

POLYSACCHARIDES.

During microscopy of *Althaea* root it is necessary to determine the presence of starch granules within the plant cells. What reagent allows such analysis? (TC, 2019){

- =Lugol's solution
 - ~Thymol solution
 - ~Concentrated sulfuric acid
 - ~Ammonium hydroxide
 - ~Alcohol solution of o-naphthol
- }

Pharmaceutical factory received a batch of *Althaea* roots. What reagent should be used in histochemical test for slime production in the course of qualitative analysis? (TC, 2019){

- ~1 % phloroglucinol solution
 - ~Dragendorff reagent
 - ~Sudan III solution
 - ~1% ammonium iron(III) sulfate solution
 - =Alcoholic solution of methylene blue
- }

To check the identity of a herbal raw material, several drops of an alcoholic solution of alpha-naphthol and concentrated sulfuric acid were applied to the root section of *Cichorium intybus* L.. It resulted in pink-violet coloring that indicates the presence of the following in the herbal raw material: (TC, 2020){

- =Inulin
 - ~Essential oils
 - ~Slime
 - ~Pectin
 - ~Fatty oils
- }

For authentication of a herbal raw material, several drops of an alcoholic solution of alpha-naphthol and concentrated sulfuric acid were applied to the root section of *Cichorium intybus* L.. It resulted in pink-violet coloring that indicates the presence of the following in the herbal raw material: (TC, 2021){

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- }

Most types of herbal raw materials are stored dry. However, for juice production the factories receive fresh herbal material. Name one such plant is processed fresh: (TC, 2021){

- ~*Capsella bursa-pastoris*
 - ~*Althaea officinalis*
 - ~*Rosa canina*
 - ~ *Urtica dioica*
 - = *Plantago major*
- }

A pharmacist has prepared an aqueous extract using the cold infusion method. What herbal raw material was it? (TC, 2021){

~Arctostaphylos leaves
~Mint leaves
~Buckthorn bark
~Thermopsis grass
=Marshmallow roots
}

VITAMINS. ORGANIC ACIDS.

The 'Aromeline' phytodrug exhibits P-vitamin activity. What herbal raw material is used in production of this drug? (TC, 2019, 2023){

=*Fructus Aroniae melanocarpae*
~*Fructus Sorbi*
~*Fructus Sambuci nigrae*
~*Fructus Viburni*
~*Fructus Crataegi*
}

A factory that manufactures vitamin preparations has received a batch of herbal raw material. It consists of round wrinkled orange-red fruits that taste sweet-sour and slightly tart. The fruits are up to 3 cm long, 1.5 cm in diameter, and are filled with hard small angular yellow nutlets. The nutlets and the inner surface of the fruits are covered with long and extremely coarse bristly down. This herbal raw material can be identified as: (TC, 2019){

~*Fructus Sorbi*
~*Fructus Ribis nigri*
~*Fructus Viburni*
~*Fructus Hippophaes*
= *Fructus Rosae*
}

A patient suffers from avitaminosis C. The physician has prescribed a course of phytotherapy. What herbal raw material is rich in this vitamin? (TC, 2019, 2023){

~*Cortex Quercus*
~*Rhizoma Tormentillae*
~*Cortex Viburni opuli*
= *Fructus Sorbi*
~*Folium Menthae piperitae*
}

Cross-section of the leaf of a medicinal plant shows cystoliths and stinging hairs with a multicellular base and a large cell on the apex that ends in a widened tip that breaks off. What herbal raw material has such microscopic characteristics? (TC, 2020){

~*Capsella bursa-pastoris*
= *Urtica dioica*
~*Alropa belladonna*
~*Mentha piperita*
~*Origanum vulgare*
}

IRIDOIDS. ESSENTIAL OILS

Essential oil of a certain plant contains up to 80% of cineole. Specify the herbal raw material that is harvested to obtain this oil: (TC, 2019, 2020){

