

Lab. 1 Part 1

Introduction :Glycosides



A. L ZAHRA'A SUHAIL NASSIR

Subjects:

1. Introduction .

2. Chemistry of Cardio active glycosides.

3. Experiment:

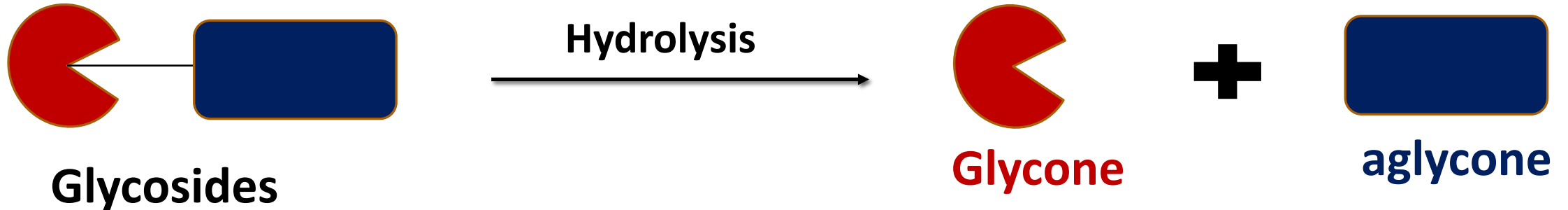
3.1. Plant used to extract C.A. glycosides.

3.2. Procedure of Extraction.

3.3. Procedure of Fractionation.

1. Introduction

Glycosides : are compounds that yield on hydrolysis, one or more sugar part and another non-sugar part. The sugar part is known as **glycone** ,and the non-sugar part is the **aglycone**.



Glycosides

- There are four basic classes of glycosides:
-

1. C-glycosides, in which the sugar is attached to the aglycone through C-C bond.

2. the O-glycosides in which the sugar is connected to the aglycone through oxygen –carbon bond,

3. S-glycosides and

4. N-glycosides.

Glycosides

Generally all glycosides are **hydrolyzed** by:

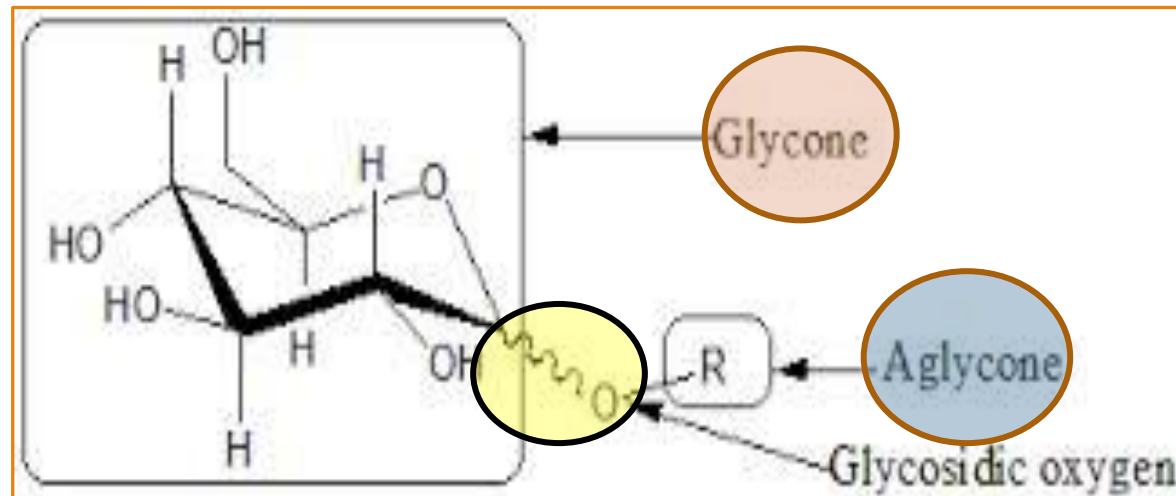
1. The presence of specific **enzyme in the plant tissue**, that are able to hydrolyzed the glycosides, such as the emulsin enzyme and the myrosin enzyme.

2. **Boiling** with mineral **acids**.

