East Point College of Pharmacy

East Point Campus, Jnana Prabha, Virgo Nagar Post
Bengaluru – 560049, Karnataka

Approved
by
Pharmacy Council of India, New Delhi

Affiliated
to
Rajiv Gandhi University of Health Sciences
Karnataka
Bengaluru – 560 041
India

LAB MANUAL

PHARMACOGNOSY & PHYTOPHARMACEUTICALS
PHARM D
2nd Year

EAST POINT COLLEGE OF PHARMACY
East Point Campus, Jnana Prabha, Virgo Nagar Post,
Bengaluru – 560049, Karnataka

PROGRAM SPECIFIC OUTCOMES	
DOCTOR OF PHARMACY	
PSO1	Acquire a thorough foundational knowledge in pharmaceutical sciences, including pharmacology, pharmaceutics, pharmaceutical chemistry, pharmacognosy and pharmaceutical analysis to excel in further academic pursuits
PSO2	Acquire and apply the pharmacotherapeutic concepts for better patient care enhancing employability across various sectors including clinical research organizations, academic and hospitals
PSO3	Equip with entrepreneurial skills and knowledge of pharmacoepidemiological studies and regulatory aspects to initiate and run successful ventures in the healthcare sector

Course:	**Code: 2.3P** **Pharmacognosy and Phytopharmaceuticals**
CO1	To identify morphology of crude drugs
CO2	To perform the powder and microscopic of crude drugs
CO3	Analyze the crude drugs by chemical test
CO4	To carry out the transverse section of plant parts to understand the arrangement of cells and tissues

EAST POINT COLLEGE OF PHARMACY
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Experiment No.:1

AIM: To study the compound microscope

REQUIREMENTS: Compound Microscope, Permanent slide (or any other specimen).

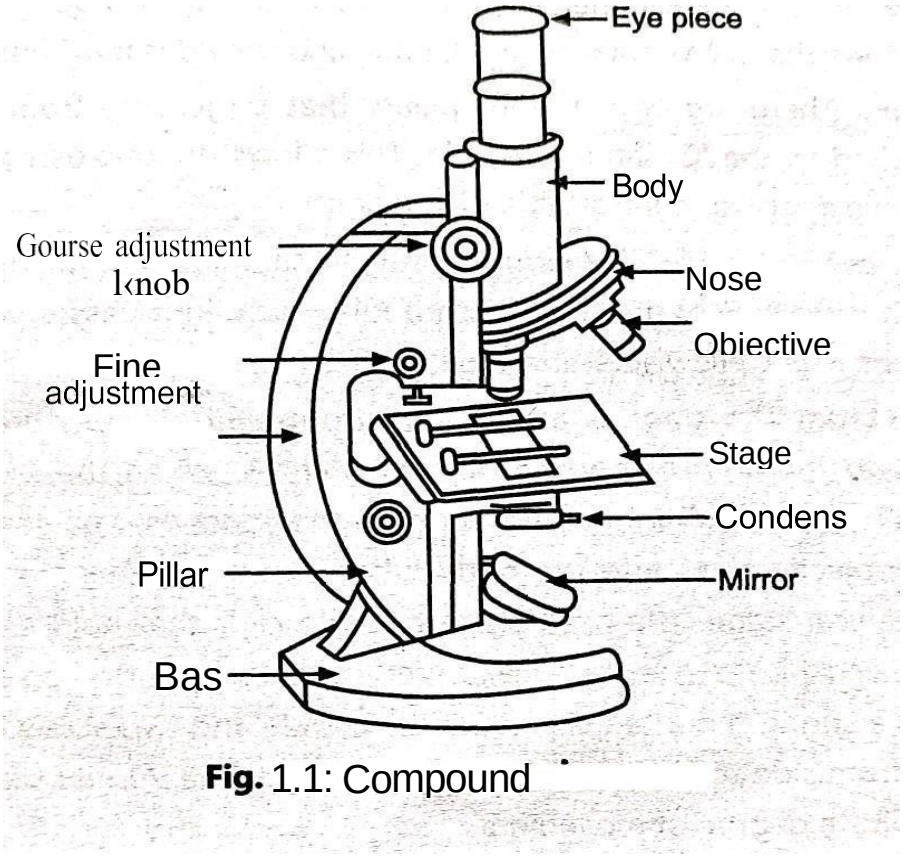


Fig. 1.1: Compound

Theory:

The microscope is one of the most commonly used instruments in medical, paramedical and clinical laboratories. It is used to study Cell Morphology, Histology, Histopathology and Microbiology. A microscope helps us to see microscopic objects that are too small and invisible to the naked eye.

Description of Compound Microscope:

The Compound microscope has the following main parts

1. The supporting system.
2. The focusing system.
3. The optical or magnifying system.
4. The illumination system including:

a) Source of light
b) Mirror
c) Condenser

1. **The support system**: It is a framework to which various functional units are attached. It consists of the following:

a) **Base:** it is a heavy metallic, 'U' shaped or 'horseshoe' shaped base with supports the microscope on work table and provides maximum stability.

b) **Pillars:** There are two upright pillar that project up from the base and are attached to the 'C' shaped handle. This allows the microscope to be tilted at a suitable angle for comfortable observation.

c) **Body tube:** It is 16-17 cm long cylindrical tube fitted at the upper end of handle which is vertical or at an angle through which light passes via the eye piece to the observer's eye visualizing the image

d) **The stage:** The stage is a square platform with an aperture in its centre and fitted to the limb below the objective lenses. When the slide is placed on it, converging rays of light emerging from the condenser passes through slide and then objective lens into the body tube. It can be either the fixed stage or the mechanical stage. The fixed stage has two clips that hold the slide in position. The mechanical stage has a calibrated metal frame fitted on right side of stage. It has a spring mounted clip to hold the slide and two screw heads to move the slide from side to side, forward and backward. The Vernier scale is also attached to indicate degree of movement

The focusing system: The focusing system consists of coarse and fine adjustment and screw heads are used for raising and lowering body tube for proper focusing the slide. The coarse adjustment moves the focusing system up or down through a large distance via a rack. The fine adjustment works in same way which requires several rotations to move the tube through a small distance. It is employed for accurate focusing.

The optical or magnifying system: It consists of body tube, eyepiece and the nosepiece. The body tube is the present between upper end of objective and eyepiece. The eyepiece fits into top of body tube. They can be 5X, 6X, 8X, 10X or 15X. Each eyepiece has two lenses; the eye lens at the top and field lens at the bottom. The field lens collects divergent rays, passes through eye lens to further magnify the image. The Nosepiece has two parts; the fixed nosepiece and the revolving nosepiece. The fixed nosepiece holds the revolving nosepiece that carries interchangeable objective lenses. The objective lenses are spring loaded objectives of different magnifying powers.
Different types of the objective lenses are low power objective or 10X, high power objective or 45X, oil İmmersion objectives Of 100X and scanning objective 3X.

Magnification: Magnification is the ability to make small objects seen larger, such as making a microscopic organism visible. The objective lenses magnify the images as stated below:

Low power objective 10X = 10 x 10 = 100 times. High power objective 45X = 45 x 10 = 450 times.

oil immersion objective (100X) = 100 x 10 = 1000 times.

oil immersion (100X) objective has very small aperture and deep focusing position i.e. 1 mm from the slide. The light rays coming from the slide (denser medium) are refracted by thin layer of air (rarer medium) away from the small aperture of the objective and results in faint image. If some other medium like cedar wood oil, paraffin or glycerin having same refractive index as that of glass is added on the slide, it removes the thin layer of air and forms a continuous medium. This avoids the refraction of light rays and results in sharp image.

2. **The illumination system:** The microscope will function only when proper illumination or lightning is provided. The illumination system is to provide uniform, soft and bright illumination.
The illumination system consists of:
(a) **Source of light:** It may be external (natural day light, electric lamp or tube light) or internal (electric in-built light source).

(b) **A condenser:** It is a system of lenses filled as short cylinder mounted below the stage.

(r) **Mirror**: A double sided mirror with one flat side and other concave is located below condenser and can be rotated in all directions. It focuses light rays into a solid cone of light onto the material under study and helps in resolving image.

(d) **Iris diaphragm:** Iris diaphragm is a thin opaque membranous structure fitted within condenser with a small lever on the side. The lever can adjust size of aperture of diaphragm and allows less or more light falling on slide,

Procedure:

1. Examine the permanent slide/blood film/specimen first with naked eye.
2. Place the microscope on working table in an upright position, and raise the body tube approximately 7-8 cm above the stage. Put the slide on the stage and using the mechanical stage, bring the specimen over the central aperture.

3. Select the low magnification objective (10X). ‘

4. Select and adjust the mirror (plane or concave) so that the light shines on the specimen 5.Adjust the condenser well down, and partly close the diaphragm to cut down excesslight.

6. Looking from the side, and using the coarse adjustment, brings the body tube down so that the low power lens is about 1 cm above the slide. Look into eyepiece and gently raise the tube till the slide tomes into focus.

7. Then choose the area of interest for viewing it under higher magnifications.

8. For focusing under high magnification, simply rotate the nosepiece so that the high magnification objective (45X) ’clicks’ into position. Raise the condenser to mid position and open the diaphragm to admit enough light. Use fine adjustment as required.

9. For focusing under oil immersion objective (1O0X}, raise the body tube 8-10 cm above De slide. Place a drop of cedar wood oil, paraffin or glycerin on &e slide. Looking from the side bring down the objective till it just enters the oil drop. Use other adjustment as required.

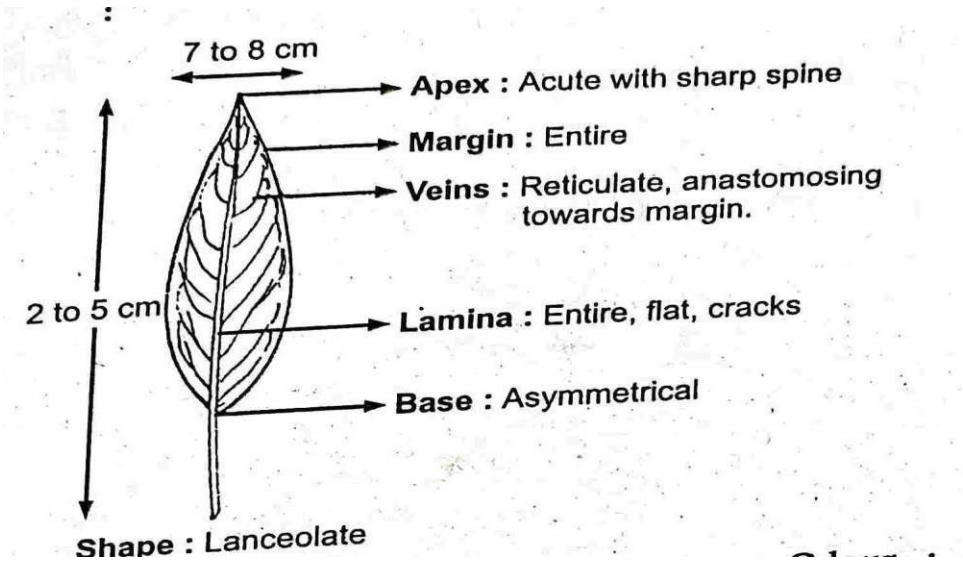
Experiment No.:2

AIM: To study the macroscopic and microscopic study of the Senna Leaf.

SYNONYMS: Senai ki patti, Sonamukhi, Tinnevelly senna.

