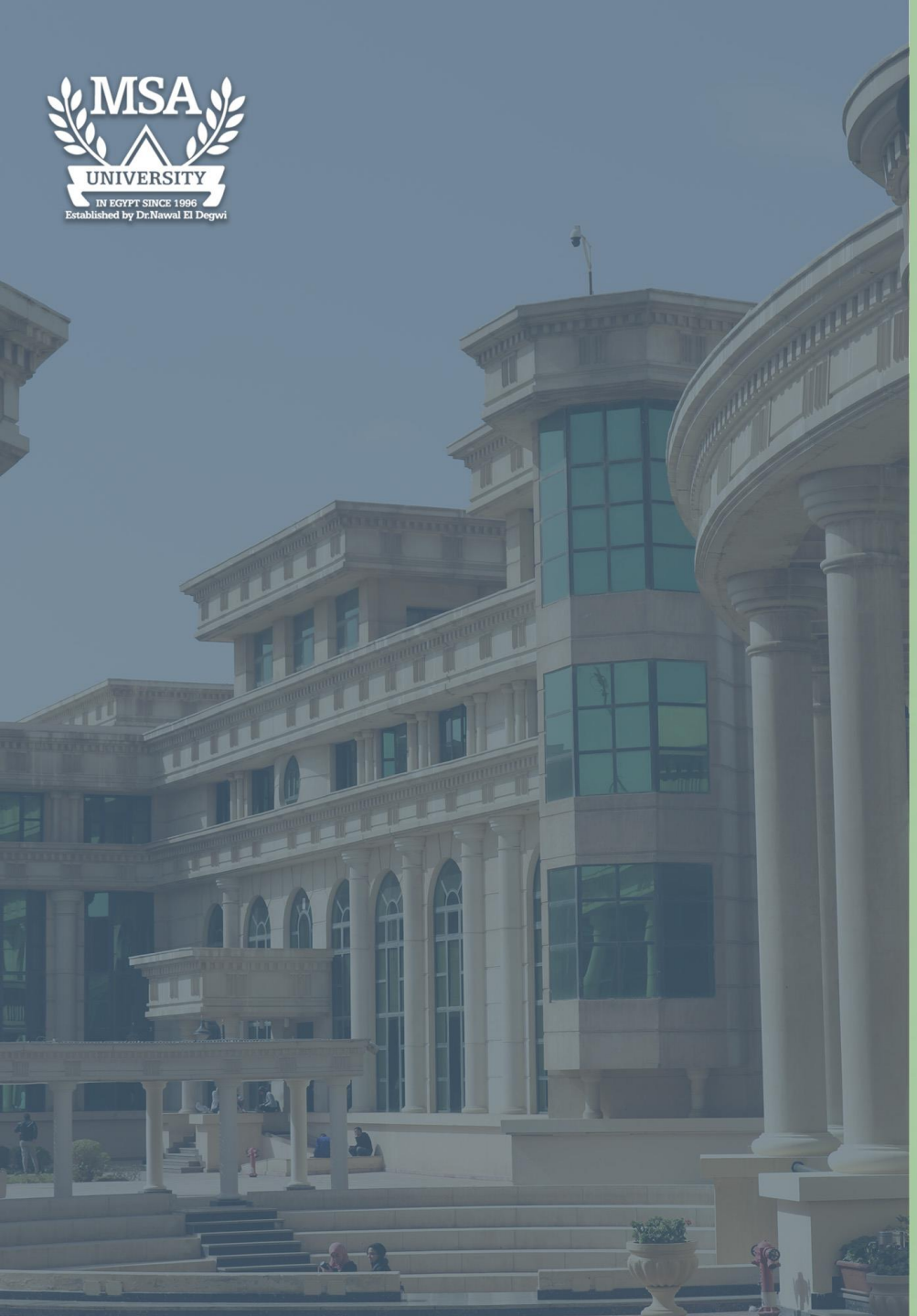

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جامعة أكتوبر للعلوم الحديثة والآداب



Pharmacognosy
PHG112





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References

Author	Date	Title	Publisher	ISBN
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Lecture 9

Herbs Examples

Interactive teaching methods and activities





Learning Outcomes

By the end of this lecture, students should be able to:

1. Knowledge / Remembering

- **Identify** the botanical sources and families of peppermint, thyme, basil, rosemary, and artemisia.
- **List** the main active constituents of each herb (e.g., menthol, thymol, linalool, cineole, artemisinin).
- **Recall** the main pharmacological and nutraceutical uses of these herbs.
- **Recognize** the characteristic organoleptic properties (odor, taste) of peppermint and thyme.

