

Pharmacognosy

PHG 112
PG 102

Associate Professor Dr Soumaya Saad Zaghloul

Fall 2024

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Professor Dr Shahira Ezzat
Associate Professor Dr Soumaya Saad Zaghloul

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Lecturer

Shahira Ezzat, PhD

Professor of Pharmacognosy
Head of Pharmacognosy
Department
Faculty of Pharmacy
MSA University

Contact Info.

Office: G 210
Email: smelkomy@msa.edu.eg

Lecturer

Soumaya Zaghloul, PhD

Assoc. Prof. of Pharmacognosy
Faculty of Pharmacy
MSA University

Contact Info.

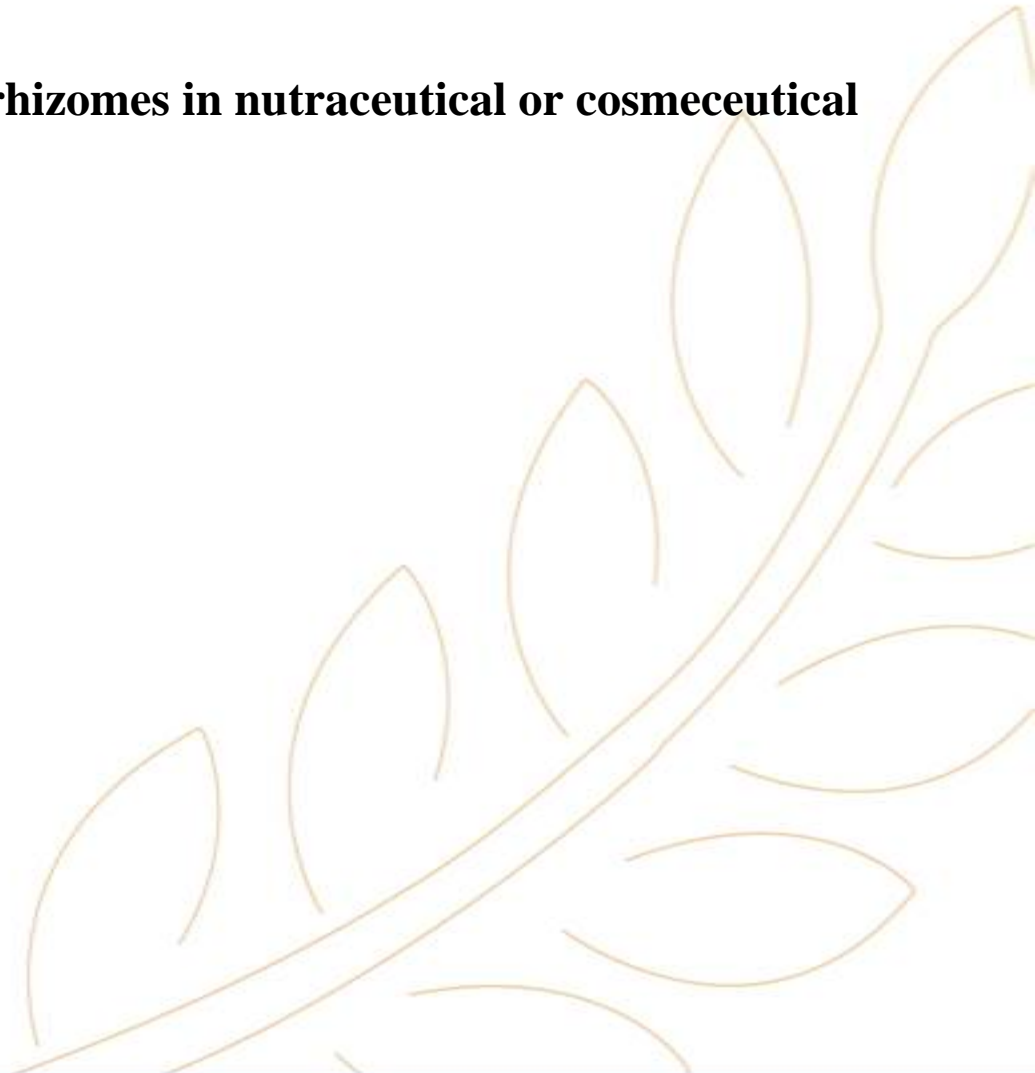
Office: G 42
Email: szaghloul@msa.edu.eg

Lecture 10



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

- **Morphological & Microscopical characters of rhubarb**
- Uses, contraindications of some important plants used as roots or rhizomes in nutraceutical or cosmeceutical**



SUBTERRANEAN ORGANS (UNDERGROUND ORGANS)

