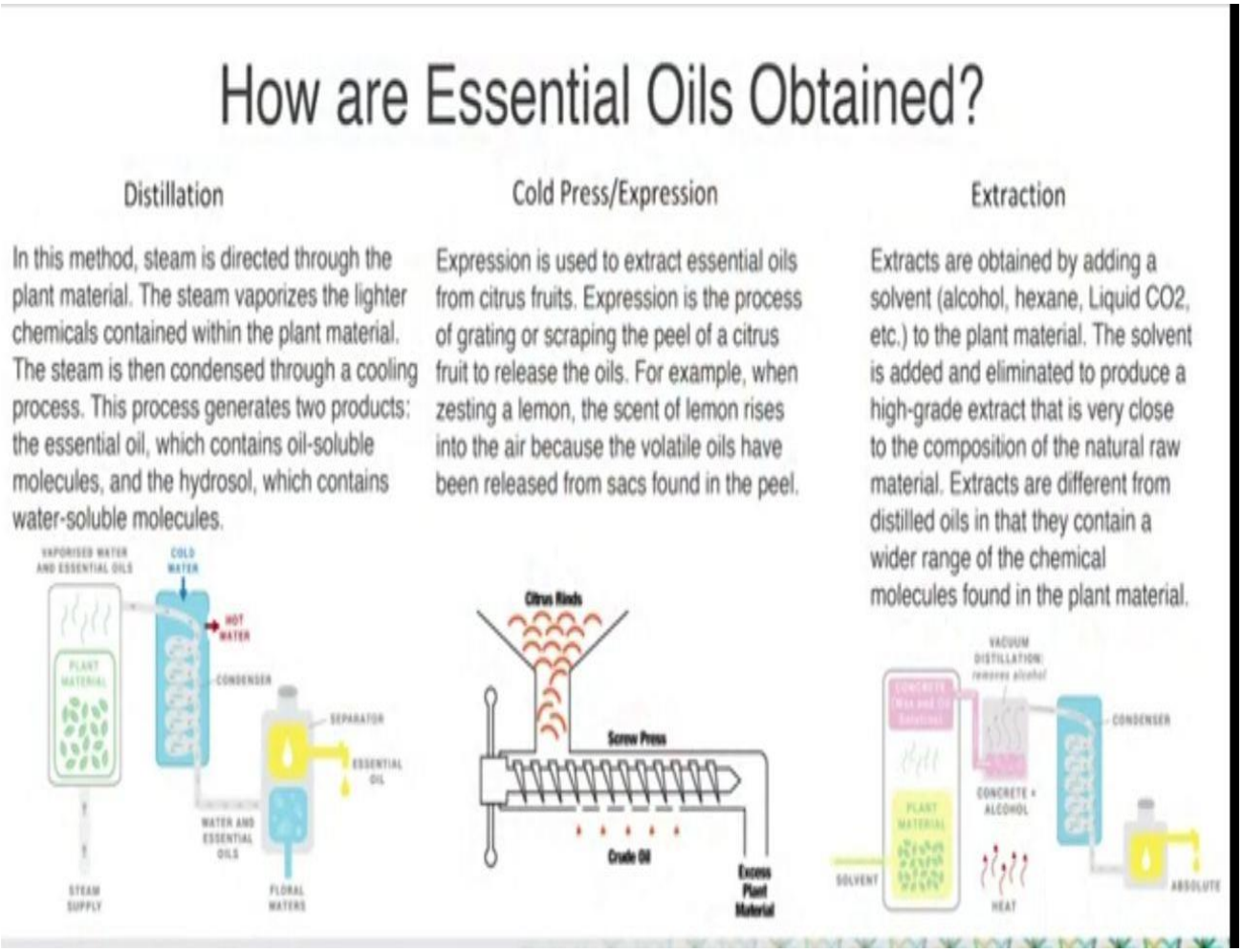
- **Water distillation method**
- **Steam distillation method**
- **Water and steam distillation method**

2- Extraction by using organic solvents.