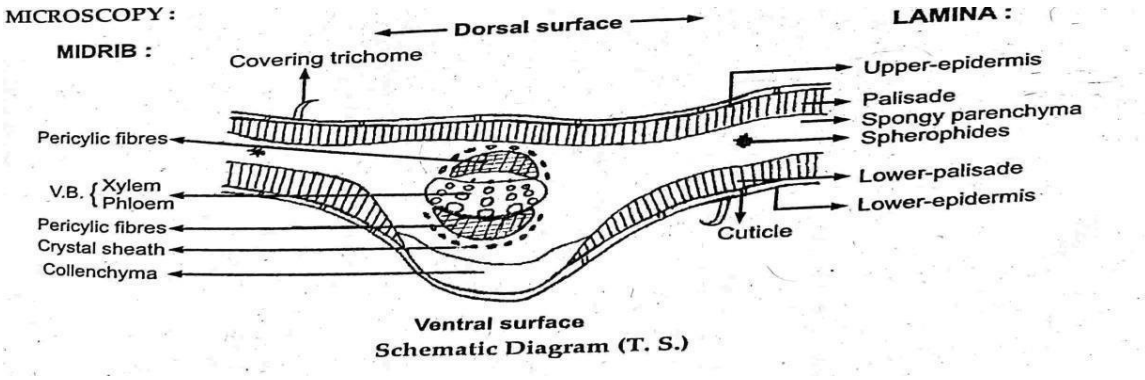
BIOLOGICAL SOURCE: It consists of dried leaflet of cassia angustifolia Vahl. Belonging to family Leguminosae and contained not less than 2.0% of glycosides calculated as Sennoside B.

Macroscopy:



Organoleptic CHARECTERS: Colour: Yellowish, **Odour:** slight, **Taste:** Mucilaginous, slightly bitter.

EXTRA FEATURES: Surface: Isobilateral, thin, pubescent (hairy) with trichromes on both surfaces.

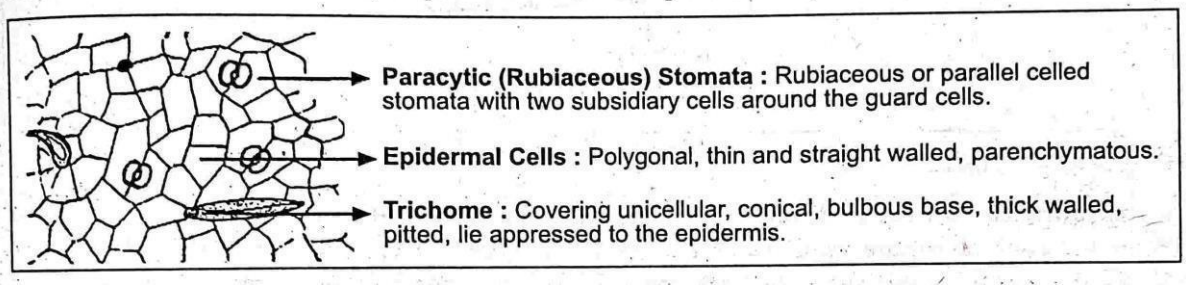


Schematic Diagram (T. S.)

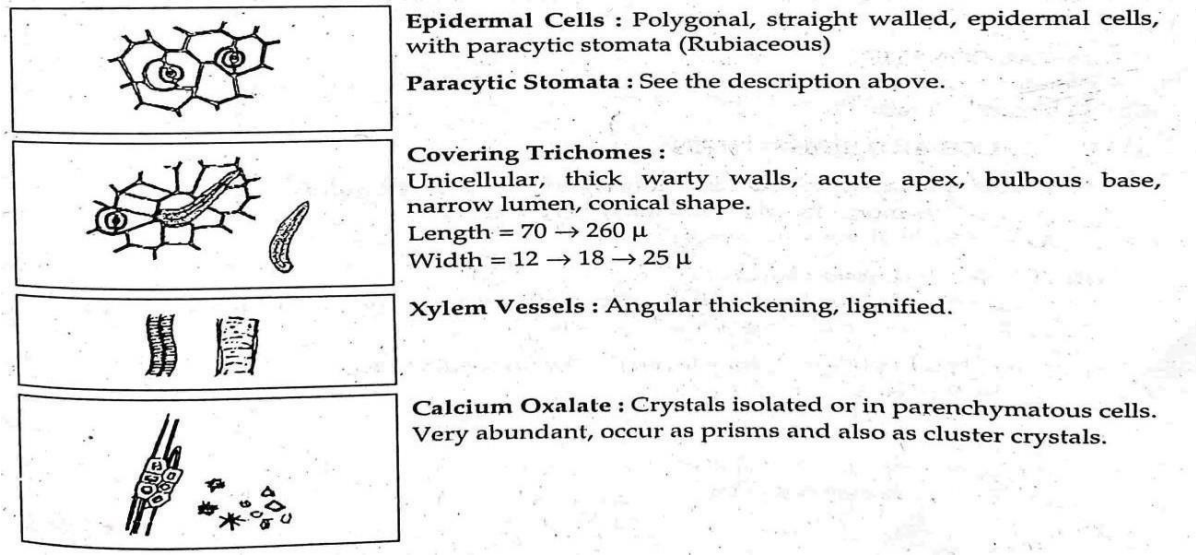
STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+ Conc.HCl(1:1)	RED/PINK	Lignified tissues:xylem (vascular bundle),sclerenchyma (pericycle)
2.	Ruthenium red	RED/PINK	Mucilaginous cellsof epidermis
3.	Sudan red III	pink	Cutin/cuticle
4.	Acetic acid	Crystal insoluble	Calcium oxalate
5.	Hydrochloric acid	Crystal soluble	Calcium oxalate
6.	Sulphuric acid (60%)	Crystal soluble	Calcium sulphate needles

SURFACE PREPARATION : (For procedure see the topic LEAVES)



MICROSCOPIC CHARECTERISTICS OF THE POWDER DRUGS:



Epidermal Cells : Polygonal, straight walled, epidermal cells, with paracytic stomata (Rubiaceous)

Paracytic Stomata : See the description above.

Covering Trichomes :
Unicellular, thick warty walls, acute apex, bulbous base, narrow lumen, conical shape.
Length = 70 → 260 μ
Width = 12 → 18 → 25 μ

Xylem Vessels : Angular thickening, lignified.

Calcium Oxalate : Crystals isolated or in parenchymatous cells. Very abundant, occur as prisms and also as cluster crystals.

CHEMICAL TEST:

BRONTRAGER TEST FOR ANTHRAQUINONE: boil the leaves with dil.sulphuric acid. Filter and cool the filtrate. Add immiscible organic solvent layer in another test tube. add strong ammonia solution, shake slightly and keep the test tube aside , lower ammonical layer shows pink/ red colour.

Chemical constituents: Mainly anthraquinone glycosides: Sennosides A, B, C, D.

Uses: Irritant purgative.

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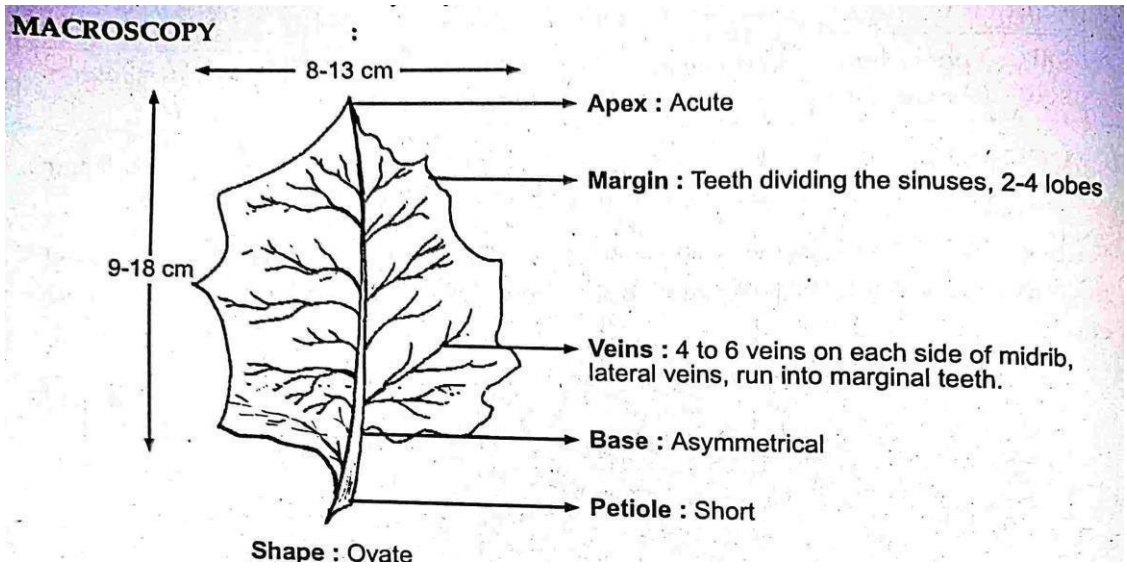
Experiment No.:3

AIM: To study the macroscopic and microscopic study of the Datura Leaf.

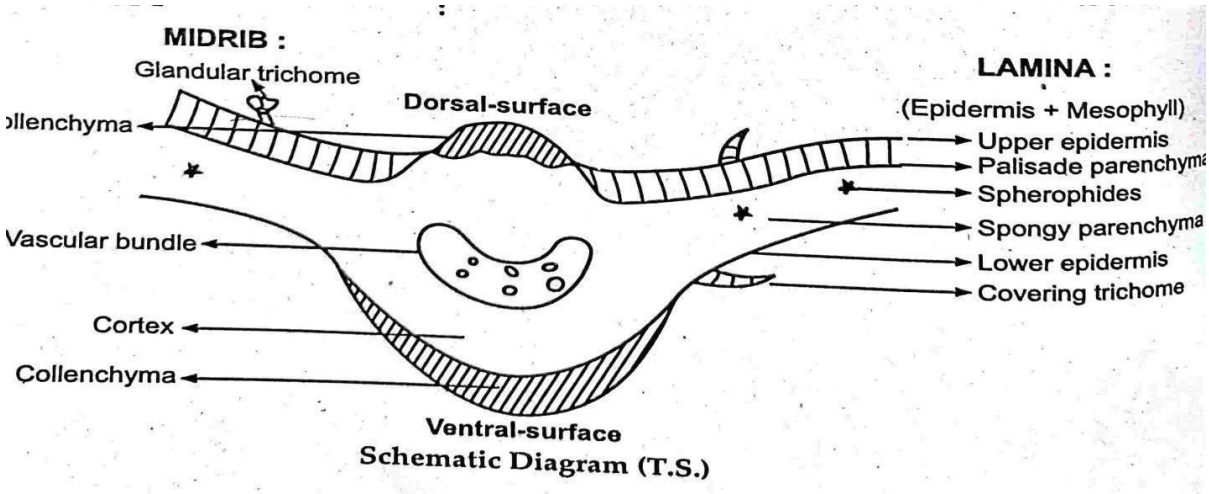
Synonym: Datura herb

Biological Source: Datura mainly consists of the dried leaves an dflowering tops of the Datura metel Family : Solanaceae. It contains not less than 0.2% of total alkaloids calculated as Hyoscyamine.



ORGANOLEPTIC CHARECTERISTIC: Colour: Pale green, **odour:** disagreeable characteristic **Taste:**
unpleasant bitter.

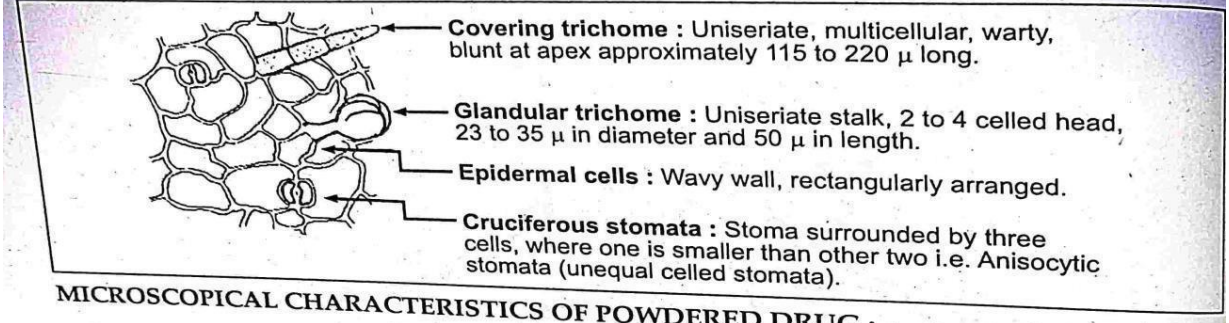
EXTRA FEATURES: Texture: Thin and minutely hairy upper epidermis darker than lower, midrib prominent on lower surface.



