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

METHODOLOGICAL DEVELOPMENT

Course: “Pharmacognosy”

practical lesson for students on the topic:
"LR and raw materials that contain various biologically active substances. Chaga, kalanchoe periste. "
Course: 3rd Faculty: medico-pharmaceutical

Approved on methodical meeting of the department
"30" August 2024
Protocol № 1
Head department
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Odessa - 2024

1. The topic of the lesson: "LR and raw materials that contain various biologically active substances. Chaga, kalanchoe periste. " - 4 years

2. Relevance of the topic:

The biologically active substances of some medicinal plants, widely used in scientific medicine, have not yet been established. Research work in this direction continues. For ease of study, such plants are combined into one topic. The research topic includes raw materials of little-studied composition with a variety of therapeutic activity, used in many diseases of the internal organs (rhizomes of yellow roosters, rhizomes and roots**six-petalled viper**, roots of lovage hard, grass of aura, leaf of flint (lining) hybrid, grass of rutvica small, grass of a throat of Laxman, grass of a foxglove silver, grass of immortelles of an annual, grass of sage Ethiopian, a leaf of an orthosyphon, a rhizome with roots of raponicony.

The knowledge gained by students in the study of this topic will be used by them in mastering some sections of PTL, pharmacology, pharmacotherapy, as well as in the practical activities of the pharmacist.

3. Objectives of the lesson:

3.1. General goals: to study medicinal plants containing biologically active substances of little-studied composition, and to perform work on macroscopic analysis of LRS of this topic.

3.2. Educational goals: formation of a professionally significant substructure of personality with relevant aspects of deontological, ecological, legal, psychological, patriotic, professional responsibility.

3.3. Specific goals:

- Know (level of assimilation according to Bezpalk - II):

1. Distribution of plants included in this topic in the plant world.

2. Latin and Ukrainian names of LRS, producing plants and families of all objects of the researched topic.

3. Terms, methods of collection, rules of drying and storage of LRS

4. External signs of the studied types of medicinal raw materials.

5. Morphological characteristics of plants, their habitats (cultivation areas), places of growth.

6. Chemical composition. Ways of use and medical application of LRS containing BAS of little-studied composition.

Based on theoretical knowledge of the topic and laboratory work:

- master the techniques (be able) (level of assimilation according to Bezpalk - III):

- recognize by external features of the plant yellow roosters, viper six-petalled, hawthorn hard, avran medicinal, flint (coltsfoot) hybrid, small rutvytsya, silver foxglove, laxman's throat, wormwood (Chernobyl), immortelle, sagebrush, sage , peony, chaga);
- determine the identity of raw materials by external signs.

