ВУЗ, III курс 6 семестр

Class 3.
Analysis of medicinal plant material containing alkaloids (II).

Aims: 1. To learn how to recognise medicinal plants containing tropane alkaloids by their external features, to determine the authenticity and quality of raw materials of this group.

2. To be able to justify the peculiarities of harvesting, drying and storage of raw materials containing alkaloids.

Questions:

1. Peculiarities of collecting and drying plants containing alkaloids.
2. Peculiarities of storage of medicinal raw materials containing alkaloids.
3. Characteristics of alkaloids derived from tropane.
4. General characteristics and micro-diagnostic features of plants of the paslin family.
5. Medicinal plants and raw materials containing tropane alkaloids:

- black hemlock;
- datura species;
- scopolia carnioli.

Laboratory work:

CARE MUST BE TAKEN WHEN HANDLING ALKALOID-BEARING RAW MATERIALS!!!

All raw materials are poisonous! Do not taste!

Work 1. Study the anatomical and morphological features of plants in the family Solanaceae.

1.Identify the characteristic morphological features of the family Solanaceae. Write down the characteristics of the family in a notebook according to the scheme:

a) life form
b) stem
c) leaf
d) inflorescence
e) fruit

2. Identify the characteristic anatomical features of plants in the Solanaceae family. Sketch the type of stomatal apparatus.

Work 2. Comparative study of morphological and anatomical features of raw materials containing tropane alkaloids.

Common Hanbane laeves – Hyoscyami nigri folia
Producing plant: Common Hanbane – *Hyoscyamus niger* L.

Thorn apple leaves – Daturae stramonii foliae
Producing plant: Thorn apple – *Datura stramonium* L.

Family: *Solanaceae*

Study the appearance of the medicinal plants, using herbarium and tables.

Describe the raw materials in a comparison scheme, having previously soaked them in hot water. Draw up the results of the analysis in the form of a table.

Features of raw materials	Hyoscyami nigri folia	Daturae stramonii foliae
Type of raw materials		
Type of leaf		
Size		
Shape		
Edge of the leaf		
Character of veining		
Petiole		
Pubescence		
Colour		
Odour		
Leaf drawing		

Prepare surface preparations of the leaves of *Hyoscyamus niger* and *Datura stramonium*, examine them under low and high magnification under a microscope, and identify the diagnostic features for recognition. Fill in the table.

Microscopic features of raw materials	Epidermis	Hairs (trichomes)		Inclusions
		simple	glandular	
Hyoscyami nigri folia				
Daturae stramonii foliae				

Draw the main microscopic diagnostic features of the raw material to be examined.

Examine the chemical composition of the leaves of Henna and datura. Write down the formula of the main alkaloid. Specify the requirements of the standardization of these raw materials.

Write down the pharmacological group and use of the raw material hemlock and durman.

Work 3: Study of the macroscopic features of the raw material of Datura innoxia.

Recurved Thorn-apple seeds **– Daturae innoxiae semina**

Producing plant: Recurved Thorn-apple – *Datura innoxia* Mill.

Family: *Solanaceae*

Study the appearance of the medicinal plant using herbarium and tables.

Describe the raw material according to the diagram. Pay attention to the characteristic features of the seeds of recurved thorn-apple: size, shape, colour. Make a conclusion about the authenticity of the studied raw material.

Study the chemical composition of the raw material. Write down the formula of the main alkaloid.

Write down the pharmacological group and the uses of the raw material of recurved thorn-apple.

Self-assessment questions:

1. Conclude what are the main morphological features that distinguish the leaves of hemlock and datura.

2. What precautions should be taken when dealing with poisonous raw materials?

3. How can you distinguish between the leaves of Common Hanbane and Thorn apple by the form of calcium oxalate inclusions?

4. Specify the raw material base of Common Hanbane, Thorn apple, Recurved Thorn-apple.

5. Name the preparations - cholinolytics. From which raw material are they obtained?