

Pharmacognosy

PHG 112
PG 102

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Fall 2024

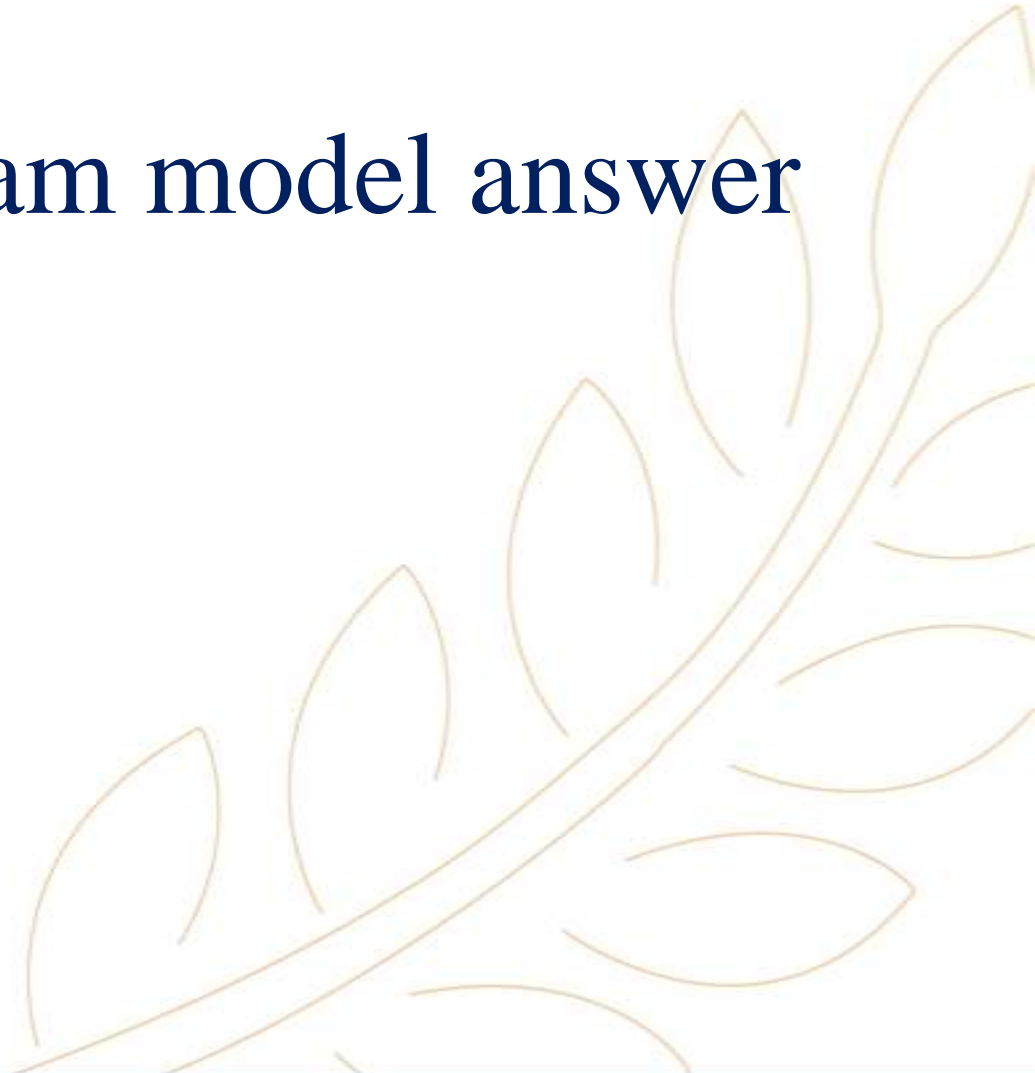


Faculty of **Pharmacy**

Lecture 1



Discussion of Midterm exam model answer

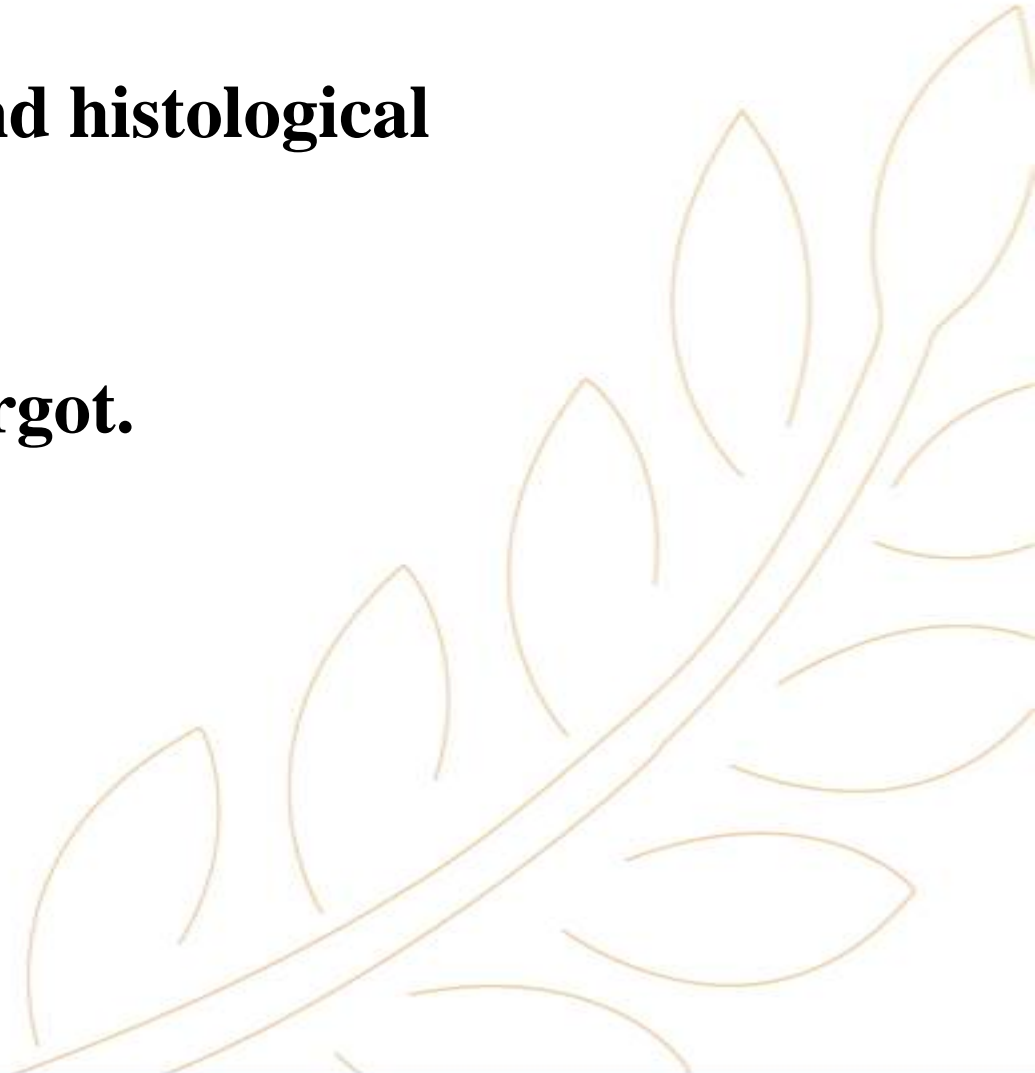


HERBS (HERBA)



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

- **Herb; definition, function, morphological and histological features.**
- **Examples of medicinal herbs:**
 - Herbs containing alkaloids *e.g.* lobelia & ergot.**
 - Herb containing resin *e.g.* cannabis.**



