

Practical Pharmacognosy

3rd. Stage

1st semester

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Lab.4



Saponin Glycosides

- This group of glycoside is **widely distributed** in higher plants.
- Saponin glycosides form **colloidal solution** in water that foam upon **shaking**,
- This is due to a **decrease in the surface tension action** done by saponin glycosides, as a result of the **hydrophobic/ hydrophilic characteristics** of the saponin, and due to this property the saponins are used in the manufacturing of beer, and soap.

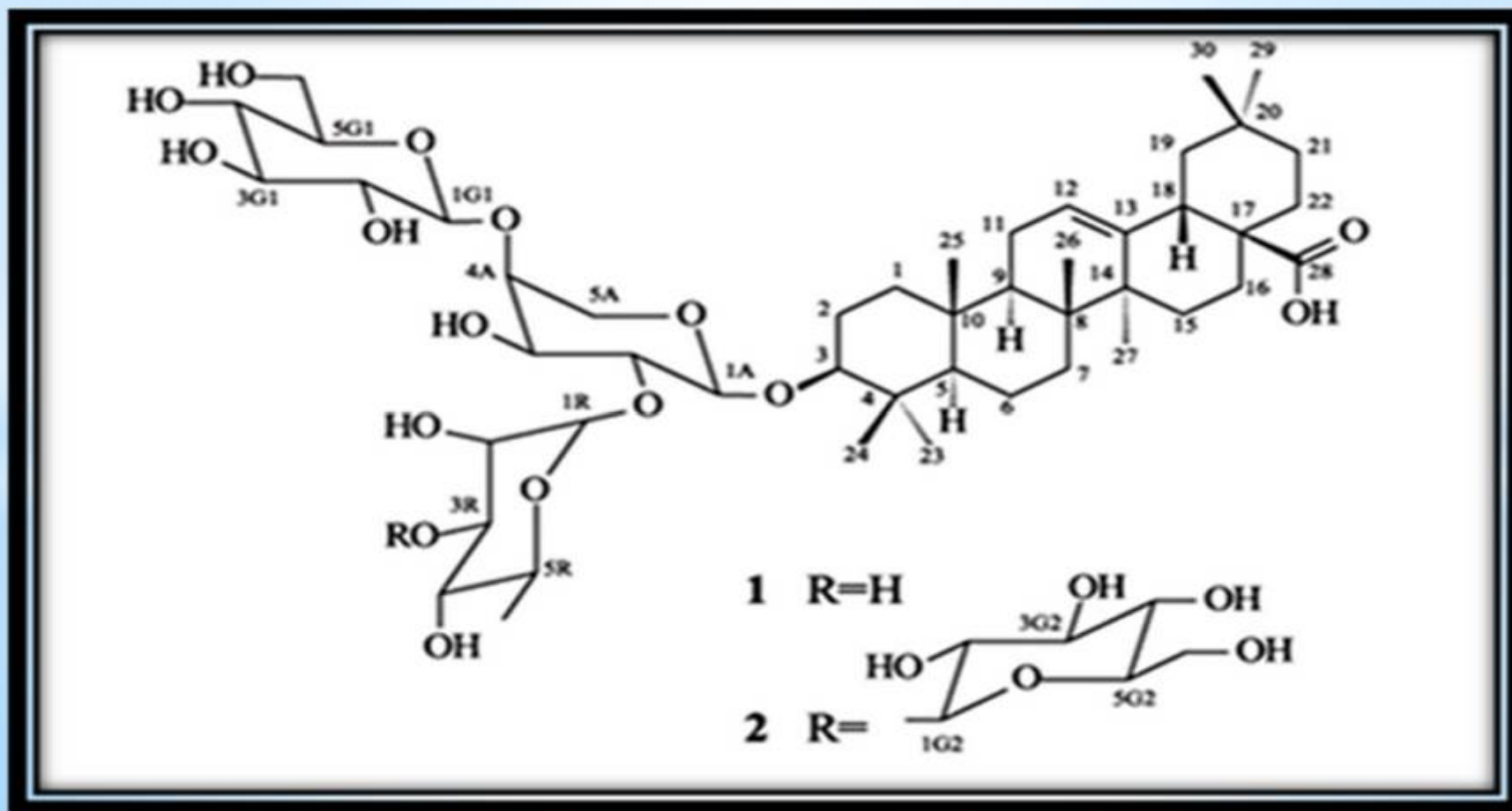


- Saponins have a **bitter, acrid taste**, and drugs containing them are usually sternutatory and otherwise **irritating the mucus membrane**.
- They **destroy red blood corpuscles** by hemolysis and are toxic especially to cold blooded animals therefore many saponins are used as fish poisons.
- The more poisonous saponin is often called *sapotoxin*, many are toxic to insects and mollusks, and some are used to control schistosomiasis snails.
- Saponin upon **hydrolysis** yield an **aglycone** known as *sapogenin*, which are crystallized upon acetylation, therefore this process is used for **purification**.

