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

GUIDELINES
on independent work of students / VTS / № 9

on the topic: «Triterpenoids. Steroids. Saponins. Natural sources of hormones and bile acids. Raw materials for the semi-synthesis of glucocorticoids. Species of Dioscorea, creeping anchors, hay fever, safflower leaf, agave species, yucca, etc. Cyanosis blue, soapwort medicinal, temptation high, ivy, birch species, calendula, cimicifuga corymbose, primrose. Natural sources of bile acids, endocrine glands of animals as sources of hormones. Stinging nettle, hawthorn, African plum, creeping serenoa. Ecdysteroids. »

Course: 3rd Faculty: medico-pharmaceutical

Approved
at the methodical meeting
departments
August 30, 2024
Protocol № 1

Head departments _____
prof. Rozhkovsky Ya.V.

Odessa - 2024

Topic: «Triterpenoids. Steroids. Saponins. Natural sources of hormones and bile acids. Raw materials for the semi-synthesis of glucocorticoids. Species of Dioscorea, creeping anchors, hay fever, safflower leaf, agave species, yucca, etc. Cyanosis blue, soapwort medicinal, temptation high, ivy, birch species, calendula, cimicifuga corymbose, primrose. Natural sources of bile acids, endocrine glands of animals as sources of hormones. Stinging nettle, hawthorn, African plum, creeping serenoa. Ecdysteroids. » - 4 years

1. Relevance of the topic

The biologically active substances to which the lecture is devoted belong to the compounds of secondary synthesis, which have a triterpenoid structure and perform important functions. Saponins have a wide range of pharmacological activity. They are very common, are part of many plant and animal organisms and are the main active ingredients of many drugs used in modern medicine. Of particular relevance are the corticotropin properties of steroid saponins, which allows the use of appropriate LRS for the synthetic production of hormones. All this knowledge is necessary for future pharmacists. Preliminary knowledge of the properties of saponins, on which the use of raw materials in the food industry and everyday life is based, will greatly contribute to the mastering of the topic material.

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 triterpenoids, steroids, saponins.
- effects on the human body of raw materials containing triterpenoids, steroids, saponins.
- LR and LRS, which have natural sources of hormones and bile acids, raw materials for the semi-synthesis of glucocorticoids .: species of dioscorea, creeping

anchors, hay fever, safflower, agave, yucca, cyanosis, blueberry, lure , calendula, cimicifuga corymbose, primrose.

- LR and LRS, which have natural sources of bile acids, endocrine glands of animals as sources of hormones. Such as stinging nettle, hawthorn, African plum, creeping serenoa.
- Ecdysteroids.

- be able to:

- to conduct a macroscopic analysis of LRS, which contains triterpenoids, steroids, saponins
- to conduct microscopic analysis of LRS, which has triterpenoids, steroids, saponins
- to know LR containing triterpenoids, steroids, saponins by herbarium samples
- distinguish from impurities raw materials containing triterpenoids, steroids, saponins