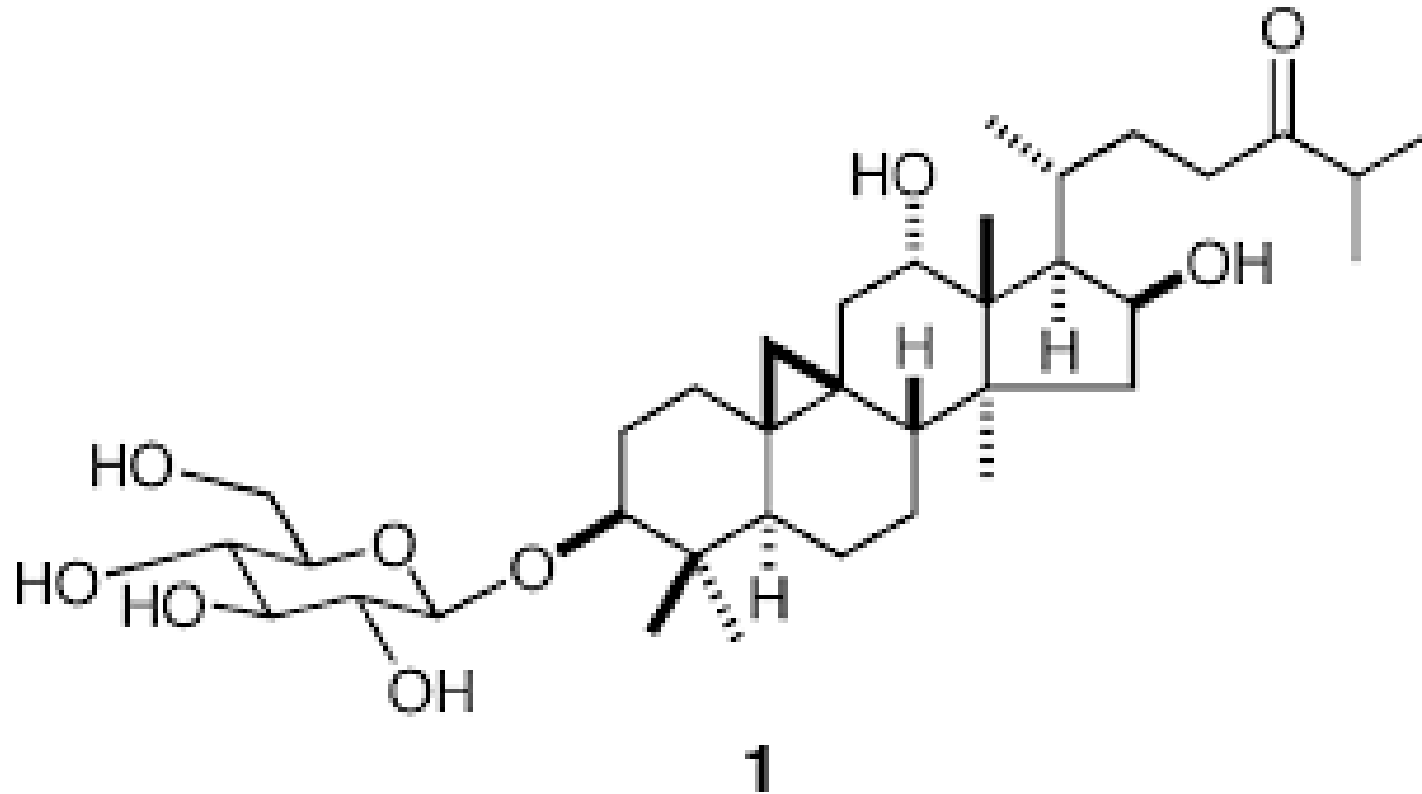
Glycosides

Inside the body:

The glycosides will be cleaved to **glycone** and **aglycone** parts, the glycone part confers on the molecule solubility properties, thus is important in the absorption and distribution in the body, while the aglycone part is responsible for the pharmacological activity.

