



## FACULTY OF PHARMACY MEDICAL UNIVERSITY OF SOFIA

Adopted by the Faculty council with a protocol No. 7/10.11.2022

DEAN:

(Prof. A. Zlatkov, DSci)

### DEPARTMENT OF PHARMACOGNOSY

## CURRICULUM OF PHARMACOGNOSY PART I

INCLUDED IN "PHARMACY" EDUCATION CURRICULUM

EDUCATIONAL DEGREE: "MASTER"

CREDITS (ECTS):17

### ANNOTATION

Pharmacognosy is a basic pharmaceutical discipline that studies medicinal materials of plant and animal origin. Some authors define it as a "multidisciplinary science", because for the comprehensive study of objects it uses a number of physical, chemical, chromatographic, spectral and other methods, through which it is connected with the scientific disciplines such as: pharmaceutical botany, pharmacology, chemistry (organic, analytical, pharmaceutical, etc.), drug technology, and others. The importance of the pharmacognosy is constantly growing, due to the ever wider use of medicinal plants in the therapy of many diseases. In the global practice, about 40% of the medicinal products are produced from plant materials.

The main goals and tasks of pharmacognosy are recognition, collection and use of the medicinal plants. The introduction of phytochemical research marks a new stage in its development. By applying of different phytochemical methods of analysis, tasks related to the clarification of the qualitative and quantitative composition of biologically active substances in plant substances (drugs) are solved. The use of new methods puts pharmacognosy on sound

scientific foundations, as a result of which, the discipline is established not only as a descriptive and applied, but also as an experimental science.

Modern goals, objectives and development guidelines are the starting points for the preparation of the pharmacognosy curriculum. The study material is systematized mainly according to the chemical classification and is divided into 23 lecture topics and 30 topics discussed in practicals and seminars. Among the primary metabolites, carbohydrates, lipids and organic acids are considered. Secondary metabolites are systematized in topics covering large groups of substances such as: phenolic compounds, steroids, terpenes, alkaloids, etc. For each group of compounds, data on the chemical structure, classification, properties, and methods of analysis, action and application are indicated. The curriculum includes new groups of natural substances for which a pharmacological action has recently been established, such as: depsides, lignans, xanthenes, quinones, sesquiterpene lactones, iridoids, phloroglucinols, etc. Over 200 plant substances are discussed in the topics, and for each the plant from which it is obtained, a macro- and microscopic description, chemical composition, action and application are indicated. Six new topics are included in the lecture course, examining the effect of plant substances on various systems in the human body, such as: respiratory, digestive, nervous, etc.

Practical classes include macroscopic and microscopic identification of plant substances important for practice and phytochemical exercises related to qualitative and quantitative analysis of main groups of biologically active substances.

The aim of the curriculum in pharmacognosy is to build student pharmacists as the most competent specialists in the field of phytochemistry, standardization of plant substances and phytoproducts, modern herbalism and phytotherapy.

**Student assessment control system:** ongoing control – 3 colloquiums, 2 seminars and a practical exam; final exam – written and oral.

## CURRICULUM

1. Pharmacognosy. Nature, object, aims and objectives. Current status and directions for development. Medicinal plants and plant substances (drugs). Discovery of new medicinal plants. Biologically active substances and factors affecting their accumulation. Active, accompanying and ballast substances. Pharmacognostic analysis.
2. General characteristics of carbohydrates and plant substances that contain them.
3. General characteristics of lipids, lipoids, prostaglandins and phospholipids.
4. Glycosides - general characteristic. Cyane and sulfur compounds and plant substances containing them.
5. Phenolic compounds – general characteristics. Simple phenols and their derivatives, phloroglucinols, lignans, phenolic acids and plant substances that contain them.
6. General characteristics of coumarins and plant substances that contain them.
7. General characteristics of flavonoids and plant substances that contain them.
8. Quinones, benzo- and naphthoquinones. General characteristics of anthraquinones and plant substances containing them.
9. General characteristics of tannins and plant substances that contain them.

10. Terpenes - general characteristic. Sesquiterpene lactones, diterpenes, triterpenes, carotenoids and plant substances containing them. Polyterpenes.
11. General characteristics of iridoids and plant substances that contain them.
12. General characteristics of essential oils and plant substances that contain them.
13. Steroids - general characteristic. Sterols and plant substances containing them.
14. General characteristics of cardiac glycosides and plant substances that contain them.
15. General characteristics of saponins and plant substances that contain them.
16. General characteristics of alkaloids and plant substances that contain them.
17. Other classes of chemical compounds and plant substances containing them. Substances of animal origin.
18. Plant substances used in diseases of the respiratory system.
19. Plant substances used in diseases of the digestive system.
20. Plant substances used in diseases of the urinary and reproductive system.
21. Plant substances used in diseases of the cardiovascular system.
22. Plant substances used in diseases of the nervous system.
23. Plant substances with immunostimulating and antitumor effects.

### **EDUCATIONAL PRACTICE**

1. Practical classes in the field.
2. Oral exam on the plant substances collected and discussed during the practice.

Date:.....

Prepared the program:

(Prof. I. Krasteva, DSci)

Head of the Department of Pharmacognosy:

(Prof. I. Krasteva, DSci)