Practical Pharmacognosy

3rd Stage

1st semester

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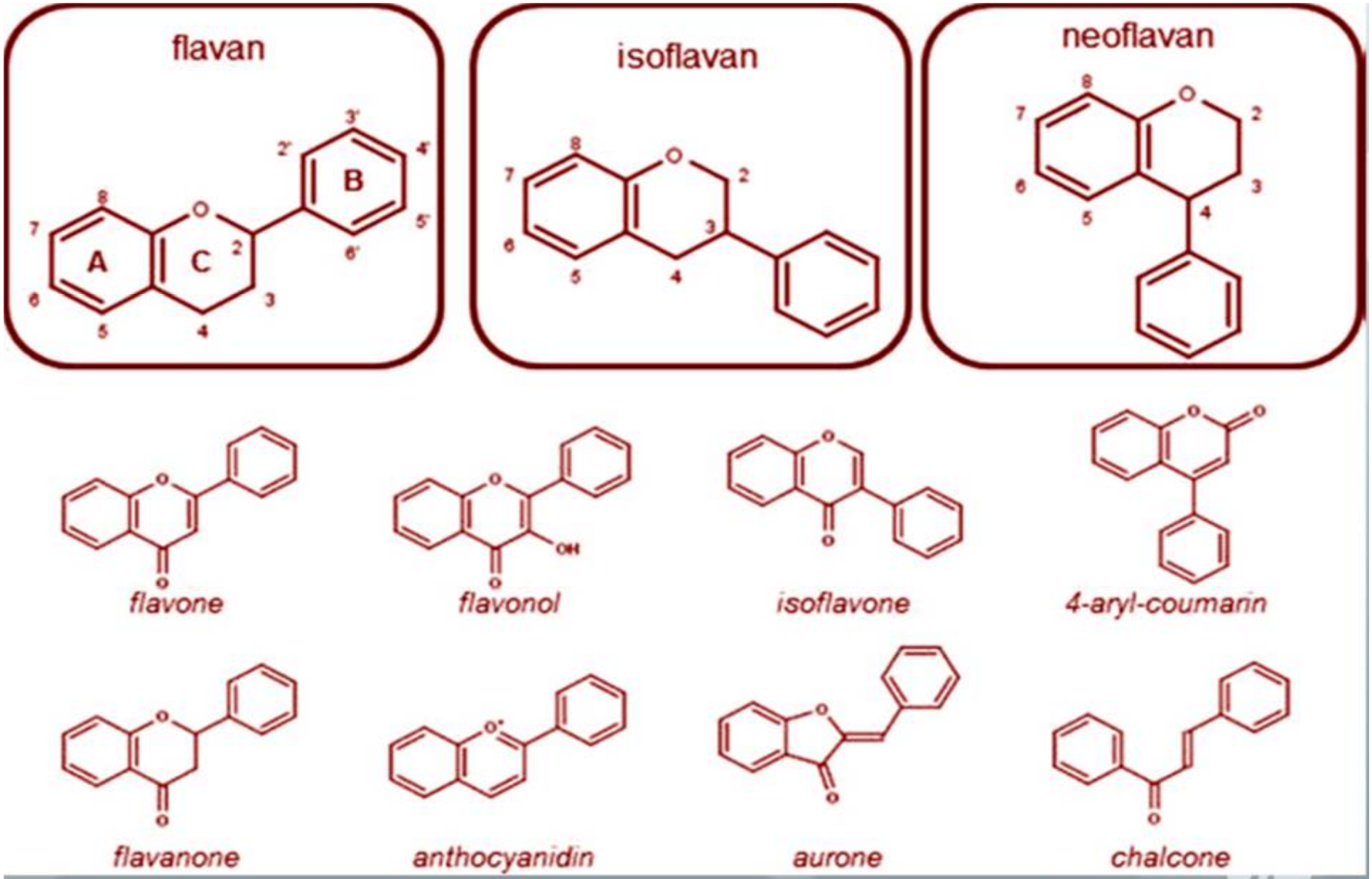
Lab.6