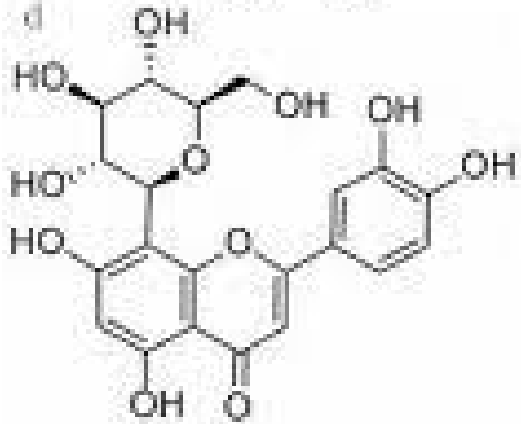
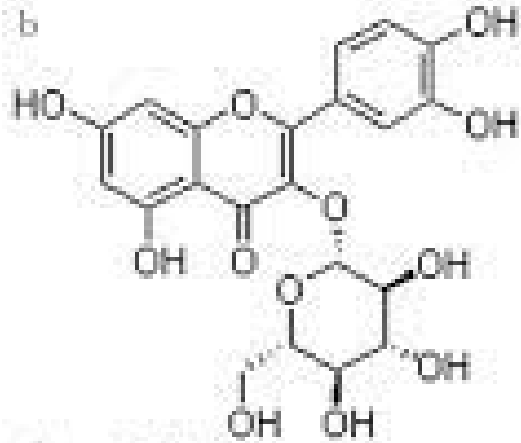


