

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

GUIDELINES
on independent work of students / VTS / № 14

on the topic: «Flavonoids. Common buckwheat, lemon, etc. citrus, Chinese tea, black elder, Baikal sagebrush, horsetail, species of St. John's wort, species of lespedece, species of goldenrod, erva woolly, robinia ordinary, ginkgo biloba. »

Course: 3rd Faculty: medico-pharmaceutical

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



Head departments _____
prof. Rozhkovsky Ya.V.

Subject: «Flavonoids. Common buckwheat, lemon, etc. citrus, Chinese tea, black elder, Baikal sagebrush, horsetail, species of St. John's wort, species of lespedeci, species of goldenrod, erva woolly, robinia ordinary, ginkgo biloba. »
- 8 years.

1. Relevance of the topic

Phenolic compounds are very common in the plant world. According to the structure of the carbon skeleton, they are divided into a number of groups. Natural glucosides, in which aglycones are simple phenols, their di- and trimers, are called phenol glycosides, which will be discussed in the next lecture. Phenolic compounds have antimicrobial, antiviral, disinfectant, anthelmintic, antitumor, adaptogenic activity, so modern knowledge on this topic and skills of analysis of the relevant LRS will be very useful in the practice of pharmacists.

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 flavonoids.
- effects on the human body of raw materials containing flavonoids.
- LR and LRS, which have flavonoids: buckwheat, lemon, etc. citrus, Chinese tea, black elder, Baikal sagebrush, horsetail, species of St. John's wort, species of lespedeci, species of goldenrod, erva woolly, robinia ordinary, ginkgo biloba.

- *be able to:*

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

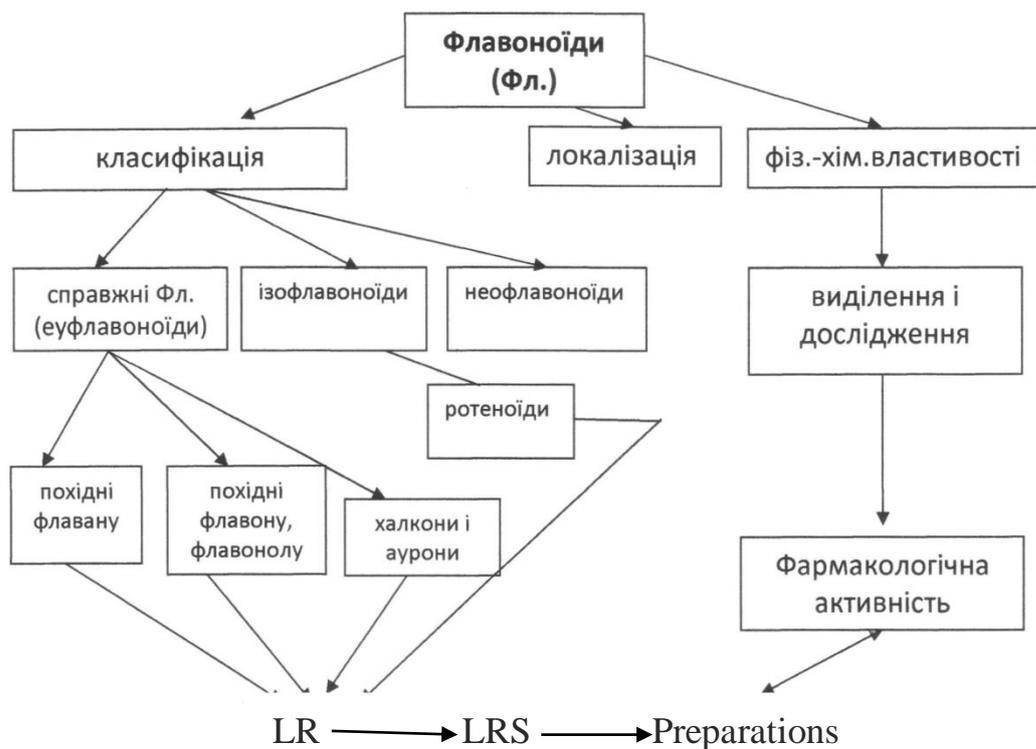
3. Materials for pre-classroom training of students.

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. Carry out qualitative reactions; purification of organic compounds.
	2. Organic chemistry	Physical and chemical properties of polysaccharides, glycosides, terpenoids, derivatives of aromatic series, heterocycles.	
	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.

