

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

**GUIDELINES**  
**on independent work of students / VTS / № 17**

**on the topic: "Alkaloids (proto- and pseudo alkaloids). Late autumn flower, species of dolphin, species of aconite, yew berry, nightshade shares frequent. "**

**Course: 3rd Faculty: medico-pharmaceutical**

**Approved on methodical  
meeting of the department  
"30" 08.2024  
Protocol № 1  
Head department  
MD, prof. JV Rozhkovsky**



**Topic: Alkaloids (proto- and pseudo alkaloids). Late autumn flower, species of dolphin, species of aconite, yew berry, nightshade is frequent. "- 4 hours.**

### 1. Relevance of the topic

Among natural BAS, alkaloids are the main group from which modern medicine derives the largest number of highly effective drugs. Alkaloids are divided into three classes: true alkaloids, pseudo- and protoalkaloids. Protoalkaloids that contain nitrogen are not part of heterocycles, but are formed from amino acids. Pseudoalkaloids (isoprenoid alkaloids) formed without the participation of amino acids and combined into a group regardless of the presence of a heterocycle (almost all pseudoalkaloids are of terpenoid origin). Most alkaloids have a selective effect on a certain group of cells, receptors. Alkaloid-containing raw materials are used for the production of individual and total drugs, which, as well as the corresponding LRS are very toxic, work with them and storage require some knowledge,

### 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 proto- and pseudo alkaloids.
- effect on the human body of raw materials containing proto- and pseudo alkaloids.
- LR and LRS, which have proto- and pseudo alkaloids: late autumn, species of dolphin, species of aconite, yew berry, nightshade.

#### - *be able to:*

- perform macroscopic analysis of LRS, which contains proto- and pseudo alkaloids.
- perform microscopic analysis of LRS, which has proto- and pseudo alkaloids.
- to know LR containing proto- and pseudo alkaloids according to herbarium samples
- distinguish from impurities raw materials that contain proto- and pseudo alkaloids.