Flavonoid glycosides

- **Flavonoids** (from the Latin word flavus meaning yellow, their color in nature) are polyphenols of plant origin that are among the most important compounds in human diet due to **their widespread distribution in foods and beverages.**
- They can occur both in the free form (aglycones) and as glycosides, and differ in their substituents (**type, number and position**) and in their instauration

- The most common classes are the flavones, flavonols, flavanones, catechins, isoflavones and anthocyanidins, which account for around 80 % of flavonoids.
- All flavonoids share a basic C6-C3-C6 phenyl-benzopyran backbone. The position of the phenyl ring relative to the benzopyran moiety allows a broad separation of these compounds into flavonoids (2-phenyl-benzopyrans), isoflavonoids (3-phenyl-benzopyrans) and neoflavonoids (4-phenyl-benzopyrans).
- Division into further groups is made.

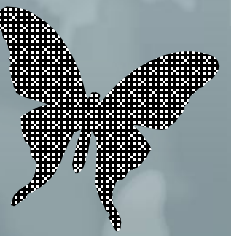


Structure of the structural backbones of the main flavonoid groups (flavan, isoflavan and neoflavan) and of relevant flavonoid classes. Atom numbering and ring nomenclature are also included.

- They have been used extensively as **chemotaxonomic** markers and are abundant in the Polygonaceae, Rutaceae, Legaminosae, Umbellifereae and Compositae.
- They occur both in the Free State and as glycosides; most are **O-glycosides** but a considerable number of flavonoid **C-glycosides** are known.
- The **glycosides** are generally ***soluble*** in **water and alcohol**, but ***insoluble*** in **organic solvents**;
- the **genins** are only **sparingly soluble in water** but are ***soluble in ether.***
- Flavonoids dissolve in **alkalis**, giving **yellow** solutions which on the addition of acid become colorless.

Pharmacological activity of flavonoids:

- A number of flavonoid-containing herbs have now been included in the **BP/ EP**, examples are Birch leaf, Calendula Flower and Elder flower.
- The group is known for its **anti-inflammatory** and **anti-allergic** effects, for **antithrombotic and vasoprotective properties**, for inhibition of tumor promotion and as protective for the gastric mucosa.
- Some of these pharmacological properties can be explained on the bases of **antioxidant activity**.
- Many flavonoid -containing plants are **diuretic** (e.g. buchu and broom) or **antispasmodic** (e.g. liquorice and parsley).
- Some flavonoids have **antitumour, antibacterial or antifungal properties.**



Isolation and Identification of Flavonoids:

Aim: Isolation method of flavonoids from Ruta.

Equipments and reagents:-

- Large beaker.
- Water bath.
- Two medium size beakers.

Reagents:

- Petroleum ether.
- 70 % aqueous methanol.
- 5 % HCl.
- Chloroform.

Procedure:

Method of extraction: Maceration.

Plant used: Ruta graveolens family Rutaceae.

Part used: Dry leaves.

Ruta graveolens

SCHEME FOR ISOLATION OF FLAVONOID GLYCOSIDE

Maceration 10 gm. of the powdered leaves in 100ml of petroleum ether overnight.

(Prepared previously)

↓

The residue is dried

↓

Macerated again with 70 % aqueous methanol overnight (prepared previously)