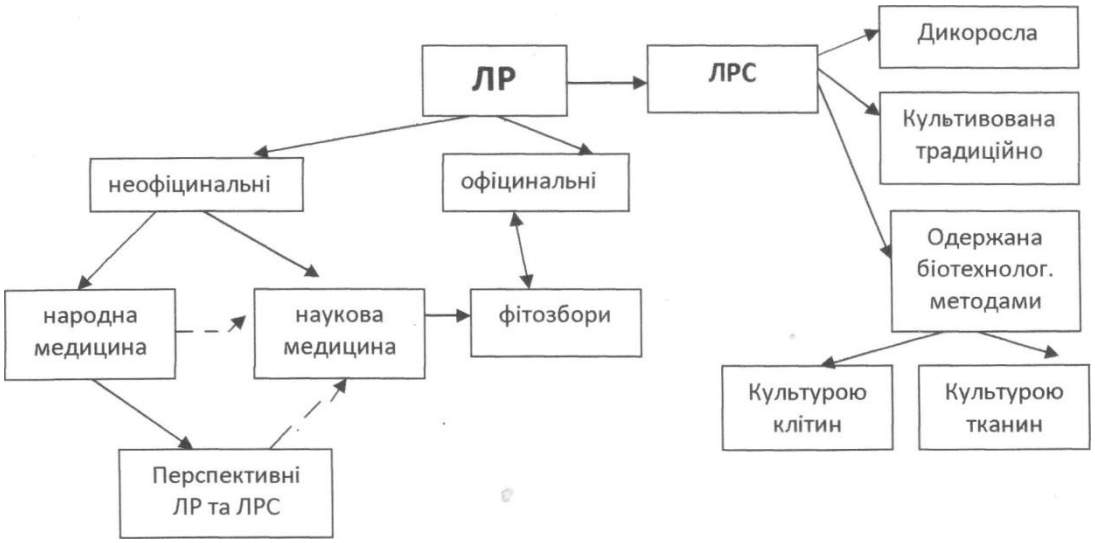
4. Interdisciplinary integration

№ p.p.	discipline	know	be able
1	2	3	4
1.	Previous disciplines: 1. Botany	Characteristic features of the families of the studied plants. Morphology of stem, bark, leaves, flower, fruit, root and rhizome. Anatomical structure of the leaf, bark, fruit, root, rhizome.	Use a microscope, prepare surface preparations and cross-sections.
	2. Organic chemistry	Physical and chemical properties of polysaccharides, glycosides, terpenoids, aromatic derivatives, heterocycles.	Carry out qualitative reactions; purification of organic compounds.
	3. Analytical chemistry	Methods of acid-base titration (neutralization) and permanganatometry	Work with analytical scales, measuring vessels, photoelectro-colorimeter, use methods of chromatography on paper and in a thin layer of sorbent.
2.	The following disciplines:		

	1. Physical and colloid chemistry	Solubility of solids and liquids in liquids. Distillation. Raoul's law. Konovalov's law. Vapor pressure and composition over mutually insoluble liquids. Buffer solutions. Polarography. Potentiometric titration. Adsorption. Ion exchange adsorption. Chromatography: paper, column, in a thin layer of sorbent, gel chromatography.	
	2. Pharmacy technology of drugs	Methods of measuring mass and volume. Preparation of powders or liquid drugs for internal and external use. Analysis of prepared liquid drugs using a burette system.	
	3. Industrial technology of medicines	Conditions of industrial preparation of medicines. Principles of organization of pharmaceutical production of various dosage forms: liquid, solid, soft, injectable solutions, etc. Machines, devices, equipment for the production of medicines.	
	4. Clinical pharmacology	Pharmacodynamics and pharmacokinetics of drugs. The pattern of action of drugs on the human body and its corresponding reactions. Basic principles of treatment in terms of drug selection, evaluation of their effectiveness and safety. Methods of qualitative and quantitative study of drugs.	
	5. Pharmaceutical chemistry	Pharmaceutical service management. Storage of medicines. Control and analytical service, organization of its work. Accounting for inventory and cash. Economic analysis of the pharmacy.	

	6. Organization and economics of pharmacy 7. Management and marketing in pharmacy	Management and entrepreneurship. Organization as an object of management. Connecting processes in management. Human Resource Management Pharmaceutical Marketing Management. Pharmaceutical market research. International marketing.	

5. Content of the topic (text and thesis), graphological structure of the lesson.
(See the text of the lecture)



6. Plan and organizational structure of the lesson.

№№ p.p.	**The main stages of the lesson, their functions and content.**	**Learning objectives in the levels of mastery.**	**Means of training and control.**	**Materials on methodical forensuring the visibility of the lesson, control the knowledge of those who teachis.**	**Term (in minutes or in%) of the total class time.**
1	**2**	**3**	**4**	**5**	**6**
1	*Preparatory stage* Organization of classes Setting learning goals Homework check	II	Oral interview on the topic	Methodical works for students,	1% 2% 25%

				album	
2	*The main stage* Conducting a practical lesson	III	Herbariums of medicinal plants, LRS, reagents		50%
3	*The final stage* Testing and assessment of practical skills Checking the final level of knowledge Providing homework with a reference to the literature	II- III II- III	Herbariums of medicinal plants, LRS, reagents	Methodical works for students, album Tests and situational tasks	5% 15% 3%