3. Materials for pre-classroom training of students.

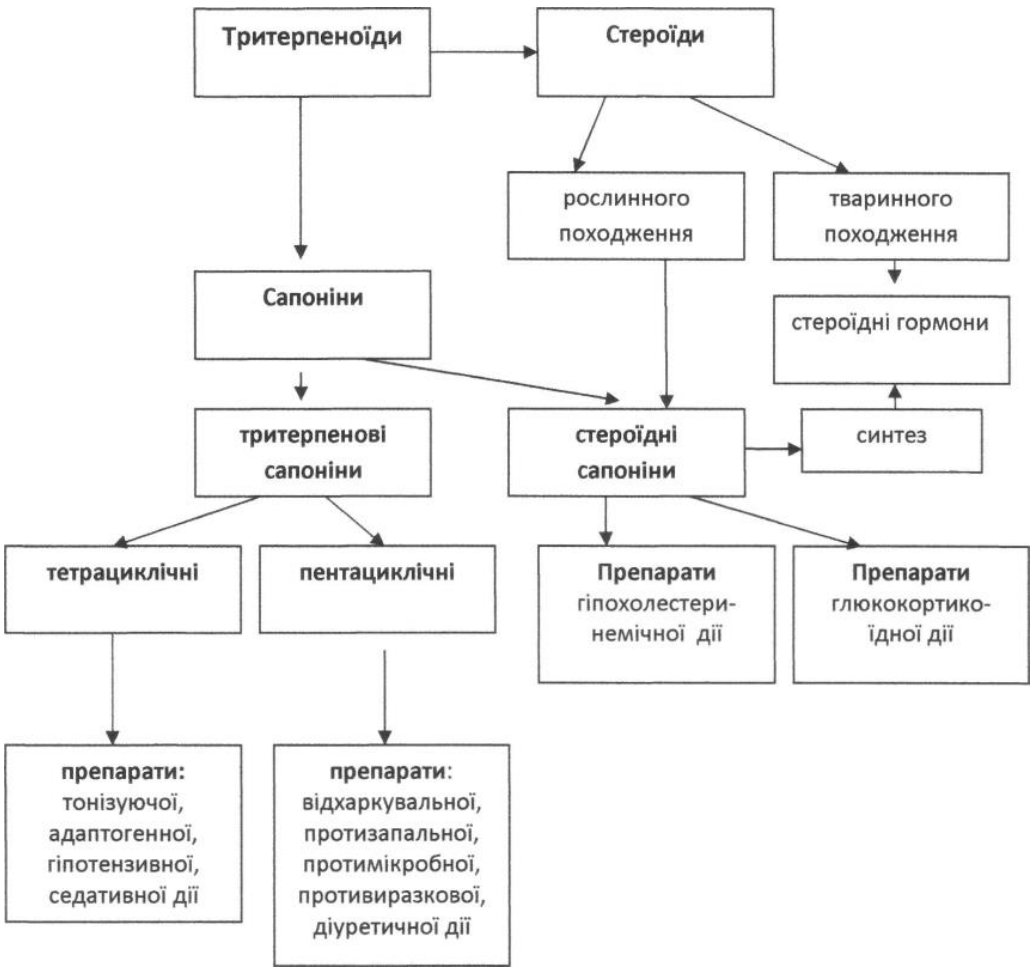
3.1. Basic basic knowledge, skills, abilities that are necessary for independent study and mastering of the topic and which are based on interdisciplinary connections:

№ №	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,	Use a microscope, prepare surface preparations and cross-sections. Carry out qualitative

	2. Organic chemistry 3. Analytical chemistry	rhizomes. Physical and chemical properties of polysaccharides, glycosides, terpenoids, derivatives of aromatic series, heterocycles. Methods of acid - base titration (neutralization) and permanganatometry	reactions; purification of organic compounds. 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.

- *structural and logical scheme*



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

№№ p / p	Basic tasks and instructions	Answers
1.	2	3
2.	Write down natural sources of hormones and bile acids, raw materials for the semi-synthesis of glucocorticoids	
3.	Write down the Latin name of the plants: species of Dioscorea, creeping anchors, hawthorn, safflower leaf and LRS, which are obtained from these plants.	
4.	Give a botanical description of plants: species of Dioscorea, creeping anchors, hay fever, safflower blade	
5.	What organs of plants: species of Dioscorea, creeping anchors, hawthorn, safflower leaf are used in medicine, give their pharmacognostic description of how they are harvested and dried.	AND) B) IN)
6.	How are plant species: species of Dioscorea, creeping anchors, hawthorn, safflower blade used in medicine?	
7.	Write down the Latin name of the plants: species of agave, yucca, cyanosis, soapwort, temptation tall, ivy, species of birch, calendula, cimicifuga corymbose, primrose and LRS, which are obtained from these plants.	
8.	Give a botanical description of plants: species of agave, yucca, cyanosis blue, soapwort, lure high, ivy, species of birch, calendula, cimicifuga corymbose, primrose	
9.	What are the organs of plants species of agave, yucca, cyanosis blue, soapwort, temptation high, ivy, birch species, calendula, cimicifuga corymbose, primrose is used in medicine, give their pharmacognostic description of how to harvest and dry them.	
10.	As species of plants: species of agave, yucca, cyanosis blue, soapwort, temptation high, ivy, birch species, calendula, cimicifuga corymbose, primrose is used in medicine?	
11.	Write down the Latin name of the plants: nettle, hawthorn, African plum, creeping serenoa and LRS, which are obtained from these plants.	
12.	Give a botanical description of plants: stinging nettle, hawthorn, African plum, creeping serenoa	