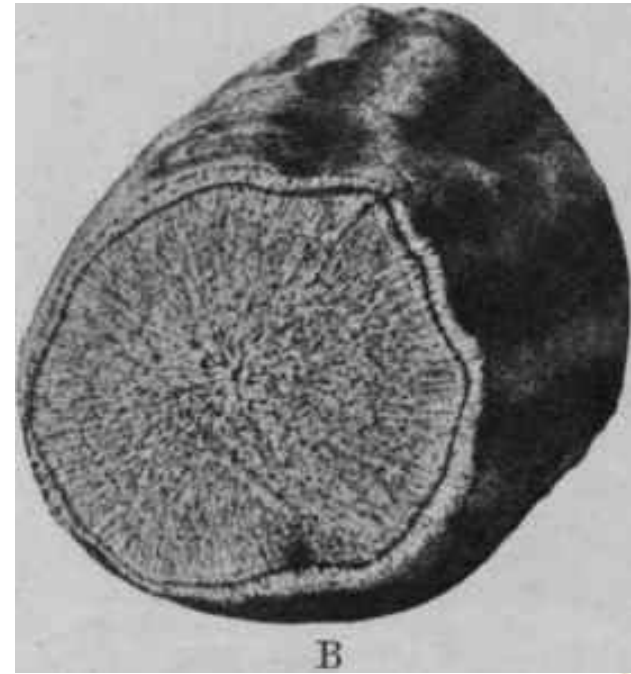
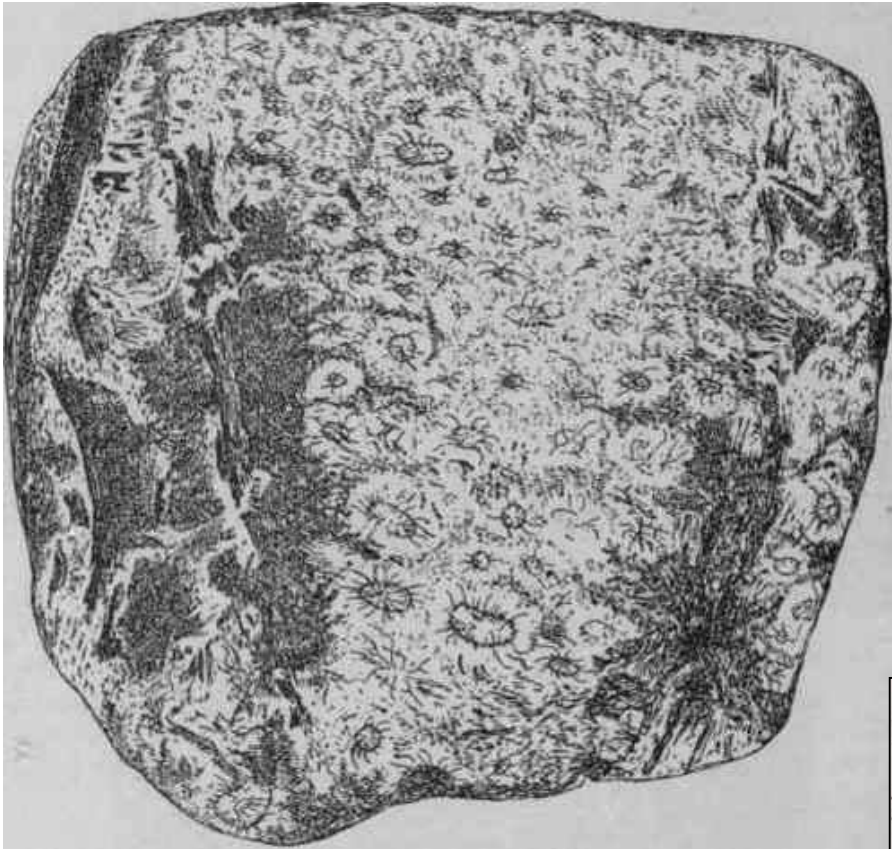
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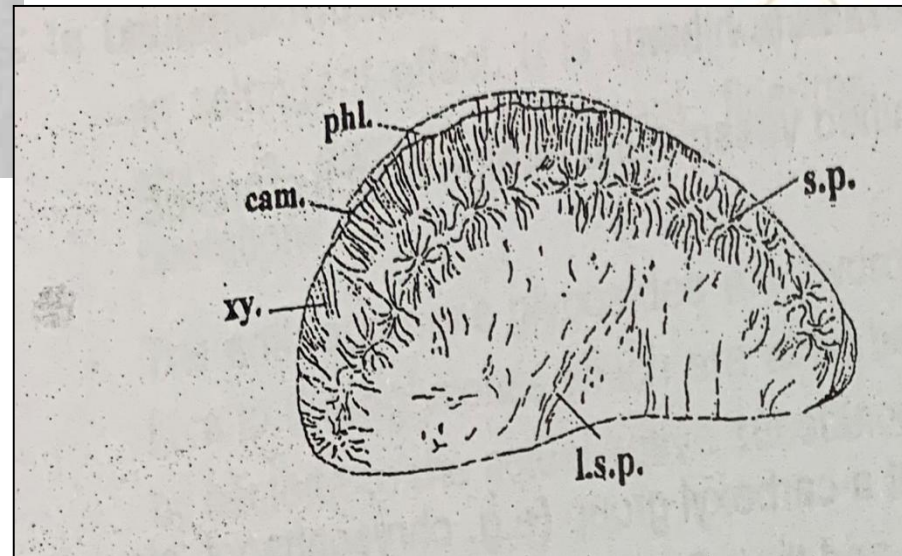
Rhubarb

Is the dried rhizome and big roots of *Rheum palmatum* and *Rheum officinale* and other species of Rheum except *Rheum rhaponticum* family Polygonaceae. Deprived of most of its bark.