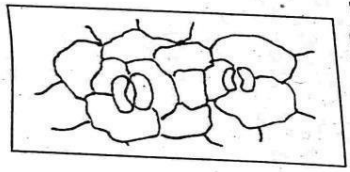
STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Dill Acetic acid	insoluble	Calcium oxalate
3.	Sulphuric acid (60%)	Crystal soluble	Calcium sulphate needles

SURFACE PREPARATION : (For procedure see the topic LEAVES)



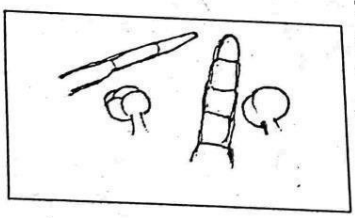
MICROSCOPICAL CHARACTERISTICS OF POWDERED DRUG :



STOMATA AND EPIDERMAL CELLS

Cruciferrous Stomata (Anisocytic) : See above

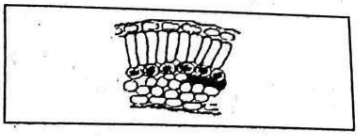
Epidermal cells : Slightly straight in upper epidermis, wavy walled in lower epidermis.



TRICHOMES

Covering Trichome :
Uniseriate, multicellular, wavy covering trichomes with blunt apex.
Length= approximately 115 to 200 μ.

Glandular Trichome :
One celled stalk and 2-4 celled head.
23 to 35 μ in diameter and 50 μ in length.



LAMINA / MESOPHYLL

Palisade Parenchyma : Elongated, compactly arranged, Cal. oxalate crystals (spherophides), vascular element, Spongy parenchyma.

CALCIUM OXALATE CRYSTALS

Spherophide Crystals : Occur in spongy parenchymatous cells and scattered in the powder.

CHEMICAL TESTS:

1. Vitali Morin reaction: The tropane alkaloid is treated with fuming nitric acid, followed by evaporation to dryness. Addition of methanolic pottassiu hydroxide solution to an acetone solution of nitrated residue, Violet colour is developed.
2. On addition of silver nitrate solution to solution of hyoscine hydrobrobide, yellowish white precipitate is formed which is insoluble on nitric acid, but soluble in dil. Ammonia solution.

CHEMICAL CONSTITUENTS: Upto 0.5% of total alkaloids Scopolamine (hyoscine) is the main alkaloid. Hyoscyamine and atropine are present in minor quantities.

USES: Parasympatholytic with anticholinergic and CNS depressant effect. Also used as mydriatic , antispasmodic and cerebral sedative. Hyoscine hydrobromide is used in motion sickness, gastric or duodenal ulcer.

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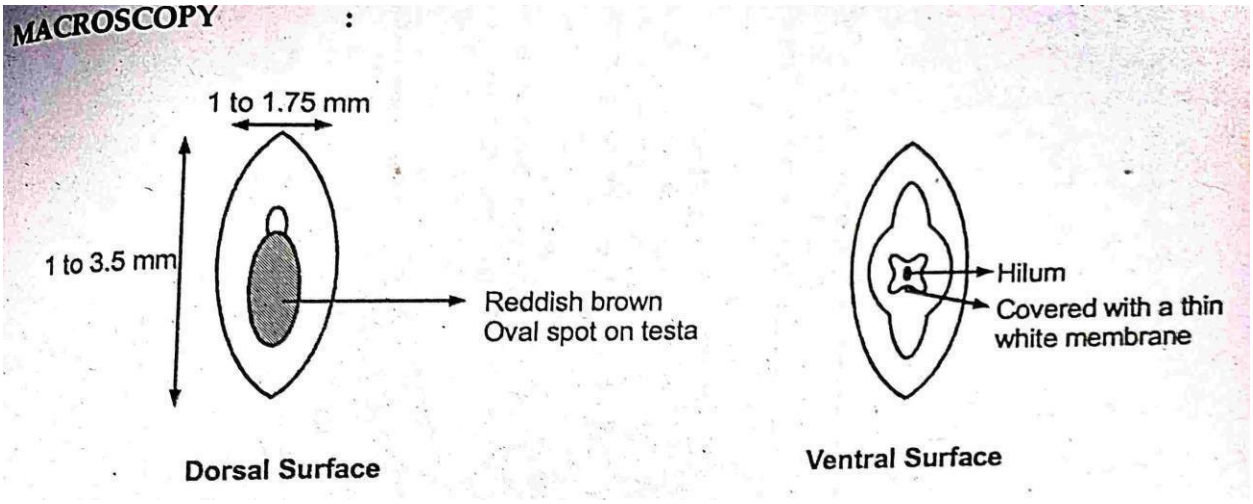
Experiment No.: 4

AIM: To study the macroscopic and microscopic study of the ISAPGOL

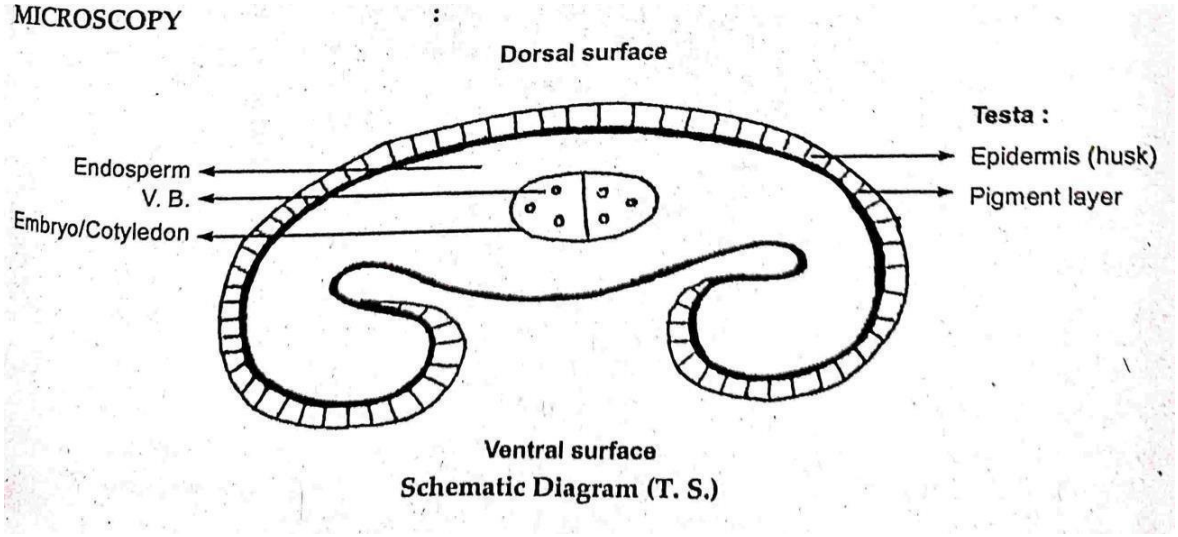
Synonym: Isapghula, Isapgol, Indian Psyllium

Biological Source: Dried seeds of Planago ovate Forsk Family: Plantaginnaceae.



ORGANOLEPTIC CHARECTERS: Colour: Pinkish grey to brown, **odour** : none, **taste :** Mucilaginous.

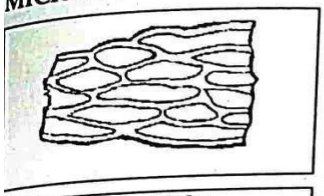
EXTRA FEATURES: Testa is hard, translucent and smooth, Weight of 100 seeds = 0.15-0.19 gms, **Swelling factor**= 10.25-13.50



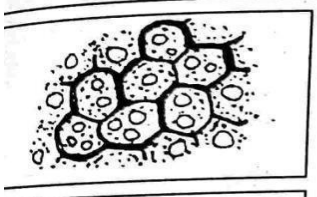
STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+ Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Ruthenium Red	Red	Mucilage present in epidermis
3.	Alcoholic Picric acid	Yellow	Aleurone grains present in the cells of endosperm and embryo
4	Sudan Red III	Red	Oil globules presentin the cells of endosperm and embryo

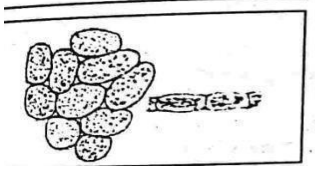
MICROSCOPICAL CHARACTERISTICS OF POWDERED DRUG :



Epidermis : Thick walled transparent, polyhedral to tangentially elongated cells, containing mucilage. The very occasional starch granules, which are present in some of the epidermal cells and may be found embedded in the mucilage. They are very small and simple or compound.



Endosperm : Thick walled cells with numerous pits. Oil globules show red colour with Sudan Red III.
Aleurone grains show yellow colour with alcoholic picric acid solution.



Pigment Layer : Yellow pigment layer.

CHEMICAL TESTS:

TEST	OBSERVATION	INFERENCE
Seeds on slide + water	Zone of mucilage is formed around each seed	Mucilage present
Powder+ Water	Forms jelly like mass	Mucilage present

CHEMICAL CONSTITUENTS: Mucilage 10%, carbohydrates, fixed oil, proteins.

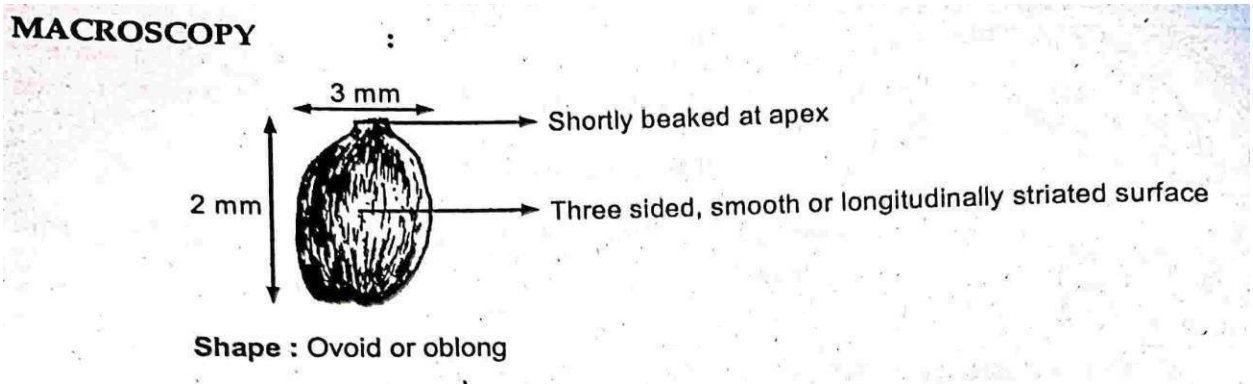
USES: demulcent, laxative in chronic constipation. Mucilage is used as a coating materials binding agent etc.

