PHARMACOGNOSY

for 3rd year students 22 Public health 226 «Pharmacy, industrial parmacy», educational program «Pharmacy» Фм17(5,0д) англ 1, 2, 3, 4, 5, 6, 7, 8 groups

27.04 – 7, 8 groups

29.04 – 1, 2 group

30.04 – 3, 4 groups

01.05 – 5, 6 group

**LABORATORY CLASS. Topic:** **«Determination of Identity and Quality of MPM.»**

**OBJECTIVE.**

Know the stages of conducting the identification of unknown MPM.

**RELEVANSE**.

Quality assurance of medicinal herbal raw materials is an indispensable component for obtaining effective medicines. Knowledge of conducting the stages of commodity analysis helps to achieve this goal.

**CONTROL QUESTIONS.**

1. Write a definition «Total ash», «Acid-insoluble ash», «Water-soluble ash».
2. Describe raw material sampling.
3. Why macroscopic and microscopic examinations of plant materials are needed?
4. Describe the initial check on the packaging of the raw material.
5. What parameters determine the samples of raw materials selected for analysis?

**TEST.**

1. Cultivation of this plant and production of medicinal plant material is under the UNO control and is forbidden in Ukraine. This plant is:

***A*** Tulip poppy

***B***Locoweed

***C***Colchicum

***D***Opium poppy

***E*** Ginseng

1. Alkaloids-containing medicinal raw material should be dried at the temperature:

***A*** 70-80°С

***B*** 50-60°С

***C*** 30-45°С

***D*** 80-90°С

***E*** 90-100°С

1. Belladonna, stramonium, and henbane leaves contain tropane alkaloids. This medicinal plant material should be stored:

***A*** According to the A list (poisonous drug substances)

***B*** According to the B list (these drug substances require caution in handling, storage or use)

***C*** According to the ordinary list

***D*** According to the “Essential oil material” list

***E***  Equated to narcotic

1. Choose a reagent which pharmacist-analyst should use to identify alkaloids in herbal raw material.

***A*** Alkali solution

***B*** Bromine water

***C*** Dragendorff’s reagent

***D*** Stahl’s reagent

***E*** Trim-Hill’s reagent

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

***A*** According to the ordinary list

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

***C*** Like odorous material

***D*** Like a dye-stuff

***E*** Like a poison

1. Taste is one of organoleptic characteristics of the medicinal raw material’s authenticity. For which medicinal plant material taste is never determined?

***A*** Milk thistle

***B*** Motherwort

***C*** Jimson weed

***D*** Common Thyme

***E*** Wild parsnip

1. During the commodity research analysis of the raw material it was discovered that it consists of a mixture of stems, leaves, flowers and fruits. Stems are cylinder, up to 4 сm long, up to 1,5 сm thick, light green with a spongiose core. Flowers are solitary, corolla is five- lobbed and of a dull purplish colour. The plant material is poisonous! It can be concluded that the raw material is:

***A*** Nettle herb

***B*** St. John's-wort herb

***C*** Peppermint herb

***D*** Belladonna herb

***E*** Shepherd's-purse herb

1. At identification of poisonous raw material the fact, that such medicinal plants as *Atropa belladonna*, *Hyoscyamus niger*, *Datura stramonium* have a common microscopic diagnostic feature is taken into consideration. This feature is:

***A*** The epidermal cells have wavy cell walls

***B*** The raw material contains calcium oxalate in its cells

***C*** Location of essential oil inside a cell

***D*** Cells are located in two layers

***E*** Presence of simple curved hairs

1. Children and pupils often collect medicinal raw material. Choose the medicinal plant material not allowed to be collected by children and pupils:

***A*** Herba Belladonnae
***B*** Herba Hyperici
***C*** Herba Bidentis
***D*** Herba Leonuri
***E*** Herba Origani

1. The belladonna leaves contain tropane alkaloids and are a poisonous admixture to other types of raw material. This admixture can be identified at microdiagnostics by such anatomic sign:

***A*** Cells, filled with calcium oxalate sand

***B*** Cells with essential oils

***C*** Cells with fatty oils

***D*** Cells, filled with spherical crystals

***E*** Cells, filled with prismatic crystals

1. The henbane leaves contain tropane alkaloids and are a poisonous admixture to other types of plant material. This admixture can be identified at microdiagnostics by such anatomic indications:

***A*** Cells, filled with prismatic crystals

***B*** Cells with essential oils

*C* Cells with fatty oils

***D*** Cells, filled with spherical crystals

***E*** Cells, filled with calcium oxalate sand

1. The characteristical microdiagnostic feature of the medicinal plant material – the jimson weed leaves – is the presence of multicellular warty hairs and inclusions of calcium oxalate, named:

***A*** Druses

***B*** Raphides

***C*** Lythocyst cells

***D*** Microcrystallic sand

***E*** Needle-like crystals

1. The characteristical microdiagnostic feature of the henbane leaves is a presence of multicellular simple and capitate hairs and inclusions of calcium oxalate, named:

***A*** Prismatic crystals

***B*** Druses

***C*** Cystoliths

***D*** Needle-like crystals

***E*** Raphides

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. Choose plant containing quinolizidine alkaloids that have expectorant effect:

***A*** Berberis vulgaris

***B*** Datura stramonium

***C*** Chelidonium majus

***D*** Thermopsis lanceolata

***E*** Orthosiphon stamineus

1. The alkaloid codeine is prescribed as antitussive. Which MRM contains this alkaloid?

***A***Plume Poppy herb

***B*** Opium poppy capsules

***C*** Celandine (Killwort) herb

***D*** Common periwinkle herb

***E*** Tea leaves

1. Codeine for medical purpose can be received in a semisynthetic way from a plant-derived alkaloid of the similar structure. Specify this alkaloid:

***A*** Berberine

***B*** Papaverine

***C*** Morphine

***D*** Protopine

***E*** Chelidonine

1. The Papaveraceae family plants contain isoquinoline alkaloids and are widely used in medicine. Indicate the species which grows wildly and is cultivated in Ukraine:

***A*** Plume Poppy

***B*** Opium poppy

***C*** Tulip poppy

***D*** Coral Plume

***E*** Field Poppy

1. The tulip poppy herb is used as antitussive remedy. The quality of this raw material is characterized by the content of:

***A*** Glaucine

***B*** Berberine

***C*** Pachycarpine

***D*** Rosevine

***E*** Sanguinarine

1. The tulip poppy herb (*Herba Glaucii flavi*) is used as a source of antitussive remedies. Which alkaloid is extracted from it?

***A*** Thermopsine

***B*** Hyndarine

***C*** Codeine

***D*** Glaucine

***E*** Protopine

1. Medicines of Madagascar periwinkle (*Catharanthus roseus*) are used for treatment of lymphogranulomatosis, haematosarcoma and in acute leukaemia therapy. Quality standardization of this raw material is carried out according to the content of:

***A*** Vinblastine

***B*** Harmine

***C*** Atropine

***D*** Hyoscyamine

***E*** Strophanthidine

1. Medicines of rauwolfia roots are used for high blood pressure treatment. Quality of this raw material is determined according to the quantity of:

***A*** Atropine

***B*** Reserpine

***C*** Hyoscyamine

***D*** Vinblastine

***E*** Adonitoxin

1. Medicines of ergot are used in obstetric-gynecological practice for uterus contraction and for cardiovascular diseases treatment. Quality of this raw material is estimated according to the quantity of:

***A*** Ajmaline

***B*** Atropine

***C*** Hyoscyamine

***D*** Reserpine

***E*** Ergotoxine

1. The positive result with Dragendorff ‘s reagent at chemical analysis of barberry root was received. Presence of which compounds does this reaction confirm?

***A*** Triterpenoids

***B*** Alkaloids

***C*** Steroids

***D*** Furocoumarins

***E*** Chromones

1. The jimson weed leaves contain tropane alkaloids and are a poisonous admixture to other types of raw material. This admixture can be identified at microdiagnostics by such anatomic indications:

***A*** Cells, filled with calcium oxalate sand

***B*** Cells with mucilage

***C*** Cells with raphides

***D*** Cells with needle-like crystals

***E*** Numerous druses

1. The adulteration with alkaloids-containing medicinal plant material is possible during plant material collection. These compounds can be identified using the reaction with:

***A*** Dragendorff’s reagent

***B*** Legal’s reagent

***C*** Trim-Hill’s reagent

***D*** Stahl’s reagent

***E*** Fehling’s reagent

1. Orange-red spots appear on the yellow background after processing of a chromatogram with Belladonna leaves extract by Dragendorff’s reagent. It confirms the presence of:

***A*** Tannins

***B*** Saponins

***C*** Alkaloids

***D*** Cardiac glycosides

***E*** Phenolic glycosides

1. Analysis of alkaloid containing raw material was carried out in an analytical lab. Choose drug which gives positive result in Vitali-Morin reaction:

***A*** Scopolamine hydrochloride

***B*** Platyphylline hydrotartrate

***C*** Quinine sulfate

***D*** Papaverine hydrochloride

***E*** Morphine hydrochloride

1. Alkaloid glaucine has an antitussive effect that is stronger and longer if compared to that of codeine, and exhibits no narcotic side effects. What medicinal plant contains glaucine?

***A*** Datura

***B*** Celandine

***C*** Thermopsis lanceolata

***D*** Yellow hornpoppy

***E*** Henbane bell (*Scopolia carniolica*)

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

***A*** Theophylline

***B*** Theobromine

***C*** Caffeine

***D*** Euphylline

***E*** Diprophylline

1. Atincture and extracts of which raw material are included in complex medicines «Bellataminal», «Becarbon», «Besalol», «Bellalgin»?

***A*** Lily-of-the-valley herb

***B*** Belladonna herb

***C*** Locoweed herb

***D*** Tickseed herb

***E*** Celandine herb

1. Medicines «Passit», «Novopassit» are used as tranquilizers, sedative and light soporific remedies. These medicines are obtained from:

***A*** Sage leaves

***B*** Tickseed herb

***C*** Passionflower herb

***D*** Elecampane herb

***E*** Common periwinkle herb

1. An alkaloid-containing phytomedicine is recommended to treat neurasthenia, insomnia, climacteric disorders. Choose this phytomedicine.