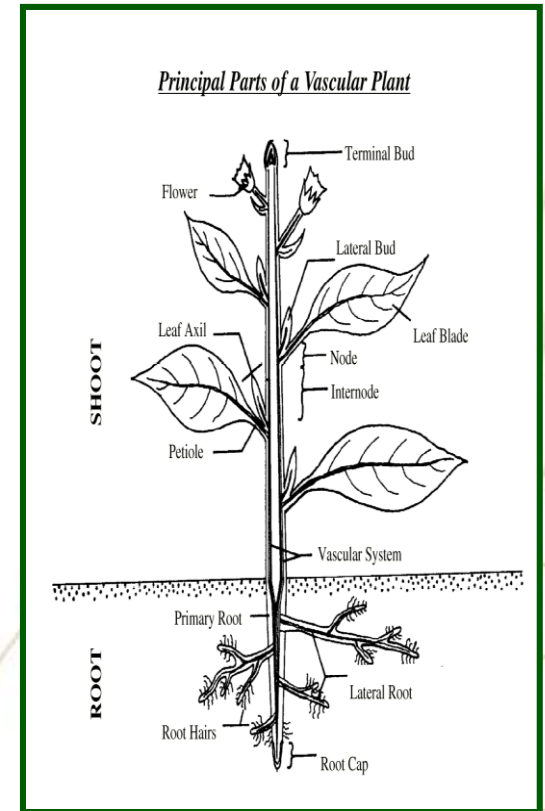
HERBS (HERBA)

What is Herb?

In Pharmacognosy

Herb is a drug composed usually of the tender parts of the plant axis.

(the stem + leaves + flowers + fruits).



Herbs include

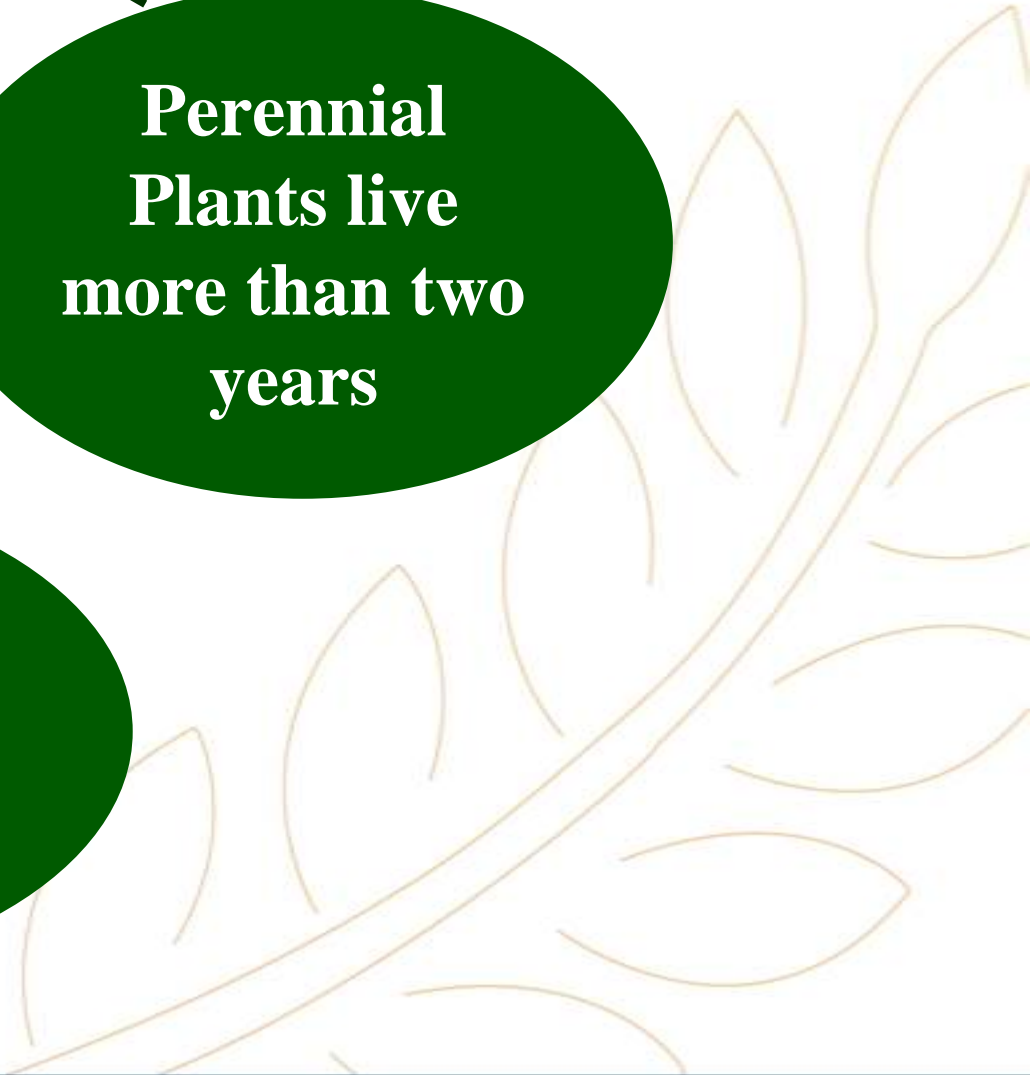
- 1- Flowering tops (young stem, leaf, flower, fruit)
- 2- Aerial parts (old stem, young stem, leaf, flower and fruit)
- 3- Whole plant (aerial parts plus root)

Herbs are classified according to life duration into

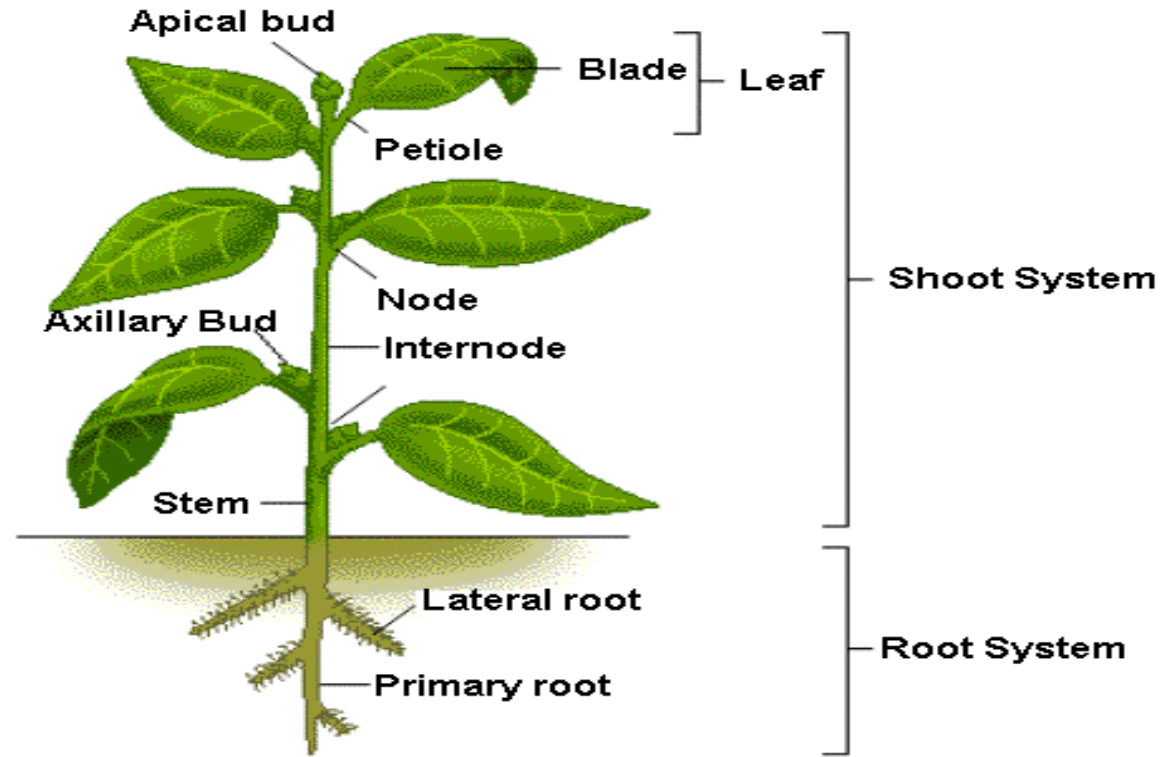
Annual
Herbs live one season and dies.