Experiment No.-5

AIM: To study the macroscopic and microscopic study of the CARDAMOM

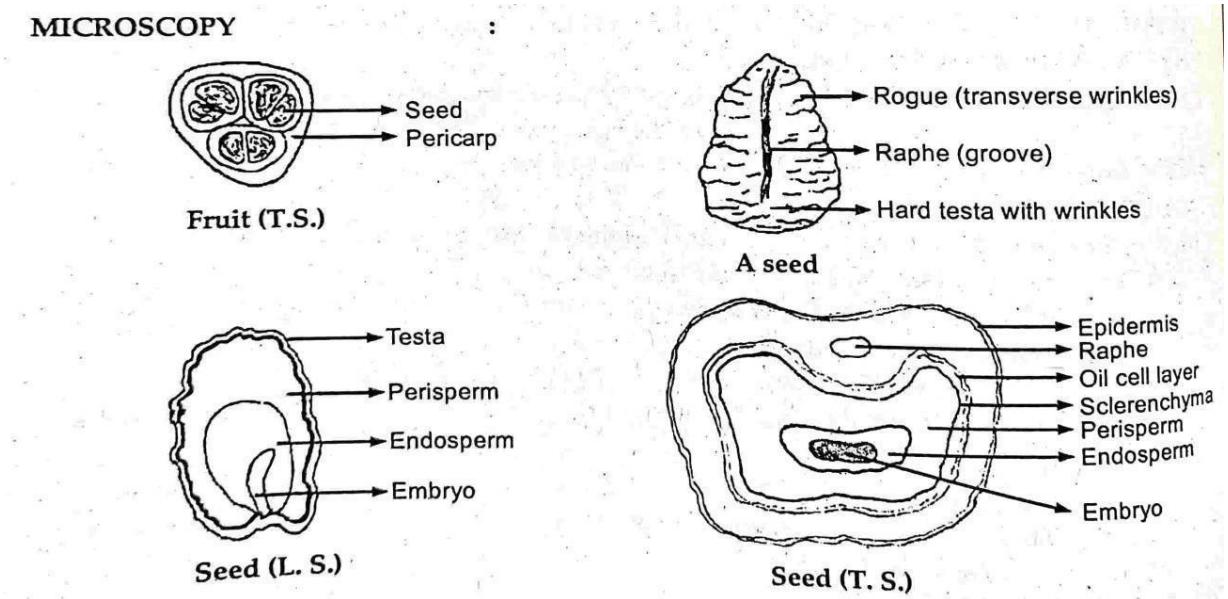
Synonym: Chotti - Ilaychi

Biological Source: It consists of dried, nearly ripe fruit of Elettaria cardamomum Var. Family: Zingiberaceae. Seeds contain of less than 4% of volatile oil.



ORGANOLEPTIC CHARECTERS: Colour: Pericarp,: Green to pale buff, Seeds: pale to reddish brown , **odour:** strongly aromatic and characteristic, **taste:** strongly aromatic.

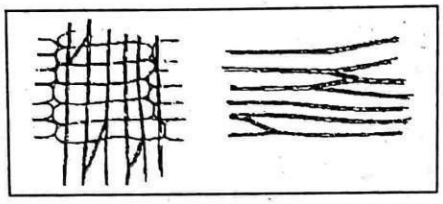
EXTRA FEATURES: fruits contain three chambers, each consists of two rows of seeds. Seeds are enclosed in membranous arillus. Each chamber contains six to ten seeds in two rows.



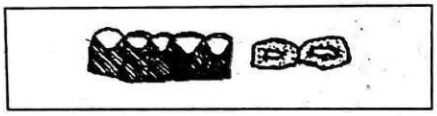
STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+ Conc. HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	SULPHURIC ACID (60%)	RED	Calcium oxalate
3.	Dil. Iodine solution	BLUE	Starch present in perisperm
4.	Sudan Red III	RED	Oil globule
5.	Alcoholic picric acid	YELLOW	Aleurone grains

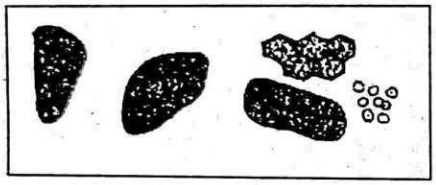
MICROSCOPICAL CHARACTERISTICS OF POWDERED DRUG :



Epidermis : Epidermal cells are straight walled, colourless to light yellow, parallel to each other, may be associated with oil cells.



Stone cells : Lignified, red to orange coloured fragments, cylindrical and elongated in side view and polygonal in surface view.



Perisperm : Thin walled cells with calcium oxalate crystals and starch grains.
Starch grains : 2 to 4 to 6 μ in diameter.
Calcium oxalate : 10 to 12 μ long. Scattered as well as in the cells of perisperm.

CHEMICAL CONSTITUENTS: **Volatile oils:** Cineol, limonene, borneol, L-terpenol, starch, fixed oil, silica.

USES: carminative, stimulant, aromatic, flavouring agent

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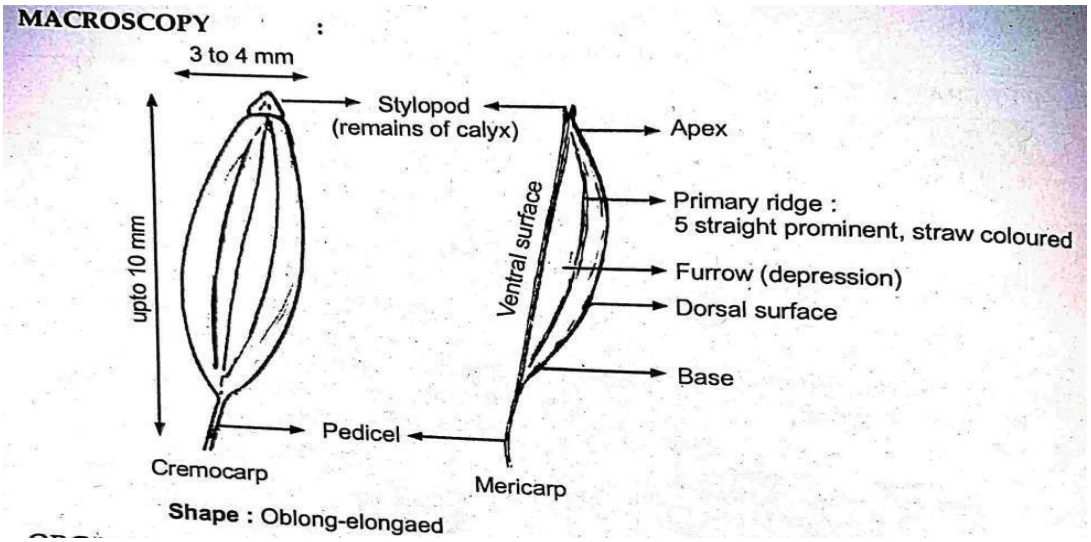
Experiment No.: 6

AIM: To study the macroscopic and microscopic study of the

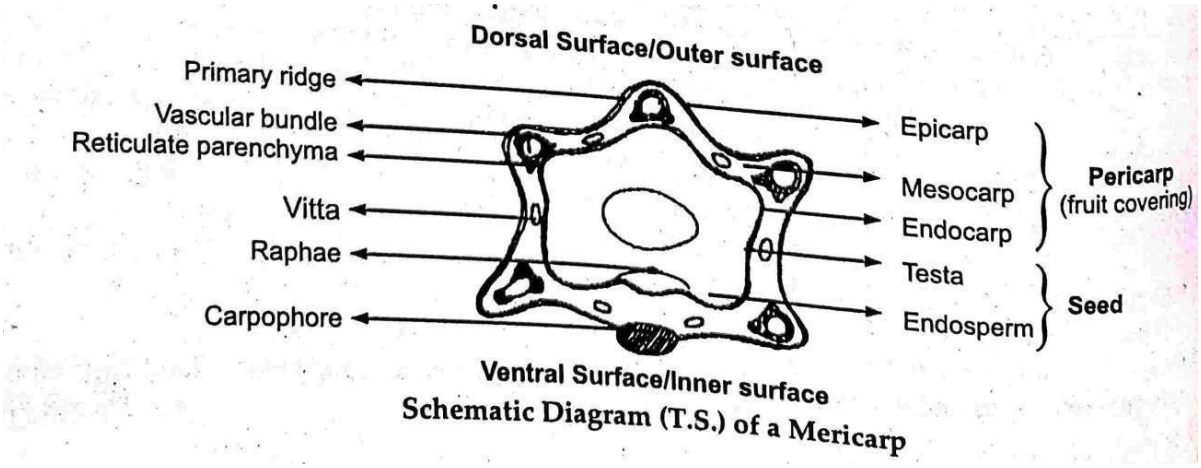
FENNEL Synonym: Bari sauf

Biological Source: Consists of dried ripe fruit of cultivated spices Foeniculum vulgare. It contains not less than 1.4% of volatile oil. **Family:** Umbelliferae.



ORGANOLEPTIC CHARECTERS: Colour: Greenish or yellowish brown **Odour**: sweet aromatic and characteristic, **Taste:** Sweet, mucilaginous, agreeable, aromatic and characteristic.

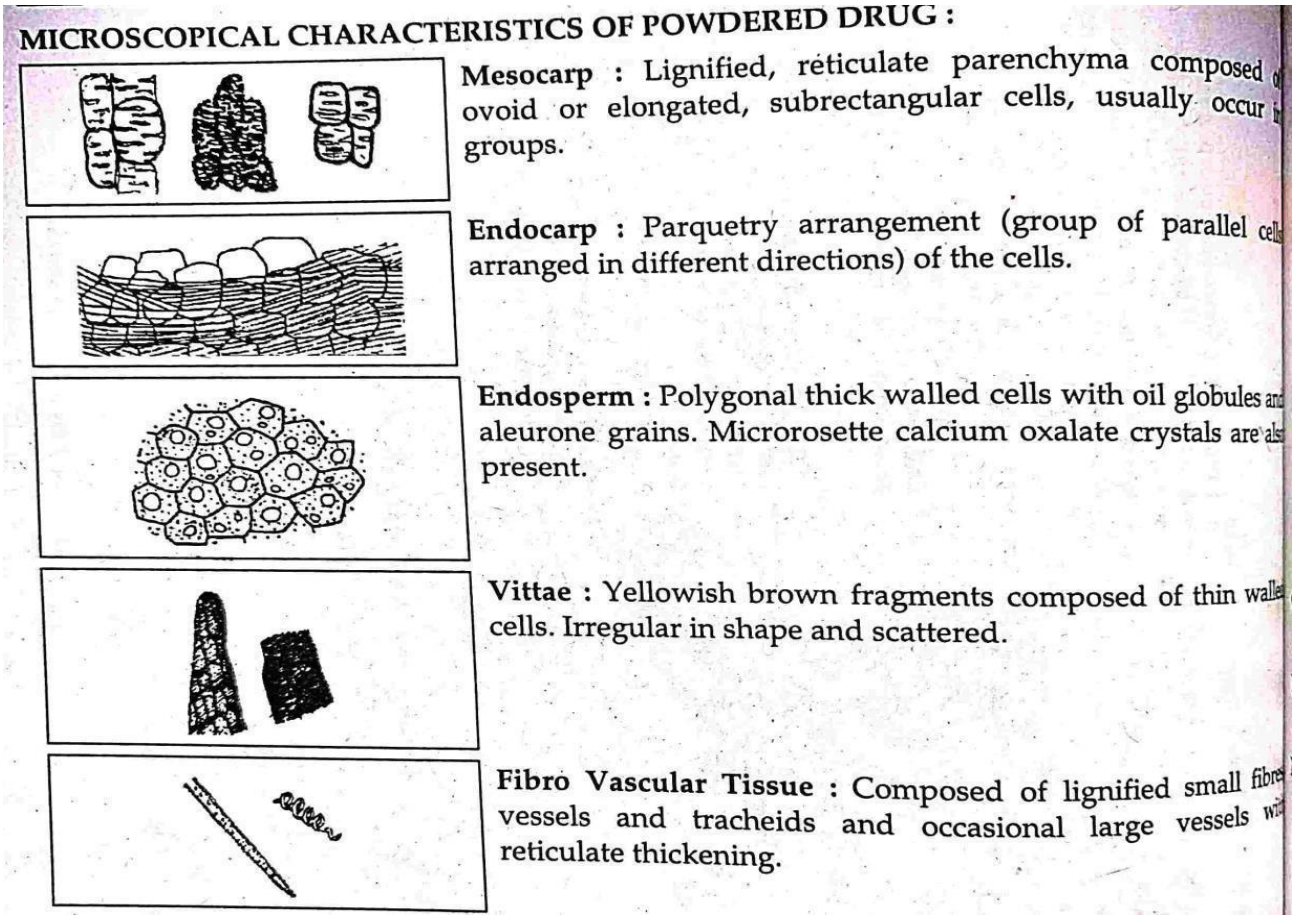
EXTRA FEATURES: fennel exhibits **cremocarp.** It consists of two equal portions called as **Mericarps** , connected by central stalks called as **carpophores.**



Schematic Diagram (T.S.) of a Mericarp

STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Sudan Red III	RED	Oil globule in the cellsof endosperm and cuticle
3.	Alcoholic picric acid	YELLOW	Aleurone grains



CHEMICAL CONSTITUENTS: Volatile oils: (4-6%), **Anethole** 50-60% of vol. oil, **d-fenchone** 10% of volatile oil, Fixed oil 12-18%, Proteins (14-22%)

Uses: carminative, respiratory stimulant, aromatic.