2. Comprehension / Understanding

- **Explain** the role of volatile oils in producing the pharmacological effects of these herbs.
- **Describe** the microscopic diagnostic features of peppermint and thyme (trichomes, stomata, pollen grains).
- **Discuss** the difference between nutraceutical and cosmeceutical applications of herbs such as rosemary.
- **Summarize** the therapeutic importance of artemisinin in malaria treatment.

Learning Outcomes

By the end of this lecture, students should be able to:

3. Application

- **Apply** microscopic and organoleptic features to identify powdered herbal drugs.
- **Use** specific chemical tests to detect active constituents such as menthol and thymol.
- **Relate** the chemical composition of herbs to their uses in respiratory, digestive, and cosmetic applications.

4. Analysis

- **Differentiate** between herbs used for nutraceutical purposes and those with cosmeceutical applications.
- **Analyze** the relationship between active constituents (e.g., thymol, menthol, artemisinin) and their pharmacological effects.
- **Compare** peppermint and thyme in terms of constituents, uses, and identification features.

Learning Outcomes

By the end of this lecture, students should be able to:

5. Synthesis / Creating

- **Construct** a comparison table summarizing source, constituents, uses, and tests of the studied herbs.
- **Propose** simple herbal formulations for conditions such as cough, indigestion, or skin care using the studied herbs.

6. Evaluation

- **Evaluate** the therapeutic benefits versus risks of using herbal products in nutraceutical and cosmeceutical applications.
- **Assess** the importance of pharmacognostic identification in ensuring quality and preventing adulteration.
- **Judge** the effectiveness of herbal remedies compared to conventional pharmaceutical treatments.



Herbs Having Nutraceutical Applications

Peppermint Herb



Origin: Is the dried leaves and flowering tops of *Mentha piperita* F. Labiatae



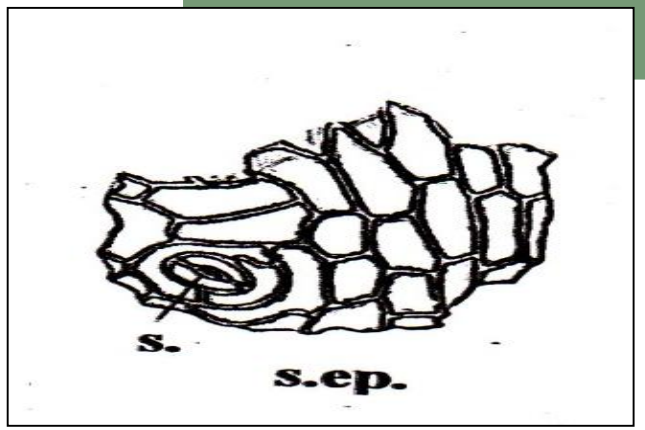


Powder:

Odour :aromatic

Taste: aromatic with cold sensation

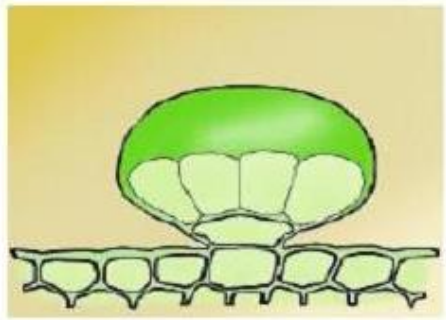
Epidermal cells of the leaf with diacytic stomata.