Perennial
Plants live more than two years

Biennial
Herbs live two seasons and dies.



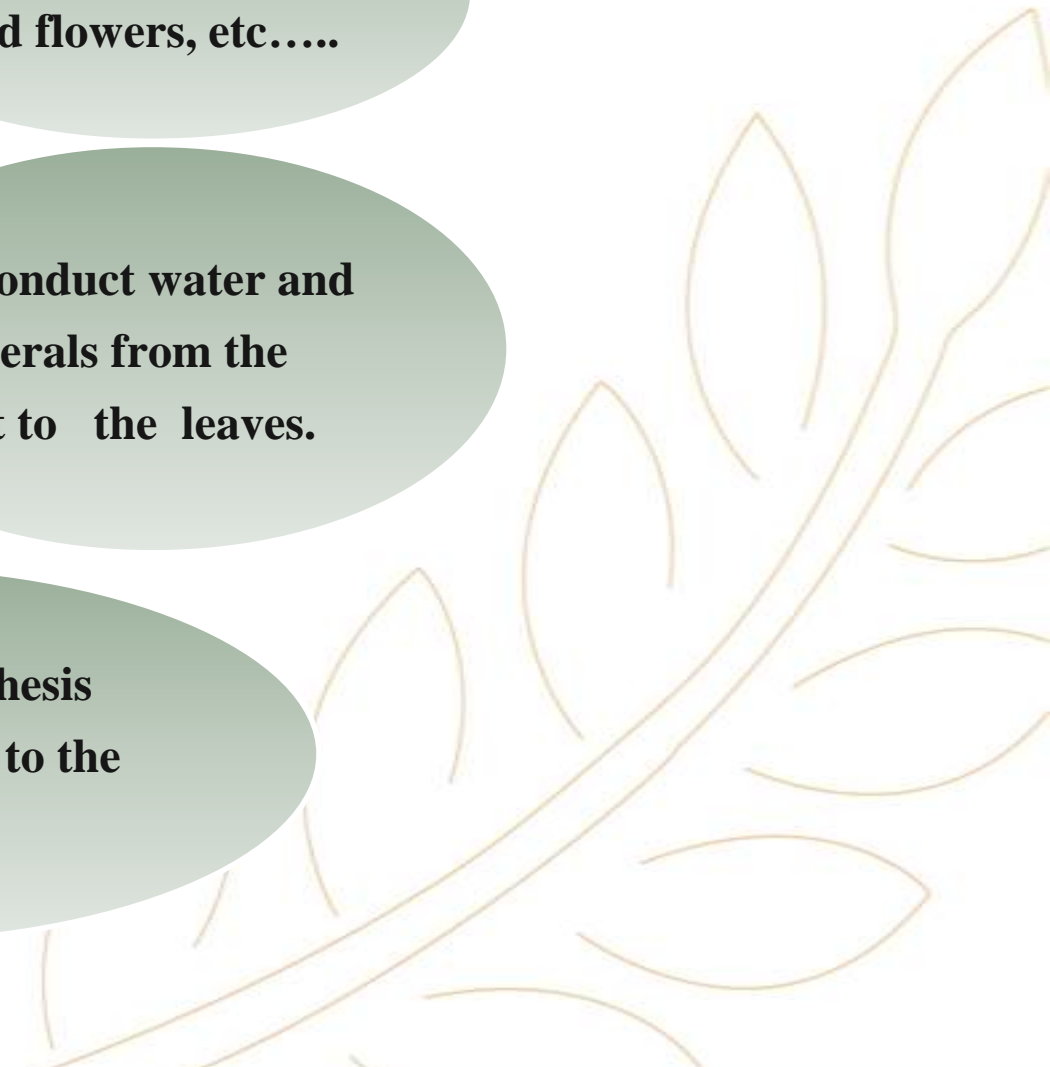
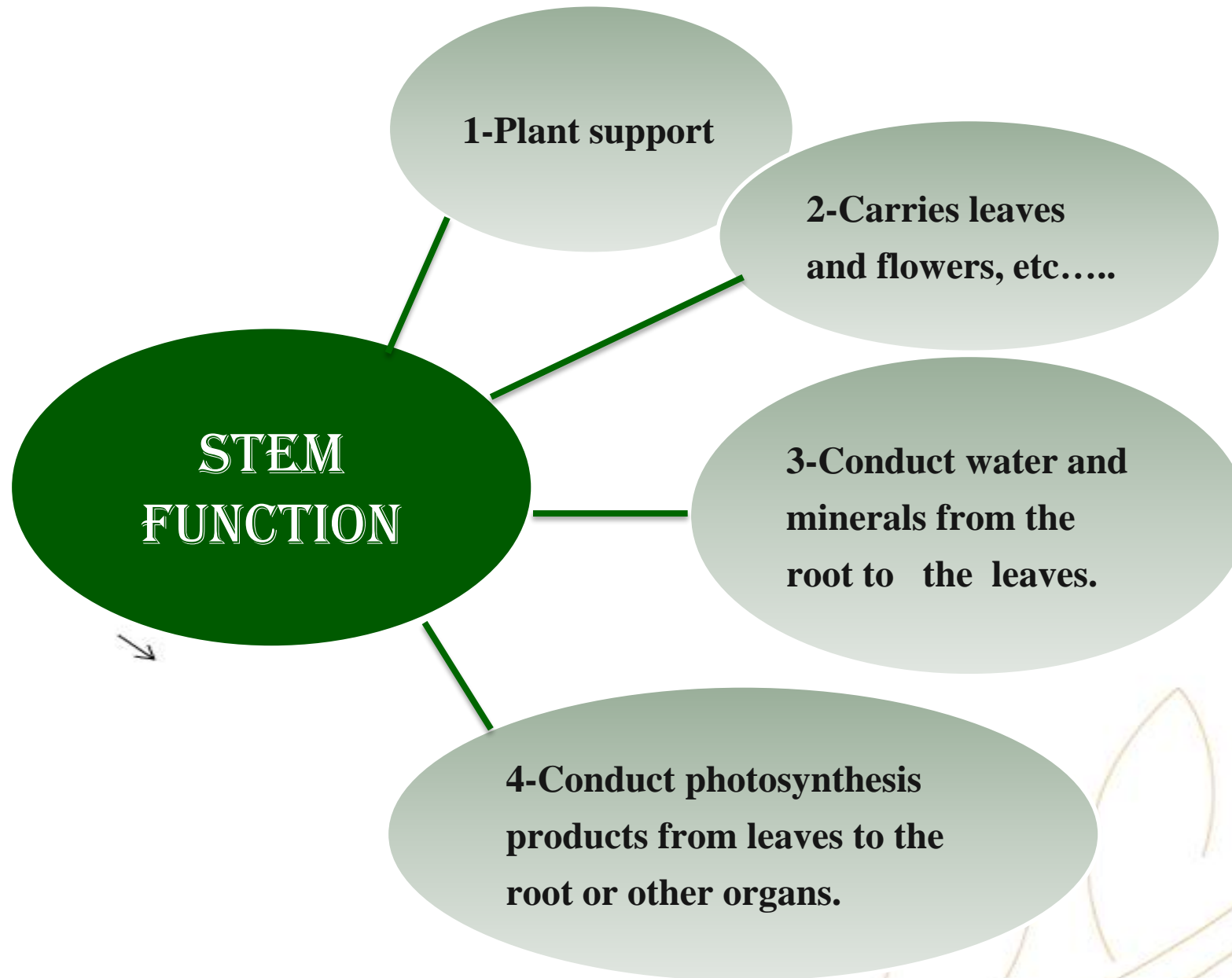
The Stem



Definition

Stem: - It is a part of the plant which carries the leaves and other plant organs.