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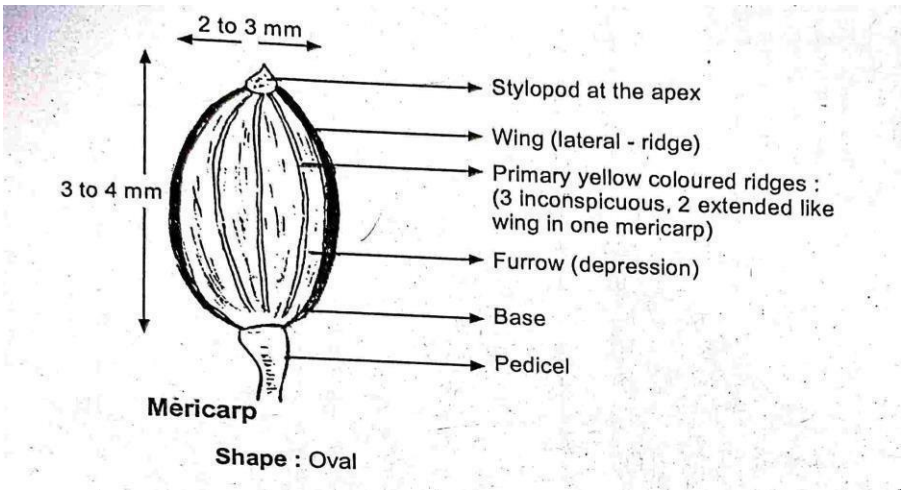
Experiment No.: 7

AIM: To study the macroscopic and microscopic study of the DILL

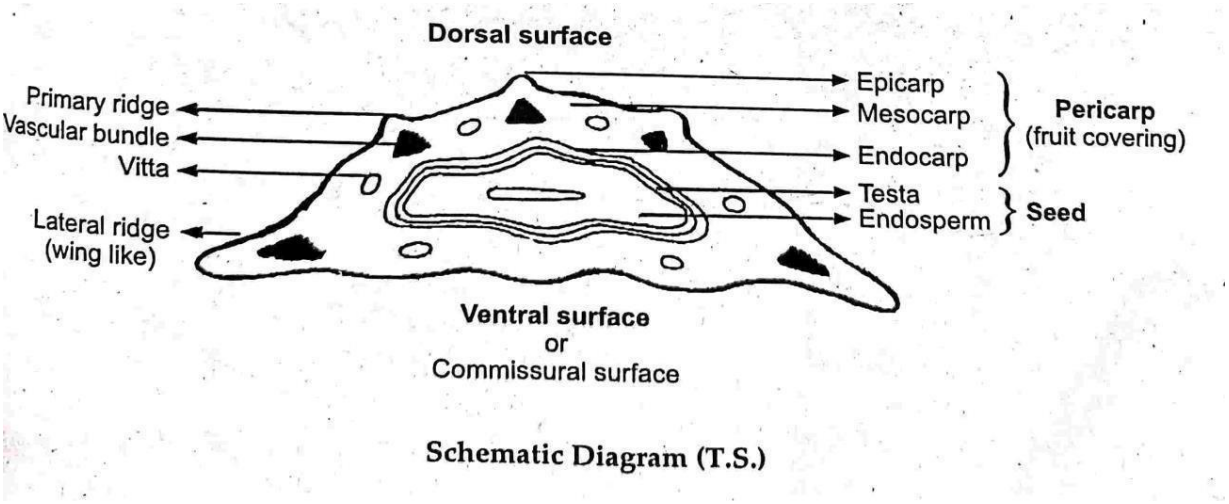
Synonym: Fructus anethi, European dill, Anethum

Biological Source: Consists of dried ripe fruit of Anethum graveolens. It contains not less than 2.5% of volatile oil. **Family:** Umbelliferae.



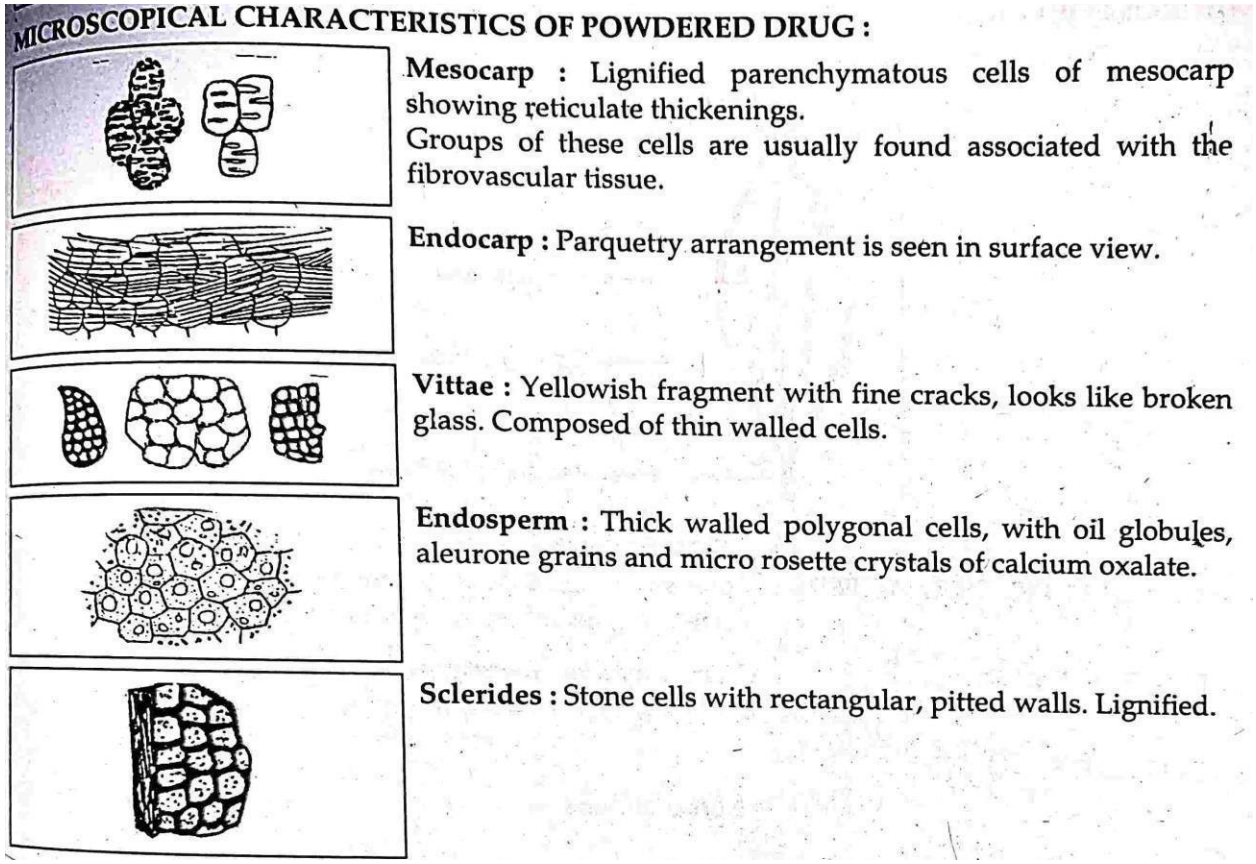
ORGANOLEPTIC CHARECTERS: Colour: chocolate brown, **Odour**: Aromatic, spicy and characteristic**, Taste;** Spicy, aromatic, and characteristic.

EXTRA FEATURES: normally separated mericarps, dorsally compressed. Orthospermous fruits.



STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Sudan Red III	RED	Oil globule in the cellsof endosperm and cuticle
3.	Alcoholic picric acid	YELLOW	Aleurone grains



CHEMICAL CONSTITUENTS: volatile oils 3-4%, 50-60% carvone , 5% dihydrocarvone , D-limonene and phellandrene etc, fixed oil protein.

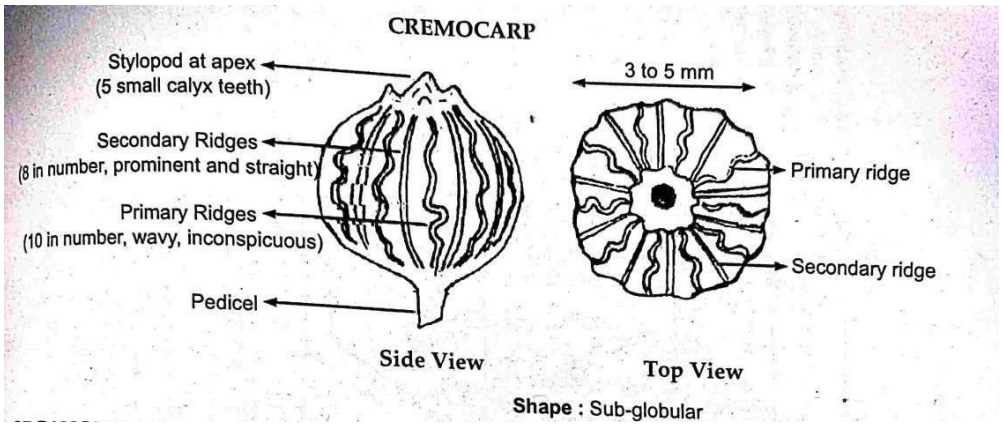
USES: Aromatic, stimulant, Antiseptic.

Experiment No.: 8

AIM: To study the macroscopic and microscopic study of the CORIANDER

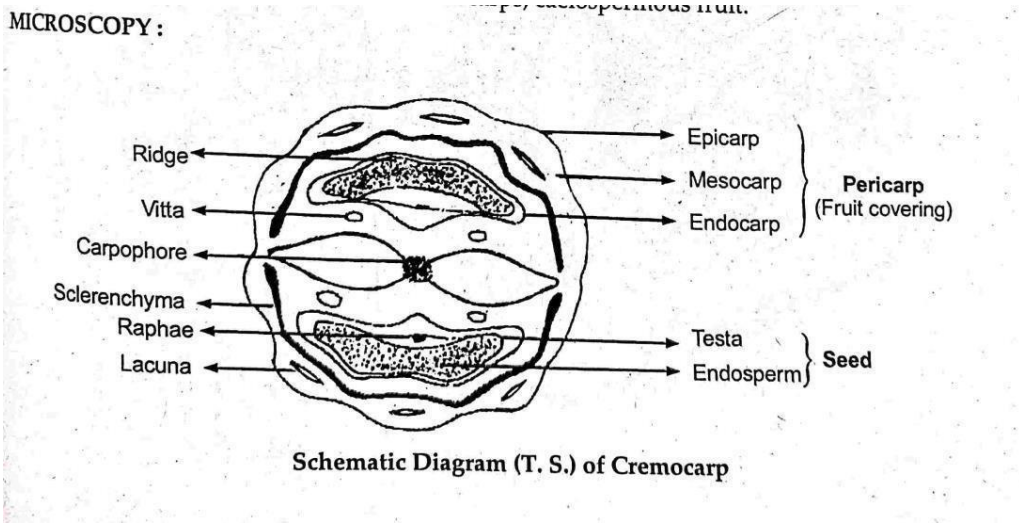
Synonym: Dhania (hindi)

Biological Source: Consists of dried ripe fruit of Coriandrum sativum. It contains not less than 0.3% of volatile oil. **Famil :** Umbelliferae.