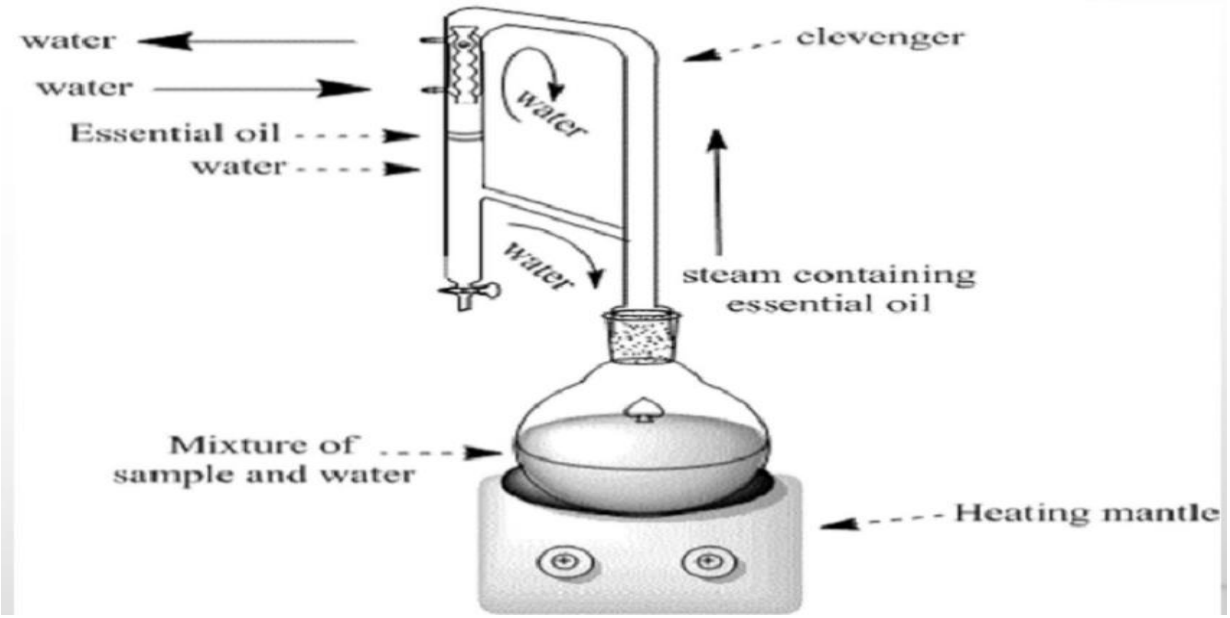
3- Extraction by hydraulic press.

4- Extraction by acid or enzymatic hydrolysis.

5- Extraction by carbon dioxide.



Hydro-distillation depends on the ability of water vapor to carry the essential oil of the plant, and therapeutcly extraction of essential oils or volatile oils according to the hydro-distillation technique by using of a clevenger apparatus is best method among them.



Clove oil

(Eugenia caryophyllata)

Family : Myrtaceae

The main component of clove oil - eugenol an important natural antibacterial drug, is used in many fields, including dentistry, pharmaceuticals, and aromatherapy. It is used as an analgesic, antiseptic, disinfectant, and antibacterial because it inhibits the growth or kills most pathogens, such as: E.scherichia coli, Bacillus substilis,, Aspergillus niger, Penicillum chrysogenum. Oil is recommended for inhalation in the treatmentof sore throat,colds .

Peppermint oil

Mentha piperita

Family :Lamiaceae

The active constituents in peppermint oil, which is prepared through distillation of the ground parts of the peppermint plant, include menthol, menthone, cineol, and

several other volatile oils. In vitro research shows peppermint oil to be effective in relaxing GI smooth muscle, possibly through an antagonistic effect on calcium channels in the gut. Peppermint oil also has been shown to relax the lower esophageal.

Thymol Oil

Family: Lamiaceae

Genus: Thymus .

Species: Thymus vulgaris L.

Thymol is one of the most important essential oils found in Thyme and known for its antiseptic and antifungal properties .

Toxicity of essential oils:

- **Toxicity of essential oils by the oral route:**

It is very low (between 2-5 g/kg anise, eucalyptus, clove) (greater than 5 g/kg chamomile, lavender) Most toxic essential oils: mustard oil (0.34 g/kg) But these data were obtained in animals . A review of the available literature shows that serious accidents, most of which involve young children are due to a small number of essential oils, ingested in large quantity: clove (eugenol), peppermint (menthol).

- **Skin toxicity Essential oils:**

They are widely used in perfumery and in the cosmetics. Extensive research has been conducted on their potential toxicity (acute, chronic) by topical using.

. Extensive research has been conducted on their potential toxicity (acute, chronic) by topical application and on their irritating (mustard, thyme) sensitizing (cinnamaldehyde).