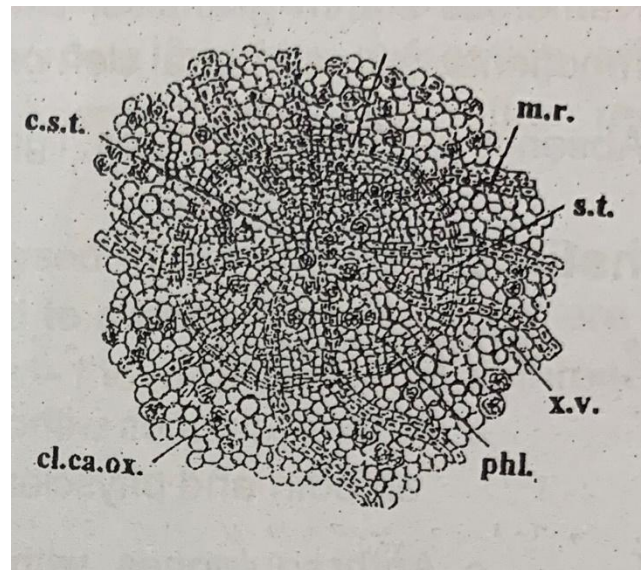




Rhubarb



Star spot of Rhubarb



Medullary ray: m.r.

Seive tube: s.t.

Phloem: phl

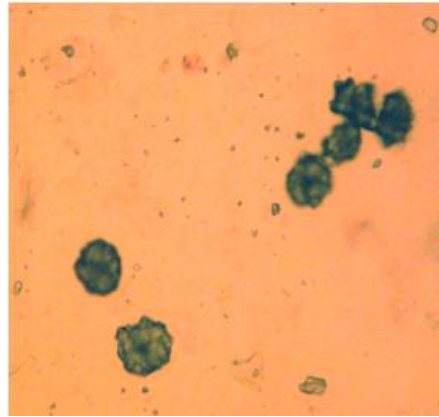
Xylem vessel: x.v.

cl.ca.ox: cluster CaOx

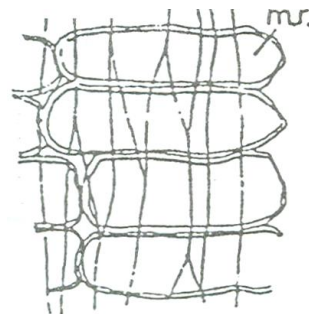
In pith region anomalous or abnormal structure called **star spots**;
the cambium produce 2ry phloem towards the center and xylem
externally to form amphivasal concentric, abnormal vascular
bundles traversed by wavy medullary rays.

Powder

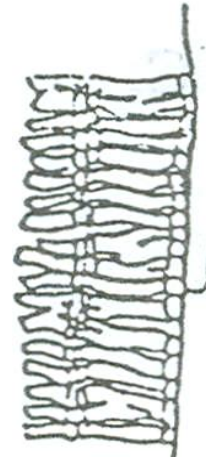
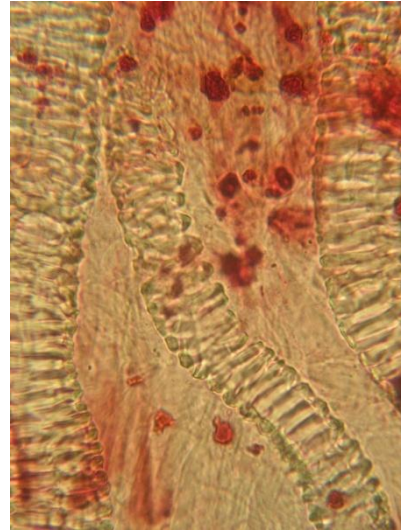
1- Very large cluster crystals of calcium oxalate.



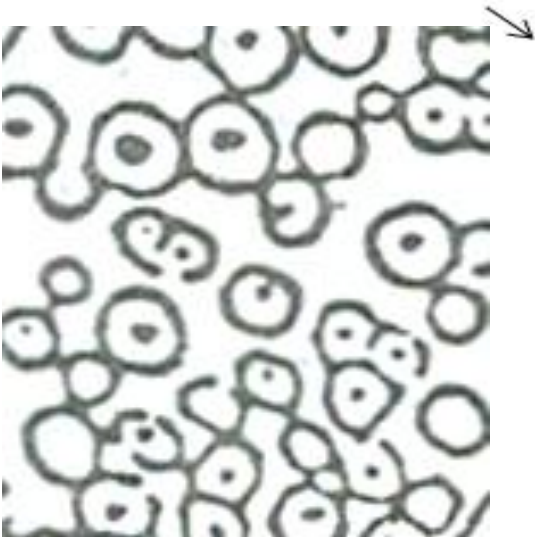
2- Medullary ray cells with brownish contents.