Test 1



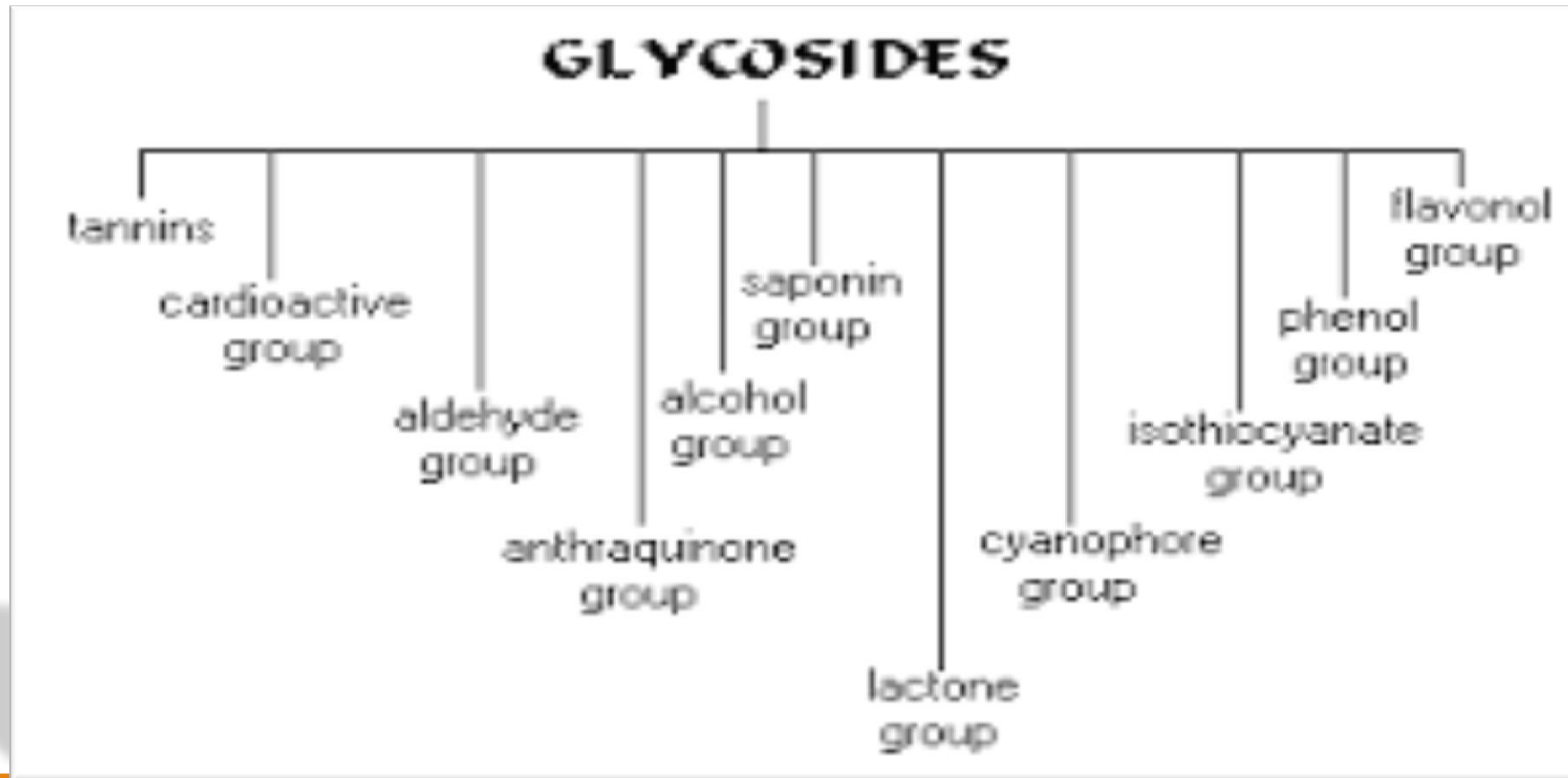
Test/2

state the aglycone part and glycone part. And indicate the type of glycosidic linkage.



Glycosides

❖ Classification of glycosides :



Cardio active Glycosides

- *They* are named so, due to their action on the heart muscle

2. Chemistry of Cardio active glycosides



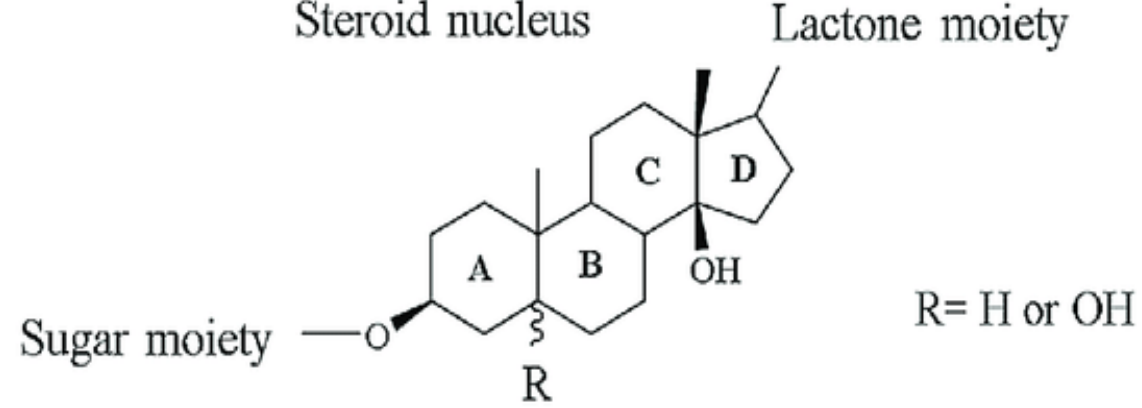
The aglycone part here is steroid

There are of two types:

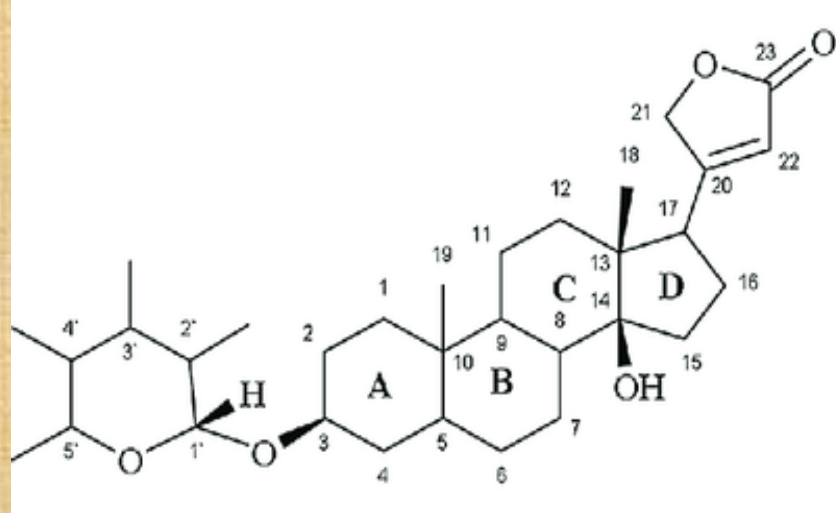
1) Cardinolides (α - β unsaturated **5** – member lactone ring).