Multicellular, uniseriate non glandular trichomes and glandular labiaceous hairs and unicellular stalk unicellular head hairs



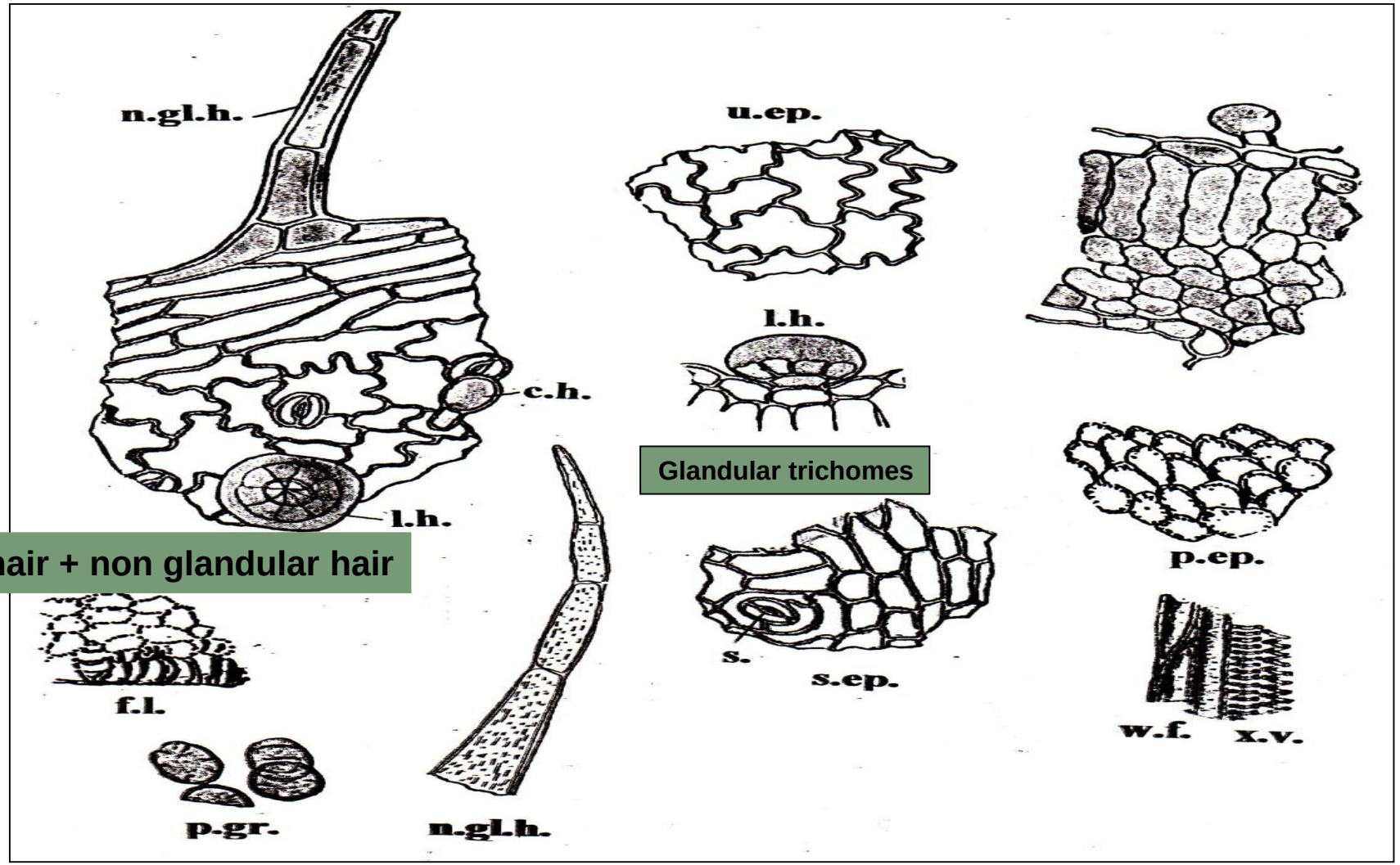




Smooth spherical pollen grains



Powdered Mentha



Glandular trichomes

Labiaceous hair + non glandular hair

ACTIVE CONSTITUENTS

1-Volatile oil mainly menthol, menthyl acetate, menthone & menthyl isovalerinate

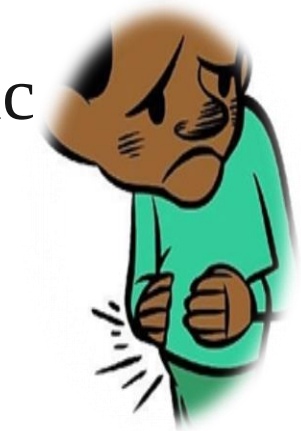