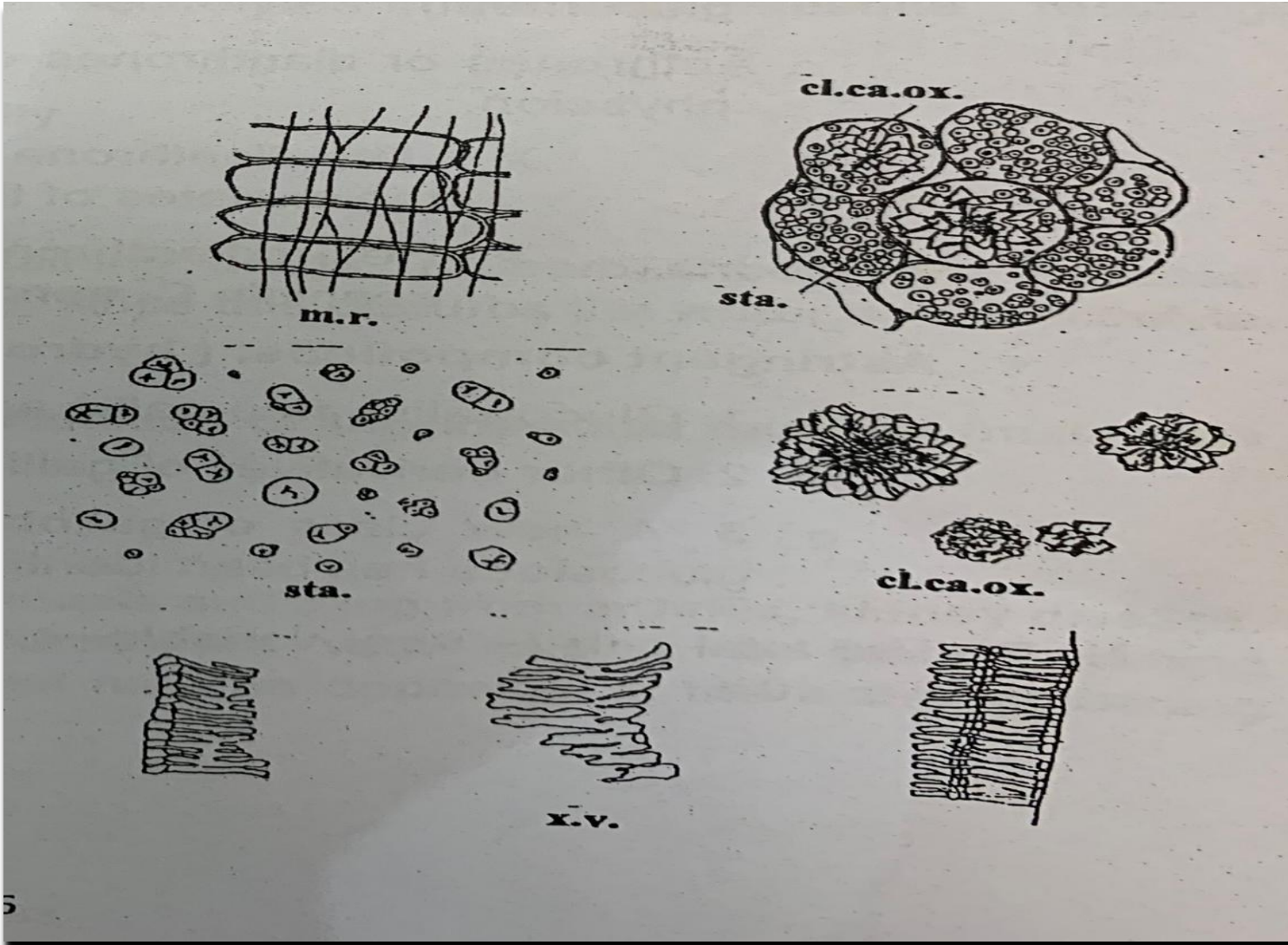
3- Non lignified xylem vessels.



4- Starch granules; simple or compounds (Muller-shaped)



Powder Rhubarb



ACTIVATION
CONSTITUENTS

1- Anthraquinones derivatives

a- Free (aglycone) e.g. emodin, aloe-emodin, chrysophanol, palmidin A, B, C and rhein

c- Sennosides glycosides A, B, C and D.

b- The glycoside derivatives of the above compounds e.g. glucoaloe-emodin and chrysophanein

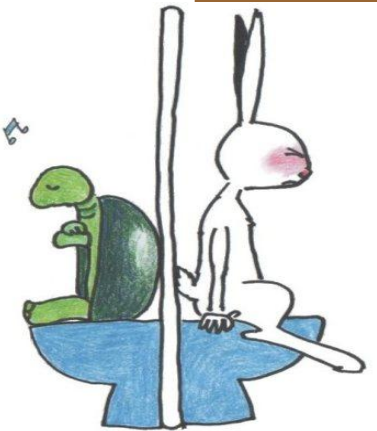
2- Tannins, e.g. gallic acid and catechin