- It has nodes and internodes.



Structure of The Stem

Epidermis:
with cuticle,
stomata and
hairs

Endodermis:
inner most
layer of
cortex.

Pericycle:
parenchyma,
collenchyma,
fibers, sclereids.

Pith:
parenchyma;
pitted lignified

Cortex:
Parenchyma,
Collenchyma

Cambium: Responsible for
2ry thickening giving 2ry
phloem outside and 2ry
xylem inside.

Phloem

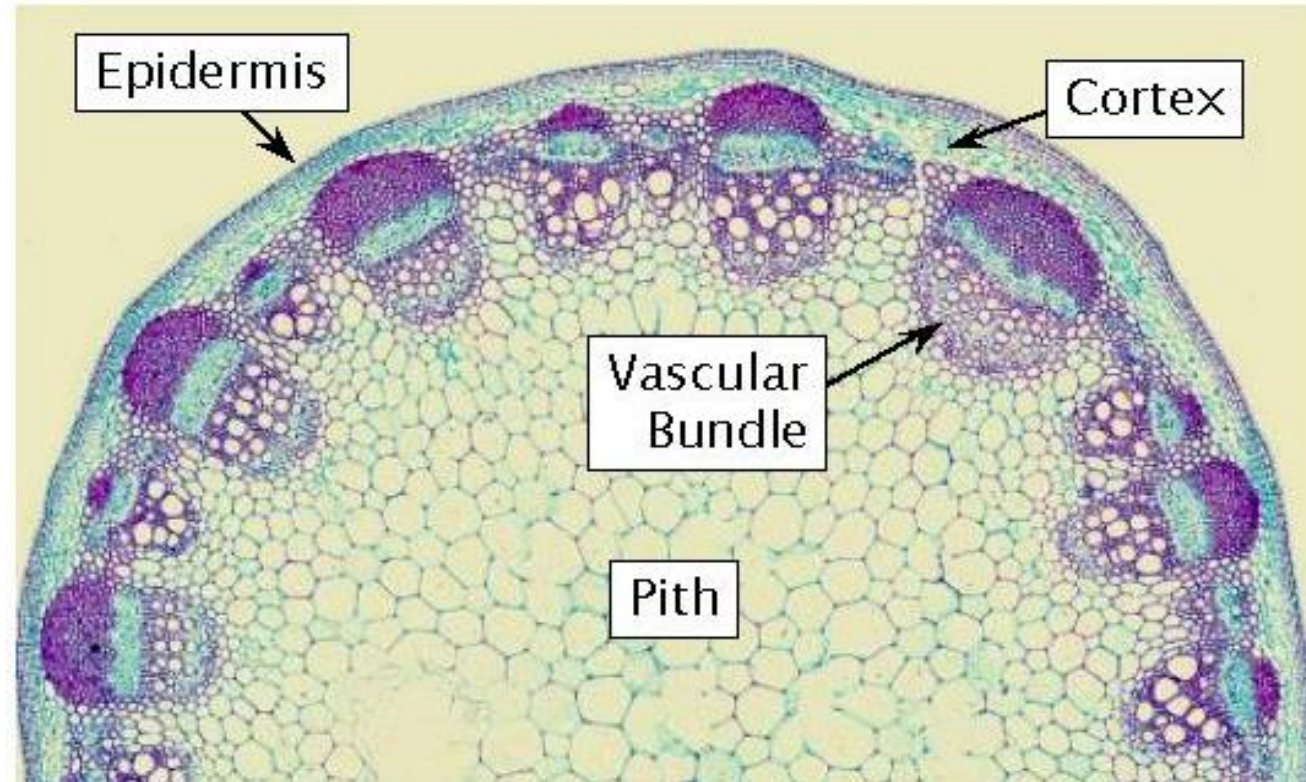
Xylem: Vessels (Spiral,
annular, pitted.

Fibers and wood
parenchyma)

N.B.

Stele: All tissues inside the endoderm .

T. S. in Young (herbaceous) stem of Dicotyledons:



[Vascular bundle is **Open V.B.**]

LOBELIA HERB

(Indian tobacco)

Asthma weed, Duchan Hindi

Origin: Is the dried aerial parts of *Lobelia inflata* F. Campanulaceae.



It is used by North American Indians as domestic medicine as a cigarette for asthma.



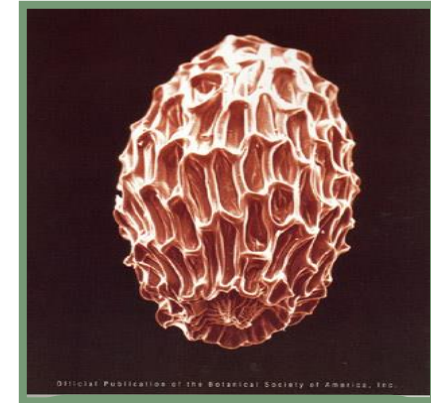
Macroscopical characters :