2-Tannins

3- Flavonoids

USES:



- Local action: antipruritic, mild local anesthetic and antiseptic
- Systemic action: carminative and gastric sedative
- Flavouring agent



Candies& chewing gums





mouth washe



tooth paste

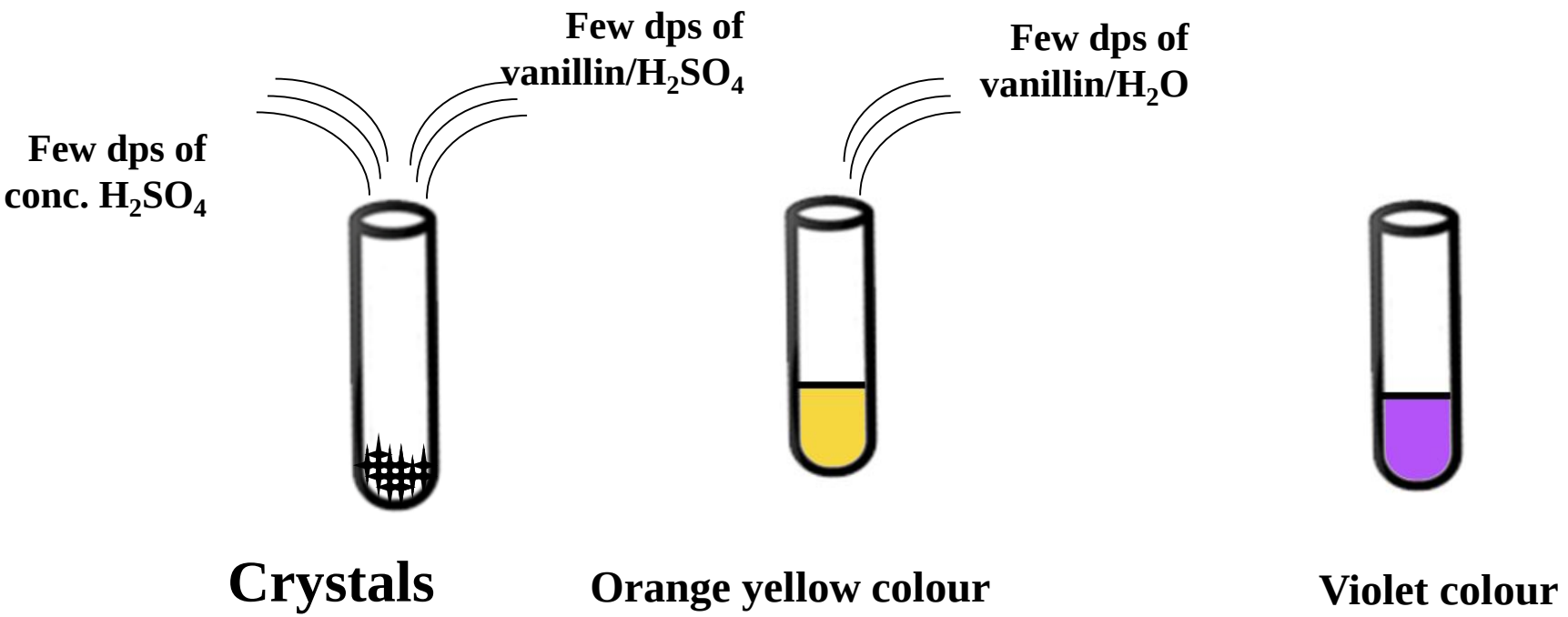


cigarette

CHEMICAL TEST

1- Oil with a mixture of glacial acetic acid and nitric acid give blue colour change to golden yellow when heating on water bath