### 3. Materials for pre-classroom training of students.

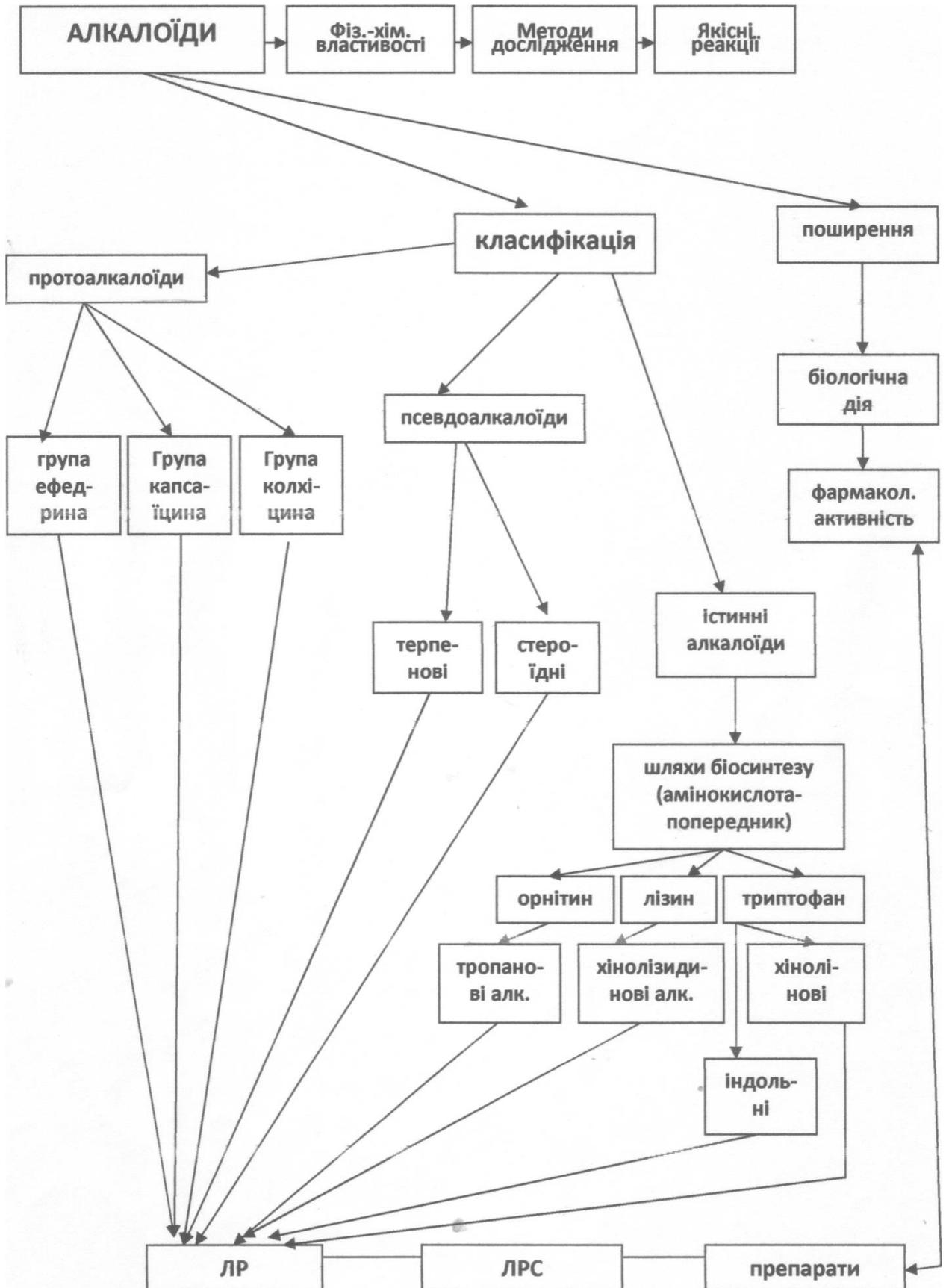
**3.1. Basic basic knowledge, skills, abilities that are necessary for independent study and mastering of the topic and which are based on interdisciplinary connections:**

<b>№</b>	<b>Discipline</b>	<b>Know</b>	<b>Be able</b>
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>
	1. Botany	Characteristic features of the families of the studied plants. Morphology of stem, bark, leaves, flower, fruit, root and	Use a microscope, prepare surface preparations and cross-sections.

	<p>2. Organic chemistry</p> <p>3. Analytical chemistry</p>	<p>rhizome. Anatomical structure of leaves, bark, fruit, roots, rhizomes.</p> <p>Physical and chemical properties of polysaccharides, glycosides, terpenoids, derivatives of aromatic series, heterocycles.</p> <p>Methods of acid - base titration (neutralization) and permanganatometry</p>	<p>Carry out qualitative reactions; purification of organic compounds.</p> <p>Work with analytical balances, measuring vessels, photoelectrocalometer, use methods of chromatography on paper and in a thin layer of sorbent.</p>
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### 3.2. Contents of the topic.

- structural and logical scheme



### 3.3. Recommended Books:

- - additional

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. фармацев. 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.

Додаткова література:

- 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. Сербін А.Г., Сіра Л.М., Слободянюк Т.О. Фармацевтична ботаніка. Підручник. – Вінниця: НОВА КНИГА, 2007. – 488 с.
3. 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 the late autumn flower and LRS, which are obtained from this plant.	
2.	Give a botanical description of the late autumn flower	
3.	What organs of late autumn flower are used in medicine, give their pharmacognostic description, how they are harvested and dried.	
4.	Late autumn flower is used in medicine as ....	

5.	Write down the Latin name of nightshade and LRS, which are obtained from this plant.	
6.	Give a botanical description of nightshade lobed	
7.	Which organs of nightshade are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
8.	Solanaceae is used in medicine as ....	
9.	Write down the Latin name of the following plants: dolphin species, aconite species, yew berries, and LRS, which are obtained from this plant.	
10.	Give a botanical description of the following plants: species of dolphin, species of aconite, yew,	
11.	What are the organs of such plants: species of dolphin, species of aconite, yew, used in medicine, give their pharmacognostic description, how to harvest and dry them.	
12.	Such plants: species of dolphin, species of aconite, yew, in medicine used as ....	