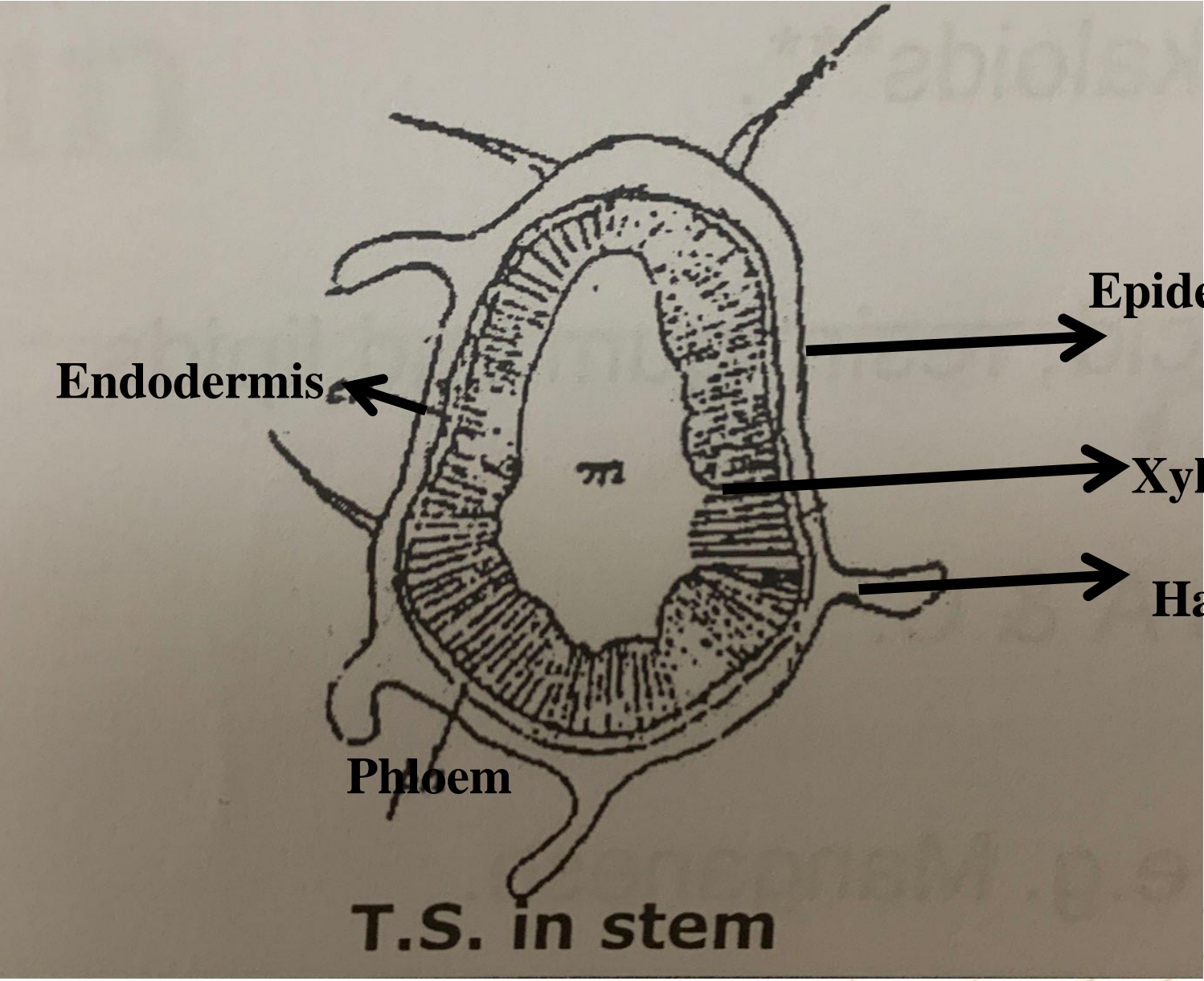
Flowers: Pale blue flowers



Fruits: Capsule containing about 500 small seeds.

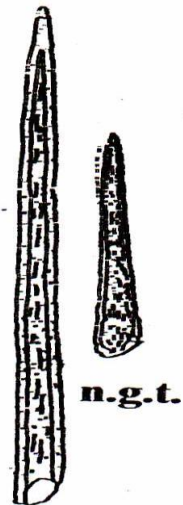
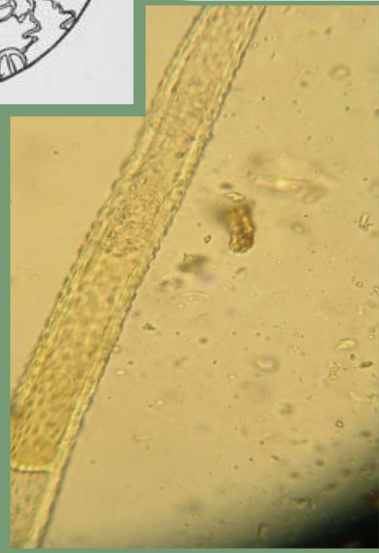
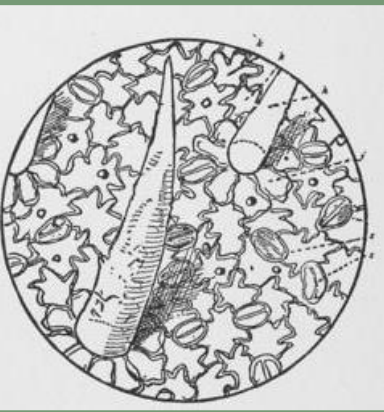


Seeds: 0.5 mm long and 0.3 mm wide, reddish-brown with reticulate surface.

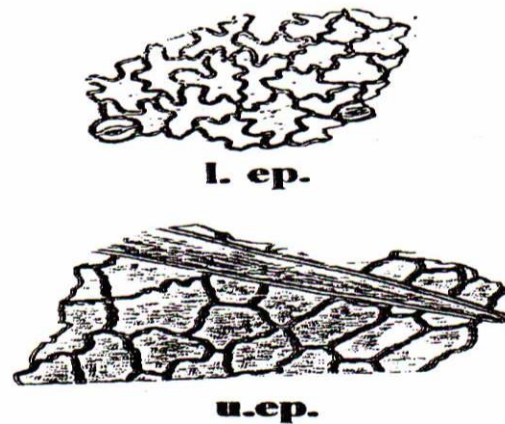


Powder:

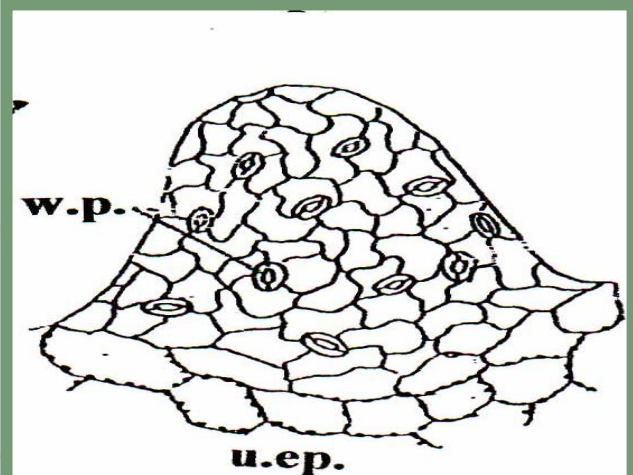
1- Non glandular hairs (conical, unicellular with lignified inner walls).



2- Fragments of leaves showing beaded papillose epidermal cells, anomocytic stomata and hairs.



5- Fragments of upper epidermis of leaves showing water pores.

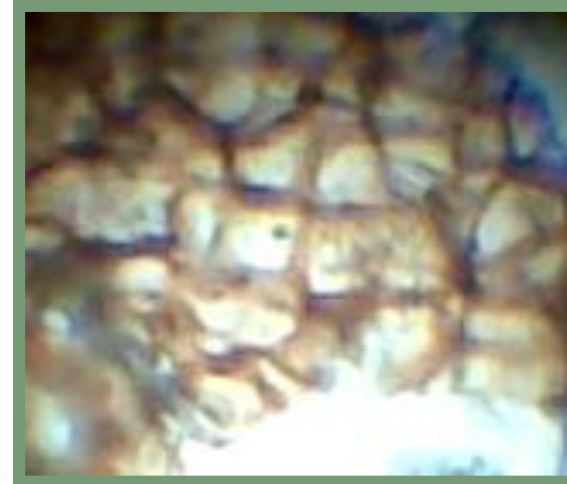
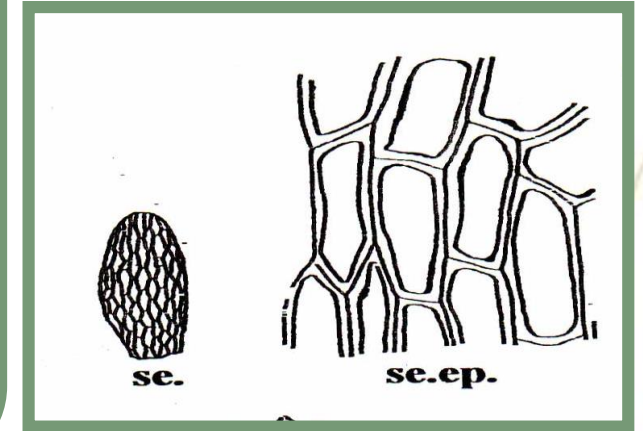


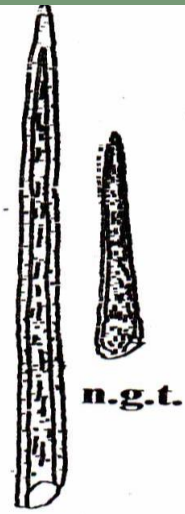
Powder:

4-Laticiferous vessels



3- Fragments of seed coat showing the characteristic thick-walled, lignified cells.



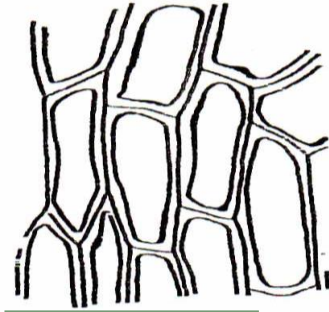


n.g.t.

