Practical Pharmacognosy

3rd. Stage

1st semester

Dr. Zahraa Shubber

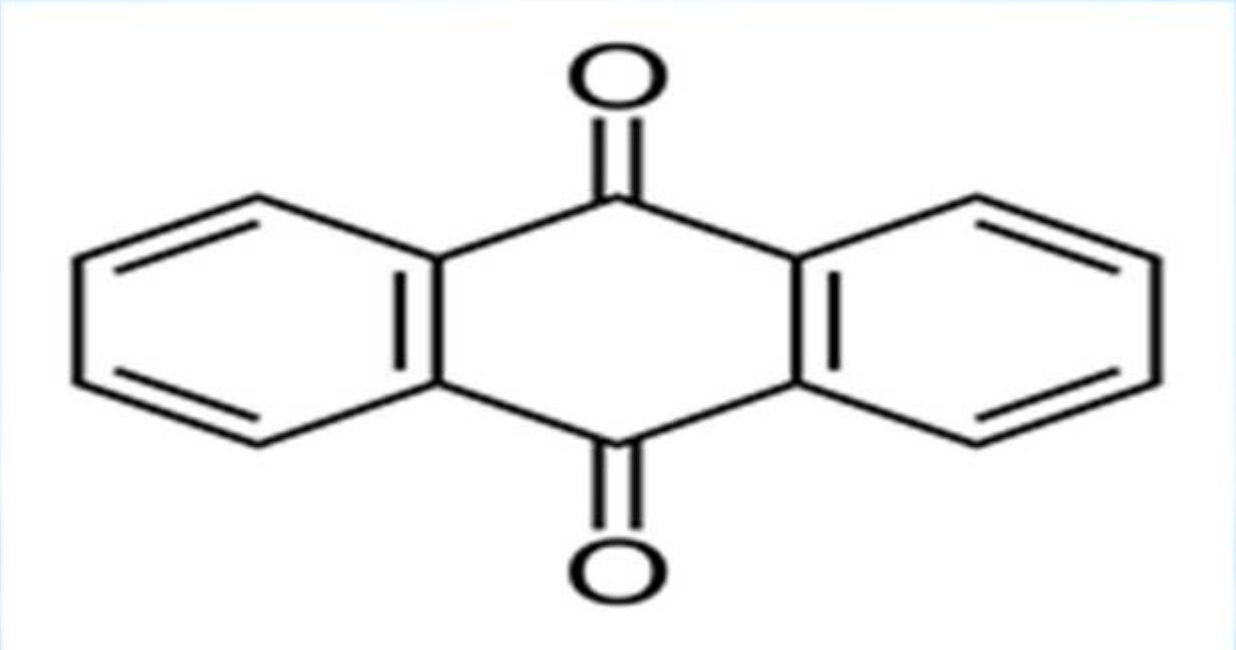
Lab.2

Anthraquinone Glycosides

- Anthraquinone and related glycosides, are stimulant cathartics, and exert their action by **increasing the tone of the smooth muscle** in the wall of colon and **stimulate the secretion of water and electrolytes into the large intestine**.
- After the oral administration, the anthraquinone glycosides are hydrolyzed in the colon by the action of enzymes of the micro flora, to the pharmacologically active free aglycones which usually produce their effect in 8 -12 hrs.
- After administration, these agents are indicated for constipation in patient who do not respond to milder drugs and for bowel evacuation before investigational procedure or surgery.

- Stimulant laxative are habit forming so the long-term use may result in laxative dependence and loss of normal bowel function.
- The glycosides of anthranols and anthrones elicit a more drastic reaction than do corresponding anthraquinone glycosides and cause discomforting and gripping action.
- The drugs mostly used are **cascara, frangula, hypericum and Senna.**
- **Aloe and Rhubarb** are not recommended due to their irritating actions which increase the chance for gripping effect.