USES AND ACTIONS

**1- Laxative
(in small dose)**

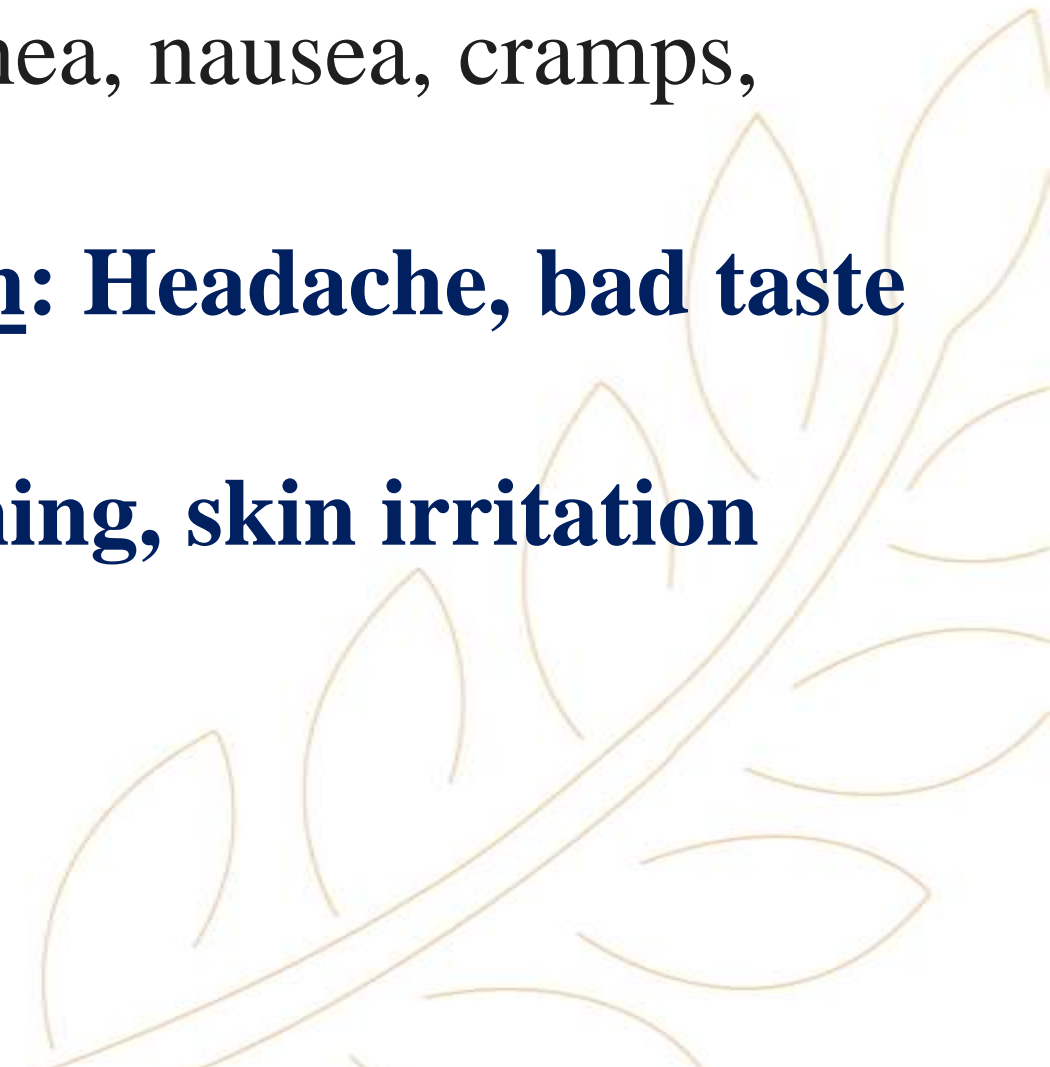
**2- In large dose
purgation followed
by astringent effect
due to tannins.**

3- Bitter stomachic.



Why *Rheum rhaponticum* is not official?

Because it contains rhaponticin glycoside that may cause :

- Gastrointestinal symptoms: Diarrhea, nausea, cramps, abdominal pain, bloating.
 - Symptoms of the nervous system: Headache, bad taste in mouth.
 - Hypersensitivity/rash: Rash, itching, skin irritation
- 

CHEMICAL TESTS:

1- Test for anthraquinone glycosides:

- Boil with Acid (H_2SO_4)
- Extract with organic solvent (ether or benzene)
- Add NH_4OH → a rose red colour in ammonical layer.

2- Powder rhubarb  **sublimation**  gives yellow needle-shaped, add KOH  reddish colour.