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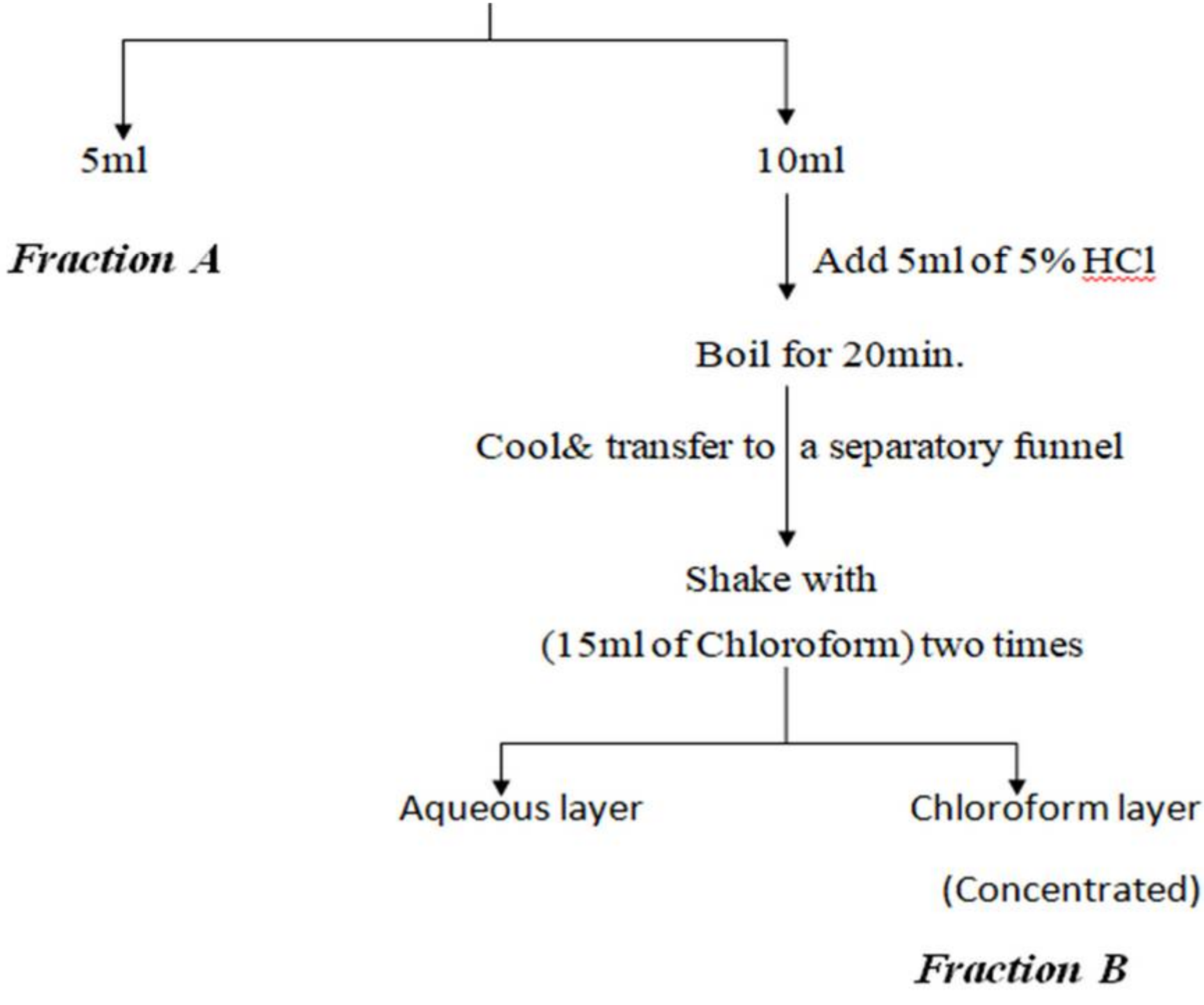
Filter

↓

Concentrated the extract to small volume (15ml)

↓

Divided into two parts


5ml
Fraction A
10ml
Add 5ml of 5% HCl
Boil for 20min.
Cool& transfer to a separatory funnel
Shake with
(15ml of Chloroform) two times
Aqueous layer
Chloroform layer
(Concentrated)
Fraction B

Results:

Fraction A : Contain the **whole glycosides.**

Fraction B : Contain the **aglycone part**.

Thank you