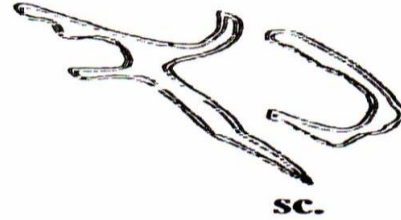
Non glandular trichome



sc.



Seed coat



sc.



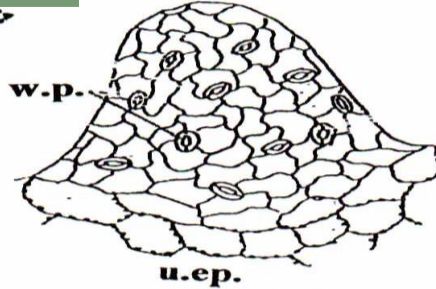
p-g.



p.c.

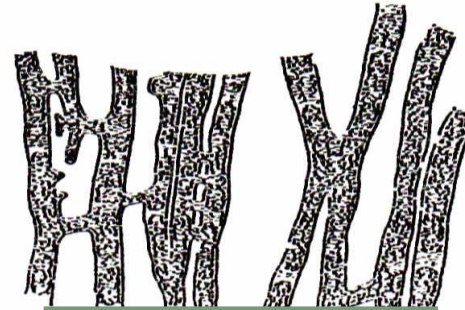


f.l.



w.p.

u.ep.



Laticiferous vessels



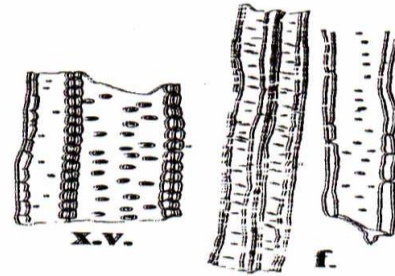
l.ep.



s.ep.



u.ep.



x.v.

f.

Lobelia powder

**ACTIVE
CONSTITUENTS**

1-Alkaloids (0.25-0.4%) Lobeline, lobelidine, lobelanine and isolobelanine.

↙
3-Lobelic acid

2-Neutral principle inflatin



USES:

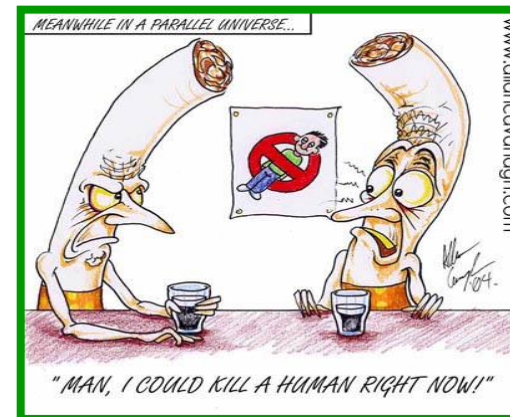
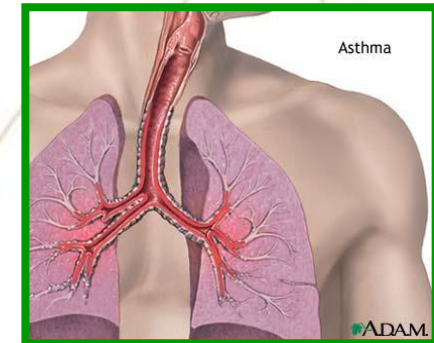
1-Expectorant

2-An injection of lobeline HCl is used for resuscitation in new born babies.

3-Inbronchitis& bronchial asthma as it dilates the bronchioles.

4-Breaking of smooking habbit

Some lobelia species used in cancer



ERGOT

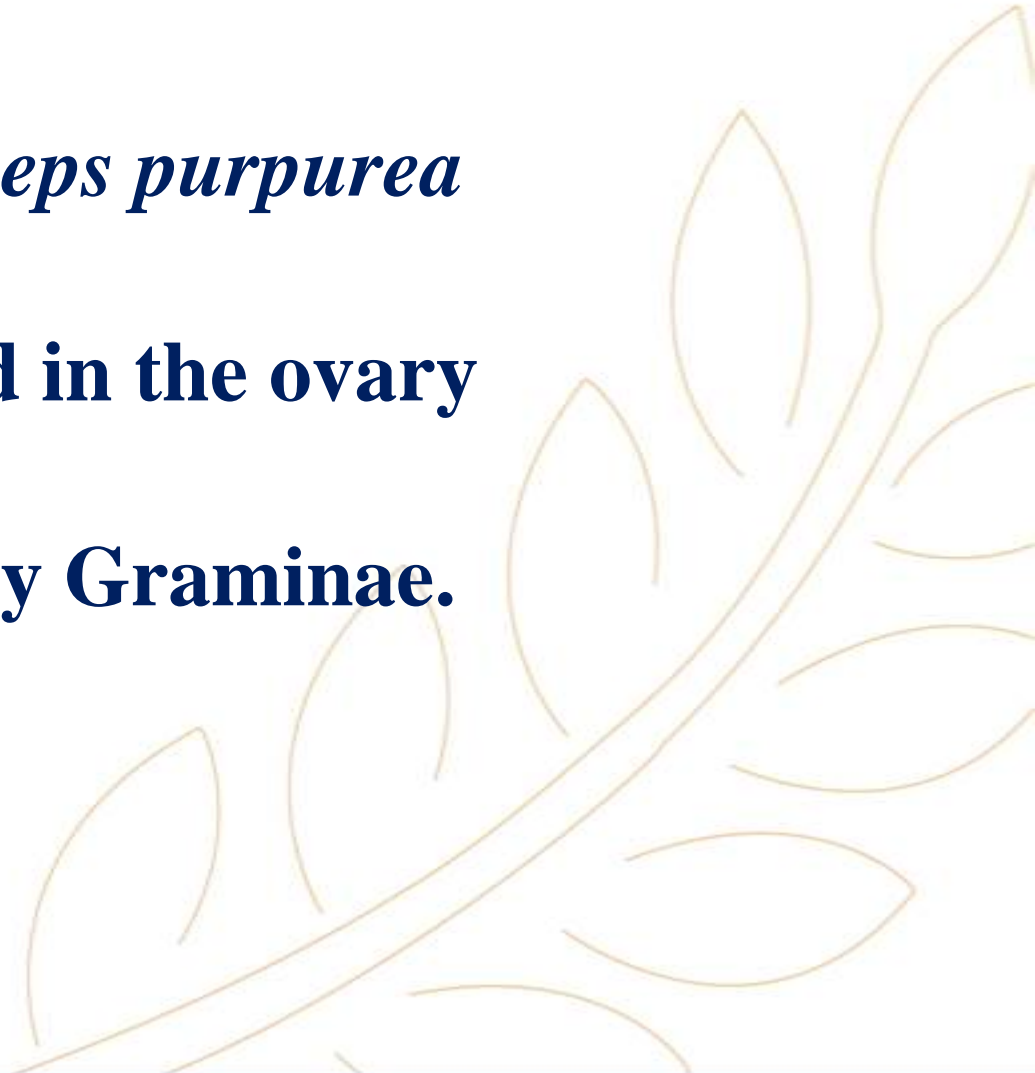
Ergot of Rye

Ergot is the Sclerotium of *Claviceps purpurea*

Family Hypocreaceae, developed in the ovary

of rye plant, *Secale cereale* family Graminae.

What is ergotism?



