

PHARMACOGNOSY

**for 3rd year students 22 Public health 226 «Pharmacy, industrial pharmacy»,
educational program «Pharmacy» ФМ18 *(5,0д) АНГЛ 1, 2, groups**

13.05, – group 1

15.05 – group 2

**LABORATORY CLASSES . Topic: « Chemical, morphological and
anatomical analysis of CARDIOGLYCOSIDES-containing herbal drugs »**

OBJECTIVE.

Know the definition of “**CARDIOGLYCOSIDES**”, classification of cardiosteroids, method of obtaining of them, condition of keeping, method of analysis, chemical tests, analysis of quality, chromatography analysis? Usage in medicine. Medicinal plants and herbal drugs: Purple Foxglove, Grecian Foxglove (Wooly Foxglove), lily-of-the-valley, Spring Pheasant's eye, Strophanthus, Gray wallflower, Oleander, Green Hellebore, Squill.

RELEVANSE.

Cardiac glycosides constitute a group of closely related natural products with highly specific and powerful action on cardiac muscles (cardiotonic). They act on the heart by direct, as well as, indirect mechanism to enhance the force and velocity of contraction. They are toxic at high doses, and with therapeutic action at smaller doses. They showed effects on the tone, excitability and contractility of the cardiac muscle and diuretic activity. In addition, they slow the rate of atrioventricular conduction. Higher doses cause toxic and sometimes lethal effects. Plants and preparations containing cardiac glycosides have long been used both as poisons and drugs in herbal medicine since ancient times. Cardioglycosides are recommended for chronic and acute heart failure, they produce sedative and diuretic effects.

CONTROL QUESTIONS.

1. Which compounds are called cardiac glycosides?
2. What physical chemical properties do cardiac glycosides have?
3. What do underlie the classifications of the cardiac glycosides?
4. Which methods of qualitative detection of cardiac glycosides are used?
5. Which methods of quantitative analysis of cardiac glycosides are used?
What is advantage of these methods?
6. How often is biological standardization of cardiac glycosides carry out?
7. What purposes are cardiac glycosides employed for?
8. How should herbal drugs contained cardiac glycosides be picked up?
9. How should herbal drugs contained cardiac glycosides be stored?
10. Characterize the chemical composition of following plants and herbal drugs:
Purple Foxglove, Grecian Foxglove (Wooly Foxglove), lily-of-the-valley, Spring Pheasant's eye, Strophanthus, Gray wallflower, Oleander, Green Hellebore, Squill.
11. Characterize the morphological and anatomical features of the following plants and herbal drugs: Purple Foxglove, Grecian Foxglove (Wooly Foxglove), lily-of-the-valley, Spring Pheasant's eye, Strophanthus, Gray wallflower, Oleander, Green Hellebore, Squill.
12. Characterize the pharmacological actions of following plants and herbal drugs: Purple Foxglove, Grecian Foxglove (Wooly Foxglove), lily-of-the-valley, Spring Pheasant's eye, Strophanthus, Gray wallflower, Oleander, Green Hellebore, Squill.

TESTS

1. Purple Foxglove leaves are used for cardioactive drugs production. What temperature should this raw material be dried at?

A 80-90°C

B 30-40°C

C 50-60°C

D 20-25°C

E 90-100°C

2. Cardiac glycosides have high toxicity that is why the medical plant material should be kept:

A According to the A list (poisonous drug substances)

B Together with other medical plant material

C According to the B list (these drug substances require caution in handling, storage or use)

D This doesn't matter

E In a separate closet

3. During the commodity research analysis of the raw material it was discovered that it consists of simple or slightly branchy stem, slightly ribbed, covered with leaves, flowers, buds. Leaves are alternate, almost sessile, digitated into 5 parts, 2 lower ones are shorter, pinnatisect. Flowers are large, goldish yellow, solitary. Calyx is green, pubescent. Smell is faint. Taste is never determined! Plant material is poisonous. Therefore this raw material is:

A Stinging nettle

B Spring Adonis

C Centaury

D Common motherwort

E Water pepper

4. To identify medicinal drug from cardiac glycosides group an analyst should prove the presence of unsaturated lactone ring. Which reagent should be used for the abovementioned?

A Discoloured magenta (rosein) solution

B Alkaline hydroxylamine solution

C Alkaline potassium tetraiodomercurate solution

D Alkaline solution of picric acid

E Saturated sodium chloride solution

5. Spring adonis herb is used for various cardiac drugs production. What is the reason of limiting the collection of the raw material?

- A** Does not grow in Ukraine
- B** It is guarded
- C** Has limited distribution in Ukraine
- D** Raw material's not available
- E** Grows on the polluted area

6. Preparations of Lily-of-the-valley have cardioactive and sedative effect. While collecting lily-of-the-valley it is possible to gather the following admixture:

- A** Treacle mustard
- B** Purple foxglove
- C** Grecian foxglove
- D** Spring adonis
- E** Solomon's seal

7. Purple foxglove (*Digitalis purpurea*) leaves standardization is carried out according to the content of cardiac glycosides. Which method of quality determination is used?