Ashwangda

Origin : dried roots of *Withania somnifera* (Ashawagandha) F. Solanaceae

Geographical origin : The Nile region, Mediterranean coastal strip as well as all the deserts of the country including that of Sinai.

Ashwagandha is used as a household remedy by Indians, who consider it as the best tonic for old people and children. It is one of the best nervine tonics of Ayurveda, the most ancient system of Medical Sciences



Major chemical constituents

- Steroidal lactones: Withanolides (as withaferin A, B, D)
- Alkaloids : Withanine, somniferine, somnine, withanmine, pseudowithamine, and withanamine , tropine, choline, pseudotropine, dl-isopelletierine, cuscohygrine, anahygrine, and anaferine .
- Others: terpenoids, saponins, phenolics, flavonoids, phytophenols, and glycosides.

Traditional Medicinal Uses

A. As a sleep aid

B. Memory enhancement

C. An adaptogen to help increase energy and resistance to stress (e.g., in case of mental and physical fatigue related to stress).

Herbal preparations correlated to medicinal use

1. Comminuted herbal substances are added to water as herbal tea in the form of decoction or infusion.
2. Powdered drug
3. Ethanolic extracts (dry extract, fluid extract, tincture)

Contraindications

- **Hypersensitivity** to the active substances and to other plants of the same family.
- Due to its immunomodulatory effects, it has been suggested that Ashwagandha should be avoided in **autoimmune diseases** such as lupus and multiple sclerosis .



Potato

Origin : the tubers of *Solanum tuberosum* F. Solanaceae.

-Potato juice offers a wealth of nutrients, including vitamin C, potassium, various B vitamins, calcium, iron, phosphorus, copper, and sulfur, among other phytonutrients and organic compounds.

-Interestingly enough, most of the nutrients in a potato are in the skin, so it is important that you do not peel potatoes when making your juice at home.



- **Benefits of Potato Juice**

- o **Prevents Aging**

- o Boosts Energy Levels

- o **Improves Digestion**

- o **Treats Ulcers**

- o Improves Heart Health

- o Boosts Immunity

- o **Speeds up Wound Healing**

- o Improves Circulation

- o Improves Hormone Production

- o Detoxifies Liver & Gallbladder



Benefits Of Potato Juice

1-Prevents Aging

Research has shown that potato juice is able to moisturize the skin and deliver antioxidants to the surface of the skin, which can help reduce the appearance of wrinkles and age spots, while also protecting against inflammation and skin infections.



2-Speeds up Wound Healing

Potato juice is rich in vitamin C that helps stimulate the production of collagen and in turn speed up the healing of wounds and sore muscles.

3-Detoxifies Liver & Gallbladder

The active ingredients in potatoes can help flush out the liver and gallbladder, two of the major detoxifying centers in the body. This, in turn, helps improve the overall health of the body.

4-Treats Ulcers

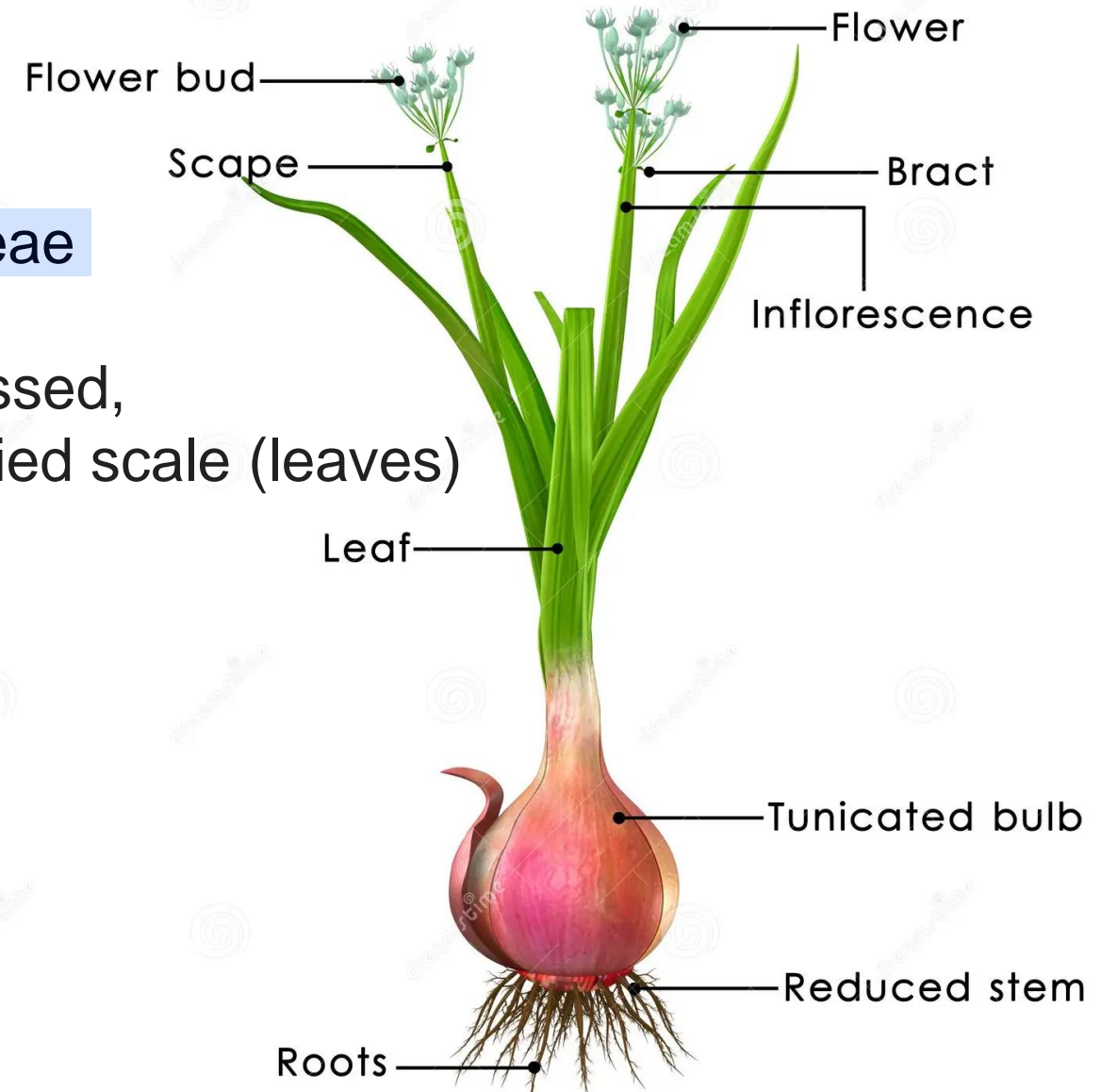
Potato juice has well-known **antacid properties** and has a slightly alkaline pH. This can help balance the acidity in your gut and prevent /treat gastric ulcers. It can form a protective layer on the mucosal lining of the stomach to relieve the pain and discomfort of this common condition as it heals.