2-



Thyme herb

Origin: Is the dried leaves and flowering tops of *Thymus vulgaris* F. Labiatae





Odour :aromatic

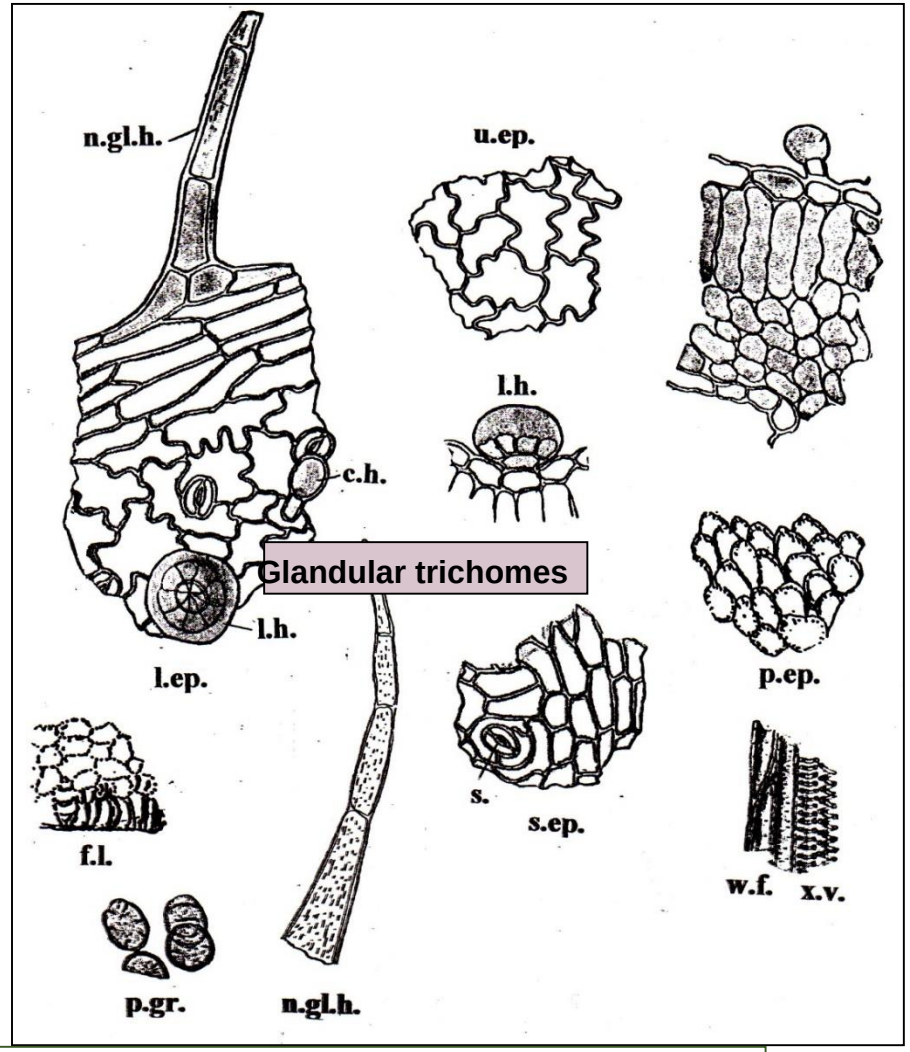
Taste: aromatic pungent.