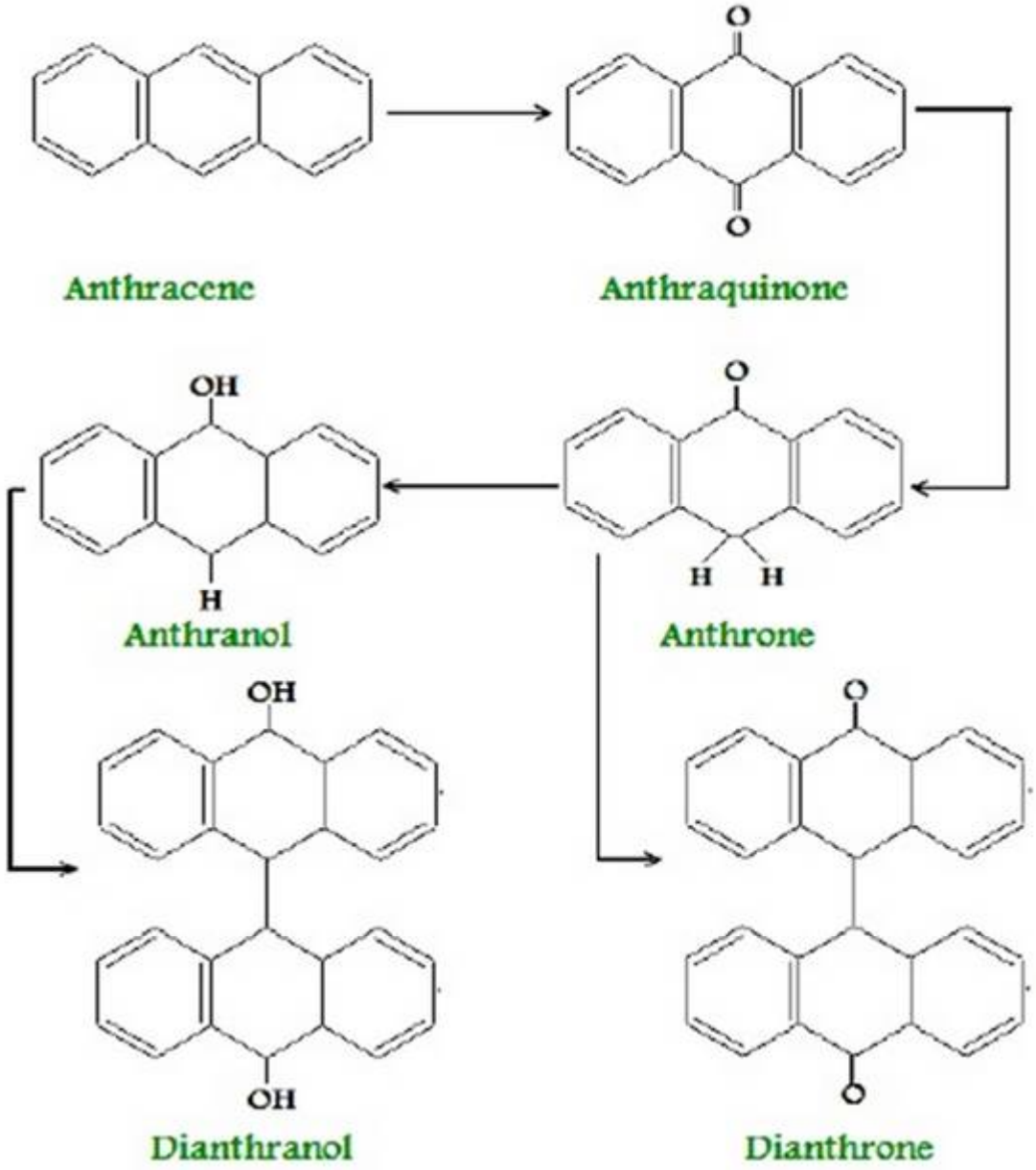
- The anthraquinone hydrolyzed to give aglycone which are di, tri, or tetra –hydroxyanthraquinone .
- Also there are antherone, dianthrones and oxanthrones.