2) Bufadienolides (doubly unsaturated **6**-member lactone ring).

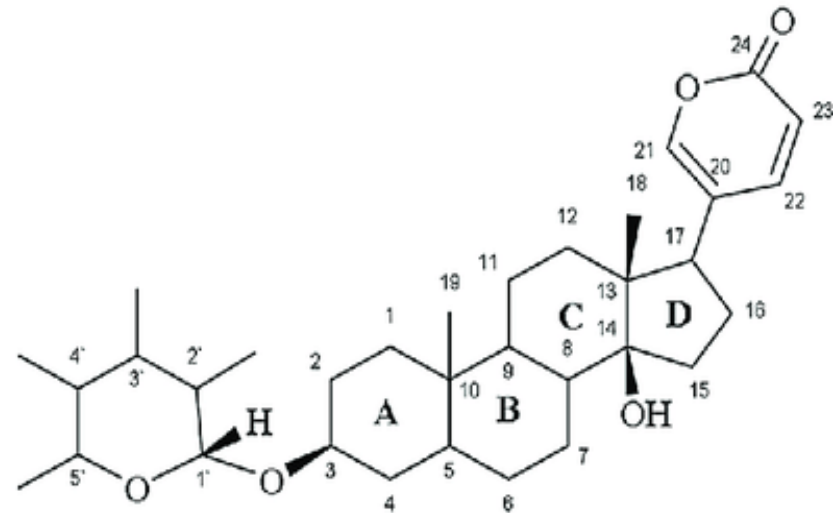
The more prevalent in nature is cardinolides type.