~*Folia Menthae piperitae*

~*Folia Betulae*
~*Folia Melissa*
=*Folia Eucalypti*
~*Folia Absinthii*
}

Menthol has an antispasmodic and analgesic effect. What herbal raw material is a source of menthol? (TC, 2019){

~*Folia Salviae*
=*Folia Menthae piperitae*
~*Folia Eucalypti*
~*Folia Absinthii*
~*Folia Betulae*
}

Microscopy of a root of a certain medicinal plant reveals the following features: parenchyma cells contain inulin, there are laticifers, cambium line is clearly visible. This root belongs to: (TC, 2019){

~*Sanguisorba officinalis*
~*Zingiber officinale*
~*Althaea officinalis*
=*Taraxacum officinalis*
~*Inula helenium*
}

A pharmacy received an infusion formulation. What herbal raw material can be used to make this dosage form? (TC, 2019){

~*Cortex Quercus*
~*Cortex Frangulae*
=*Rhizomata cum radicibus Valerianae*
~*Cortex Viburni*
~*Radices Rhei*
}

Essential oil of a certain plant contains up to 80% of cineole. Specify the herbal raw material that is harvested to obtain this oil: (TC, 2019, 2020){

~*Folia Betulae*
~*Folia Melissa*
~*Folia Menthae piperitae*
=*Folia Eucalypti*
~*Folia Absinthii*
}

Camomile flowers are a popular medicinal substance in scientific medicine. What plant is the source of this herbal raw material? (TC, 2021){

~*Anthemis arvensis*
~*Tripleurospermum inodorum*
=*Chamomilla recutita*
~*Leucanthemum vulgare*
~*Anthemis cotula*
}

Menthol medicinal substance can be chemically classified as a: (TC, 2021){
=Monocyclic terpene
~Glycoside
~ Bicyclic terpene
~Polypeptide
~Acyclic terpene
}

Microscopy of herbal raw material reveals the following diagnostic characters in the microslide: multilayer cork, large parenchymal cells, filled with inulin; clearly visible cambium layer, large vessels; schizogenous cavities with essential oil. These features confirm the authenticity of the following herbal raw material: (TC, 2021){
~ Radices Althaeae
~Rhizomata et radices Rubiae
~Radices Ononidis
=Rhizomata et radices Inulae
~Radices Taraxaci
}

A pharmacy has received a batch of herbal raw material – caraway fruits. What medical plant is cultivated for harvesting of this herbal raw material? (TC, 2021){
~Anisum vulgare
~Anethum graveolens
~Foeniculum vulgare
~Coriandrum sativum
=Carum carvi
}

Eucalyptus essential oil is used as an antiseptic. What excretory structures of a leaf accumulate this substance? (TC, 2021){
~Glandular «spots»
~Glandular hairs
~Secretory cells
~Essential oil glands
=Essential oil cavities
}

Origanum vulgare herbal raw material is harvested during the flowering. How is it harvested? (TC, 2021){
~The whole plant is dug up
~Only the tips of the inflorescences are cut
=The grass is cut with a knife or sickle at a distance of 20-30 cm from the ground
~The leaves are plucked with the stem
~The whole plant with a root is pulled out from the soil
}

Achillea grass is harvested during a certain stage of plant growth. Name this stage: (TC, 2021){
~During the shoot growth
~Before the flowering
~During the fruiting
~During the budding
=During mass flowering

}

Bioactive substances of this plant have secretolytic, antispasmodic, antifatulent, and slight diuretic effect. Its essential oil is used in making of gripe water. What plant is it? (TC, 2021){

- =Foeniculum vulgare
 - ~Crataegus sanguinea
 - ~Tanacetum vulgare
 - ~Betula pendula
 - ~Calendula officinalis
- }

According to the State Pharmacopoeia of Ukraine, the herbal raw material used in production of plantaglucide should be tested by means of thin-layer chromatography. The resulting chromatogram will have a weak blue zone, which will indicate the presence of: (TC, 2023){