7. Materials on methodological support of the lesson.

7.1. Control materials for the preparatory stage of the lesson: questions, tasks, tests.

Tests:

1. The patient asked to determine the herbal raw materials offered by the folk healer for the treatment of digestive organs. The raw material grows together with the alder marsh and differs from the alder by large yellow flowers and fruits in the form of elliptical boxes. In the non-flowering state differs in bluish leaves and the absence of rhizomes aromatic odor and bitter taste. These signs are most characteristic of the plant:

A. Iris yellow

V. Tyrlich is yellow

S. Foxglove large-flowered

D. Perstach erect

E. Oman is high

2. Enter the name of the impurity, in appearance similar to the leaves of mother-and-stepmother growing next to each other. The leaves are obscurely triangular, and at the base -deeply cut, with a thick vein along the edge of the cut:

A. Flint hybrid

C. They lured high

S. Burdock

D. Swamp ordinary

E. Immortals are annuals

3. Specify medicinal plant raw materials used in neurological practice as a sedative:

A. Peony

V. Althea medicinal

WITH. St. John's wort

D. Rosehip brown

E. Thyme is common

4. Name the medicinal plant raw materials used for the production of gastric appetite stimulants. Used in the form of tincture and thick extract; is a part of Zdrenko's medicine:

A. Wormwood is common

B. Stinging nettle

C. St. John's wort

D. Chamomile

E. Peppermint

5. The herb Chernobyl (Artemisia vulgaris) is used as a gastric appetite stimulant. Quantitative assessment of this plant material is carried out in terms of:

A. Azulene

V. Cyanine

S. Lanatozide

D. dioscin

E. ononin

6. The farm received a batch of wormwood, used for the production of tinctures and thick extract. Quantitative analysis of this plant material is carried out by assessing the content:

A. Essential oils

B. Alizarin

S. Kumarin

D. Tannins

E. Flavonoids

7. When instructing on the procurement of valerian raw materials, it is necessary to indicate to the procurer the unacceptable impurity to valerian:

AND. Snakechnik six-petalled

V. Oman is high

S. Creeping thyme

D. Wormwood is bitter

E. Field saw

8. During the commodity analysis of medicinal raw materials it was found that it consists of a straight, powerful stem, woody at the base. The leaves of the plant are opposite, petiolate, succulent, thick, light green with a reddish tinge, elliptical or ovate, crenate-toothed, with 3-5 (rarely 7) elliptical or ovate leaves that sit on short petioles. The flowers are collected in apical paniculate inflorescences. Fruits -flyers with numerous small seeds. These signs are most characteristic of the plant:

A. Kalanchoe feathery

B. Aloe tree

S. Ammi dental

D. Podophilus thyroid

E. Hinn tree

9. Peony herb is avoided in the form of tincture has a calming effect. It is used for

neurasthenia, insomnia, vegetative-vascular disorders. Name the timing of procurement of this raw material:

A. During flowering

B. During juicing

C. During fruiting

D. At rest

E. At rest

10. Medicinal plant raw materials are used for the preparation of semi-thick extract "Befungin", used in chronic gastritis, gastrointestinal dyskinesia with atony, gastric ulcer, as a symptomatic agent that improves the overall condition of cancer patients. Define LRS:

A. Fungus betulinus

B. Gentiana lutea

C. Erysimum canescens

D. Plantago psyllium

E. Chelidonium majus

Question:

1. Distribution of plants included in this topic in the plant world.
2. Terms, methods of collection, rules of drying and storage of LRS.
3. Latin and Russian names of LRS, which produce plants and families of all objects of the research topic.
4. Morphological characteristics of plants, their habitats (areas of cultivation), habitats.
5. External signs of the studied types of medicinal raw materials.
6. Chemical composition. Ways of use and medical application of LRS containing biologically active substances of little-studied composition.
7. Specify patented and official drugs based on plants of little-studied composition.