Cardiac glycosides

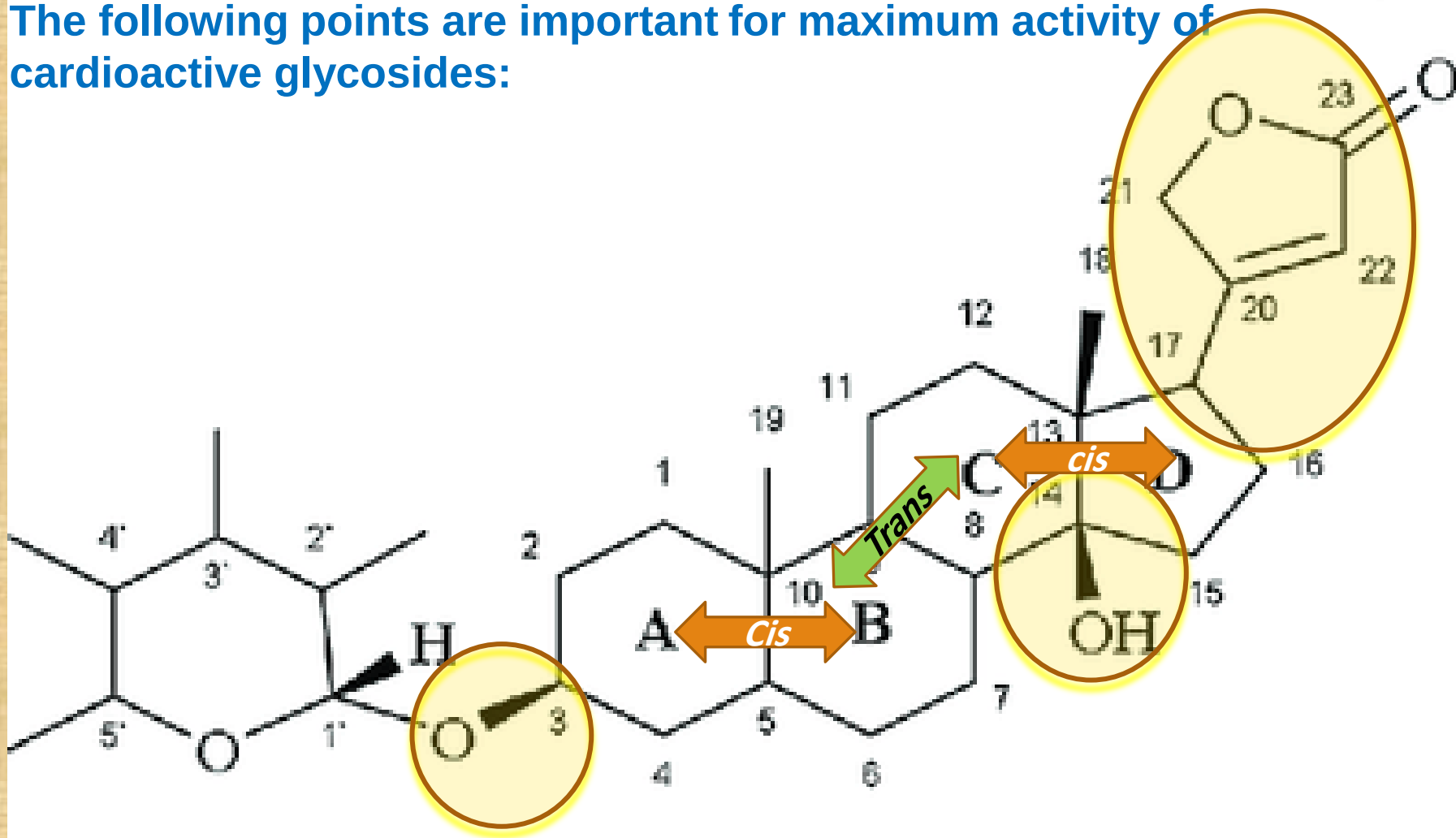


Cardenolides



Bufadienolides

The following points are important for maximum activity of cardioactive glycosides:



Cardenolides

- ☐ 17 -β -lactone ring (Cardinolide or Bufadinolide).
- ☐ 3 -β - OH.
- ☐ 14 -β-OH .
- ☐ CATSC
 - ✓ C= *cis* between two rings (A&B) (C&D).
 - ✓ T= *Trans* between two rings (B&C).
 - ✓ S= *Syn*. A= *Anti*.



3. Experiment:

3.1. Plants Containing Cardio active Glycosides

1. Digitalis (digitalis or foxglove) Digitalis purpurea of the Family **Scrophulariaceae**.

anumber of glycosides as digitoxin ,gitoxin and getaloxine.



2. The plant used in our laboratory is Nerium oleander of the **Family Apocyanaceae**. The main glycoside of which is oleandrin.



3.2. Isolation and Identification of the Cardio active Glycosides :

Procedure of Extraction:

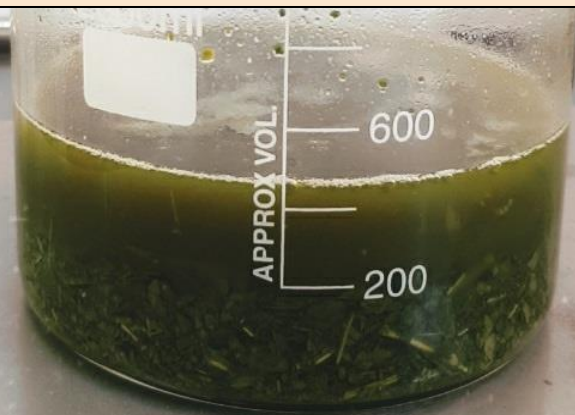
Method of extraction: **Maceration.**

Plant used: **Nerium oleander.**

Part used: **dry leaves.**

1

1. Maceration 10 gm of the powdered leaf in 100 ml of 70% Ethanol for 24 hrs



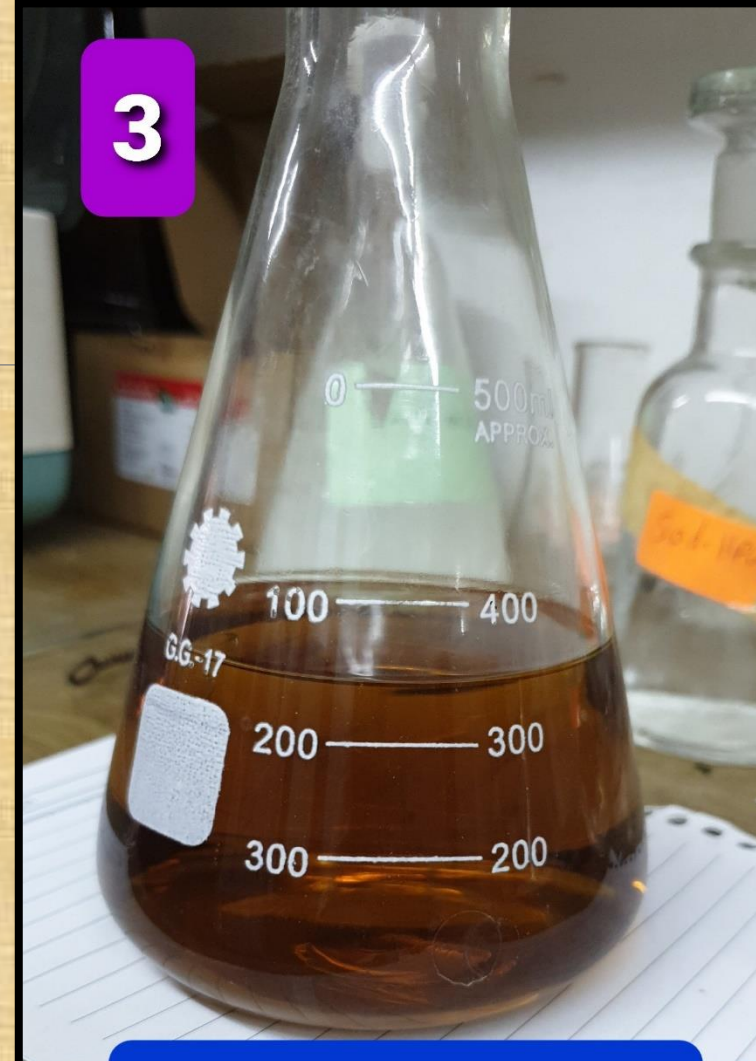
Maceration of plant in 70% Ethanol

2



Filtration after 24 hrs

3



Crude extract

4



10 ml of crude
extract

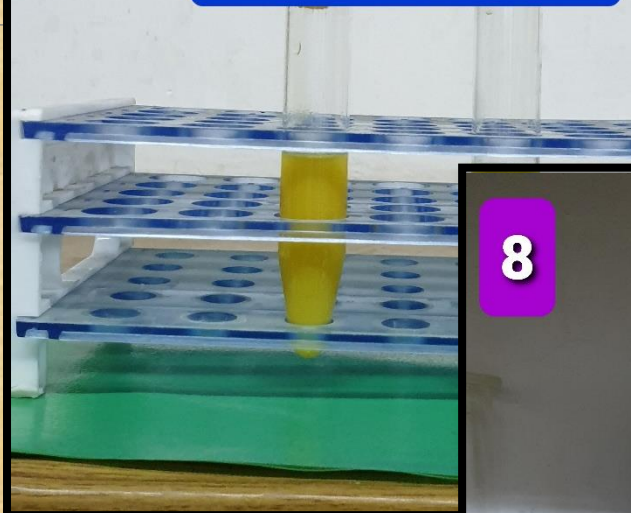
6



After addition of Lead sub
acetate

7

Divide equally in 2
parts using cetrifuge
tubes



8

Centrifuge
for 5 mins



5



Add
5 ml
of
Lead
sub
acetate

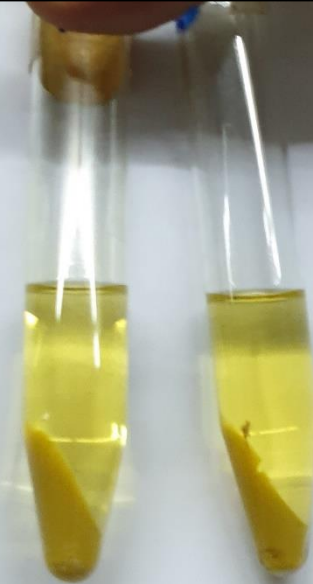


9



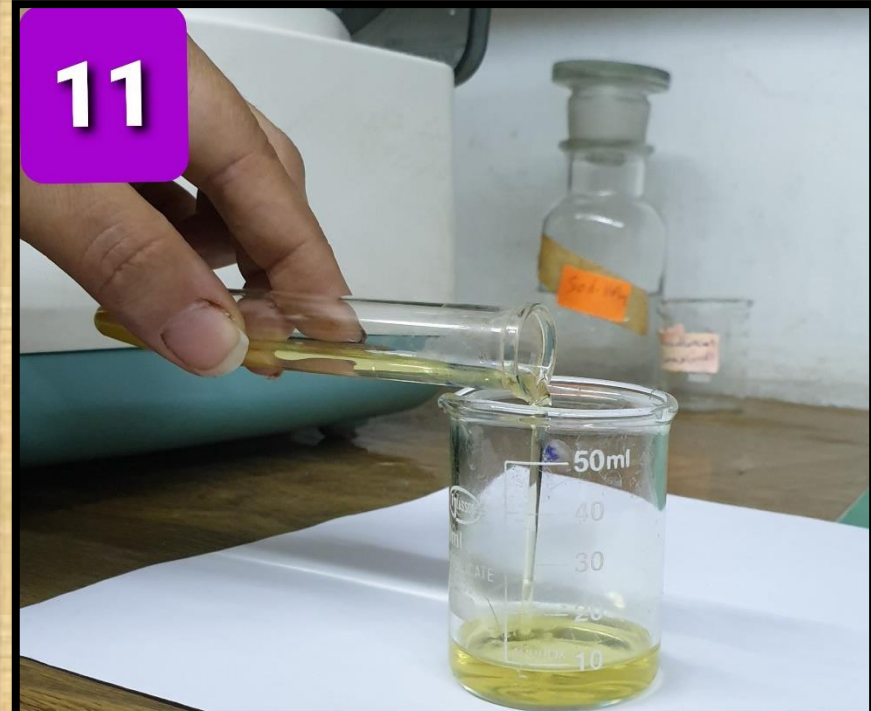
turbidity due to ppt . after
addition of Lead sub acetate
to crude extract

10