- =Azulene
 - ~Atropine
 - ~Aucubin
 - ~Acteoside
 - ~Acorone
- }

Menthol has anesthetic and antiseptic effect. What plant is the source of menthol? (TC, 2023){

- ~Folia Absinthii
 - ~Folia Uvae ursi
 - ~Folia Eucalypti
 - ~Folia Salviae
 - =Folia Menthae piperitae
- }

Thymol and carvacrol are the main active ingredients of *Thymus serpyllum*. To what class of bioactive substances do they belong? (TC, 2023){

- ~Flavonoids
 - ~Xanthones
 - =Essential oils
 - ~Iridoids
 - ~Alkaloids
- }

CARDIAC GLYCOSIDES

Purpurea glycoside A and purpurea glycoside B are the main active substances of *Digitalis purpurea*. They belong to the following class of bioactive substances: (TC, 2020){

- ~Alkaloids
 - ~Phenolic compounds
 - ~Flavonoids
 - =Cardiac glycosides
 - ~Anthracene derivatives
- }

A pharmaceutical company produces a medicine under the brand name "Corglyconum"? What herbal raw material is used in preparation of this drug? (TC, 2020, 2021, 2023){

- ~Dandelion roots
- ~Wormwood grass

~Plantain leaves
~Buckthorn bark
=Lily-of-the-valley grass
}

The chemical structure of *Strophanthus* cardiac glycosides can be characterized by the presence of the following in position 10 of the steroid ring: (TC, 2021){

~Methoxy group
~Alcoholic hydroxyl
=Aldehyde group
~Ethoxy group
~Phenolic hydroxyl
}

Corglycon herbal preparation is used as a cardiotoxic agent in cardiovascular diseases. It is obtained from leaves of a certain medicinal plant. Name this plant. (TC, 2023){

~Digitalis purpurea
~Datura
~Eucalyptus
=Convallaria majalis
~Erysimum diffusum
}

SAPONINS.

What medicinal plant has antiinflammatory and expectorant properties due to its content of triterpene saponins? (TC, 2019, 2020){

~*Panax ginseng*
~*Aralia mandshurica*
~*Astragalus dasyanthus*
~*Orthosiphon stamineus*
=*Glycyrrhiza glabra*
}

During processing, drying and refinement of herbal raw materials containing saponins, the dust particles can cause mucosal irritation. Therefore, precautionary measures should be taken when working with: (TC, 2019){

=*Rhizoma et radices Polemonii*
~*Rhizomata Tormentillae*
~*Rhizomata et radices Rubiae*
~*Radices Araliae*
~*Rhizomata Bistortae*
}

Preparations of *Panax* roots have tonic and adaptogenic properties and improve mental and physical working ability. If there is no *Panax* tincture in the pharmacy, it can be substituted with preparations of: (TC, 2020, 2021){

~*Taxaxaci radices*
=*Araliae mandshuricae radices*
~*Glycyrrhizae radices*
~*Tormentillae radices*
~*Calami radices*
}

Licorice roots contain saponins. What reaction can prove their presence in the herbal raw material? (TC, 2021){

- ~Fehling's test
- ~Molisch's test
- ~Reaction with iron(III) chloride
- =Foam index
- ~Dragendorff's test

What medicinal plant has anti-inflammatory and expectorant properties due to its content of triterpene saponins? (TC, 2023){

- ~Orthosiphon stamineus
- =Glycyrrhiza glabra
- ~Panax ginseng
- ~Aralia mandshurica
- ~Astragalus dasycanthus

SIMPLE PHENOLS. LIGNANS. XANTHONES.