7.2. Materials of methodical support of the main stage of employment: professional algorithms, orientation maps for formation of practical abilities and skills, educational tasks.

The list of educational practical tasks that must be performed during the practical laboratory lesson:

Task 1. To study a six-petalled viper and to carry out the analysis of raw materials on AND (section: external signs).

1. To study the appearance of the six-petalled viper according to the herbarium pattern (scheme № 1). Write down the Latin and Russian names of raw materials produced by plants and families.

   Scheme № 1

DETERMINATION OF A PLANT THAT PRODUCES ACCORDING TO EXTERNAL SIGNS

- Life form (herbaceous plant, shrub, shrub, tree).
- Type of underground organs (root, rhizome, tuber, etc.).
- The structure of the stem (shape, nature of branching, pubescence, diameter, etc.).
- Sheet placement (alternate, opposite, whorled).
- Leaves (simple or complex, the shape of the leaf blade or fox-dots, edge, veining, color, size).
- Flowers (single or inflorescence, flower structure, color, size, etc.). Fruit (type, shape, color, size).
- Bark (in woody species), (color, presence, shape and color of lentils, thorns, etc.).

2. Describe the appearance of the rhizome and root of the six-petalled viper on the example of a sample of raw materials (scheme № 2).

Scheme № 2

ANALYSIS OF RAW MATERIALS "UNDERGROUND AUTHORITIES" BY EXTERNAL SIGNS

- Commodity type of raw material (unharvested, cut, cleaned or uncleaned from the

plug, etc.).

- Type of underground organs (roots, rhizomes with roots, rhizomes, tubers, bulbs, bulbs, etc.).
- Shape (cylindrical, conical, lumpy, twice curved, etc.).
-Sizes.
- Surface (smooth or wrinkled, the presence of longitudinal or transverse folds, scars from leaves, stems, traces of lateral roots, etc.).
- Color on the outside, at the break.
- The nature of the fracture (granular, fibrous, smooth, rolling, bristly, etc.).
- The presence of the core.
- Type of structure of the conductive system (beam, beamless).
- Odor when scraping or wetting with water.
- Taste (in non-toxic objects).

3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of the AND.

Task 2. To study zhivokist rigid and to carry out the analysis of raw materials on AND (section: external signs).

1. To study the appearance of hardwood in a herbarium pattern (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of burdock root hard on the example of a sample of raw materials (see Scheme № 2).
3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-52-72.

Task 3. To study hybrid flint and to carry out the analysis of raw materials on AND (section: external signs).

1. Examine the appearance of flint hybrid by herbarium specimen (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of a flint hybrid leaf on the example of a sample of raw materials (scheme № 3).

Scheme № 3

ANALYSIS OF RAW MATERIALS "SHEETS BY EXTERNAL SIGNS

- Type of leaf and dissection of the leaf blade: (simple: pal-chatorassechenny, palchato- or peristorozdilnym, peristolopastnye, three- or five-lobed).
- Stem stem or sessile.
- Shape (round, elliptical, ovoid, lanceolate, linear).
- The edge of the leaf (solid, serrated, toothed, crenate, etc.).
- The nature of veining (arcuate, reticular, finger, pinnate, parallel).
- 0pushenie.
- Color of the upper and lower sides.
- The size of the sheet or leaves.
- Odor when rubbing the object or wetting
- Taste (for non-toxic objects).
- Specific features.

3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-54-72.

Task 4. Examine the small rut and analyze the raw materials for AND (section: external signs).