***A*** Vinblastine

***B*** Ergotamine

***C*** Glaucine hydrochloride

***D*** Securinine nitrate

***E*** Novopassit

1. Medicines «Ajmaline» and «Pulsnorma» are used as antiarrhythmic remedies. These medicines are obtained from:

***A*** Catharanthus leaves

***B*** Common periwinkle herb

***C*** Snakeroot

***D*** Stramonium leaves

***E*** Nux vomica seeds

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

***A*** Belladonna

***B*** Bush pea

***C*** Common periwinkle

***D*** Colchicum

***E*** Lobelia (Indian tobacco)

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

***A*** Colchicum corm

***B*** Hellebore rhizomes and roots

***C***  Scopolia rhizomes

***D*** Belladonna root

***E*** Snakeweed root

1. Choose the medicinal raw material which is used for obtaining medicine «Sanguiritrin» with antimicrobial activity:

***A*** Celandine

***B*** Datura Plume poppy

***C***

***D*** Capsicum

***E*** Bush pea

1. It is known that fungi can be the source of biologically active substances. For example, the source of indole alkaloids is:

***A*** Ergot

***B*** Snakeroot

***C*** Nux vomica

***D*** Foxfeet

***E*** Scopolia

1. The herbal medicine «Ukrain» is used as an antitumour remedy. The medicinal raw material for this medicine is:

***A*** Motherwort herb

***B*** Celandine herb

***C*** Peppermint leaves

***D*** Sage leaves

***E*** Barberry root

1. The alkaloid codeine with anticough action also has a narcotic effect. Therefore in pediatric practice it is necessary to replace it by other alkaloid which does not have this side effect:

***A*** Jervine

***B*** Papaverine

***C*** Thebaine

***D*** Glaucine

***E*** Capsaicine

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. Common periwinkle leaves are used for devincan, vincapan production. Vincristine is determined in leaves by a reaction:

***A*** Diazocoupling reaction

***B*** With solution of iron chloride

***C*** With Dragendorff’s reagent

***D*** Legal’s reaction

***E*** Reaction with sulfuric acid

1. For biologically active substances identification 1 % picric acid water solution was added to celadine herb infusion. Yellow precipitation confirms the presence of:

***A*** Saponins

***B*** Flavonoids

***C*** Tannins

***D*** Alkaloids

*E* Anthracene derivatives

1. The MRM with such characteristics is received for analysis: a mixture of obovate-acuminate leaves up to 25 cm long and up to 20 cm wide; base of the leaf is cuneated with deep sinuate margin; petiole is cylindrical. Venation is palmate-netted: the main vein and major veins come out at the inner surface of a leaf. The upper surface is dark and greyish-green, the under surface paler. A smell is weak, narcotic. Taste is never determined. The plant is poisonous! Which plant does the described MRM belong to?

***A*** *Chelidonium majus*

***B*** *Passiflora incarnata*

***C*** *Datura stramonium*

***D*** *Hyoscyamus niger*

***E*** *Vinca minor*

1. Berberine is a biologically active compound of barberry. Which group of biologically active compounds does berberine belong to?

***A*** Glycosides

***B*** Alkaloids

***C*** Saponins

***D*** Flavonoids

***E*** Anthracene derivatives

1. Snakeweed rootscontain reserpine. It has hypotensive and sedative effects. Which class of biologically active substances does reserpine belong to?

***A*** Anthracene derivatives

***B*** Saponins

***C*** Flavonoids

***D*** Alkaloids

***E*** Cardioglycosides

1. The representatives of *Solanaceae* family are widely used in medical practice as alkaloid-containing plants. Which from the representatives of the family is the source of steroidal alkaloids?

***A*** Scopolia carniolica

***B*** Solanum laciniatum

***C*** Capsicum annuum

***D*** Solanum tuberosum

***E*** Atropa belladonna

1. The main active substance of barberry leaves is berberine. Which class of biologically active substances does it belong to?

***A*** Alkaloids

***B*** Flavonoids

***C*** Coumarins

***D*** Tannins

***E*** Essential oils (volatile oils)

1. Belladonna, henbane and datura leaves containing tropane alkaloids must be stored according to the following list requirements:

***A*** A list (poisonous drug substances)

***B*** B list (these drug substances require caution in handling, storage or use)

***C*** General storage list

***D*** Essential oil MPM storage list

***E*** List of substances equivalent to narcotics

1. Bush pea herb is used for medicines with antitussive activity production. Which alkaloid is isolated from it?

***A*** Glaucine

***B*** Hyndarine

***C*** Thermopsine

***D*** Codeine

***E*** Protopine

1. The alkaloid glaucine has antitussive action. What MRM contains this alkaloid?

***A*** Tulip poppy herb

***B*** Plume Poppy herb

***C*** Celandine herb

***D*** Common periwinkle herb

***E*** Tea leaves

**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.