13.	What are the organs of plants: stinging nettle, hawthorn, African plum, creeping serenoa are used in medicine, give their pharmacognostic description of how to harvest and dry them.	
14.	How are plant species: nettle, hawthorn, African plum, creeping serenoa used in medicine?	

3.5. Materials for self-control.

3.5.1. Questions for self-control.

1. Define the concept: saponins.
2. Describe their prevalence in flora and fauna.
3. Give the classification of saponins.
4. What physicochemical properties characterize saponins?
5. How are LRS secretions and saponins performed?
6. Describe the features of collection, drying, storage and processing of LRS containing saponins.
7. Ways of use and application in medicine and technology of raw materials containing saponins.
8. Give the names of the main plant sources of raw materials containing saponins.

3.5.2. Test tasks for self-control.

1. When identifying medicinal plant raw materials, the pharmacist-analyst prepared water extracts and shook the test tube intensively, thus forming a stable and abundant foam. What biologically active substances are present in raw materials.

A Saponins

B Tannins

C Alkaloids

D Anthracene derivatives

E Fatty oil

2. Rhizome with cyanosis roots contain saponins. Which method of analysis can detect the level of saponins?

A foam number

B is an acid number

C is an ethereal number

D iodine number

E saponification number

3. On the basis of licorice roots produce various dosage forms - tablets, powders, syrups, fees, but not developed dosage form - injectable solution. Licorice roots exhibit hemolytic properties inherent in the active substances:

A saponin

B alkaloids

C essential oils

D iridoids

E polysaccharides

4. LRS was obtained for analysis, which is pieces of roots of cylindrical shape, of different lengths, covered with brown longitudinally wrinkled cork. Purified raw materials on the outside from light yellow to brownish-yellow, fracture light yellow, very fibrous. The smell is faint. The taste is very sweet, slightly irritating. Determine the analyzed LRS.

A Radices Glycyrrhizae

B Radices Taraxaci

C Radices Berberidis

D Radices Araliae mandshuricae

E Radices Ginseng

5. Dust of some types of vegetable raw materials during processing, drying and grinding causes irritation of mucous membranes, so precautions should be taken when working with:

A Radices Glycyrrhizae

B Radices Taraxaci

C Rhizomata Calami

D Rhizomata Bistortae

E Radices Althaeae

6. Licorice roots are used to make several drugs of various directions of action. Offer the patient a drug based on licorice flavonoids with antiulcer effect:

A Liquiritone

B Glycerin

C Glitter

D Licorice syrup

E Convaflavin

7. Phytopreparation "Flacarbin" has antispasmodic, anti-inflammatory and antiulcer effects. The herbal source of this drug is:

A Sweet naked

B Blue cyanosis

C Horse chestnut

D Manchurian Aralia

E Calendula

8. For what reason in Ukraine it is impossible to harvest wild raw materials of woolly astragalus?

A The species is listed in the Red Data Book of Ukraine (Europe)

B The species does not grow in Ukraine

C The species has a very limited distribution in Ukraine

D There are no stocks of raw materials in Ukraine

E The species grows only in the area contaminated with radionuclides

9. The pharmacy received a plan to harvest medicinal plant raw materials - horsetail grass. What kind of horsetail is to be harvested, is pharmacopoeial and used in medicine

Herba Equiseti arvensis;

B Herba Equiseti hyemalis;

C Herba Equileti sylvatici;

D Herba Equiseti pratensis;

E Herba Equiseti palustris.

Methodical recommendations were made by _____ *associate professor Boyko IA*