PHARMACOGNOSY

**LABORATORY CLASS. Topic: «Chemical, morphological and anatomical analysis of MPM containing alkaloids – IІ.»**

**OBJECTIVE.**

Know the macro- and microscopic signs of medicinal plant material containing protoalkaloids, purine alkaloids and pseudoalkaloids.

**RELEVANSE.**

Alkaloids are natural compound of high pharmacological activity. They often are characterized by selective action. Due to their specific activity, alkaloids are widely used in medicine. Among natural biologically active substances alkaloids are represented by the largest amount of highly active pharmaceuticals (more than 10%). Alkaloids containing plants are used in drug stores for preparation of medicines *ex tempore* (especially in homeopathy) and mainly as an industrial source for individual and halenic pharmaceuticals manufacturing. Alkaloids are used in treatment of almost all diseases.

**CONTROL QUESTIONS.**

1. Describe methods of alkaloids’ isolation from plant material.
2. Describe the general tests which are used to confirm the presence of alkaloids in plant material.
3. Describe the distribution of alkaloids in plant kingdom and the influence of environment at the accumulation of alkaloids by plant material.
4. Describe the accumulation of alkaloids and their functions in plants.
5. Characterize the rules of collection for alkaloid-containing plant material.

**TEST.**

1. The remedies of Cayenne pepper are used as irritant, warming remedy for neuralgia, radiculitis. This effect is provided by:

***A*** Carotenoids

***B*** Saponins

***C*** Flavonoids

***D*** Capsaicinoids

***E*** Phenolic glycosides

1. Which substance from purine alkaloids forms a white precipitate with 0.1% tannin solution?

***A*** Euphylline

***B*** Theobromine

***C*** Theophylline

***D*** Caffeine

***E*** Diprophylline

1. Colchicine alkaloids are used for malignant tumours treatment. These medicines are obtained from:

***A*** Common periwinkle

***B*** Bush pea

***C*** Lobelia (Indian tobacco)

***D*** Belladonna

***E*** Colchicum

1. Specify the medicinal raw material, which is used for colchamine ointment production:

***A*** Hellebore rhizomes and roots

***B*** Scopolia rhizomes

***C*** Colchicum corm

***D*** Belladonna root

***E*** Snakeweed root

1. Replace glaucine hydrochloride, which cannot be found at the pharmacy, with another herbal medicine of a similar action for the patient :

***A*** Broncholytin

***B*** Mucaltin

***C*** Codeine phosphate

***D*** Anti-cough pills

***E*** Galanthamine hydrobromide

1. Medicines of ephedra herb have bronchodilatory and psychostimulative effect. Such plant material and medicines should be kept:

***A*** Like a poison

***B*** Like a dye-stuff

***C*** Like odorous material

***D*** According to the ordinary list

***E*** According to the B list

1. Which substance from purine alkaloids forms a white precipitate with 0.1% tannin solution?

***A*** Theophylline

***B*** Caffeine

***C*** Theobromine

***D*** Euphylline

***E*** Diprophylline

1. Write Latin names of each plant, plant material and family and make a logic chain: A – medicinal plant; B – group of biologically active compounds; C – active compound; D– pharmacological activity.

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|  | **A** | **B** | **C** | **D** |
| 1. | Veratrum | Protoalkaloids | Colchicine, colchamine | Stimulant, diuretic |
| 2. | Ephedra | Steroidal pseudoalkaloid | Jervine | Antitumour  |
| 3. | Coffee | Diterpenoid pseudoalkaloid | Capsaicin | Local irritant |
| 4. | Colchicum | Protoalkaloids | Ephedrine | Broncholytic |
| 5. | Capsicum | Purine  | Caffeine, theophylline | Insecticidal |
| 6. | Tea | Purine | Caffeine, tannins | Stimulant, antidiarrhoeal |
| 7. | Yew | Protoalkaloids | Taxol | Antitumour |

1. Match the logical chain: structure – name – group of alkaloids – plants.

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| a. Caffeine | 1. Protoalkaloid | I. Capsicum |
| b. Colchicine | 2. Purine alkaloid | II. Coffee |
| c. Capsaicin | 3. Pseudoalkaloid | III. Colchicum |

1. Match the logical chain: structure – name – group of alkaloids – plants.

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| a. Ephedrine | 1. Purine alkaloid | I. Ephedra |
| b. Colchicine | 2. Protoalkaloid | II. Tea |
| c. Taxol | 3. Pseudoalkaloid | III. Colchicum |

1. Match the logical chain: structure – name – group of alkaloids – plants.

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| a. Capsaicin | 1. Purine alkaloid | I. Veratrum |
| b. Caffeine  | 2. Protoalkaloid | II. Coffee |
| c. Jervine | 3. Pseudoalkaloid | III. Yew |

1. Match the logical chain: structure – name – group of alkaloids – plants.

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| a. Jervine | 1. Protoalkaloid | I. Veratrum |
| b. Theophylline | 2. Pseudoalkaloid | II. Colchicum |
| c. Colchamine | 3. Purine alkaloid | III. Capsicum |

**PRACTICAL TASKS.**

You have to fill in your laboratory hand-book on the topic: Macro- and microscopic analysis of medicinal plant material containing protoalkaloids, purine alkaloids and pseudoalkaloids.

**Objects:** capsicum, ephedra, colchicum, tea, coffee, cola, cocoa, guarana, aconite, delphinium, yew, kangaroo apple, veratrum.

**LITERATURE TO PREPARE FOR THE LESSON.**

1. Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Upyr, Ya.V. Dyakonova, V.Yu. Kuznetsova, I.G. Zinchenko, O.A. Kyslychenko; ed. by V.S. Kyslychenko. – Kharkiv : NUPH: GoldenPages, 2011. – 552 p.; il.
2. Pharmacognosy: textbook for higher school students / V.S. Kyslychenko, L.V. Lenchyk, I.G. Gurieva et al.; ed. by V.S. Kyslychenko. – Kharkiv : NUPH: GoldenPages, 2019. – 584 p.
3. Tests KROK–2. Topic Alkaloids.