- A** Biological standardization
- B** Potentiometry
- C** Gravimetry
- D** Permanganatometry
- E** Spectrophotometry

8. Choose medicine the raw material for which is woolly foxglove:

- A** Erysimin
- B** Corglycone
- C** Digitoxin
- D** Adoniside
- E** Celanide

9. Cardioactive medicines are obtained from Foxglove leaves, but they have cumulative characteristic. Specify plants which contain cardiac glycosides and do not possess cumulative properties:

A Bird cherry tree, Ephedra, Lily-of-the-valley

B Strophanthus, Treacle mustard, Tickseed

C Spring adonis, Common horstail (Equisetum), Primrose

D Lily-of-the-valley, Spring adonis, Treacle mustard

E Bush pea, Strophanthus, Rhaponticum

10. Foxglove plant material is a source of cardiotonic drugs. Which purple foxglove organs are used as herbal raw material?

A Roots

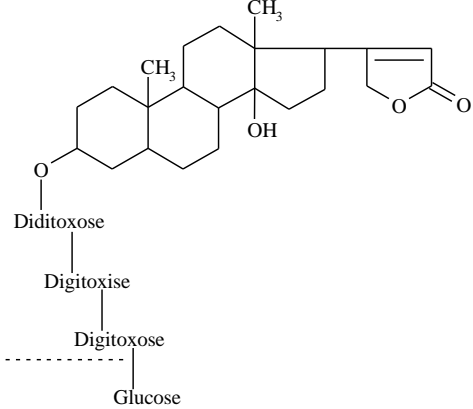
B Leaves

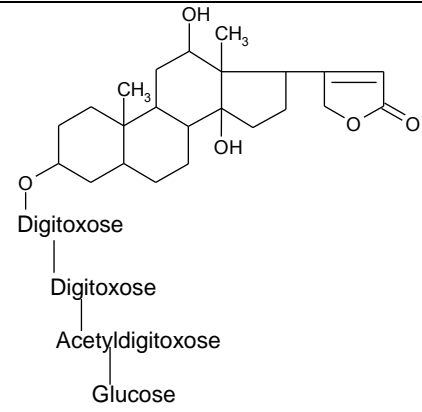
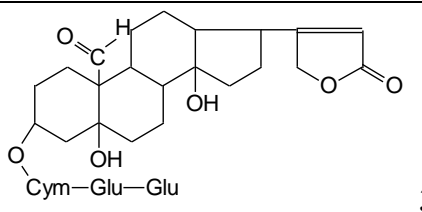
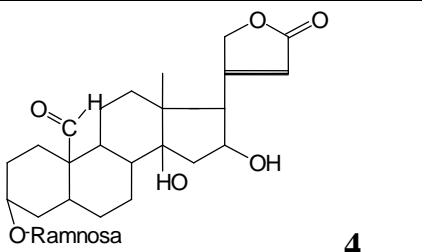
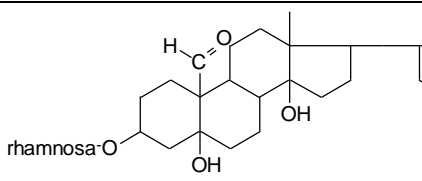
C Fruits

D Seeds

E Herb

11. Join structure of Cardioglycosides with its name and medicinal plant from where it comes

Cardioglycosides, structure	Cardioglycosides, name	Medicinal plant
 <p style="text-align: right;">1</p>	<p>A. Lanatoside</p>	<p>I. Adonis vernalis</p>

 <p>Digitoxose Digitoxose Acetyldigitoxose Glucose</p> <p style="text-align: right;">2</p>	B. Adonitoxin	II. Digitalis purpurea
 <p>Cym—Glu—Glu</p> <p style="text-align: right;">3</p>	C. Purpurea-glycosides	III. Strophantus Kombe
 <p>O Rhamnosa</p> <p style="text-align: right;">4</p>	D. convallotoxin	IV. Digitalis lanata
 <p>rhamnosa O</p> <p style="text-align: right;">5</p>	E. lanatoside	V. Convallaria majalis

PRACTICAL TASKS.

You have to fill in your laboratory hand-book on the topic: Morphological and anatomical analysis of cardioglycosides-containing herbal drugs.

LITERATURE TO PREPARE FOR THE LESSON.

1. Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Upyr, Ya.V. Dyakonova, V.Yu. Kuznetsova, I.G. Zinchenko, O.A.

Kyslychenko; ed. by V.S. Kyslychenko. – Kharkiv : NUPH: GoldenPages, 2011. – 552 p.; il.

2. Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Lenchyk, I.G. Gurieva et al.; ed. by V.S. Kyslychenko. – Kharkiv : NUPH: GoldenPages, 2019. – 584 p.

Tests KROK–2. Topic Cardioglycosides