ORGANOLEPTIC CHARECTERS: Colour: Brownish yellow, **Odour:** Aromatic, **taste:** Spicy and characteristic.

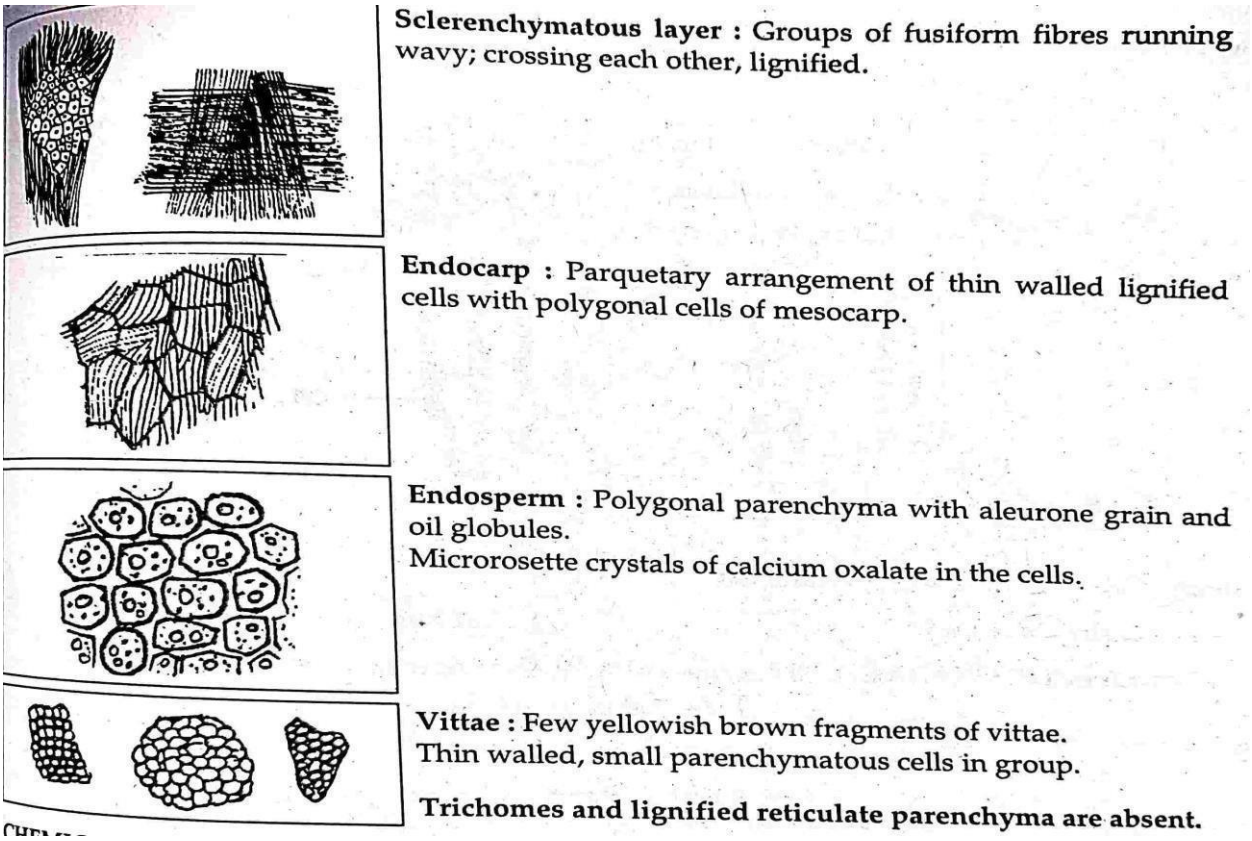
EXTRA FEATURES: Cremocarps, caelospermous fruit.



STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Sudan Red III	RED	Oil globule in the cellsof endosperm and cuticle
3.	Alcoholic picric acid	YELLOW	Aleurone grains

MICROSCOPICAL CHARECTERISTICS OF POWDERED DRUG:



Sclerenchymatous layer : Groups of fusiform fibres running wavy; crossing each other, lignified.

Endocarp : Parquetary arrangement of thin walled lignified cells with polygonal cells of mesocarp.

Endosperm : Polygonal parenchyma with aleurone grain and oil globules.
Microrosette crystals of calcium oxalate in the cells.

Vittae : Few yellowish brown fragments of vittae.
Thin walled, small parenchymatous cells in group.

Trichomes and lignified reticulate parenchyma are absent.

CHEMICAL CONSTITUENTS: Volatile oil 0.2-1%: coriandrol (D-Linalool 60-70%). Terpene 20%, Fixed oil 13-20%, Proteins 17%.

USES: carminative, aromatic, stimulant, spice, flavouring agent.

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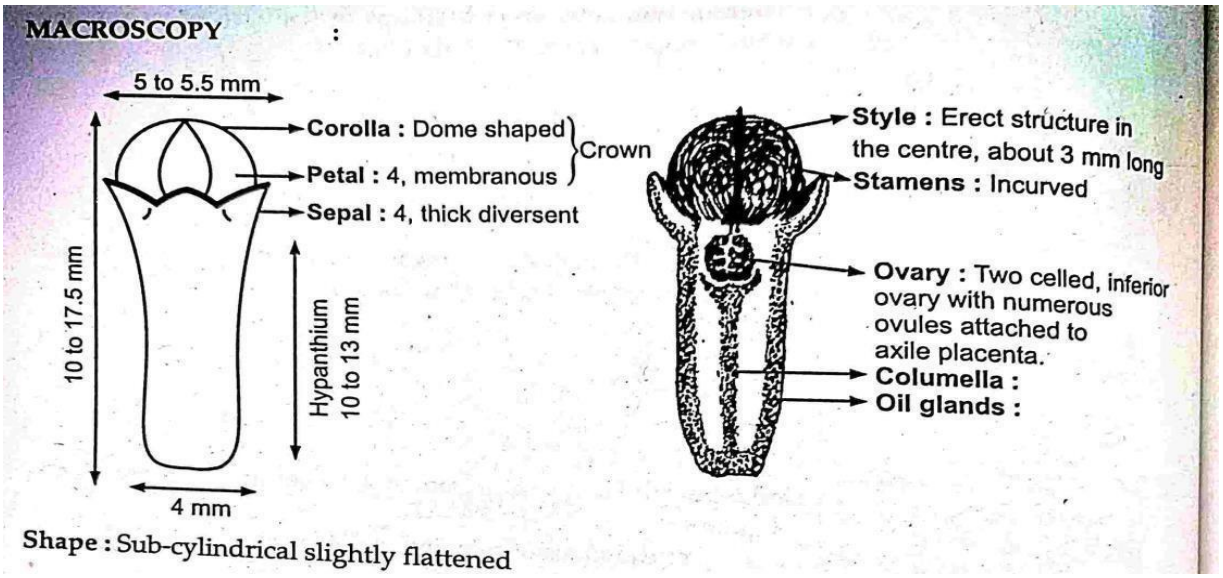
Experiment No.: 9

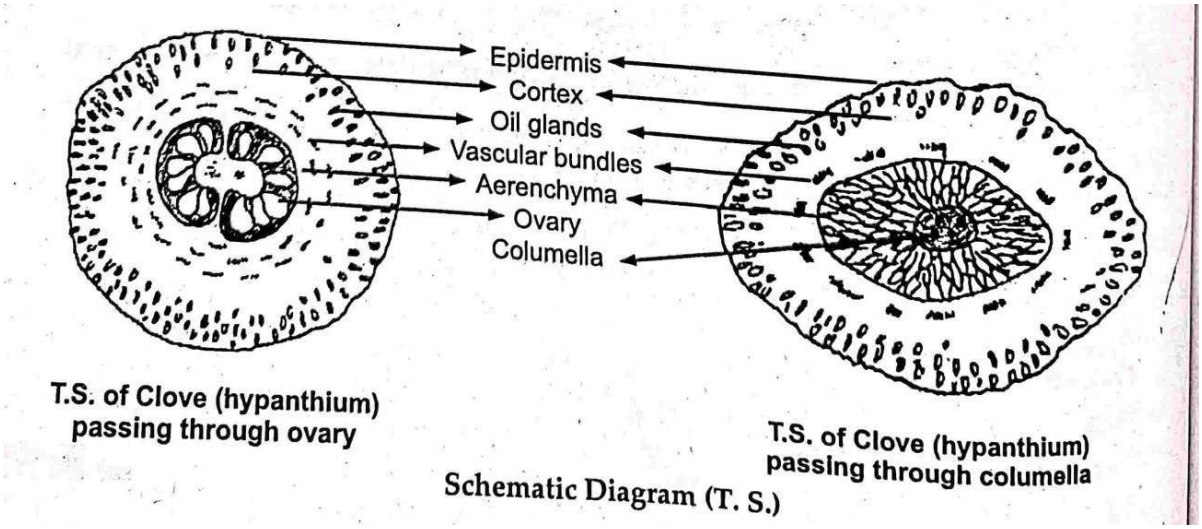
AIM: To study the macroscopic and microscopic study of the

Clove Synonym: Lavang (Hindi)

Biological Source: It consists of dried flower buds of Eugenia caryophyllum. It contains not less than16% of Clove oil. **Family:** Myrtaceae.

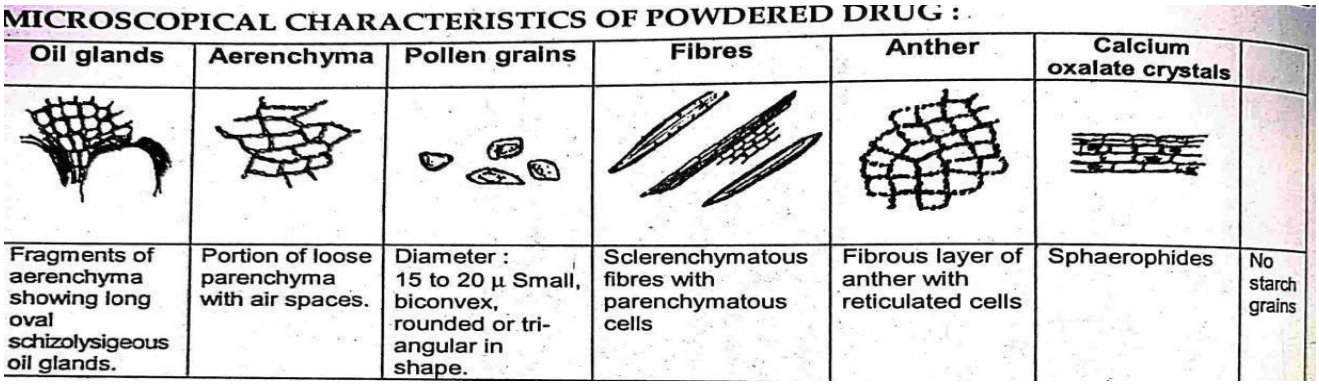


ORGANOLEPTIC CHARECTERS: Colour: Dark brown or crimson red, **Odour:** Aromatic, **Taste;** Spicy pungent followed by numbness.



STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2.	Sudan Red III	RED	Oil globule in the cellsof endosperm and cuticle
3.	Strong KOH solution	Needle shaped potassium eugenate crystals	Eugenol of Volatileoil
4.	Dil hydrochloric acid	Crystals soluble	Calcium Oxalate crystals
5.	Sulphuric acid	Soluble , needles of calcium sulphate on standing	Calcium oxalate crystals



CHEMICAL TEST:

SL NO	TESTS	OBSERVATION	INTERFERENCE
1	Aqueous extract+ Lead acetate solution	White ppt	Tannins
2	Clove oil + alcohol+ ferric chloride 5% solution	Blue colouration	Eugenol
3	Aqueous extract + Ferric chloride solution5%	Dark colour	tannins

CHEMICAL CONSTITUENTS: volatile oil: Eugenol, isoeugenol, methyl and dimethyl furfural, alpha and beta caryophylline , hydrolysable tannins.

