

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

**GUIDELINES**  
**on independent work of students / VTS / № 7**

**on the topic: "Essential oils (parts 1 - 3). Sources of camphor, types of roses, ginger, turmeric, parsley, Siberian fir, mountain arnica, black poplar, rosemary, cinnamon, cloves, cornflowers. "**

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

Approved  
at the methodical meeting  
departments  
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Protocol № 1



Head departments \_\_\_\_\_  
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**Topic: "Essential oils (parts 1 - 3). Sources of camphor, types of roses, ginger, turmeric, parsley, Siberian fir, mountain arnica, black poplar, rosemary, cinnamon, cloves, cornflowers. " - 8 years**

### **1. Relevance of the topic**

There are many fragrant essential oil plants in the world flora. The pleasant aroma of fragrant plants is due to the presence of essential oils in them. Essential oils are a mixture of liquid, volatile substances, distilled with water vapor. Essential oils are a mixture of fragrant light substances belonging to different classes of organic compounds, mainly terpenoids. Terpenoids are oxygen derivatives of terpenes. Terpenes and terpenoids can be compounds of the aliphatic, hydrocyclic or aromatic series. They are a very large class of organic compounds and are widely represented in the plant world. Sesquiterpenes (sesquiterpenoids) are heavy volatile fractions of essential oils. LRS containing sesquiterpenes include: tsitvarny wormwood flowers, Taurian wormwood grass, chamomile flowers, yarrow grass and flowers, rhizomes and roots of ergot, rhizomes of azalea.

### **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 essential oils.
- effects on the human body of raw materials containing essential oils
- LR and LRS, which have essential oils: sources of camphor, types of roses, ginger, turmeric, parsley, Siberian fir, mountain arnica, black poplar, rosemary, cinnamon, cloves, cornflowers.

**- *be able to:***

- perform a macroscopic analysis of LRS, which contains essential oils
- perform microscopic analysis of LRS, which has essential oils

- to know LR, which contains essential oils according to herbarium samples
- distinguish from impurities raw materials that contain essential oils

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

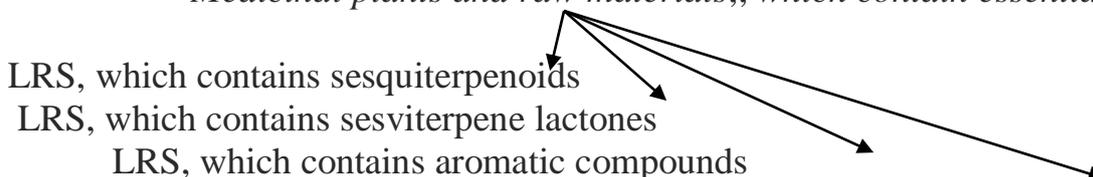
**3.1. Basic basic knowledge, skills, abilities that are necessary for independent study and mastering of the topic and which are based on interdisciplinary connections:**

№	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.

*- structural and logical scheme*

*Medicinal plants and raw materials,, which contain essential oils*



LRS, which contains resins, balms and gums

## 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:

№№	Basic tasks and instructions	Answers
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p / p		
1.	2	3
2.	Write down the Latin name of the species of rose and LRS, which are obtained from this plant.	
3.	Give a botanical description of rose species.	
4.	What organs of rose species are used in medicine, give their pharmacognostic description, how they are harvested and dried.	AND) B) IN) D)
5.	Types of roses in medicine are used as...	
6.	Write down the Latin name of the plant ginger and LRS, which is obtained from this plant.	
7.	Give a botanical description of ginger.	
8.	What organs of ginger are used in medicine, give their pharmacognostic description, how to harvest and dry them.	AND) B) IN)
9.	Ginger is used in medicine as ....	
10.	Write down the Latin name of turmeric long and LRS, which is obtained from this plant.	
11.	Give a botanical description of the types of turmeric long.	
12.	Which organs of turmeric are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
13.	Write down the Latin name of parsley and LRS, which are obtained from this plant.	
14.	Give a botanical description of parsley.	
15.	What organs of parsley are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
16.	Parsley in medicine is used as ....	
17.	Write down the Latin name of the Siberian fir and LRS, which are obtained from this plant.	
18.	Give a botanical description of Siberian fir.	
19.	What organs of Siberian fir are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
20.	Siberian fir is used in medicine as ....	
21.	Write down the Latin name of black poplar, rosemary, cinnamon, cloves, basil and LRS, which are obtained from these plants.	
22.	Give a botanical description of black	

	poplar, rosemary, cinnamon, fragrant cloves, cornflowers.	
23.	What organs of black poplar, rosemary, cinnamon, fragrant cloves, cornflowers are used in medicine, give their pharmacognostic description, how to harvest and dry them.	
24.	Black poplar, medicinal rosemary, cinnamon, cloves, cornflowers are used in medicine as...	