1. Examine the appearance of basil small herbarium sample (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.

2. Describe the appearance of grass basil small on the example of a sample of raw materials (scheme № 4).

Scheme № 4

ANALYSIS OF RAW MATERIALS "GRASS" On external signs

- "Commodity type" of raw materials (unharvested, cut, threshed)
- Stem structure (shape, branching, pubescence, color, size, specific features).
- The nature of the leaf arrangement (alternate, opposite, whorled).
- Letter.
- The location of the flowers on the stem.
- Flowers.
- Fruits and seeds.
- Sizes of stems, leaves, flowers.
- Coloring.
- 3apah when rubbing.
- Taste (in non-toxic objects).

3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-51-72.

Task 5. To study a prickly zopnik and to carry out the analysis of raw materials on AND (section: external signs).

1. To study the appearance of the prickly zopnik on the herbarium sample (scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.

2. Describe the appearance of prickly grass on the example of a sample of raw materials (see Scheme № 4).

3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-18-72.

Task 6. To study silver foxglove and to carry out the analysis of raw materials on AND

(section: external signs).

1. Examine the appearance of silver foxglove on a herbarium pattern (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of silver foxglove grass on the example of a sample of raw materials (see Scheme № 4).
3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-15-72.

Task 7. To study wormwood and to carry out the analysis of raw materials on AND (section: external signs).

1. To study the appearance of wormwood on the herbarium sample (see Scheme №1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of wormwood grass on the example of a sample of raw materials (see Scheme № 4).
3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-23-72.

Task 8. Study the Ethiopian sage and analyze the raw materials for the AND (section: external signs).

1. Examine the appearance of Ethiopian sage on a herbarium specimen (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of Ethiopian sage on the example of a sample of raw materials (see Scheme № 4).
3. Note the compliance of the test sample of raw materials (on external grounds) to the

requirements of FS 42-22-72.

Task 9. Examine the yellow roosters, Avran medicinal, Laxman's throat, dried annual flowers and external signs of raw materials for AND (section: external signs).

1. To study the appearance of iris (iris) yellow, avran medicinal, periwinkle Laxman and dried annual flowers on herbarium specimens (see Scheme № 1).
2. To study the appearance of the rhizome of iris (iris yellow), the herb Avran medicinal, the herb periwinkle Laxman and the herb dried annual flowers on the example of samples of raw materials (see Schemes № 2 and 4).
3. Write down the Latin and Russian names of raw materials produced by plants and families.

Task 10. To study orthosyphon stamen and to carry out the analysis of raw materials on AND (section: external signs).

1. To study the appearance of the orthosyphon stamen on the herbarium sample (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of the sheet orthosyphon on the example of a sample of raw materials (scheme № 3).
3. Note the compliance of the sample of raw materials (by external signs) to the requirements of GF XI, Article 21.

Task 11. To study safflower blade and to carry out the analysis of raw materials on AND (section: external signs).

1. Examine the appearance of safflower blade on a herbarium specimen (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.

2. Describe the appearance of the rhizome with roots on the example of a sample of raw materials (see Scheme № 2).
3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-99-72.

Task 12. To study an unusual peony and to carry out the analysis of raw materials on AND (section: external signs).

1. Examine the appearance of the peony evades the herbarium pattern (see Scheme № 1). Write down the Latin and Russian names of the raw materials that produce plants and families.
2. Describe the appearance of the root of the peony is avoided on the example of a sample of raw materials (see Scheme № 2).
3. Note the compliance of the test sample of raw materials (on external grounds) to the requirements of FS 42-99-72.

Instructional materials for mastering professional skills, abilities:
Methods of work performance, stages of performance:
a) get the necessary LRS
b) to study and describe the appearance of the obtained LRS, to draw LRS
c) to conduct LRS training
d) to study the anatomical and diagnostic features of roots and rhizomes
e) to study the anatomical and diagnostic features of fruits and leaves
f) record the observations in a laboratory journal

7.3. Control materials for the final stage of the lesson: tasks, tasks, tests, etc.
Question:
1. Write the Latin names of raw materials that produce plants and families of safflower.
2. What is the importance of levzeya for food?
3. What morphological features are characteristic of levzei as a plant?