After 1st Centrifuge

11



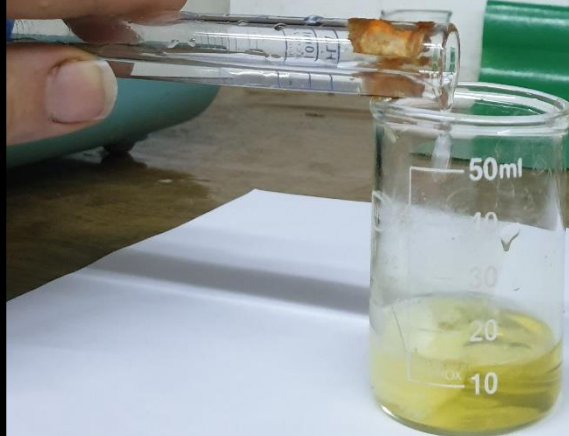
Decantation

12



Supernatant layer

13



**Addition of 10% Sod.
Phosphate**

14

After addition of
Sod.Sulphate



15



- Take supernatant and divide in to *two* parts

Take one division and put in the separatory funnel

[*10 ml* of *Chloroform: Ethanol (3:1 v/v)*]

Take the organic lower layer and put it in the conical flask

Fraction A

Place the other division of the extract in the conical flask

Add 3 ml of 4N HCl

Boiling in water bath for
15 mins

Cool & transfer to a
Separatory funnel

[10 ml of Chloroform]

Add Anhydrous sod. Sulphate until get a clear solution
then decant the chloroform layer to get:

Fraction B



Thank
you

*The End of
Part 1... to be
Continued*