USES: Carminative, aromatic, antiseptic, stimulant, flavouring agent, dental analgesic oil, in microscopic work , for isolation of eugenol.

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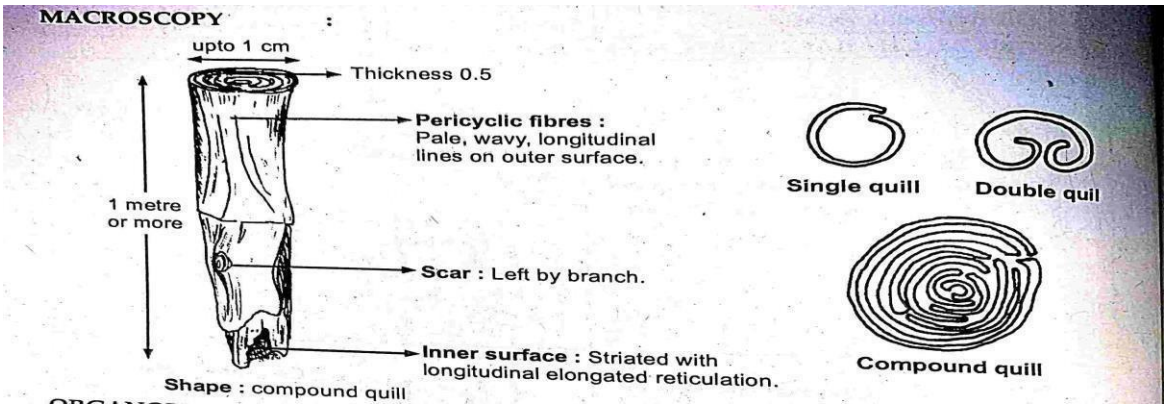
Experiment No.:10

AIM: To study the macroscopic and microscopic study of the CINNAMOM

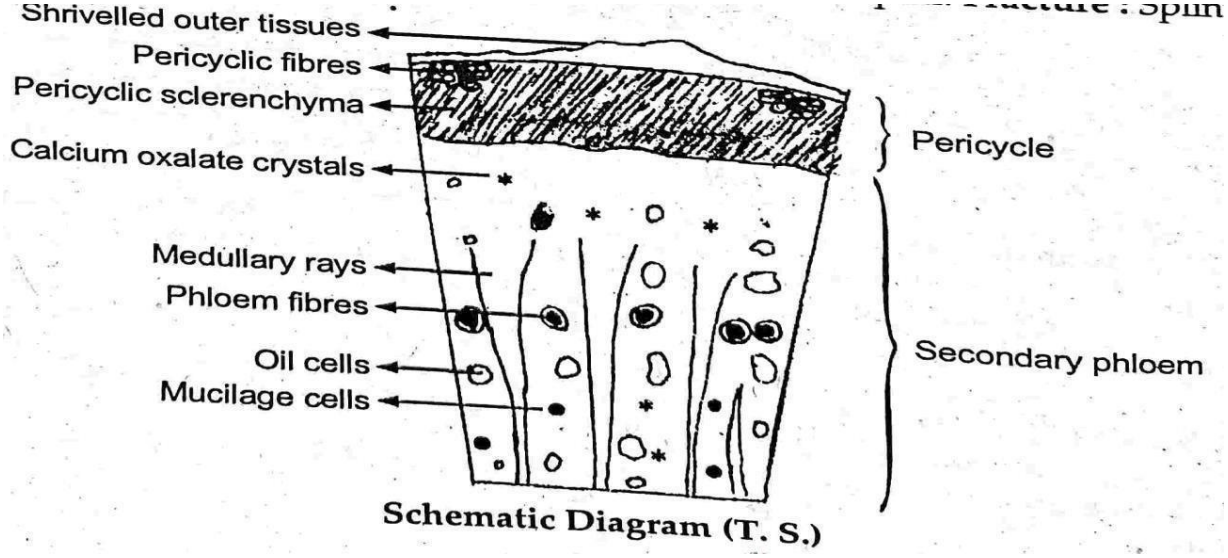
Synonym: Cinnamon bark, kalmi-dalchini

Biological Source: It Consists of dried inner bark of the shoots of coppied trees of Cinnamomum zelanicum,It contains not less than 0.1% volatile oil. **Family:** Lauraceae.



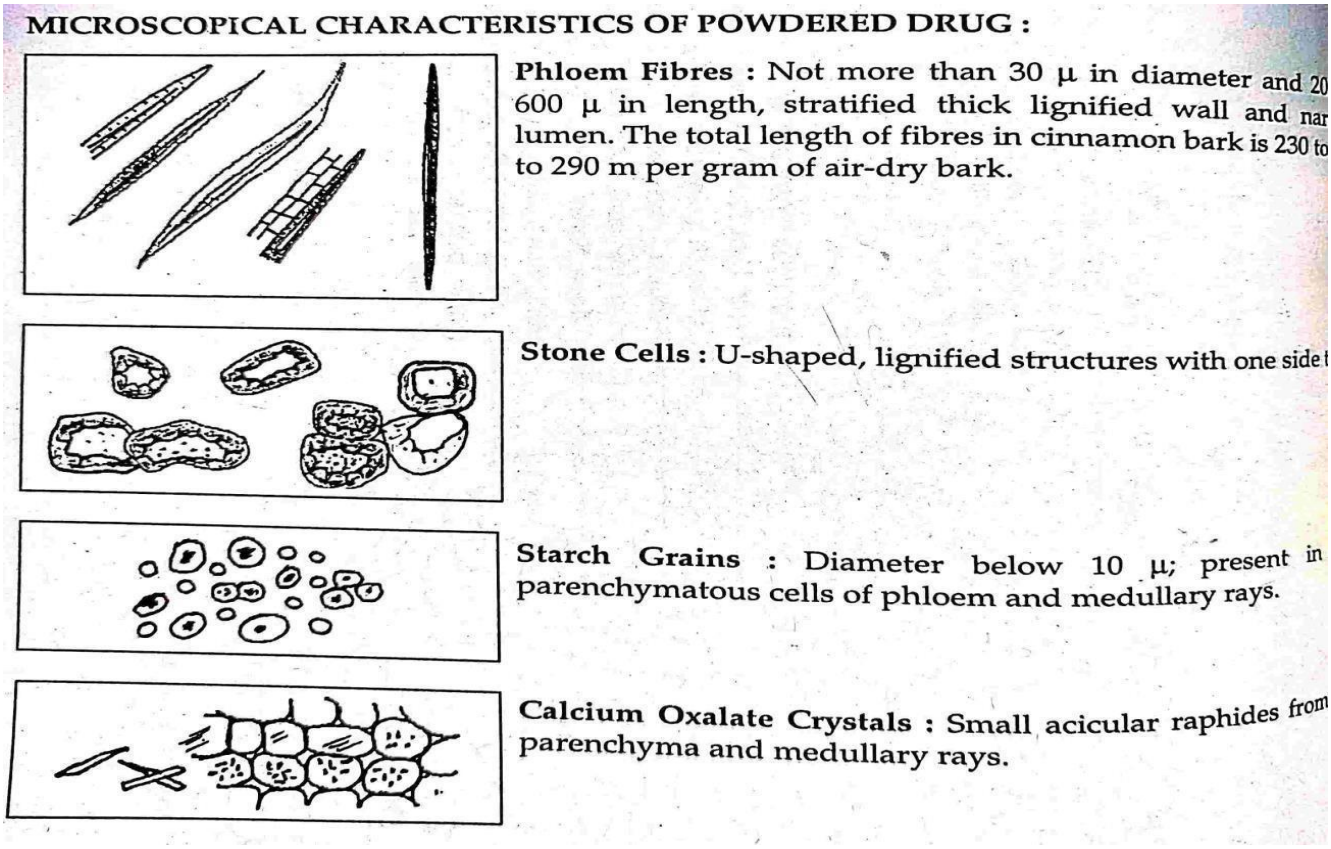
ORGANOLEPTIC CHARECTERS: Colour: outer surface dull yellowish brown, inner surface darker in colour, **Odour**: Fragrant, **Taste:** Warm, sweet.

EXTRA FEATURES: Bark is free of cork, single or double quillsor or single closely packed compound quill. **Fracture**: splintery.



STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+ Conc. HCl(1:1)	RED/PINK	Lignified tissues:xylem (vascular bundle)
2.	Iodine	BLUE	strach
3.	Ruthanium red	PINK	Mucilage cells
4.	Dil hydrochloric acid	Crystals soluble	Calcium Oxalate crystals
5.	Accetic acid	Insoluble	Calcium oxalate crystals
6.	1% solution of osmic acid	Brown or pale	Volatile oil
7.	Dil. Tincture alkana	Red on standing 30 mins	Volatile oil



CHEMICAL TEST:

SL NO	TESTS	OBSERVATION	INTERFERENCE
1	Volatile oil+ 5ml of alcohol+ one drop of ferric chloride	Green colour	Cinnamic aldehyde + eugenol present in volatile oil
2	Chloroform extract or volatile oil on slide+ drop of 10% aqeous phenyl hydrazine hydrochloride solution	Red shaped crystals	Cinnamic aldehyde
3	Aq. Solution + FeCl3 solution	Dark colour	Tannin
4	Aq. Extract + lead accetate	White ppt	Tannin
5	AQ.Extract+potassium permanganate solution	Decolourisation	Tannin

CHEMICAL CONSTITUENTS: volatile oil 0.5-1%:Cinnamic aldehyde (55-65%) , Eugenol, tannins, starch ,, calcium oxalate.

USES: Carminative, aromatic, mild astringent, powerful germicide.

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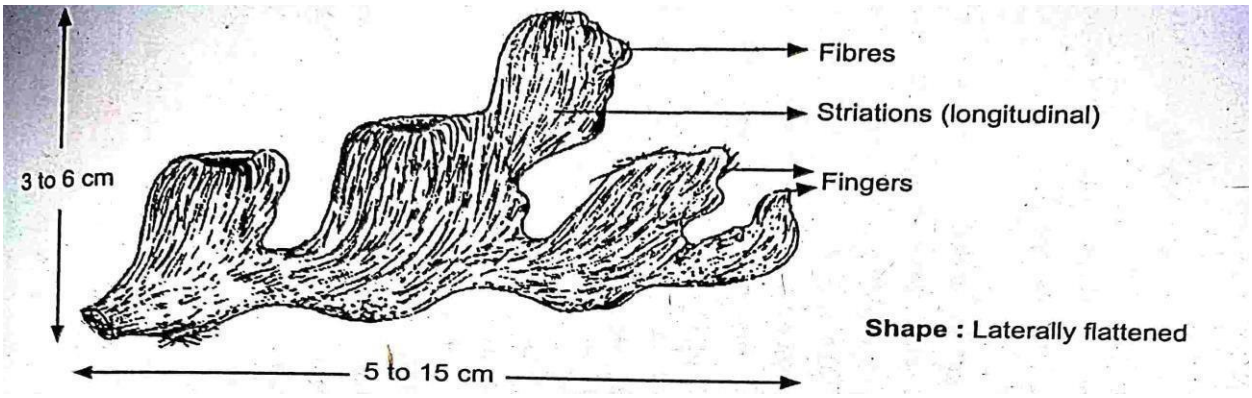
Experiment No.:11