The herb is short, grayish brown and hairy

Chemical test

Thymol crystals + 1 ml glacial acetic acid + 6 drops conc H_2SO_4 + 1 drop HNO_3 → deep bluish green

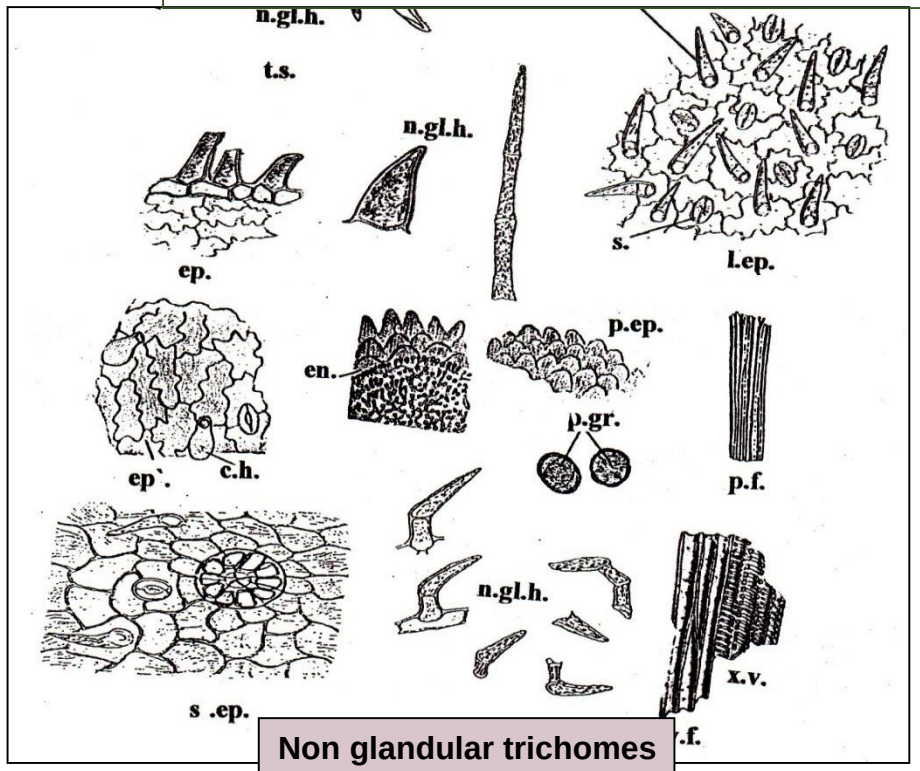
Powdered Mentha



Labiaceous hair + non glandular hair

Powdered Thyme

Non glandular hairs are present on both surfaces being uniseriate sharply pointed often bent near the base as well as labiaceous hairs.



Non glandular trichomes (bent hair)

ACTIVE CONSTITUENTS

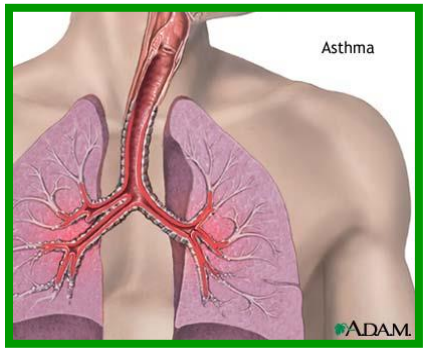
1- Volatile oil mainly Thymol, Carvacrol, Linalool,Broneol and Bornylacetate.

2-Tannins

3- Flavonoids

USES

1- Used for bronchitis, whooping cough and upper respiratory tract infections.



2- The oil is used as carminative, antispasmodic



3- Flavouring agent and antiseptic in mouth washes, toothpaste and creams

4- Antifungal for skin infection







Sweet basil (Ocimum) herb

Origin: Is the dried leaves and flowering tops of *Ocimum basilicum L.* F. Labiatae





ACTIVE CONSTITUENTS

1-Volatile oil mainly linalool, eugenol, geranial, methyl eugenol, 1,8-cineole, and other compounds.

