

Microscopical Examination of
Leaves & Flowers Containing
Volatile Oil

Lab No. 4

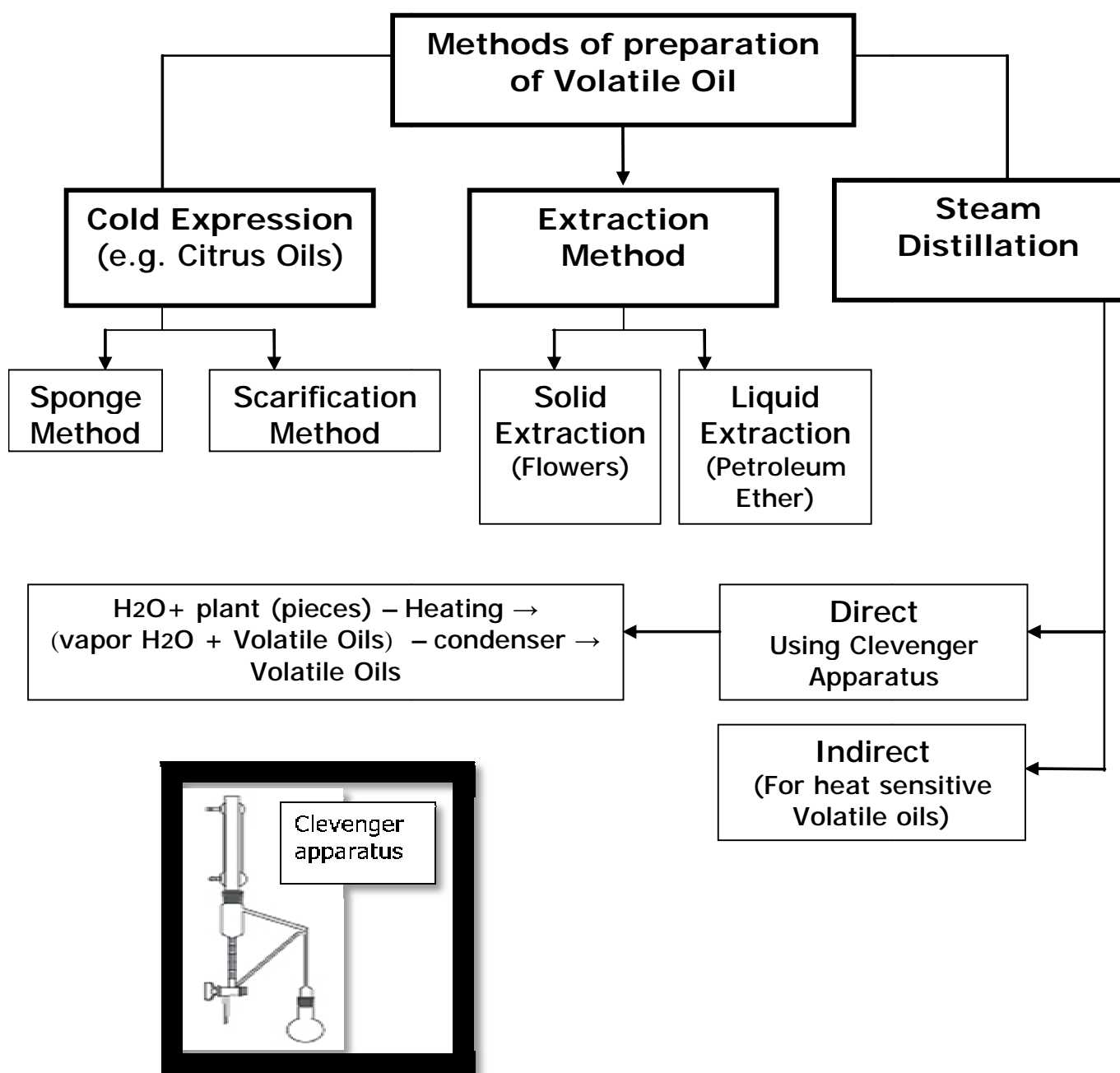




Volatile oil - Containing Plants (1)

Volatile oils:

- § They are odours principles found in plants
- § Volatile oils evaporate when exposed to air at ordinary temperature