Arctostaphylos leaves have uroseptic effect. The following is an allowable admixture to this herbal raw material: (TC, 2019){

- ~Herba Bursae pastoris
- ~Folia Digitalis lanata
- ~Folia Urticae
- =Folia Vitis idaeae
- ~Folia Cotini coggygriae

Schisandra chinensis seeds contain lignans. What pharmacological effect will the preparations made of *Schisandra chinensis* have? (TC, 2019){

- =Tonic
- ~Antitumor
- ~Reparative
- ~Sedative
- ~Hepatoprotective

Silibor is a herbal drug that is used as a hepatoprotector. This drug is made from: (TC, 2019){

- ~Flores Centaureae cyani
- ~Flores Tanacetii
- ~Flores Crataegi
- ~Herba Equiseti arvensis
- =Semina Sylibi

"Immunal" immunostimulant is often prescribed against chronic upper respiratory tract infections. What herbal raw material is used in its production? (TC, 2019){

- ~Radices Araliae elata
- ~Radices Rhei
- ~Radices Ginseng
- ~Rhizomata et radices Eleuterococci

=*Herba Echinaceae purpurea*

}

The preparations of *Silybum marianum*. "Silibor" and "Carsil" have hepatoprotective action. What parts of *Silybum marianum* are the herbal raw material from which these medicines are being made? (TC, 2020){

~Flowers

=Seeds

~Grass

~Leaves

~Roots

}

FLAVONOIDS.

Grass of *Equisetum arvense* is often recommended as a diuretic. What herbal raw material can be used as its substitute? (TC, 2019){

~*Herba Menthae piperitae*

~*Herba Convallariae*

~*Herba Leonuri*

=*Herba Aervae lanatae*

~*Herba Adonidis*

}

The medicinal plants of the *Fabaceae* family contain various groups of bioactive substances. What representative of this family contains flavonoids and is used as an industrial source of rutin? (TC, 2020, 2021){

~*Ononis arvensis*

~*Thermopsis alterniflora*

~*Glycyrrhiza glabra*

=*Styphnolobium japonicum*

~*Bidens tripartite*

}

A pharmaceutical warehouse has received a batch of herbal raw material - hawthorn flowers. Merchandise analysis revealed in one of the sacks a significant amount of bird- cherry flowers besides the hawthorn flowers. What parameter of the raw material quality should be determined? (TC, 2020){

~Moisture content

~Extractive values

~Mineral admixtures

~Ash values (Total ash)

=Acceptable admixtures

}

A herbal raw material (fruits) was sent for analysis. This material consists of glossy black drupes 8 mm in diameter with one large spherical light-brown seed that is very firm. Its chemical analysis showed the presence of condensed tannins. What plant is the source of this herbal raw material? (TC, 2020){

~*Ribes nigrum*

~*Rhamnus cathartica*

~*Schisandra chinensis*

=*Prunus padus*
~*Vaccinium myrtillus*
}

Chemical analysis of *Helichrysum* flowers shows positive result of the cyanidin test. This reaction indicates the presence of the following class of compounds: (TC, 2021){

~Alkaloids
~Saponins
~Coumarins
~Polysaccharides
=Flavonoids
}

Several species of *Polygonum* genus are used in medicine. One of these species has rootstocks rich in tanning agents, which are used to treat diarrhea. Name this species: (TC, 2023){

~*Polygonum alpinum*
~*Polygonum persicaria*
=*Polygonum aviculare*
~*Polygonum bistorta*
~*Polygonum hydropiper*
}

"Cratal" drug is used as a cardioprotective agent. What herbal raw material is the source of this drug? (TC, 2023){

~Mint leaves
=Hawthorn fruits
~Peony grass
~Foxglove leaves
~Lily-of-the-valley leaves
}

Liquid extract of hawthorn flowers is a component of the "Cardiophyt", "Biovital", and "Herovital" drugs that have a hypotensive and sedative effect. When is this herbal raw material harvested? (TC, 2023){

~At the end of flowering
~During flowering
~During the sap rise
~Before flowering
=At the beginning of flowering, when some of the flowers have not yet opened
}

A pharmaceutical warehouse has received a batch of herbal raw material - hawthorn flowers. Merchandise analysis revealed in one of the sacks significant amount of bird-cherry flowers besides the hawthorn. What quality assessment of the herbal raw material should be performed? (TC, 2023){

=Acceptable admixtures
~Extractive values
~Mineral admixtures
~Moisture content
~Ash values (Total ash)
}

ANTHRACENE-DERIVATIVES.