Chemical Structure of Anthraquinone

Chemistry:

*Chemically these are related to **anthracene.***



Isolation and Identification of the Anthraquinone Glycosides:

1. Extraction:

Aim: To isolate the anthraquinone glycosides.

Equipments:

- Large beaker & two medium size beakers.
- Two conical flasks.
- Centrifuge & Centrifuge tubes.
- Separatory funnel.
- Water bath.
- Round bottom flask.
- Filter paper.
- Reagent bottle.

Reagents:

- Conc.HCl acid.
- Chloroform.
- 60% w/v ferric chloride solution.

Procedure:

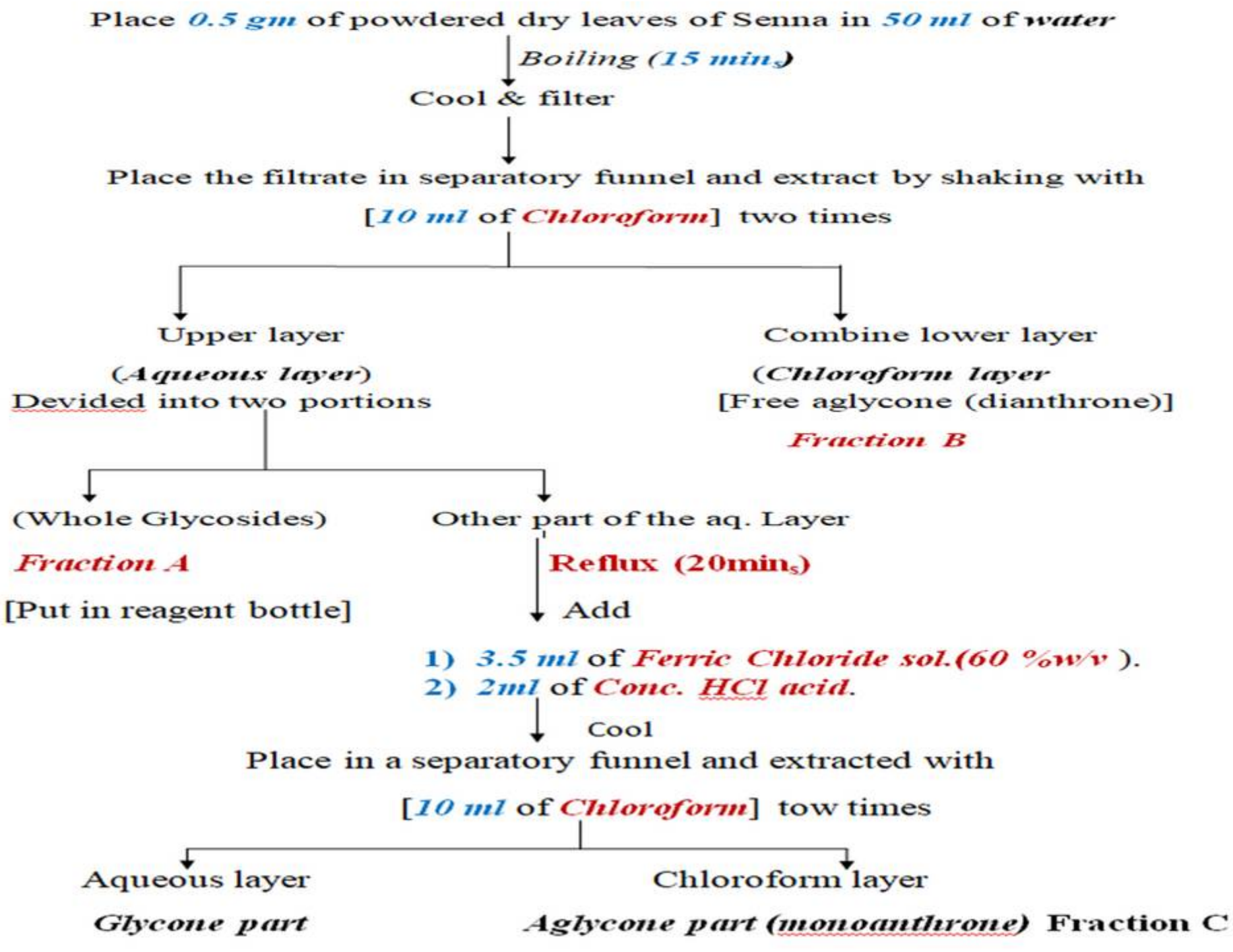
Method of extraction: Decoction.

