ODESSA NATIONAL MEDICAL UNIVERSITY
Department of General and Clinical Pharmacology and Pharmacognosy

GUIDELINES
on independent work of students / VTS /

on the topic: «Cardioglycosides. Species of hellebore, bulb above sea level. "

Course: 3rd Faculty: medico-pharmaceutical

Approved
at the methodical meeting
departments
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Protocol № 1

Head departments _____
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Odessa - 2024

Subject: «Cardioglycosides. Species of hellebore, bulb above sea level. "- 4 years

1. Relevance of the topic

Cardioglycosides are triterpene organic compounds that have a steroid part in their structure, which makes them close to steroid saponins and hormones. The importance of this group of BAS is that they specifically act on the heart muscle, are still not synthesized, and modern individual drugs of this group are of plant origin. When studying the topic, special attention should be paid to the strong action of individual drugs-cardioglycosides and the toxicity of raw materials from which they are obtained, which requires appropriate precautions when working with raw materials, and also provides storage of most of its species on list B.

2. Learning objectives:

As a result of independent elaboration of this theme students should:

- know:

- basic information about macroscopic and microscopic methods of analysis of LR and LRS, which contain cardioglycosides.
- effects on the human body of raw materials containing cardioglycosides.
- LR and LRS, which have cardioglycosides: species of hellebore, bulb above sea level.

- be able to:

- perform a macroscopic analysis of LRS, which contains cardioglycosides.
- perform microscopic analysis of LRS that has cardioglycosides.
- to know LR containing cardioglycosides by herbarium samples
- distinguish from impurities raw materials that contain cardioglycosides.

3. Materials for pre-classroom training of students.

3.1. Basic basic knowledge, skills, abilities that are necessary for independent study and mastering of the topic and which are based on interdisciplinary connections:

№ №	Discipline	Know	Be able
1	2	3	4
	1. Botany	Characteristic features of the families of the studied plants. Morphology of stem, bark, leaves, flower, fruit, root and rhizome. Anatomical structure of leaves, bark, fruit, roots, rhizomes.	Use a microscope, prepare surface preparations and cross-sections.
	2. Organic chemistry	Physical and chemical properties of polysaccharides, glycosides, terpenoids, derivatives of aromatic series, heterocycles.	Carry out qualitative reactions; purification of organic compounds.
	3. Analytical chemistry	Methods of acid - base titration (neutralization) and permanganatometry	Work with analytical balances, measuring vessels, photoelectrocalometer, use methods of chromatography on paper and in a thin layer of sorbent.

3.2. Contents of the topic.

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3.3. Recommended Books:

8. Literature

Basic literature

1. Фармакогнозія: підручник (I—III р. а.) / І.А. Бобкова, Л.В. Варлахова. – 3-є видання Всеукраїнське спеціалізоване видавництво «Медицина» 2018, 504с.

2. Фармакогнозія: базовий підручн. для студ. вищ. фармац. навч. закл.(фармац. ф-тів) IV рівня акредитації / В.С. Кисличенко, І.О. Журавель, С.М. Марчишин та ін.; за ред. В.С. Кисличенко. – Харків: НФаУ: Золоті сторінки, 2015. - 736 с.

3. Навчальний посібник з дисципліни «Фармакогнозія» / Я. В. Рожковський, Б. В. Приступа, І. А. Бойко, Н. В. Герасимюк, В. В. Черногорюк -: Методична розробка кафедри фармакогнозії ОНМедУ. – Одеса: ОНМедУ, 2019 – 51 с.

4. Державна Фармакопея України: в 3 т. / Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів». – 2-е вид. – Харків: Державне підприємство «Український науковий

фармакопейний центр якості лікарських засобів», 2015. – Т. 1. – 1500 с.

Additional literature:

1 Державна Фармакопея України: в 3 т. / Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів». – 2-е вид. – Харків: Державне підприємство «Український науковий фармакопейний центр якості лікарських засобів», 2014. – Т. 3. – 732 с.

2. Практикум з ідентифікації лікарської рослинної сировини: навч. посіб. / [В. М. Ковальов, С. М. Марчишин, О. П. Хворост та ін.] ; за ред. В. М. Ковальова, С. М. Марчишин. – Тернопіль: ТДМУ, 2014. – 250 с.