Proper harvesting of *Frangula alnus* herbal raw material greatly influences the quality and quantity of its active substances. Therefore, the optimal time for *Frangula alnus* bark harvesting is the period of: (TC, 2019){

- Dormancy
- ~Flowering
- ~Defoliation
- =Sap flow
- ~Fruiting
- }

In the process of phytochemical examination of *Cortex Frangulae*, the reaction with alkaline solution resulted in red coloring, which indicates the presence of the following: (TC, 2019){

- ~Flavonoids
- ~Slime
- ~Alkaloids
- =Anthracene derivatives
- ~Saponins
- }

Cortex Frangulae and its derivative drugs are used as laxatives in medicine. According to the State Pharmacopoeia of Ukraine, during chromatographic identification of *Cortex Frangulae* it is necessary to detect: (TC, 2019){

- ~Purpurea glycosides
- ~Panaxosides
- =Glucofrangulins
- ~Ginkgosides
- ~Fenatosides
- }

What effect will anthracene derivatives have, if -OH- groups are located in both benzene rings of anthraquinone? (TC, 2020, 2021){

- ~Sedative
- =Laxative
- ~Choleretic
- ~Diuretic
- ~Litholytic
- }

A herbal raw material was sent for analysis: rounded cordate leaves with incised margins that are irregularly coarsely, and finely toothed; the upper leaf surface is naked, while its lower surface is covered in white down. Leaf petioles are thin, with a groove on the upper part, often downy. Leaf blade length is usually 8-15 cm. a petiole is approximately 5 cm long. The upper leaf surface is green, while the lower leaf surface is whitish-gray. No odor. The taste is slightly bitter with a slimy texture. What herbal raw material is it? (TC, 2020){

- ~*Folia Urticae*
- =*Folia Farfarae*
- ~*Folia Menthae*
- ~*Folia Uvae-ursi*
- ~*Folia Eucalypti*
- }

A man came to a pharmacy asking for a litholytic and diuretic drug «Marelin». If there is no such drug in the pharmacy, powdered roots and rhizomes of a certain plant can be recommended as a substitute. Name this plant: (TC, 2021){

- ~*Rhodiola rosea*
- =*Rubia tinctorum*
- ~*Dryopteris filix-mas*
- ~*Valeriana officinalis*
- ~*Sanguisorba officinalis*

Microscopy of transverse section of a bark sample shows a wide dark red cork layer, lamellar collenchyma, druses, bast fibres with a crystal sheath, and medullary rays. What herbal raw material is it? (TC, 2021){

- ~Birch bark
- ~Willow bark
- =Buckthorn bark
- ~Oak bark
- ~Ash bark

Specialists of a pharmaceutical enterprise confirm the identity of *Cassia acutifolia* herbal raw material. During reaction with alkali it developed cherry-red coloring. What substances were identified? (TC, 2023){

- ~Glycosides
- ~Alkaloids
- ~Iridoids
- ~Tannins
- =Anthraquinones

TANNINS.

The following herbal raw material is a source of tannin in pharmaceutical manufacture: (TC, 2019){

- ~*Rhizomata Bistortae*
- ~*Fructus Viburni*
- =*Folium Cotini coggygriae*
- ~*Rhizomata et radix Sanguisorbae*
- ~*Rhizomata Bergenias*

What herbal raw material is used as an industrial source of tannins? (TC, 2020){

- ~Rose hips
- ~Nettle leaves
- =*Cotinus coggygria* leaves
- ~*Persicaria hydropiper* grass
- ~*Solidago canadensis* grass

A herbal raw material (fruits) was sent for analysis. This material consists of glossy black drupes 8 mm in diameter with one large spherical light-brown seed that is very firm. Its chemical analysis showed the presence of condensed tannins. What plant is the source of this herbal raw material?