Plant used: Senna Cassiaa cutifolia, Cassia angustifolia

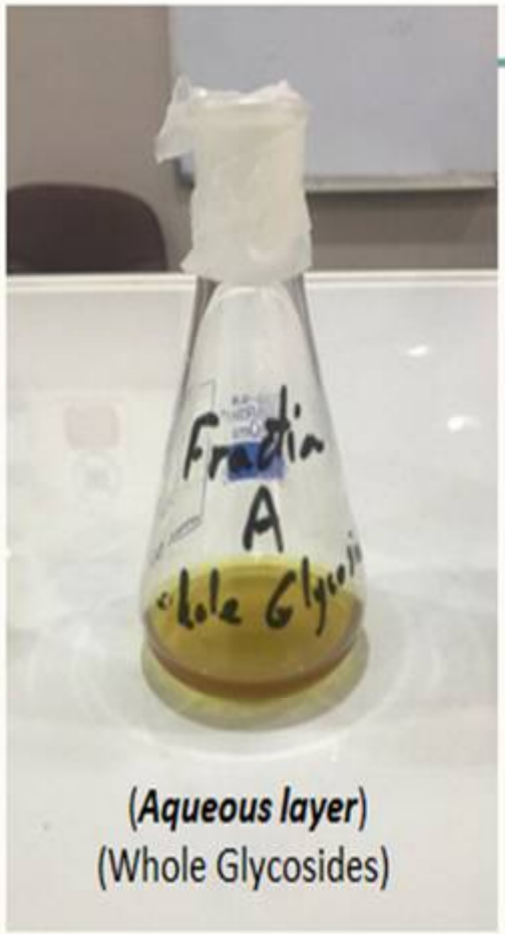
Family: Leguminosaea.

Part used: Dry leaves.