2-Tannins

3- Flavonoids

USES

- **Antiviral activity toward SARS-CoV-2. due to its monoterpenes and flavonoids**
- **Antibacterial**
- **Leaf extract administered orally had the potential to improve neuromuscular coordination, active behavior, the ability to recognize objects, and enhance short-term memory**
- **A great wound healing ability**
- **Antiinflammatory effect**
- **Combat anxiety, depression and insomnia**
- **Aid in weight loss.**



Herbs Having Nutraceutical and Cosmeceutical Applications

Rosemary Herb

Origin: Is the dried leaves and flowering tops of *Rosmarinus officinalis L.*

F. Labiatae





ACTIVE CONSTITUENTS

1-Volatile oil mainly 1,8-cineole, α-pinene, α-terpineol, verbenone, limonene, bornyl acetate, terpinolene and camphor

2-Tannins

3- Flavonoids

USES

- **Antioxidants and anti-inflammatory compounds**
- **Enhancing memory and concentration &prevent brain aging**
- **Antioxidant and anti-inflammatory in the treatment of diabetes mellitus and its complications**

AS A COSMECEUTICAL

- **Stimulates hair growth and reduce hair fall. It also helps to reduce scalp inflammation.**
- **Rosemary helps to balance sebum**
- **Protect skin cells from damage**
- **Acts against UV-induced and pollution-induced skin aging and against cutaneous inflammation.**

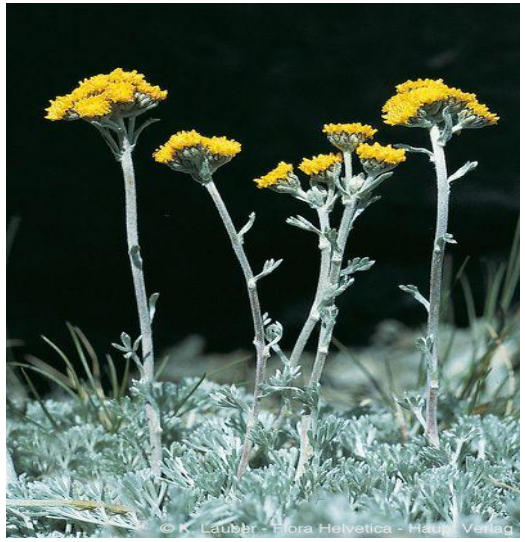




Important Herb

Artemisia herb

Origin: The dried leaves and flowering tops of *Artemisia annua* L. Family Asteraceae





ACTIVE CONSTITUENTS

1-Volatile oil mainly monoterpenes such as Artemisia ketone, camphor, camphene, borneol, a-pinene, and1,8-cineole

sesquiterpenes; such as Germacrene A

2-Artemisinin

3- Coumarin

USES

- **Artemisinin is well established for the treatment of malaria, including highly drug-resistant strains**
- **Anti viral against SARS-CoV-2 and its rapidly evolving variants**
- **Anti inflammatory**
- **Anti cancer**
- **It is considered as a promising component to be used in wound healing applications**



Homework

11- ……. alkaloid is used to treat migraine.

a-Ergometrine b- Ergotamine c- LSD d- Ergosterol e- Ergotoxin

12-……is the major constituent in the volatile oil of thyme.

a-Thymol b-Menthol c- Linalool d- Artemisia ketone e- α-pinene

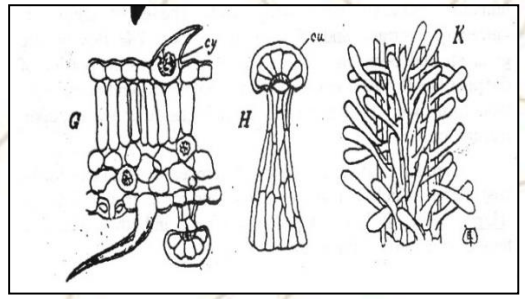
13-……..is effective to relief arthritis pain , and vitamin K deficiency.

a-Lychee b-Avocado c-Lemon d- Papaya e-Capsicum

14-……stimulates hair growth and reduce hair fall. It also helps to reduce scalp inflammation.

a-Artemisia b-Rosemary c-Mentha d-Ocimum e- Thyme

- Question 2:A) You are supplied with a sample, its microscopical examination showed the following key elements, answer the given questions:
- a) Identify the key elements and name the corresponding drug (4 marks)
- b) Mention two major active constituents for this drug (2 marks)
- c) Suggest two uses for this drug (2 marks)
-
- d) Describe two tests that can be used to confirm the identity of this drug in biological samples &in powdered form (2 marks)





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