### 3.5. Materials for self-control.

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

1. What is the importance of essential oils for plants?
2. List the methods of obtaining essential oils from plants.
3. Describe the method of obtaining essential oils by steam distillation.
4. What reagent can detect essential oils in medicinal plants?
5. What are the features of drying raw materials containing essential oils?
6. Draw the structure of the fruit of anise and indicate its diagnostic features (cross section under a microscope).
7. Draw the structure of the fennel fruit (cross section under a microscope) and indicate its diagnostic signs.
8. Name the possible impurities in the fruits of anise and fennel and indicate their distinctive features.
9. How to store the fruits of anise and fennel in a pharmacy and in a warehouse?
10. What is the chemical composition of raw materials and essential oil of anise and fennel?
11. Describe the appearance of raw oregano.
12. What is the chemical composition of raw oregano and where it is used?
13. Name the life form of thyme and indicate the external signs of raw materials.
14. What is the chemical composition of raw materials and thyme oil?

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

1. Essential oils have a variety of pharmacological effects. Among the families richer in essential oils are:

- A *Apiaceae*
- B Brassicaceae
- C Fabaceae
- D Gentianaceae
- E Polygonaceae

2. The pharmaceutical factory received a batch of vegetable raw materials - lavender herb. The quality of raw materials is established using the following method

- A Distillation with water vapor
- B Chromatographic analysis
- C Titrimetric analysis
- D Biological analysis
- E Sublimation

3. Standardization of sage leaf is carried out by the method of:

- A Distillation with water and steam
- B Photoelectrocolorimetry
- C Spectrophotometry
- D Gravimetry
- E Iodometry

4. Standardization of juniper fruits is carried out by the method of:

- A Distillation with water and steam
- B Photoelectrocolorimetry
- C Spectrophotometry

D Gravimetry

E Iodometry

5. What method is the basis for quantitative determination of the essential oil content in eucalyptus leaves according to the pharmacopoeial method:

A steam distillation

B enfleurage

C pressing

D extraction with an organic solvent

E extraction with fatty oil

6. In the study of the quality of essential oils are determined by a number of indicators, namely: organoleptic characteristics, physical and chemical constants.

Indicate which indicators refer to physical constants:

A Specific weight, angle of rotation.

B Taste, color.

C Smell, Transparency.

D Acid number, ether number.

E The ether number after acetylation.

7. In order to establish the purity of the herbal remedy, a drop of lavender essential oil was applied to a strip of filter paper and heated in a stream of warm air. After some time, an increase in the diameter of the spot was observed. What impurity is present in lavender oil?

A fatty or mineral oil

B phenol

C ethanol

D acetone

E diethyl ether

8. To determine the purity of the essential oil, ethanol was added to a tube of peppermint oil and turbidity was observed. What impurities does peppermint oil contain?

A fatty oil

B phenol

C acetone

D ethyl acetate

E diethyl ether

9. The quality of peppermint oil is determined by the menthol content. What numerical value determines the content of menthol in peppermint oil

A ether number after acetylation

B acid number

C foam number

D peroxide number

E iodine number

10. One of the methods of obtaining essential oil is the method of enfleurage or maceration. Indicate from which medicinal plant raw materials the essential oil is obtained by this method.

A damask rose petals

B lemon peel

C coriander seeds

D mint leaves

E chamomile flowers

11. The essential oil of rose flowers is obtained by the method:

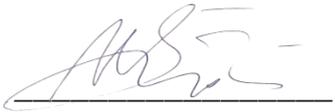
A enfleurage

B steam distillation

C biological standardization

D sublimation

E chromatographic analysis

*Methodical recommendations were made by  associate professor Boyko IA*