AIM: To study the macroscopic and microscopic study of the

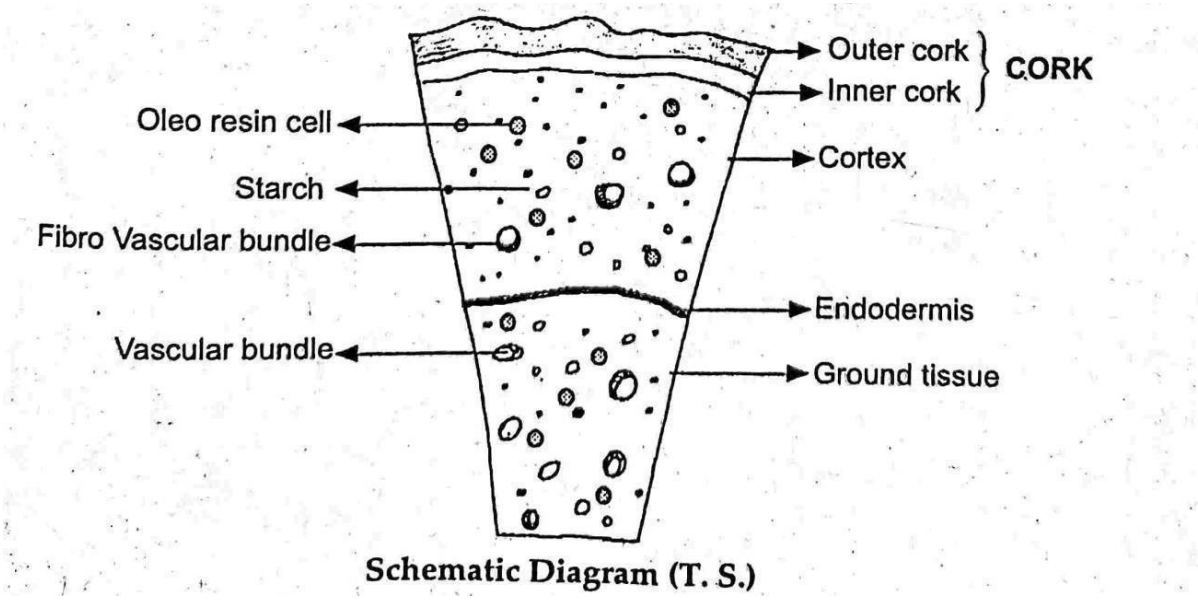
GINGER Synonym: Sonth, zinger, Jamica ginger

Biological Source: It Consists of dried rhizome of Zingiber officinale , scrapped to remove the dark outer skin and dried in the sun. **Family: Zingiberaceae**.



ORGANOLEPTIC CHARECTERS: Colour: externally buff colour, **odour:** agreeable and aromatic, **Taste:** agreeable, pungent, and characteristic.

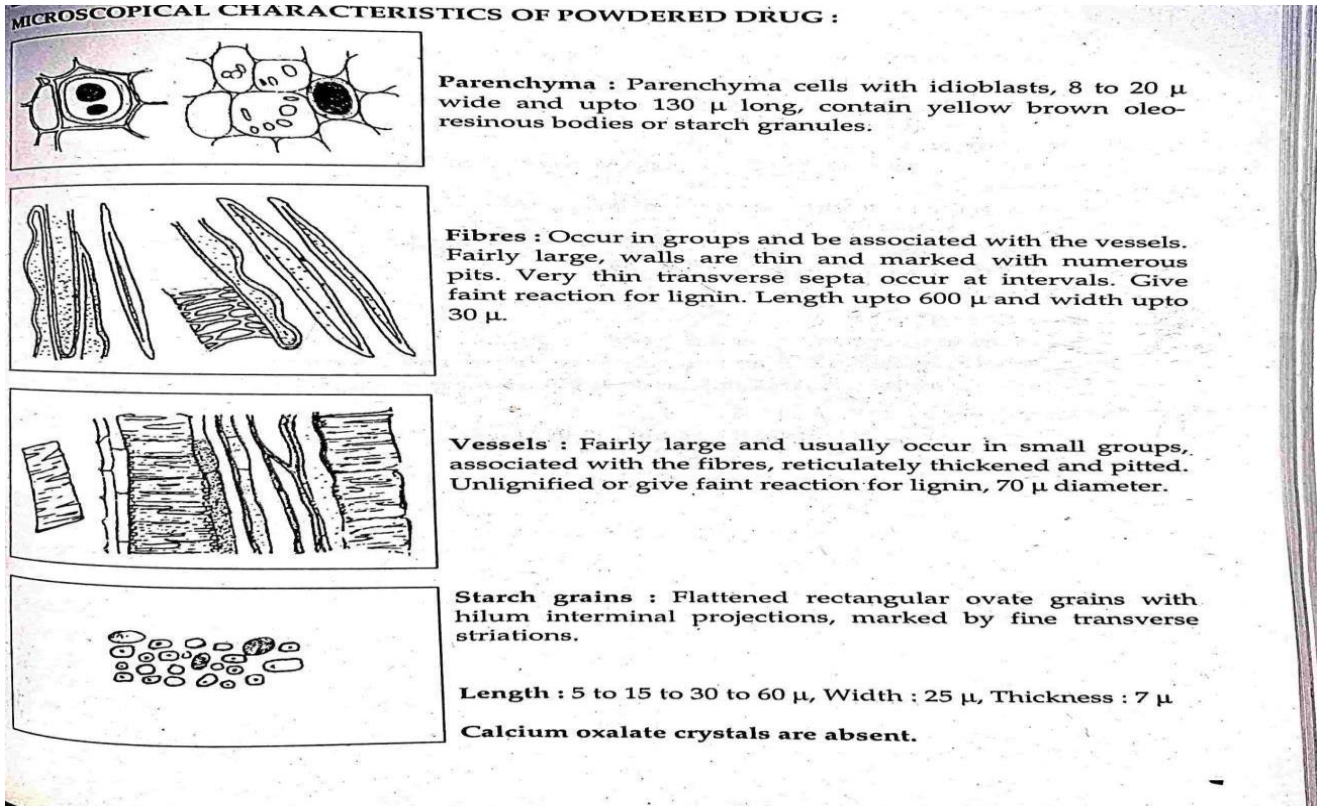
EXTRA FEATURE: Sympodial branching, horizontal rhizome, transversely cut surface shows well marked endodermis and stele. **Fracture:** short and fibrous.



Schematic Diagram (T. S.)

STRAINING/ DIAGNOSIS/MACRO-CHEMICAL TESTS:

SL NO	REAGENTS	OBSERVATION	CHARECTERISTICS
1.	Phloroglucinol+Conc.HCl(1:1)	RED/PINK	Lignified tissues: xylem(vascular bundle))
2	Iodine	BLUE	starch



CHEMICAL TEST: Boil the drug with 5% potassium hydroxide or alkali – pungency of the ginger destroyed.

CHEMICAL CONSTITUENTS: volatile oil, Terpenes, cineol, citral, borneol, **pungent principle:** gingerol, shogaol, zingerone.

USES: Carminative, stimulant, flavouring agent

Experiment No.: 12

AIM: To study the test of the AGAR:

CHEMICAL REQUIREMENTS: agar, ruthenium red, barium chloride, fehling solution, iodine solution.

Test of Agar:

Sl. NO	Experiments	Observation	Inference
1	Agar is boiled with water	Stiff jelly on cooling	Agar may be present
2	Agar solution is treated with ruthenium red	Pink color	Agar may be present
3	Hot agar solution is treated with barium chloride reagent	White PPT	Agar may be present
4	Hot agar solution is treated with fehling's solution and heated	Red PPT	Agar may be present
5	Agar solution is treated with iodine solution	Crimson to brown color	Agar may be present
6	Agar ash taken on a slide and add two drops HCl and observed under microscopes	Spongy spicules of diatoms are observed	Agar may be present

Experiment No.: 13

AIM: To study the test of the acacia

CHEMICAL REQUIREMENTS: Acacia, Strong lead acetate, Sulphuric acid, Benzedrine, Iodine solution, HCl, Fehling solution

Test for Acacia:

SL NO	EXPERIMENTS	OBSERVATION	INFERENCE
1	5ml of a 2%W/V solution of acacia is treated with 1 ml of strong lead sub acetate solution	Flocculent whitePPT is produced	Acacia may be present
2	Dissolve 0.25gm of acacia in 5 ml of water by shaking in cold. add 0.5 ml of H_2SO_4 and 0.5 ml1% solution of benzidine in alcohol, shake and allowed to stand	Unstable deep blue color is noticed (due to enzyme oxidase)	Acacia may be present
3	10ml of 2%W/V solution of acacia, add 0.2 ml of a 20%w/v solution of lead acetate	No ppt isproduced	Acacia may be present
4	0.1 gm of acacia powder add 1 ml of N/50 iodine solution	The mixture does notacquirecrimson color(distinction from agar and tragacanth)	Acacia may be present
5	To 1 ml of acacia solution add 4 ml of water and dilute HCl acid and boiled for few minutes. Add Fehling's solution andheat	Red ppt (due tocuprous oxide)	Acacia may be present

Experiment No.: 14

AIM: To study the test of the TRAGACANTH

CHEMICAL REQUIREMENTS: Tragacanth, Ferric chloride solution, Copper oxide, conc. Ammonium hydroxide, Lead accetate, Fehling solution, Caustic potash.

Test for Tragacanth:

Sl no	Experiment	Observation	Inferences
1	Drug is boiled with freshly prepared 10% aqueous ferric chloridesolution	Deep yellow ppt	Tragacanth maybe present
2	Dissolve tragacanth and precipitated copper Oxide in conc.ammonium hydroxide	Stringy ppt	Tragacanth maybe present
3	Tragacanth solution istreated with Fehling's solution and heated	Red ppt	Tragacanth maybe present
4	Drug solution treated with lead acetatesolution	White ppt	Tragacanth maybe present
5	Tragacanth is treated with 5%aqueous causticpotash	Canary yellow color	Tragacanth maybe present

Experiment No.: 15

AIM: To study the test of the GELATIN

Chemical requirements:

- ✓ Gelatin
- ✓ Copper sulphate
- ✓ Conc. Nitric acid
- ✓ Mercuric nitrate
- ✓ Ninhydrin solution
- ✓ Nitrous acid

Sl. No	Test	Observation	Inference
1	Biuret test: To alkaline solution of a protein (2ml), a dilute solution of copper sulphate is added	A red or violet coloris obtained with peptide containingat least two peptide linkage	-
2	Xanthoproteic reaction:Protein+ warmed with conc. Nitric acid	Give yellow fever	The color becomes orange color when solution made alkaline
3	Millon's reagent:(Mercuric nitrate in Nitric acid containing a trace of nitrous acid)	Give white PPT	PPT turn on red color on heating.
4	Aq. Solution of protein + alcoholic solution of Ninhydrin and heated	Red to violet color	-

Experiment No.: 16

AIM: To study the test of the STARCH

Chemical requirements:

- ✓ Starch
- ✓ Iodine solution

Sl. No	Test	Observation
1	Boil 1 gm of starch with 15 ml ofwater and cool	The transcalent viscous jelly is produced
2	Adding iodine solution on the abovejelly	Jelly turns deep blue incolour. The blue colour disappears on warming and reappear on colling

Experiment No.: 17

AIM: To study the test of the HONEY

Chemical requirements:

- ✓ Honey
- ✓ Fehling's solution A and B
- ✓ Molisch reagent (α- Naphthol dissolved in Ethanol)
- ✓ Conc. H2SO4

Sl. No	Test	Observation	Inference
1	Honey + Fehling solution A and B	Red PPT	Honey is present
2	Sugar solution + Molisch reagent +conc. H2SO4	Purple ring form	Honey is present

Experiment No.: 18

AIM: To study the test of the CASTOR

OIL Chemical requirements:

- ✓ Petroleum Ether

Sl. No	Test	Observation
1	Castor oil treated with the half of itsvolume Petroleum Ether (50-60°)	Completely soluble in petroleum ether
2	Oil +equal volume of alcohol and cool to0C for 3 hrs.	Castor oil is present

Vision and Mission of the Institution

Vision

The East Point College of Pharmacy aspires to be a globally acclaimed institution, **recognized** for **excellence in** pharmaceutical education, research and nurturing students for **holistic development.**

Mission

M1 Create pharmacy graduates through **quality education**

M2 Promote innovation, **creativity**, and excellence **in teaching**, learning, and **research**

M3 **Inspire** integrity, teamwork, critical thinking**, personal** development, and ethics in **students** and lay **the** foundation for lifelong learning

M4 **Serve** the **healthcare, technological, scientific**, and **economic** needs of then **society**.