Onion

Origin: the bulbs of *Allium cepa* F. **Amaryllidaceae**

The bulbs are composed of shortened, compressed, underground stems surrounded by fleshy modified scale (leaves) that envelop a central bud at the tip of the stem



Active constituents

Onion is characterized by the sulfur compounds.

-Organic sulfur compounds: thiosulfinates, thiosulfonates, cepaenes, S-oxides, S,S-dioxides, monosulfides, disulfides, trisulfides.

Biological effects

- Hypoglycemic.
- Antibacterial.
- Inhibition of platelet aggregation.
- Antihyperlipidaemic.
- Antiallergic and anti-inflammatory.



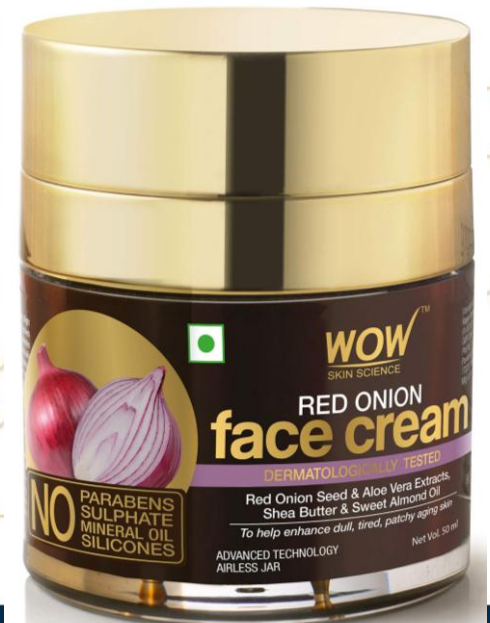
Onion for hair loss

- **Stimulate hair growth** as being rich in vitamins (A and C), minerals (potassium, calcium, magnesium) and sulfur which is already naturally present in the composition of the keratin which constitutes our hair, our skin and our nails.
- **Onion oil helps fight dandruff** and cleanse the scalp due to purifying and sanitizing properties
- **Onion oil will also fight breakage and hair loss.**



Onion for skin and nail care

- 1- **Purify skin with imperfections due to its antibacterial and purifying properties**
- 2- Anti-inflammatory effect.
- 3- Alleviate the pain, it acts as an analgesic,
- 4- **Strengthen soft and fragile nails**



Chinese knotweed

Origin : the roots of *Polygonum multiflorum* Thunb. (PM) F. Polygonaceae .
is a commonly used and ancient Chinese herbal remedy prepared from the root of
the tuber