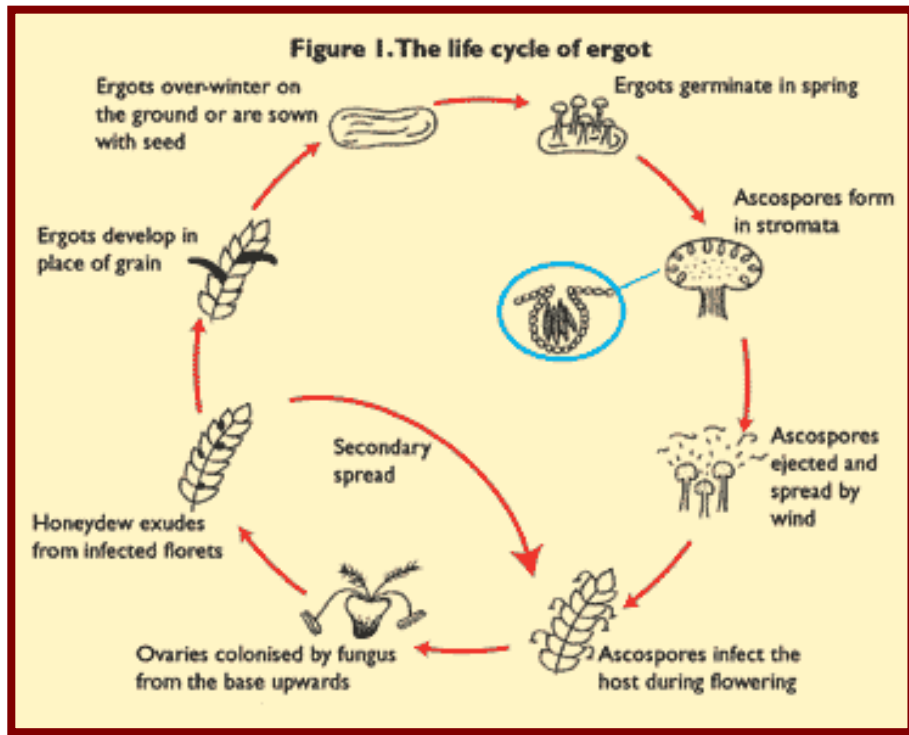


PLATE XXXVII.—*Claviceps purpurea* (Rye ergot). (From Jackson: *Experimental Pharmacology and Materia Medica.*)

ACTIVE CONSTITUENTS
&
USES

A- Alkaloids

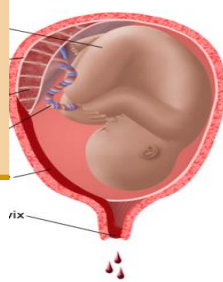
**B - LSD (lysergic
acid diethylamide)
a hallucinogenic drug
(illegal)**

**C- Ergosterol
used in synthesis
of Vit. D**

A- Alkaloids

1- Ergometrine alkaloid:

- It stimulates the uterus → initiate delivery (labor)
- It reduces postpartum haemorrhage



2- Ergotamine alkaloid:

- Used for the treatment of migraine.
- Used in combination with caffeine to treat headache



3- Ergotoxine alkaloid:

It has antihypertensive action



Pharmaceutical Preparations Containing Ergot Alkaloids



CHEMICAL TESTS

1- Test for Chitin



Digest the sclerotium with NaOH to give chitosan, acetic acid and ammonia.

Chitosan + Iodine + H₂SO₄ gives violet colour.

2-Test for colouring substance

Shake the ergot with ether & 5 drops of H₂SO₄, add NaHCO₃ and shake well where a reddish violet colour is given in the aqueous layer (used to detect ergot in flour).

3- Test for ergotoxin (Van Urk)

Shake the ergot with Na₂CO₃ and CHCl₃. Separate the chloroform layer and shake it with PDMAB and FeCl₃ in H₂SO₄ where a blue colour is developed in the acid layer.

CANNABIS HERB

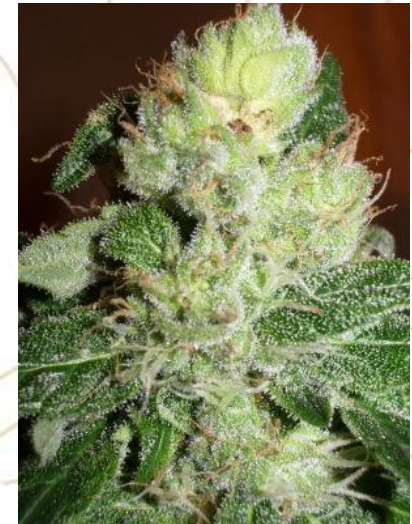
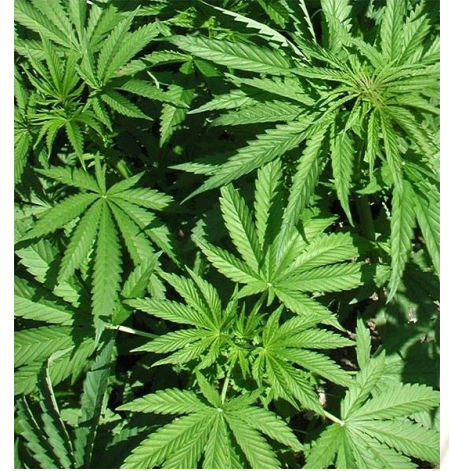
(Indian Hemp, Hashish, Marihuana)

Origin: Is the dried pistillate plants

(leaves and flowering tops) of

Cannabis sativa Family Cannabinaceae.

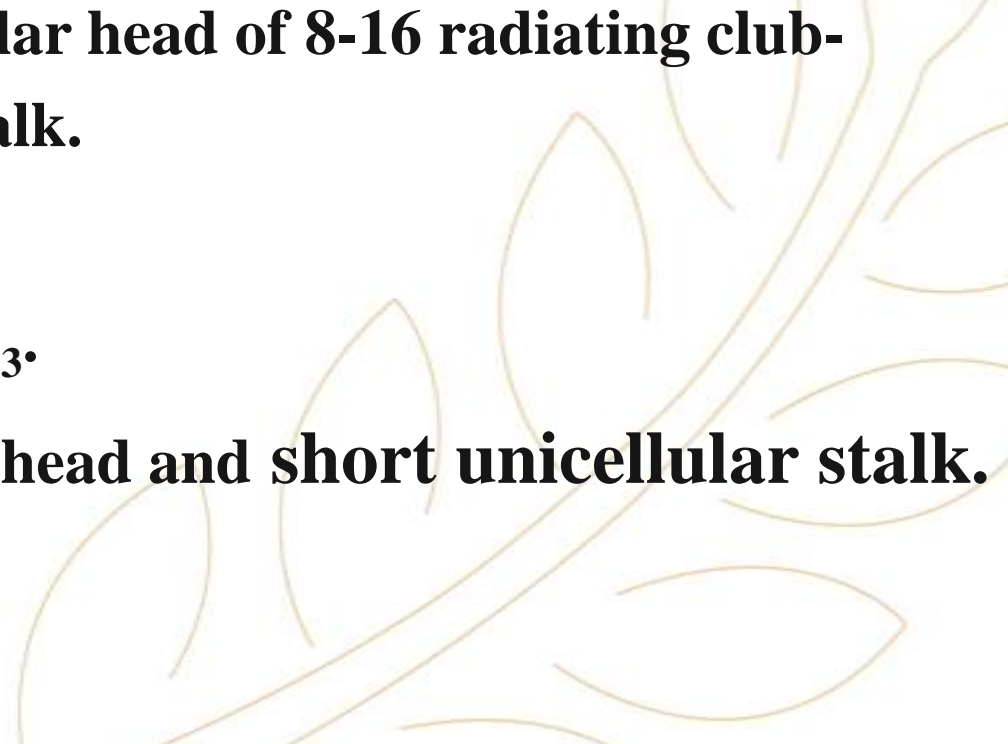
- The plant is cultivated in tropical countries for resin production.
- In temperate region it produces less or no resin but more fibers.