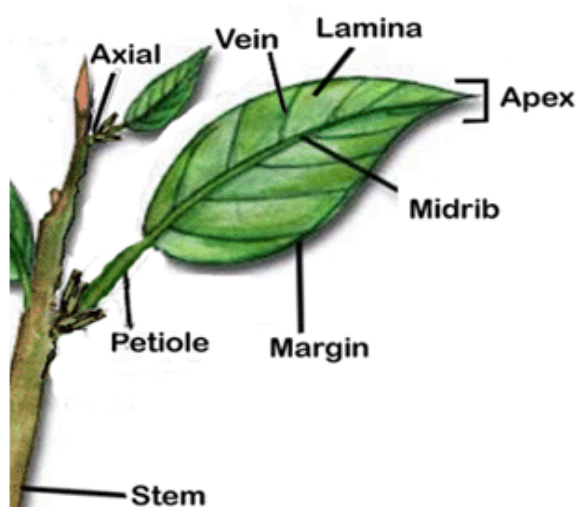




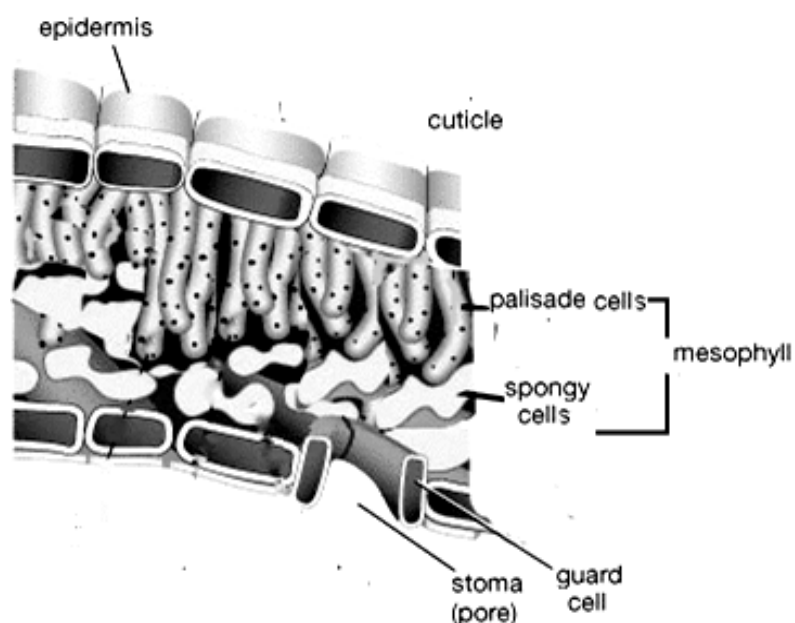
The Leaf

The leaf is the lateral out growth, normally of limited growth on the stem from which it differs in structure and organization.

Diagram of entire leaf:



Transverse section of Leaf Lamina:



Example of powdered leaves containing volatile oils:

Mentha (See Table)

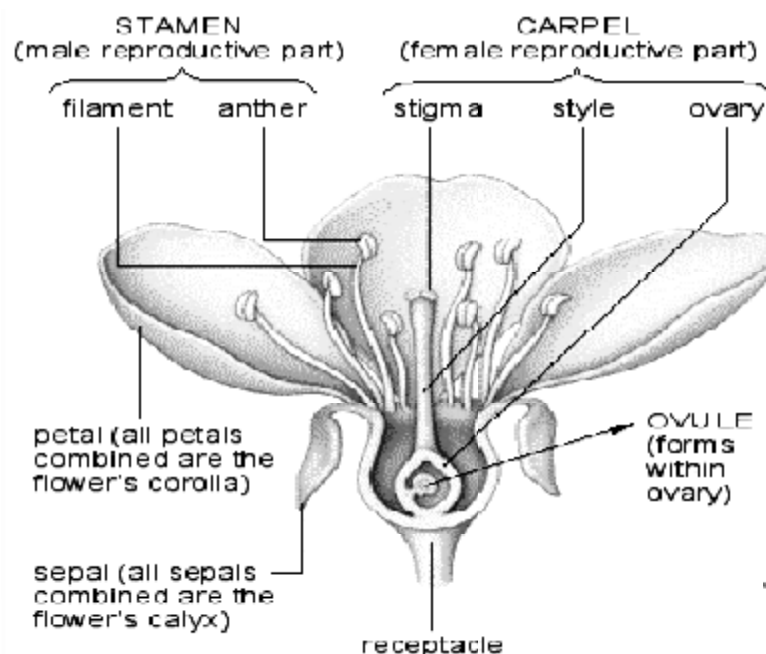


The Flower

The flower is composed of:

- 1) Receptacle
- 2) Calyx
- 3) Corolla
- 4) Androecium
- 5) Gynaecium

P.S: the flower can be complete or incomplete (missing one or more of these components)



1) Receptacle:

The receptacle can be flattened or convex & it is usually short

2) Calyx:

Calyx is formed of 2-5 sepals. It protects essential organs of the flower.

3) Corolla:

The corolla consists of petals. It protects the essential organs and attracts the insects carrying pollens.

4) Androecium:

The male sexual organ in flower, consists of one or more stamens.

The stamen consists of: filament & anther



5) Gynaecium:

The female sexual organ in flower, it consists of carpels.

Typical Carpel formed of: Ovary, style & stigma

Kinds of flowers

According to sexual structure:

Hermafrodite	<ul style="list-style-type: none">• The presence of both male & female organs in one flower.
Unisexual	<ul style="list-style-type: none">• Only one of the sexual organs is present. It may be staminate (only androecium is present) or pistillate (only gynaecium is present)
Sterile	<ul style="list-style-type: none">• the absence of both female & male organs.

Examples of powdered flowers containing volatile oils:


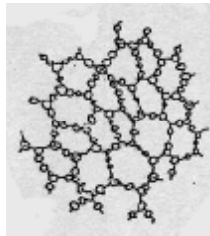

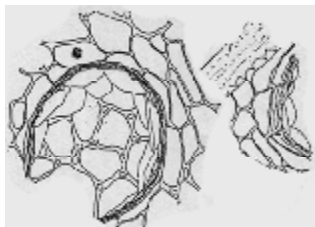

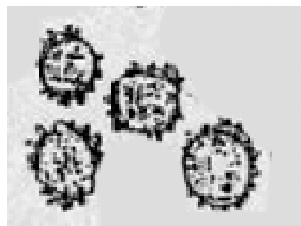
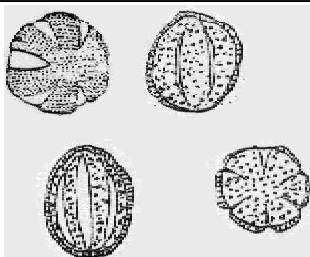
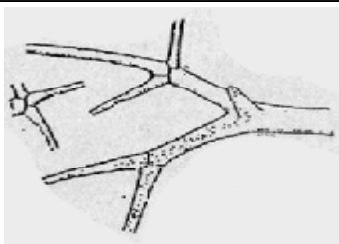
- § Clove
- § Lavender
- § Chamomile

(See Table)



	Mentha (peppermint)	Clove	German Chamomile	lavender
Origin	Dried leaf of <i>Mentha piperita</i>	Dried dark bud of <i>Eugenia caryophyllata</i>	Dried flower head of <i>Matricaria chamomilla</i>	Dried flowers of <i>Lavendula officinalis</i>
Family	Labiatae	Myrtaceae	Asteraceae	Labiatae
Odour	Characteristic	Characteristic	Aromatic Apple-like odour	Fragrant aromatic
Taste	Aromatic	Characteristic (acid and spicy)	Slightly bitter	Aromatic
Color	Green	Dark brown	Green yellow	Greyish to dark blue
Microscopical examination	§ Mount: KOH § Secretory organ: Labiateous hair(Glandular hair unicellular stalk , multicellular head) § Diacytic stomata	§ Mount in chloral hydrate § Triangular pollen grain § Fibrous layer of anther § Oil gland	§ Mount in chloral hydrate § Spherical spiny pollen grain	§ Hexagonal Pollen grains with 6 germ pores § Non-glandular branched hair (tree like)



Clove		<u>See table for details</u>
Triangular pollen grains	Fibrous layer of anther	Oil gland
	 	
Chamomile		
Spiny pollen grains		
 		
Lavender		
Pollen grains	Branched hair	
		
Mentha		
Diacytic stomata	Labiaceous hair	