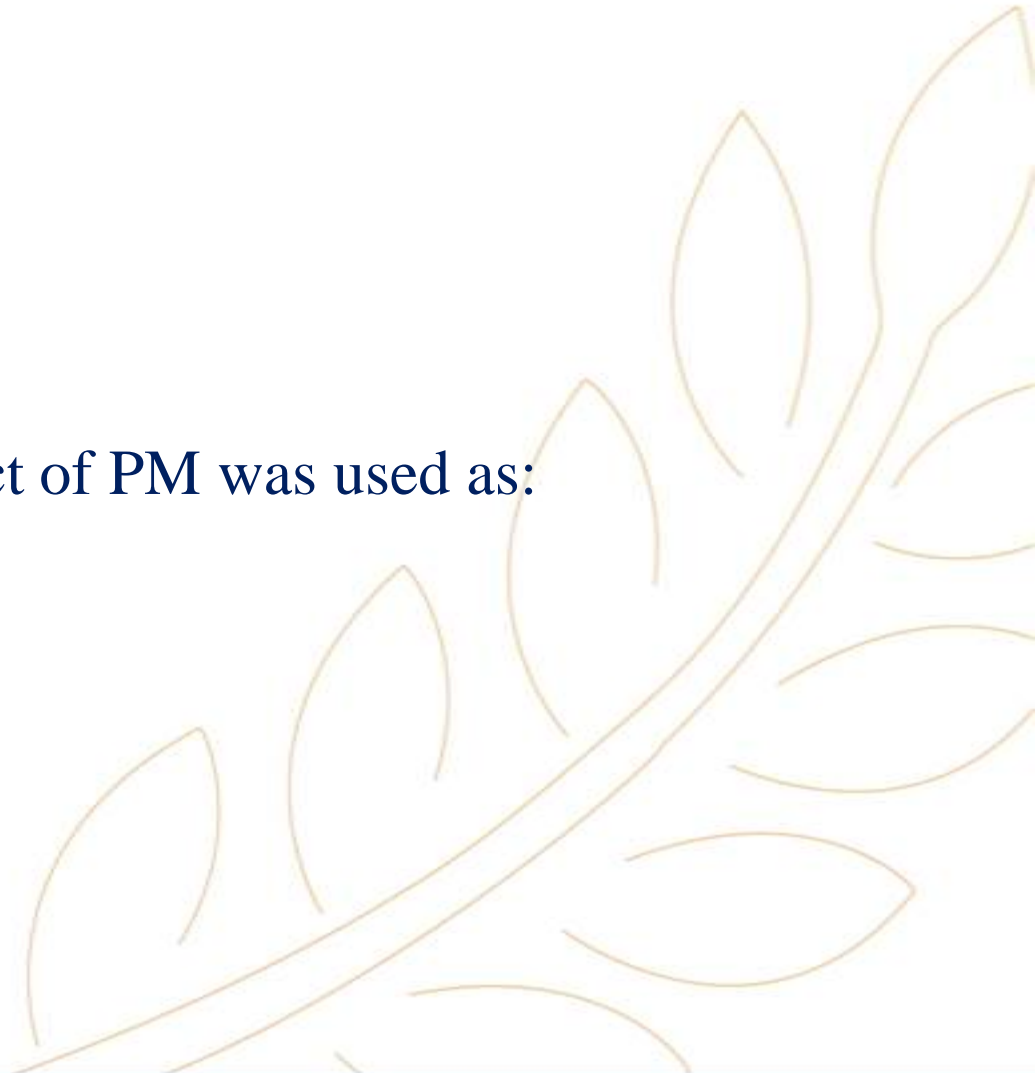
Active constituents

- Anthraquinone derivatives are the major characteristic constituents
- Stilbenes
- Flavonoids and phenolic acids

Uses

In traditional Chinese medicine (TCM), the root extract of PM was used as:

- A tonic to strengthen liver and kidney functions.
- Anti-tumor, anti-oxidant
- Anti-bacterial
- Anti-hyperlipidemia



The plant has long been used as a component for anti-hair loss and **anti-hair greying** treatment prescriptions

The extract **promotes hair growth** by inducing anagen phase in resting hair follicles.

For its antioxidant properties, this extract helps combat free radicals, reducing oxidative stress and promoting skin health.





Home work

- Mr Mahmoud is a 50-year-old occasional smoker who started smoking at a young age, with a history of hypertension for three years. He also suffers from hair falling.

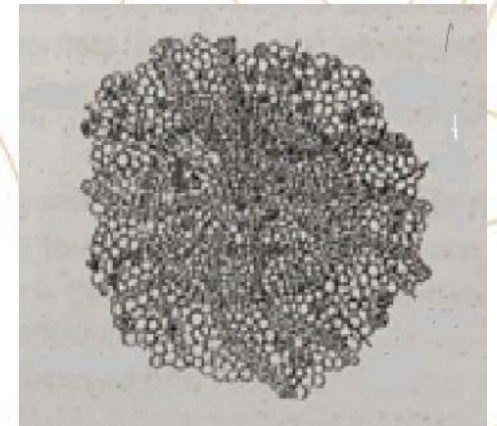
I- Recommend a herbal drug to **control his hypertension.** (Mention the drug name, active constituents, one other use and the chemical test)

II-Suggest a mixture of **two crude drugs** that can be used to treat his boldness.

- Figure A



- 1- The name of the drug.
- 2- Description of the figure.
- 3- Two uses of this drug.
- 4- Test for the active constituents.



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