Senna

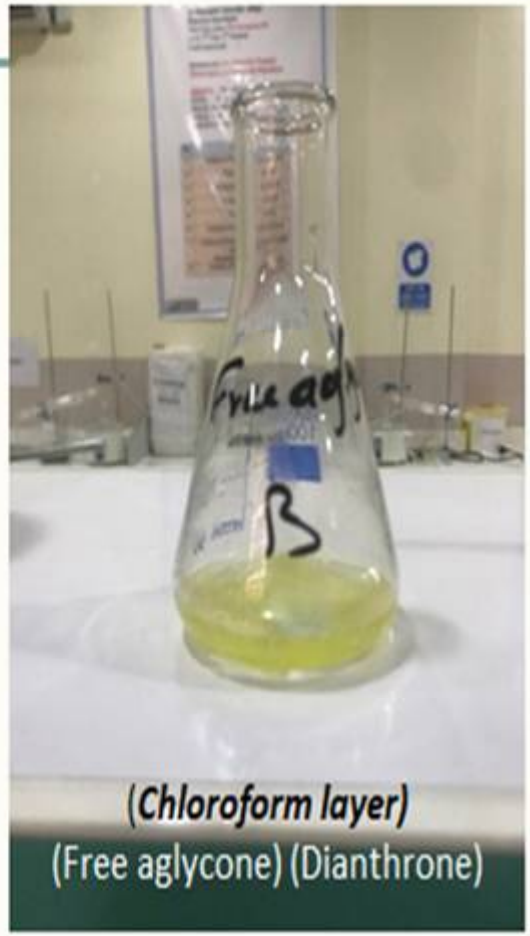

Place 0.5 gm of powdered dry leaves of Senna in 50 ml of water
Boiling (15 mins)
Cool & filter
Place the filtrate in separatory funnel and extract by shaking with
[10 ml of Chloroform] two times
Upper layer
(Aqueous layer)
Devided into two portions
Combine lower layer
(Chloroform layer
[Free aglycone (dianthrone)]
Fraction B
(Whole Glycosides)
Fraction A
[Put in reagent bottle]
Other part of the aq. Layer
Reflux (20mins)
Add
1) 3.5 ml of Ferric Chloride sol.(60 %w/v).
2) 2ml of Conc. HCl acid.
Cool
Place in a separatory funnel and extracted with
[10 ml of Chloroform] tow times
Aqueous layer
Glycone part
Chloroform layer
Aglycone part (monoanthrone) Fraction C

Procedure



(*Aqueous layer*)
(Whole Glycosides)

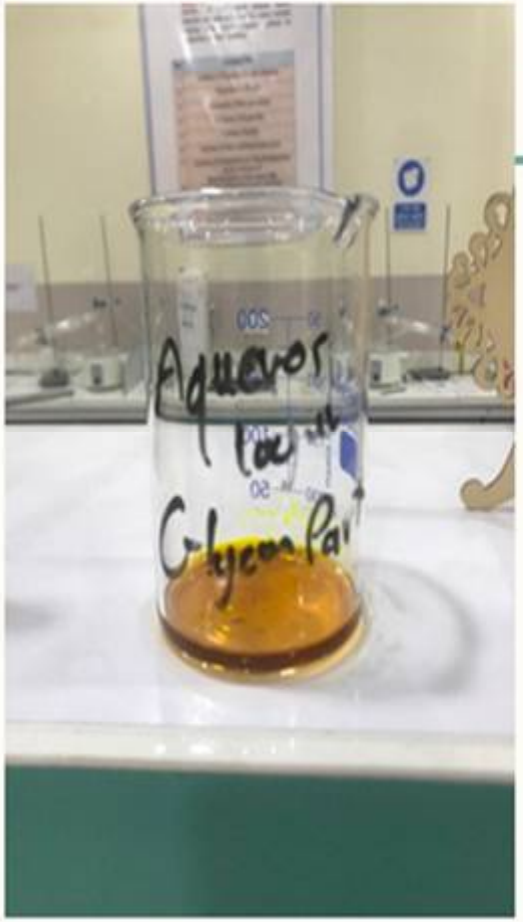
Fraction A



(*Chloroform layer*)
(Free aglycone) (Dianthrone)

Fraction B

Procedure



Aqueous layer
(Glycone part)

Chloroform layer
Aglycone part (Monoanthrone)
Fraction C

Results:

Fraction A : Contain the whole glycosides.

Fraction B : Contain the aglycone (dianthrone) .

Fraction C: Contain the aglycone part (monoanthrone).

The Chemical Tests

Borntrager's test

Aim: Identity test for aglycone part of anthraquinone glycosides.

Equipment & Reagents:

- Separatory funnel.
- Test tube.
- Dilute HCl.
- Benzene.
- Dilute ammonia (10%).

