PHARM.D • YEAR 2

Pharmacognosy & Phytopharmaceuti

CHAPTER 13

Detailed Study of Oils

PPT CHAPTER COVER



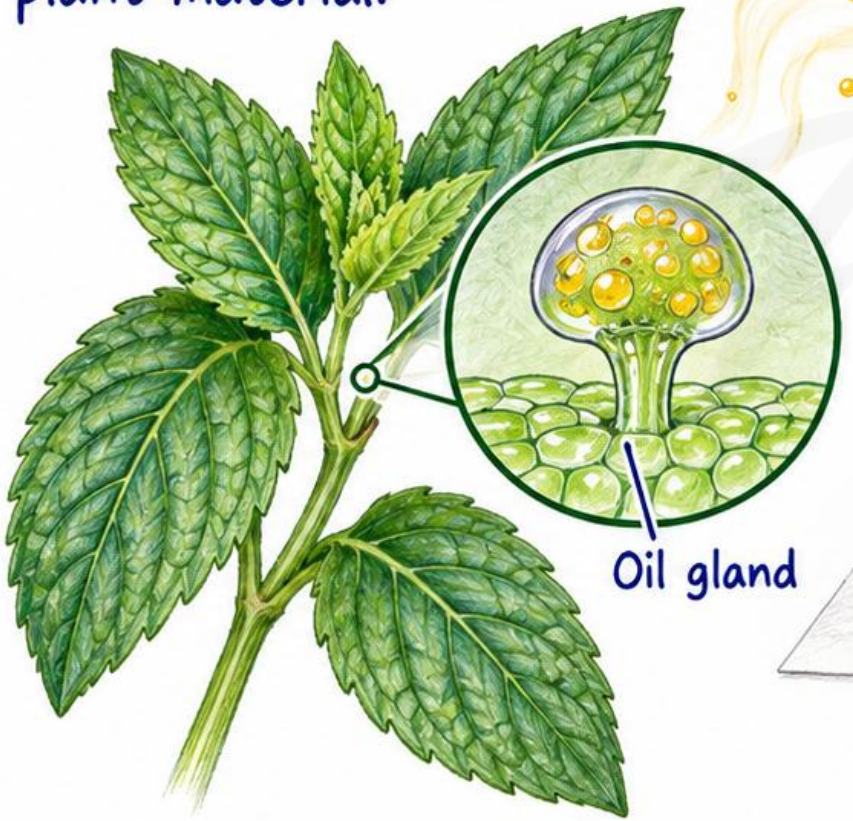
DOCTOR OF PHARMACY

Volatile oils: aroma in a mixture

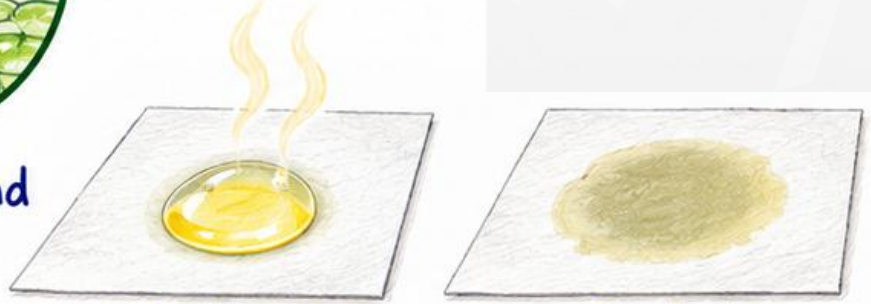
Volatile oils, also called essential oils, are aromatic mixtures obtained from plant material.



Plants use these secondary metabolites in defence, pollinator attraction and chemical communication.



Most are lipophilic liquids containing low-molecular-mass terpenes, oxygenated terpenoids and other volatile compounds.



Volatile oil (evaporates)

Fixed oil (persistent stain)



Their aroma and flavour support uses in pharmaceuticals, perfumery, cosmetics and food flavouring.

Biological activity depends on the actual composition.

They evaporate on exposure to air and usually leave no permanent greasy stain, unlike fixed triglyceride oils.

Where plants store volatile oils



Leaves: eucalyptus and mint.



Flowers: rose, lavender and jasmine.



Bark: cinnamon.