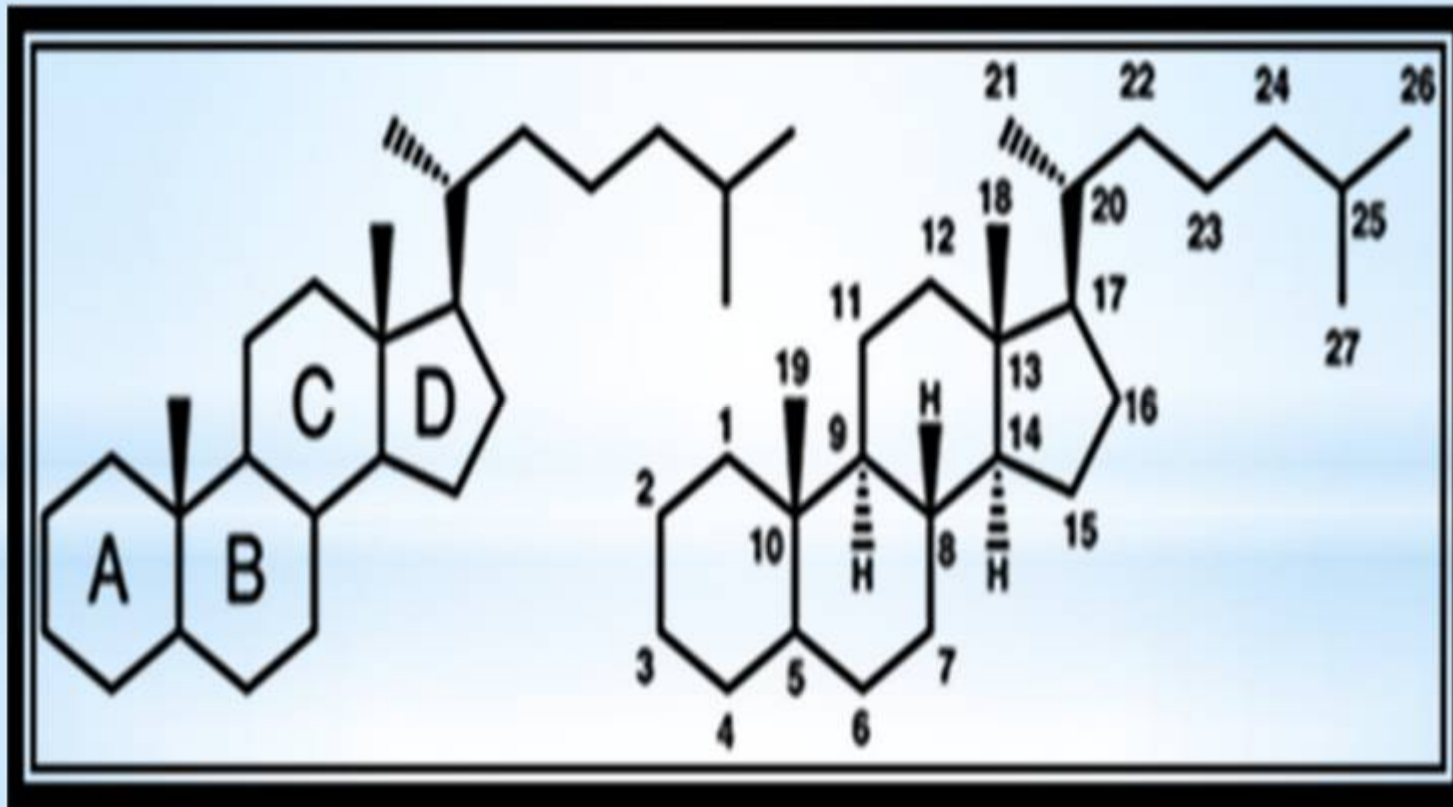


According to the structure of the aglycone, two kinds of saponin are recognized:

1. Pentacyclic triterpenoid saponins (acidic, and the C-atom is C30)



2. Steroidal saponins (neutral C- atom is C27).



Isolation & Identification of the Saponin Glycosides:

Procedure:

Method of extraction: Decoction.

Plant used: Saponaria officinalis family Caryophyllaceae.

Part used: Dry root.



Saponaria officinalis

Add *0.1 gm* of Saponaria root in coarse powder to *20 ml* distilled water in a beaker and boil gently for *2-3 minutes*.



Filter hot and allow cooling



Dilute *5ml* of the filtrate with water and shake vigorously.



add to the filtrate *5ml* of *dilute H₂SO₄ acid* and boil gently for *3-5 min_s*.