3.4. Guidance card for self - study of a student with using the literature on the topic:

№№ р / р	Basic tasks and instructions	Answers
1.	2	3
1.	What are cardioglycosides?	
2.	What are the qualitative reactions to raw materials containing cardiosteroids?	
3.	Write down the Latin name of the species of hellebore and LRS, which are obtained from this plant.	
4.	Give a botanical description of the species of hellebore	
5.	What organs of hellebore species are used in medicine, give their pharmacognostic description, how they are harvested and dried.	
6.	Types of hellebore in medicine are used as	
7.	Write down the Latin name of the bulb above sea level and LRS, which are obtained from this plant.	
8.	Give a botanical description of the bulb above sea level	

9.	What organs of the bulb are used in medicine, give their pharmacognostic description, how they are harvested and dried.	
10.	The bulb above sea level is used in medicine as	

3.5. Materials for self-control.

3.5.1. Questions for self-control.

1. Definitions of "cardioglycosides", "cardiosteroids".
2. Classification of cardioglycosides.
3. Distribution of glycosides in the plant world.
4. Ways of use and application in medicine of raw materials that contain cardioglycosides -cardenolides and cardioglycosides-bufadienolides.
5. What is "biological standardization", what are the units of action?
6. Features of drying, storage and processing of raw materials containing cardiac glycosides.

3.5.2. Test tasks for self-control.

1. To obtain standard medicinal plant raw materials of lily of the valley grass, the drying regime is carried out at a temperature of 50-60 ° C to suspend the next possible biochemical process.

A enzymatic hydrolysis of cardiac glycosides

B oxidation of phenolic compounds

C evaporation of essential oils

D Oxidation of resinous substances

E Oxidation of terpenoids

2. To obtain medicinal plant raw materials of lily of the valley, the drying regime is carried out at a temperature of 50-60 ° C. What chemical processes do not occur

A enzymatic hydrolysis of cardiac glycosides

B oxidation of phenolic compounds

C evaporation of essential oils

D Oxidation of resinous substances

E Oxidation of terpenoids

3. Lily of the valley herb is a source of cardiotonic drugs. To identify cardioglycosides in this plant material can be used reactions:

A with Legal's reagent

B with Dragendorf reagent

C cyanidin test

D with tannin

E nitrogen compounds

4. During the analysis of the purity of medicinal plant raw materials, an impurity of toxic raw materials was detected. What reaction should a pharmacist choose - an analyst to detect cardiac glycosides in a toxic impurity.

A reaction with Lieberman-Burhard reagent

B reaction with Trimm Hill reagent

C reaction with Stahl's reagent

D reaction with Dragendorf reagent

E reaction with Marki's reagent

5. To detect which fragment of the molecule in the preparations of glycosides of the cardiac group of cardenolides chemist VTK pharmaceutical company reacts with a solution of sodium nitroprusside in an alkaline environment?

A five-membered lactone cycle

B methyl group

C cyclopentaneperhydrophenanthrene
D alcohol hydroxyl
E digitoxosis

6. Strophanthus seeds are a source of "ambulance" as a cardiotonic agent. To identify cardiosteroids use the reaction:
A with Chugaev's reagent
B with Dragendorf reagent
C with Hager's reagent
D with Fehling's reagent
E with Wagner's reagent

7. One of the methods of quantitative determination of active substances in raw materials is the method of biological standardization. For which group of biologically active substances it is used:
A cardiac glycosides
B alkaloids
C fatty oils
D tannins
E mucus

8. Standardization of foxglove leaf is carried out on the quantitative content of cardiac glycosides. What method is used to determine the good quality of this raw material
A method of biological standardization;
B method of potentiometric titration;
C gravimetric analysis;
D method of permanganatometric titration;
E Method of spectrophotometric analysis.

9. The activity of plant raw materials and drugs containing cardiac glycosides, expressed in units of action. What method is used to standardize foxglove leaves according to the requirements of DF 11?

A biological standardization

B photoelectrocolorimetry

C spectrophotometry

D densitometry

E titrometry

10. Standardization of lily of the valley grass is carried out by the appropriate method:

A biological method on frogs

B biological method in dogs

C spectrophotometric method

D densitometric method

E by high performance liquid chromatography

11. In pharmacies, tinctures and novogalenic preparations containing cardiac glycosides store:

A behind list B

B on list A

C according to the general list

D separately from LRS, which contain nutrients

E in a tightly closed container filled with paraffin

12. Store LRS "leaves of foxglove" should be:

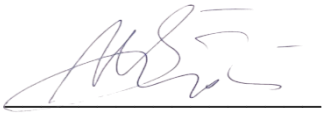
A behind list B

B on list A

C is isolated from the other

D along with others

E tight

Methodical recommendations were made by  *associate professor Boyko IA*