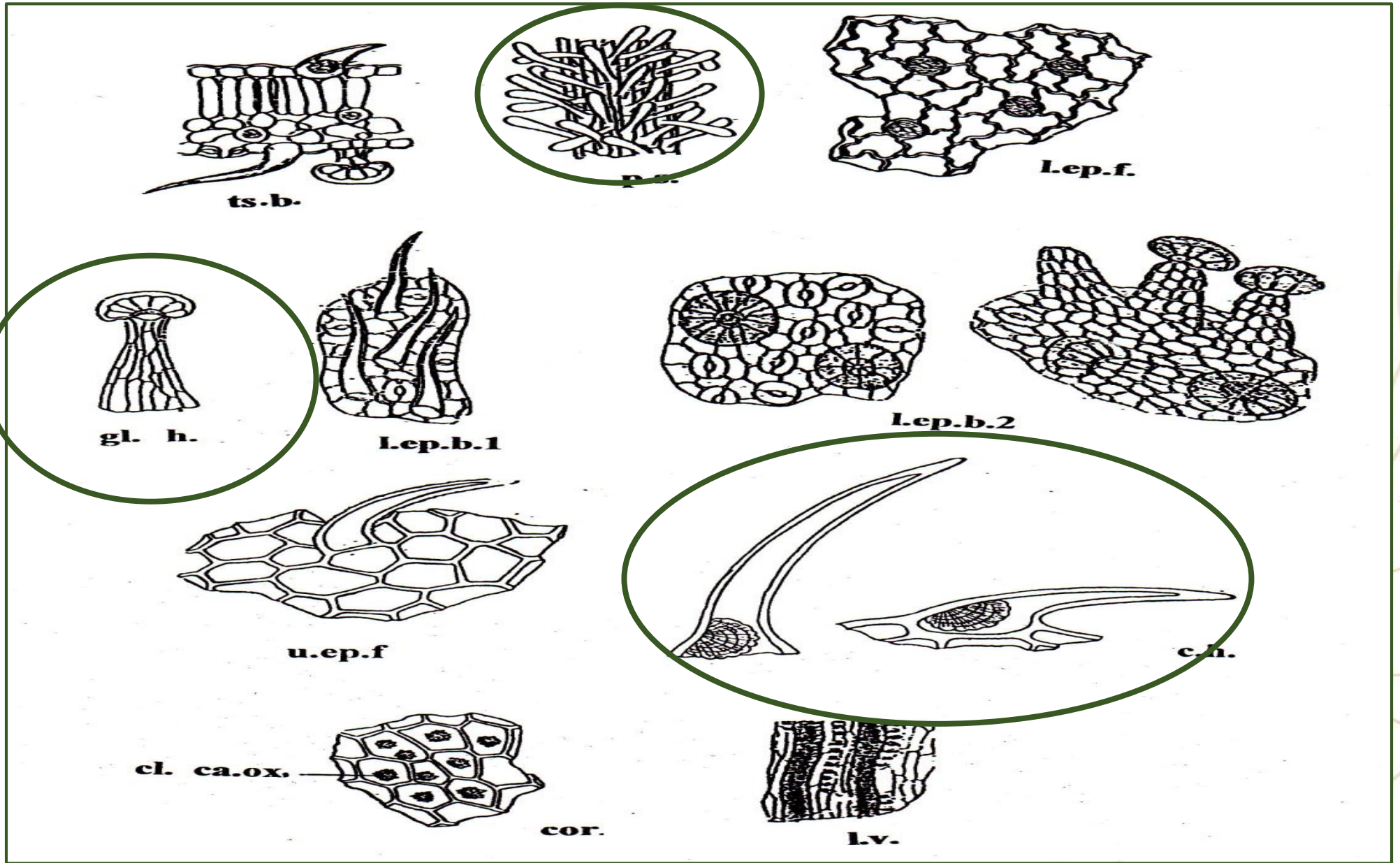
Powdered cannabis

- **Colour:** dark green
- **Odour:** narcotic characteristic
- **Taste:** No taste.

Microscopical characters of the powder:

- **1-Glandular trichomes showing globular multicellular head of 8-16 radiating club-shaped cells and a long multicellular pluriseriate stalk.**
 - **2- leaf tissue with cluster crystal of Ca Ox.**
 - **2- Curved hairs with or without cystolith of CaCO₃.**
 - **3- Glandular trichomes with labiate glandular head and short unicellular stalk.**
 - **4- Papillosed stigma.**
 - **5- Laticiferous vessels and pericyclic fibers.**
- 

Powdered cannabis



1-Resin materials , tetrahydrocannabinol and cannabinoids e.g. cannabidiol & cannabinal

2-Nitrogen bases e.g. choline, trigonelline

ACTIVE CONSTITUENTS

3-Volatile oil, oxidase enzyme

4-Sterols

Cerebral stimulant, it produces mental excitement , delirium with hallucination followed by sleep interrupted by bad dreams & marked weakness & mental depression, high sensitivity to sound and less to time & space.

**Anti anxiety & sedative
in mania & hysteria**

USES & ACTIONS

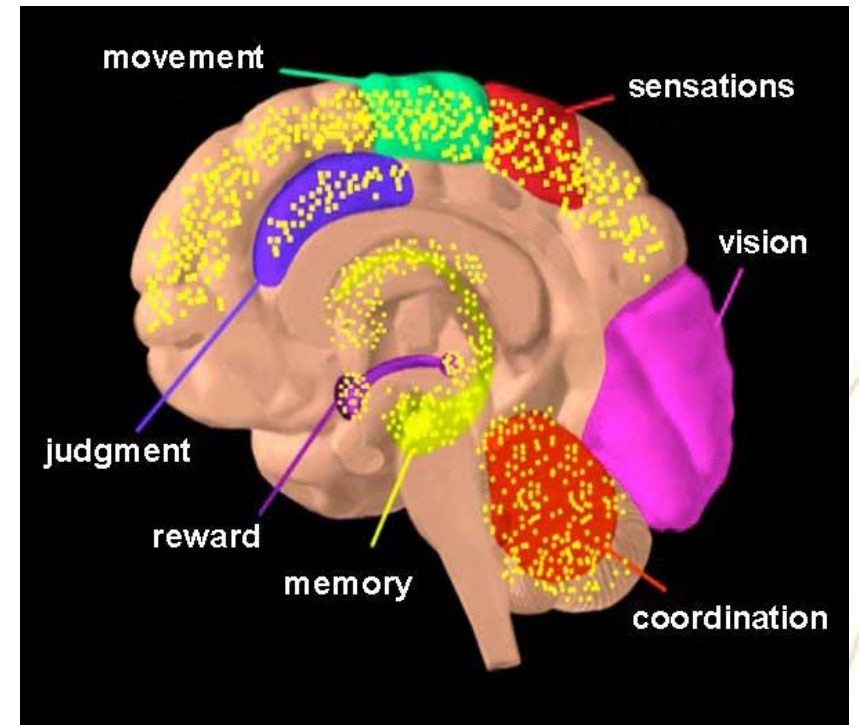
Analgesic

THC is a potent anti-emetic used in cancer patients

Side Effects

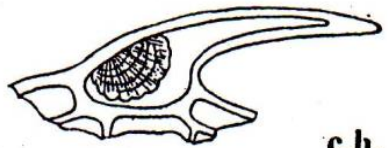
❑ Short term side effects may include a decrease in short-term memory, dry mouth, impaired motor skills, red eyes, and feelings of paranoia or anxiety

❑ Long term side effects may include addiction, decreased mental ability in those who started as teenagers, and behavioral problems in children whose mothers used cannabis during pregnancy.



CHEMICAL TESTS

1- Powder+ HCl produces eff. due to Calcium carbonate in cystolith.



c.h.

2- Beam's test:
Cannabis shaken with light petrol and alc. KOH and amyl alcohol give violet pink colour.

3- Fast blue test:
(di-O-anisidine tetrazolium chloride)

Biological samples + Fast Blue reagent

Different sequences of colours with different cannabinoids



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Established by Dr.Nawal El Degwi
October University for Modern Sciences and Arts
جامعة أكتوبر للعلوم الحديثة والآداب

Thank You!

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