4. Where does the levzeya meet and grow?

5. How to properly procure raw levzei, ensure plant protection?

6. What are the external signs of raw levzei and indicators that reduce its quality?

7. What chemical compounds are found in the rhizomes and roots of levzei?

8. Name the drugs derived from the raw materials of levzei, where they are used?

9. Why is levzeya called the "moral root"?

10. Write the Latin names of the raw materials that produce plants and families of kidney tea.

11. Describe the morphological features of kidney tea as a plant.

12. Where does kidney tea grow and cultivate?

13. What is the peculiarity of the preparation of kidney tea leaves?

14. What are the external features characteristic of quality raw materials for kidney tea? What can reduce its quality?

15. Name the chemical compounds found in kidney tea.

16. List the dosage forms obtained from raw kidney tea.

17. How is kidney tea used in medicine?

18. Write the Latin names of raw materials that produce plants and families of raspberries.

19. What is the nutritional value of raspberries?

20. What are the morphological features characteristic of raspberries as a plant?

21. What is the habitat of raspberries?

22. How to ensure the protection of Malinnikov?

23. What external signs of raw materials characterize the authenticity of raspberry fruit? What reduces their quality?

24. In what dosage forms are raspberries used?

25. How what funds are used raspberries?

Tests:

1. Specify medicinal plant raw materials, the juice of leaves and stems of which

contains up to 40% polysaccharides, flavonoids, catechins, tannins, organic acids, enzymes, ascorbic acid and trace elements. The juice has anti-inflammatory and antiseptic properties, promotes rapid cleansing and wound healing.

A. Kalanchoe pinnata

B. Artemisia absinthium

C. Arctium lappa

D. Ephedra ejuisetina

E. Gentiana lutea

2. Choose a medicinal plant, the raw material of which is used in the form of infusion as a moderate diuretic in renal dysfunction:

A. Orthosyphon stamen

C. Blue cyanosis

S. Ginseng

D. Stinging nettle

E. Oplopanax is high

3. Choose a medicinal plant, the raw material of which is used for the preparation of galenic preparations with antihypertensive properties:

A. Eucommia Ulmoides oliver

B. Iris pseudacorus

C. Gratiola officinalis

D. Menyanthes trifoliate

E. Rosa canina

4. Medicinal plant material levzei safflower is used as a stimulant in functional disorders of the nervous system, mental and physical fatigue, reduced efficiency. What are the raw materials of this plant:

A. Roots

B. Leaves

C. Fruits

D. Grass

E. Inflorescence

5. In 1966, phytoecdysons derived from steroids were isolated from plants. Chemically, ecdysons are polyoxysteroids. Which of the following plants contains ecdysons:

A. Leuzea carthamoides

B. Adonis sibiricus

C. Arnica Montana

D. Datisca cannabina

E. Calendula officinalis

6. Choose medicinal plant raw materials, the infusion of which is used as a diaphoretic:

A. The fruits of raspberries

B. The fruits of black elderberry

C. Blueberries

D. The fruits of chokeberry

E. The fruits of sea buckthorn buckthorn

7. What is the biological effect of drugs from the herb stinking basil:

A. Hypotensive

V. Sechoginna

C. Hepatoprotective

D. venotonizing

E. Zhovchoginna

8. Medicinal plant material of foxglove is used in the form of decoctions for inflammatory processes in the oral cavity (stomatitis, gingivitis), enteritis, enterocolitis and dyspepsia, as well as burns and wet eczema. It is a part of binding fees. What are the raw materials of this plant:

A. Roots

B. Leaves

Dish

D. Inflorescences

E. Fruits

8. Literature

Basic literature

1. Фармакогнозія: підручник (І—ІІІ 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.

10. The topic of the next lesson:

Commodity analysis. Analysis of drug fees and teas.

Methodical recommendations were made by _____ associate professor Boyko IA

(Signature)