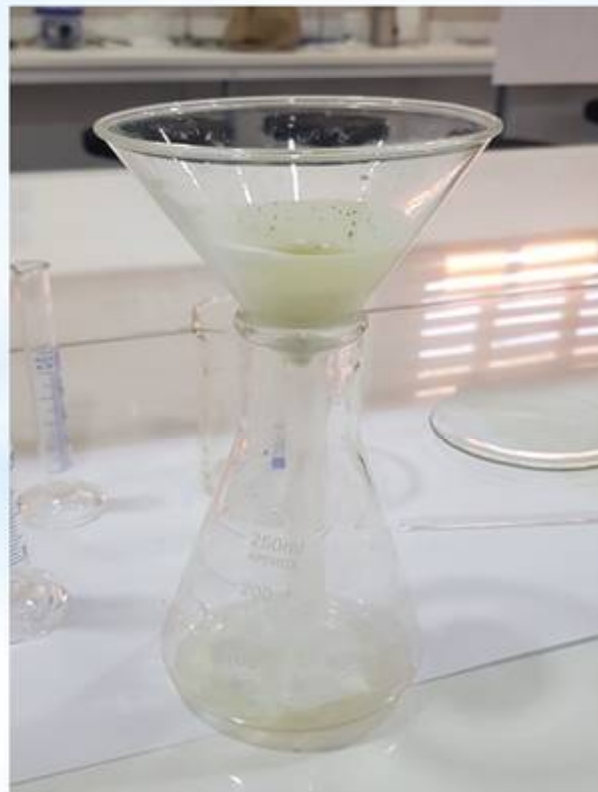
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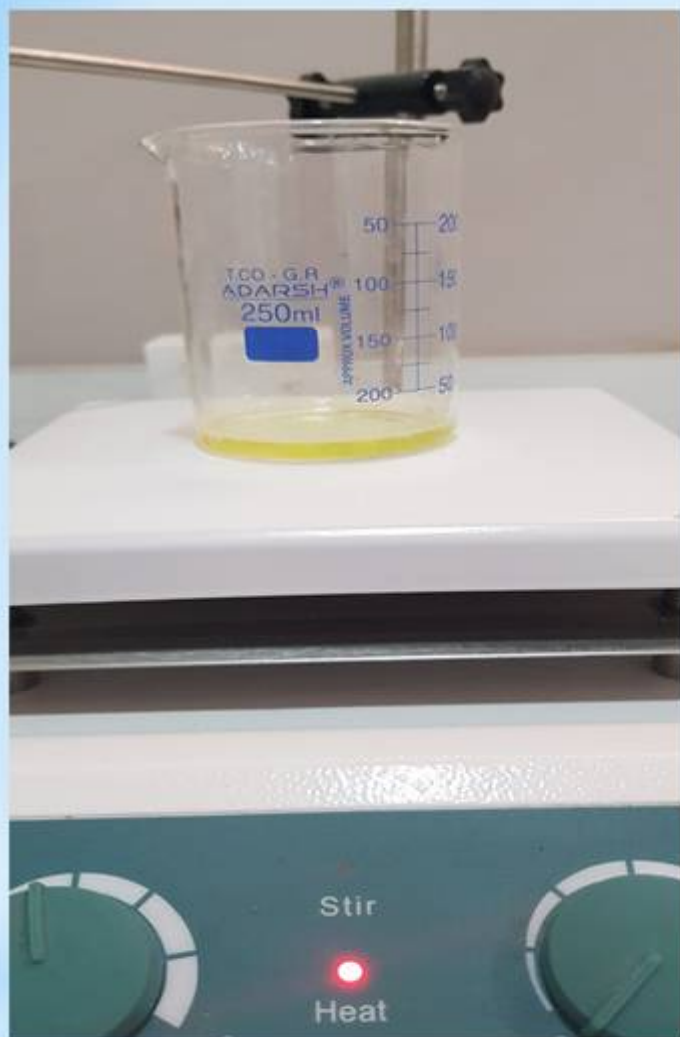
Supernatant is
glycone

Precipitate is
aglycone

***The aglycones are obtained by acid hydrolysis and are insoluble in water but are soluble in 90% alcohol.**

Procedure





The Chemical Tests

■ *THE FEHLING TEST:*

Aim: Identity test (specific) for Saponin glycosides.

Equipment & Reagents:

- Test tube.
- NaOH.
- Fehling Reagent.
- litmus paper.

Procedure:

- Make the filtrate alkaline with NaOH.
- Add 1 ml of Fehling Reagent to 3 ml of the solution.
- heat for 10mins on boiling water bath.

Results:

Brick- red precipitation in the solution

The result of Fehling's test

Fehling's test

A test tube containing a brick red precipitate. The precipitate is a fine, granular solid that has settled at the bottom of the tube, forming a distinct layer. The liquid above the precipitate is a clear, colorless solution. The test tube is held vertically against a light background.

Brick red precipitate

Thank you

