Topic of the class:

"Quantitative analysis of medicinal plant raw materials containing various groups of biologically active substances (oxycinnamic acids)"

Aims:

1. To learn the methods of quantitative analysis of medicinal plant raw materials containing oxycinnamic acids.

2. To learn how to perform quantitative analysis of oxycinnamic acids by spectrophotometric method.

Work 1. Determination the moisture content of the medicinal plant material "Nettle Leaves".

Take a sample of the raw material from the teacher for analysis.

Carry out moisture determination and calculate the percentage of moisture content in the sample of raw material to be examined.

Compare the obtained result with the data of the pharmacopoeial article "Nettle Leaves". Write a conclusion.

Write the results of the study in the form of a protocol.

Work 2: Determination of oxycinnamic acids from the herbal material "Nettle Leaves".

Take a sample of the raw material from the teacher for analysis.

Study the method of determination of oxycinnamic acids by spectrophotometric method in medicinal herbs.

Carry out the determination of oxycinnamic acids according to the method and calculate the percentage of oxycinnamic acids in the sample of raw material.

Compare obtained result with pharmacopoeial article "Nettle leaves". Write a conclusion.

The results of the study write in the form of a protocol.

Protocol of analysis of medicinal raw materials

Date_____

Medicinal raw material
Eng/Lat._____
_____
Medicinal plant Eng/Lat._____
_____
Family Eng/Lat_____

Determination of moisture:
Regulatory moisture content:
Calculations:

Quantitative determination of oxycinnamic acids:
Standardisation of raw materials according to normative documentation:
Calculations:

Conclusion:_____
_____

Method of determination of the sum of oxycinnamic acids

Quantitative determination of the amount of oxycinnamic acids is determined by spectrophotometric method according to the procedure FS.2.5.0019.15 "Nettle Leaves" GF XIV edition.

About 0.5 g (exact weight) of crushed material is placed in a 250 ml flask with a graduated cylinder and 50 ml of 70% alcohol is added. The flask with the contents is attached to a reflux condenser and heated in a boiling water bath for 30 minutes, occasionally shaking the flask. After cooling down the extraction is filtered through a paper filter into a 100 mL flask. The extraction is repeated twice more by filtering into the same flask. The combined extracts are diluted with 70% alcohol to the mark and stirred (solution A).

2 mL of solution A is transferred into a 25 mL volumetric flask and diluted with 96% alcohol to the mark (solution B).

The optical density of solution B is determined on a spectrophotometer at 330 nm in a cuvette with a layer thickness of 10 mm. Alcohol 96% is used as a reference solution.

The content of the amount of oxycinnamic acids in terms of chlorogenic acid in absolutely dry raw materials in percentage (X) is calculated by the formula:

$$X = \frac{A_x \times 100 \times 25 \times 100 \times 100}{A_{1см}^{1\%} \times \alpha \times 2 \times (100 - W)}$$

где A_x - the optical density of the test solution;

$A_{1см}^{1\%}$ – specific absorbance of chlorogenic acid at 330 nm, equal to 507;

α – weight of test sample, g;

W – moisture content, %.