### **3.5. Materials for self-control.**

#### **3.5.1. Questions for self-control.**

1. Define the term "alkaloids".
2. Give the classification of alkaloids.
2. .Describe the physicochemical properties of alkaloids as weak bases.
3. What role do alkaloids play in the life of the plant organism?
4. What factors affect the accumulation of alkaloids in LRS?
5. Name the types of pharmacological activity of alkaloids.
6. Describe the methods of isolation and study of alkaloids in LRS.
7. Name the qualitative reactions to alkaloids.
8. By what principle are protoalkaloids isolated and classified?
9. Name and describe LR and LRS containing protoalkaloids.
10. What BAR are pseudoalkaloids? What other name does this group have?

#### **3.5.2. Test tasks for self-control**

1. Medicinal plant raw materials containing alkaloids are dried at a temperature of:  
A. 50-60 ° C D. 30-45 ° C. 70-80 ° C D. 80-90 ° C E. 90-100 ° C

2. Select the reagent to be used by the pharmacist - analyst to detect alkaloids in plant materials. A. Dragendorff reagent B. Bromine water C. Alkali solution D. Stahl's reagent E. Trim Hill reagent

3. In the chemical analysis of alcohol extract from the roots of barberry was obtained a positive result with Dragendorff reagent. The presence of which class of BAS is evidenced by the reaction A. Alkaloids B. Steroids  
C. Triterpenoids  
D. Furocoumarins E. Chromones

4. At preparation of a number of kinds of vegetable raw materials hit of the poisonous impurity containing alkaloids is possible. This class of compounds can be identified by the reaction: A. With Dragendorff reagent B. With Legal's reagent C. With Trim-Hill reagent D. With Stahl's reagent E. With Fehling's reagent

5. When processing the chromatogram of belladonna leaf extract with Dragendorff's reagent, orange or orange-red spots appear on a yellow background. This indicates the presence of: A. alkaloids B. saponins C. tannins D. cardiac glycosides E. phenologlycosides

6. Periwinkle leaves are used for the manufacture of drugs devincan, vincanan. Reaction A is used to determine vincristine in the leaf. with Dragendorff reagent B. with a solution of ferric chloride. Legal's reaction. azo compound reaction E. reaction with sulfuric acid

7. To determine the biologically active substances to the infusion of celandine grass was added 1% aqueous solution of picric acid. A yellow precipitate formed, which indicates the presence of raw materials:

- A. Alkaloids
- B. Flavonoids
- C. Tannins
- D. Saponins
- E. Anthracene derivatives

8. According to which list should be stored belladonna leaves, blackberries and datura, which contain tropane alkaloids?

- A. According to list B
- B. According to list A
- C. According to the general list
- D. According to the list "Essential oil raw materials"
- E. Equated to drugs

9. Choose storage conditions for black leaves, belladonna leaves, datura leaves:

- A. According to list B
- B. According to list A
- C. Equated to drugs
- D. According to the general list
- E. According to the list of "Scented"

10. Preparations of capsicum fruits are used as an irritant, warming agent for the treatment of neuralgia, radiculitis. This effect is due to:

- A. capsaicinoids
- B. saponins
- C. flavonoids
- D. carotenoids
- E. phenologlycosides

11. Peppercorns contain burning compounds, specify which:

- A. capsaicinoids
- B. coumarins
- C. pyrocatechol
- D. robinin
- E. alizarin

12. Horsetail ephedra grass contains alkaloids, including L-ephedrine. Ephedra herb is used in medicine as:

- A. Adrenomimetic agent
- B. Cholagogue
- C. Resolvent
- D. Diuretic
- E. Laxative

***Methodical recommendations were made by***



***associate professor Boyko IA***