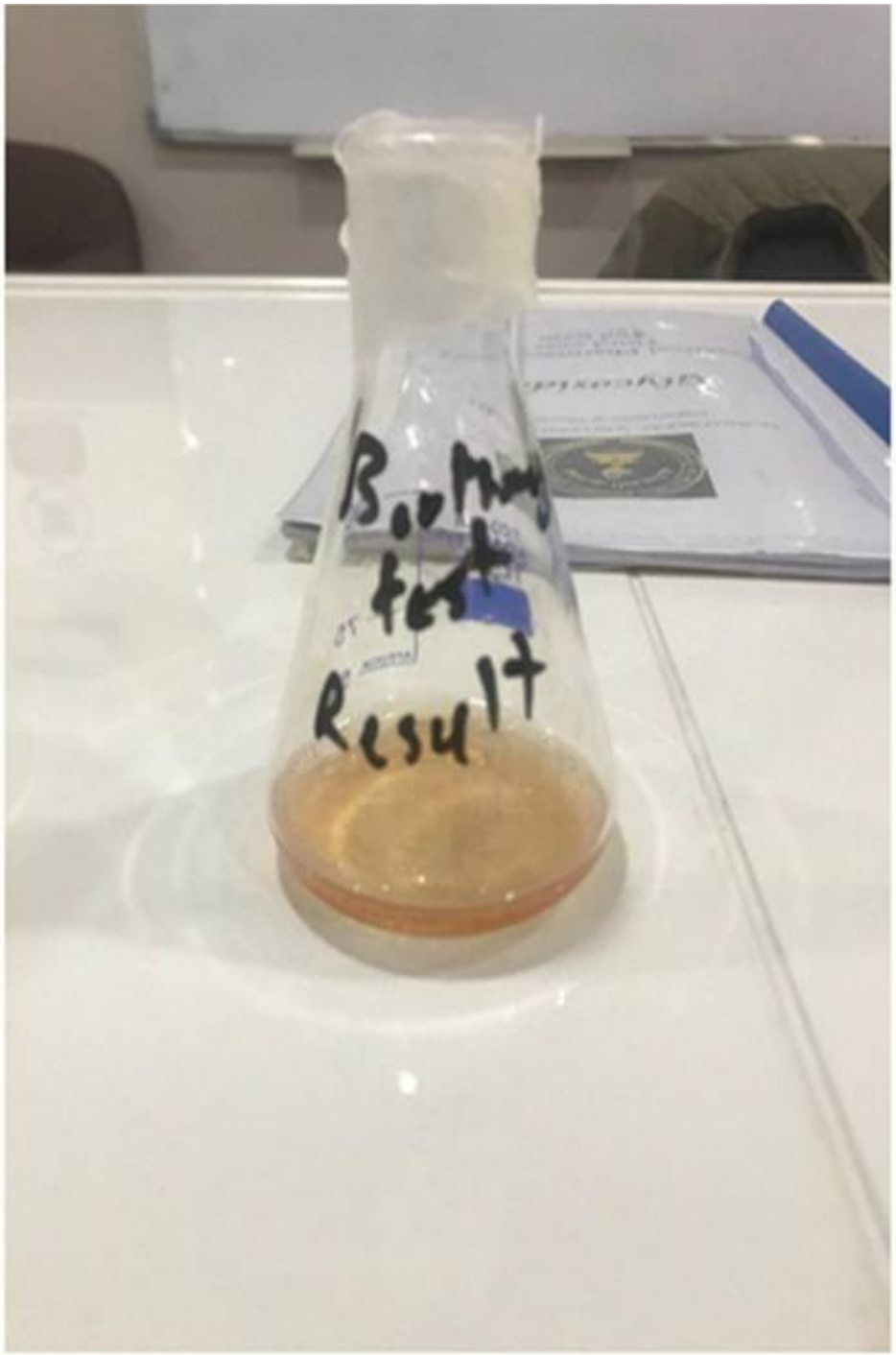
Procedure:

To ***5ml*** of the Senna extract (***fraction A***), add ***5ml dilute HCl***, then place the mixture in a separatory funnel and partitioning with ***5ml*** of ***benzene*** for ***1min***.

Take the upper benzene layer (***free aglycone***) and shake it with ***dilute ammonia (10%).*** Check the intensity of the color.

Results:

Pink color will be produced which is very clear with monoanthrones than dianthrones.



The chemical test result


THANK
YOU