(TC, 2020){
~Ribes nigrum
~Rhamnus cathartica
~Schisandra chinensis
=Prunus padus
~Vaccinium myrtillus
}

Oak bark is standardized by its tannin content. What method is used to determine this group of bioactive substances according to the State Pharmacopoeia of Ukraine? (TC, 2023){

~Titrimetry
~Fluorimetry
=Spectrophotometry
~Biological method
~Gravimetry
}

ALKALOIDS.

Drugs derived from *Rauwolfia serpentina* roots are used in hypertension treatment. Authenticity of *Rauwolfia serpentina* herbal raw material can be confirmed by its content of: (TC, 2019){

~Vinblastine
~Hyoscyamine
~Atropine
=Reserpine
~Adonitoxin
}

Codeine is used as a cough- depressant. What herbal raw material contains this alkaloid? (TC, 2019){

~Herba Macleayae
~Herba Chelidonii
~Herba Vincae minoris
~Folia Theae
=Capita Papaverts
}

Alkaloids are used in medical practice for treatment of various diseases. Based on its chemical composition, the following substance can be classified as a quinolizidine alkaloid: (TC, 2020){

=Pachycarpine hydroiodide
~Scopolamine hydrobromide
~Quinine sulfate
~Caffeine monohydrate
~Codeine phosphate
}

"Novo-Passit" preparation is used as a sedative. It is manufactured from the following herbal raw material: (TC, 2020){

=Passiflora grass
~Acorns calamus rhizomes
~Taraxacum roots
~Viburnum bark

~Populus nigra buds
}

Berberis vulgaris herbal raw material is a source of medicinal substances with cholagogic and hemostatic effect. What parts of this plant are harvested as a herbal raw material? (TC, 2021){

~Leaves and flowers
=Roots and leaves
~Leaves and fruits
~Leaves and seeds
~Roots and fruits
}

Standardization of certain herbal raw material is done by calculating its alkaloid content in terms of hyoscyamine. Name this herbal raw material: (TC, 2021){

~Fructus Capsici
~Radices Berberidis
~Herba Chelidonii
~Herba Thermopsis lanceolatae
=Folia Belladonna
}

Hyoscyamine and scopolamine are typically contained in the plants of the following family: (TC, 2023){

~Papaveraceae
~Asteraceae
~Apocynaceae
~Fabaceae
=Solanaceae
}

ANALYSIS. RESOURCES.

Various admixtures are possible in the process of harvesting, drying, and primary processing of herbal raw material. Organic admixtures include: (TC, 2019){

~Metallic objects
~Sand
~Soil particles
~Glass fragments
=Non-harvested parts of the same plant
}

Herbal raw material **CANNOT** be tasted if it contains: (TC, 2019){

~Bitter glycosides
=Toxins
~Vitamins
~Polysaccharides
~Essential oils
}

Herbal raw material quality depends on the period when it was harvested. Subterranean organs - roots, rhizomes, subterranean tubers - should be harvested: (TC, 2019, 2020){

~Before the bloom

- ~At the end of the bloom
- ~During the period of vegetation
- ~During the bloom
- =In early spring or autumn

}

A certain type of herbal raw material is being collected in spring during the sap flow. Specify this material: (TC, 2020, 2023){

- =Bark
- ~Infructescences
- ~Buds
- ~Flowers
- ~Roots

}

During merchandise analysis a dispensing chemist should reject herbal raw material if it: (TC, 2021){

- ~Contains other non-poisonous plants
- ~Contains excessive moisture
- ~Has first-degree vermin infestation
- ~Contains other parts of the target plant
- =Contains poisonous plants

}

MRM of ANIMAL ORIGIN.

Snake venom-based drugs are widely applied in treatment of locomotor apparatus diseases. Main components of these venoms are: (TC, 2019, 2023){

- ~Polisaccharides
- ~Alkaloids
- ~Phenol alcohols
- ~Cardiac glycosides
- =Toxic proteins

}