Seeds: cardamom.



Fruits: fennel and anise;
lemon and orange peel.



Rhizomes: ginger;
roots and rhizomes: valerian.



Wood: sandalwood.



Oleoresin: turpentine
from pine stems.

The medicinal part matters: different parts of a plant may yield oils with different compositions.

Fennel and anise are botanically fruits, although they are often called seeds in everyday trade.

Terpenes: the carbon framework

Terpene hydrocarbons contain carbon and hydrogen; oxygenated derivatives are commonly called terpenoids.

Monoterpenes have 10 carbons, corresponding to two isoprene units.

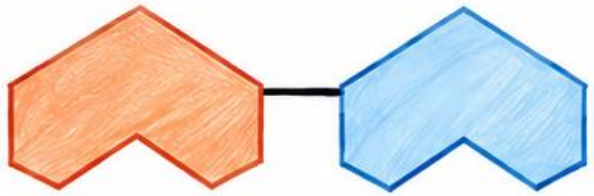
Examples: limonene in citrus, pinene in turpentine and myrcene in bay oil.



Limonene in citrus



Pinene in turpentine



Isoprene unit Isoprene unit



Myrcene in bay oil

Sesquiterpenes have 15 carbons, corresponding to three isoprene units.

Examples: zingiberene in ginger and farnesene in chamomile.



Zingiberene in ginger



Isoprene unit Isoprene unit Isoprene unit

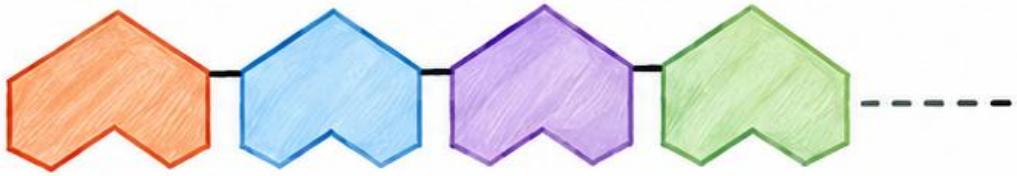


Farnesene in chamomile

Sesquiterpenes are generally less volatile than monoterpenes.



Essential oils mainly feature these smaller terpenes; high-carbon terpenes are not typical major volatile constituents.



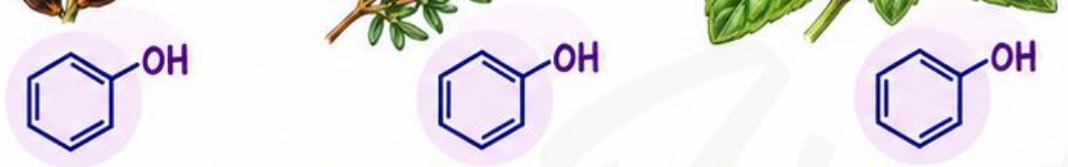
Oxygenated oils: phenols and alcohols

Phenols









Eugenol: clove oil. Thymol: thyme oil. Carvacrol: oregano oil.

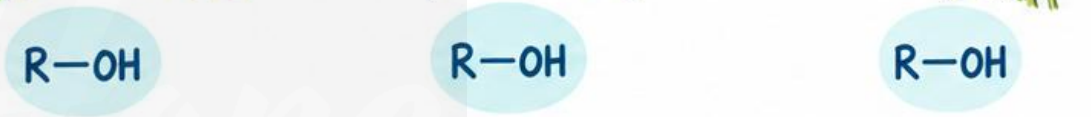
These aromatic phenolic constituents contribute to antimicrobial and antioxidant activity observed in suitable preparations.

Alcohols







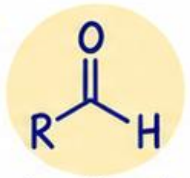


Menthol: peppermint. Geraniol: rose oil. Linalool: lavender oil.

They influence fragrance and other oil-specific properties.

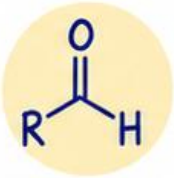
Aldehydes





Cinnamaldehyde: cinnamon bark oil.





Citral: lemongrass oil.

Functional-group classification describes chemical constituents; an essential oil remains a mixture, often spanning several groups.

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