- *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 on the topic:

№№ р / р	Basic tasks and instructions	Answers
1.	2	3
1.	Write down the Latin name of buckwheat and LRS, which is obtained from this plant.	
2.	Give a botanical description of buckwheat	
3.	What organs of buckwheat are commonly used in medicine, give their pharmacognostic description of how they are harvested and dried.	
4.	Common buckwheat is used in medicine as	
5.	Write down the Latin name of elderberry and LRS, which are obtained from this plant.	
6.	Give a botanical description of black elderberry	
7.	What organs of elderberry are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
8.	Elderberry is used in medicine as	
9.	Write down the Latin name of the following species of plants: lemon and others. citrus, Chinese tea, Baikal	

	sagebrush, horsetail, species of St. John's wort, species of lespedece, species of goldenrod, erva woolly, robinia common, ginkgo biloba and LRS, which are obtained from this plant.	
10.	Give a botanical description of the following species of plants: lemon and others. citrus, Chinese tea, Baikalsagebrush, horsetail, species of St. John's wort, species of lespedece, species of goldenrod, erva woolly, robinia ordinary, ginkgo biloba	
11.	What are the organs of such plant species: lemon, etc. citrus, Chinese tea, Baikalsagebrush, horsetail, species of St. John's wort, species of lespedece, species of goldenrod, erva woolly, robinia common, ginkgo biloba are used in medicine, give their pharmacognostic description of how to harvest and dry them.	
12.	The following types of plants: lemon and others. citrus, Chinese tea, Baikalsagebrush, horsetail, species of St. John's wort, species of lespedece, species of goldenrod, erva woolly, robinia ordinary, ginkgo biloba in medicine used as ...	

3.5. Materials for self-control.

3.5.1. Questions for self-control.

1. Define the term "flavonoids".
2. Give the classification of flavonoids.
3. Z. Describe the physicochemical properties of flavonoids.
2. What role do flavonoids play in the life of the plant organism?
3. Name the types of pharmacological activity of flavonoids.
4. Describe the methods of isolation and study of flavonoids in LRS.
5. Name the qualitative reactions to flavonoids.

6. Describe the current domestic scientific achievements in the study of flavonoids and prospects for the study of domestic flora in order to obtain new flavonoid drugs.

3.5.2. Test tasks for self-control.

1. Pharmacological properties of plant flavonoids are associated with the presence in their molecule of reactive functional groups. Specify them: A Phenolic B Aldehyde C Ester D Ethyl E Methyl

2. Flavonols reduce the level of hyaluronidase, prevent the oxidation of ascorbic acid and adrenaline, resulting in increased strength of blood vessels. Name the following flavonol: A Rutin B Radioloside C Aspidinoid D Esculin E Aesculetin

3. Flavonols reduce the level of hyaluronidase, prevent the oxidation of ascorbic acid and adrenaline, resulting in increased strength of blood vessels. Name the following flavonol: A quercetin B Hesperidin C Eriodictin D Apigenin E Cyanidin

4. Moderate antitumor effect is manifested by leucoanthocyanidins. Specify the following compound: A Dolphinidin B Quercetin C Methylchalcone D Epicatechin E Myricetin

5. To determine the authenticity of the fruits of Japanese sophora to the extraction added concentrated HCl and magnesium shavings. A pink-red color was observed, which indicates the presence of: A Flavonoids; B Tannins; C Coumarins; D Anthracene derivatives; E Saponins.

6. To determine the identity of the flowers of cumin, magnesium powder and concentrated HCl were added to the extract from LRS. Observed red color,

indicating the presence of A Flavonoids B Polysaccharides C Tannins D Alkaloids E Vitamins

7. To identify the raw material to the infusion of hawthorn flowers was added magnesium metal powder and concentrated hydrochloric acid. A pink color is formed, which indicates the presence in the raw material: A flavonoids B coumarins C tannins D mucus E alkaloids

8. When developing analytical and normative documentation for a new type of vegetable raw material containing flavonols, the pharmacist should choose a reaction to confirm this class of compounds.

9. Hawthorn fruits are standardized for the content of hyperoside. Suggest a qualitative reaction to identify this substance in the extract from medicinal plant raw materials: A Cyanidin test. B Lactone test. C Vitali-Morena reaction. D Lieberman-Burhard reaction. E Murexide test.

10. The chemical analysis of cumin flowers gave a positive result of the cyanidin test. The presence of which class of compounds is evidenced by the reaction: A flavonoids B anthocyanins C coumarins D saponins E alkaloids

11. In the chemical analysis of the buds of Japanese sophora, the result of a cyanidin test was obtained. Which class of BAS is indicated by the reaction performed? A Flavonoids B Alkaloids C Anthracene derivatives D Saponins E Coumarins

12. An alcoholic solution of aluminum chloride was added to the alcohol extract of LRS. Observed a yellow-green color, which indicates the presence of: A flavonoids B saponins C coumarins D anthracene derivatives E tannins

Methodical recommendations were made by  associate professor Boyko IA