ВУЗ, III курс 6 семестр

Class 4.
Analysis of medicinal plant material containing alkaloids (III).

Aims: 1. To be able to recognise medicinal plants containing isoquinoline and steroidal alkaloids by their external features and to distinguish them from impurities.

2. To be able to identify the authenticity of raw materials containing isoquinoline and steroidal alkaloids by morphological and anatomical signs.

3. To be able to establish its quality.

Questions:

1. Characterisation of isoquinoline and steroid alkaloids.
2. Medicinal plants and raw materials containing isoquinoline alkaloids:
- *Chelidonium majus* L.;
- *Berberis vulgaris* L.;
- *Papaver somniferum* L.
3. Medicinal plants and raw materials containing steroid alkaloids:
- species *Veratrum*.

Laboratory work:

WHEN WORKING WITH ALKALOID-CONTAINING RAW MATERIALS, CARE MUST BE TAKEN!!!

Medicinal plants and raw materials containing isoquinoline alkaloids

Work 1. Macroscopic analysis of leaves of *Berberis vulgaris* L.

Common Barberry leaves – Berberidis vulgaris folia
Producing plant: Common Barberry – *Berberis vulgaris* L.
Family *Berberidaceae*

Study the producing plant from herbariums and tables, highlight the diagnostic signs for its recognition.

Describe the raw material according to the scheme. Conclude on the authenticity of the raw material according to external signs.

Study the requirements of the ND for the quality of raw barberry.

Write down the chemical composition of the raw material and the chemical formula of the main alkaloid. Specify the requirements of the ND for the content of active ingredients.

Specify the pharmacological effect and use of the raw material.

Work 2. Macroscopic analysis of root of *Berberis vulgaris* L.

Common Barberry roots – Berberidis vulgaris radices
Producing plant: Common Barberry – *Berberis vulgaris* L.
Family *Berberidaceae*

Describe the raw material according to the diagram. Draw conclusions about the authenticity of the raw material from its appearance.

Carry out a qualitative reaction for berberine.

Qualitative reaction on berberine: powder of barberry root is placed on a slide in a drop of 2% hydrochloric acid and covered with a cover glass. Record the observations in the workbook.

Write down the chemical composition of the raw material. Specify the requirements of the ND for the content of active ingredients.

Specify the pharmacological effect and use of the raw material.

Work 3: Morphological and anatomical analysis of the raw material of *Chelidonium majus* L.

Greater Ceandine herb – Chelidonii majoris herba
Producing plant: Greater Ceandine – *Chelidonium majus* L.
Family *Papaveraceae*

Study the producing plant from the herbarium, highlighting the diagnostic features to identify it. Note that all parts of the plant contain orange coloured secretions.

Describe the raw material according to the scheme. Make a conclusion about the authenticity of the raw material on the basis of external characteristics.

Prepare and examine a surface preparation of a celandine leaf under low and high magnification in a microscope. Use the atlas to study the microscopy of the raw material. Note that the most important diagnostic feature of all celandine organs (except seeds) are the geniculate spleens, filled with yellowish-brown contents, which run in conductive bundles, forming an almost continuous ring around the bundle; and the simple, multicellular (7-20 cells) hairs with clearly visible nuclei in each segment. Sketch the microscopy.

State the chemical composition and standardization of the raw material. Write down the formulas of the main active substances.

Write down the pharmacological effects and uses of the herb celandine.

Medicinal plants and raw materials containing steroid alkaloids

Work 4. (Student research work) Morphological and anatomical analysis of the raw material of Veratrum lobelianum Bernh.

Lobel's hellebore rhizomes with roots –Veratri lobeliani rhizomata cum radicibus
Производящее растение: Lobel's hellebore – *Veratrum lobelianum* Bernh.
Family *Melanthiaceae* (*Liliaceae*)

Study the producing plant from the herbarium, highlighting the diagnostic signs for its recognition.

Describe the raw material according to the scheme. Make a conclusion about the authenticity of the raw material according to its external features.

Prepare micro preparations of the rhizome and roots of Lobel's hellebore. Examine under low and high magnification in a microscope. Identify the main diagnostic features of the material.

Write down the chemical composition of the raw material. Specify the requirements of ND on the content of active ingredients.

Specify the pharmacological effect and use of the raw material.

Self-assessment questions:

1. What micro-diagnostic signs can be used to identify the raw material of celandine?

2 Justify the rational terms for collecting raw barberry.

3. Specify the characteristic external signs of common barberry root.

4. What is the peculiarity of the chemical structure of berberine alkaloid?

5. What precautions should be observed when collecting and processing raw material of hellebore?

6. Specify the peculiarities of the use of raw material and preparations of Lobel's hellebore.