Plant sources of cold, diaphoretic, antimicrobial and antiparasitic medicines

Colds are a common name for acute respiratory diseases that occur most often after hypothermia. Anti-coldaction have linden flowers, raspberry fruit, elderberry flowers, etc. Due to intense sweating increases heat transfer evaporation, heat transfer evaporation, reduces body temperature, Increased excretion of metabolic products with sweat, which facilitates the work of the kidneys and liver.

The mechanism of action diaphoretics are not sufficiently studied. Increased sweating contributes to the release of the body from various toxic substances that penetrate from outside or formed in the body during the disease. Diaphoretic effect contributes to the reception of hot liquids. Plants, containing diaphoretic substances can be prescribed in combination with each other in the form of diaphoretic medicinal tea collections.

The advantage of herbal remedies over synthetic drugs is that they are mostly non-toxic, rarely causeside effects and contains a complex of biologically active substances.

Medicinal plants, raw materials of which are used for colds

- **small-leaved linden** - *Tilia cordata*
- **large-leaved linden** - *Tilia platyphyllos*
- **red raspberry** - *Rubus idaeus*
- **elderberry/ black elder** - *Sambucus nigra*

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LINDEN FLORES –*TILIAE FLORES*

small-leaved linden - *Tilia cordata Mill.*

large-leaved linden - *Tilia platyphyllos Scop*.

Family *Tiliaceae*

Tilia cordata is a deciduous tree growing to 20–40 m tall, with a trunk up to 1 m diameter. The bark is smooth and grayish when young, firm with vertical ridges and horizontal fissures when older. The crown is rounded in a formal oval shape to pyramidal. Branching is upright and increases in density with age. The leaves are alternately arranged, rounded to triangular-ovate, 3–8 cm long and broad, mostly hairless (unlike the related *Tilia platyphyllos*) except for small tufts of brown hair in the leaf vein axils – the leaves are distinctively heart-shaped. The buds are alternate, pointed egg shaped and have red scales.

The small yellow-green hermaphrodite flowers are produced in clusters of five to eleven in early summer with a leafy yellow-green subtending bract, have a rich, heavy scent; the trees are much visited by bees to the erect flowers which are held above the bract.

The fruit is a dry nut-like drupe 6–7 mm long by 4 mm broad containing one, or sometimes two, brown seeds (infertile fruits are globose), downy at first becoming smooth at maturity, and (unlike *T. platyphyllos*) not ribbed but very thin and easily cracked open.

Tilia cordata

Tilia platyphyllos is a narrowly domed tree with a moderate growth rate, and can eventually attain a height of 40 metres. The reddish-brown young stems later develop dark grey bark with fine fissures and furrows. The branches spread upwards at wide angles. The twigs are reddish-green and slightly pubescent. The foliage consists of simple, alternately arranged leaves. As indicated by its common name, this tree has larger leaves than the related *Tilia cordata* (small-leaved linden), 6 to 9 cm (exceptionally 15 cm). They are ovate to cordate, mid to dark green above and below, with white downy hair on the underside, particularly along the veins, tapering into a mucronate tip. The margin is sharply serrate, and the base cordate; the venation is pinnate along a midrib. The pubescent petiole is usually 3–4 cm long, but can vary between 1.5–5 cm.

The small, fragrant, yellowish-white flowers are arranged in drooping, cymose clusters in groups of 3 to 4. Their whitish-green, leaf-like bracts have an oblong-obovate shape. The geniculate peduncles are between 1.5–3 cm long. The hermaphroditic flowers have 5 sepals and 5 tepals, numerous stamens, but no staminodes. The superior ovary is 2–10 locular with one smooth style. The flowers are pollinated by bees and some butterflies.

The fruit is a fat, round, tomentose, cream-colored nutlet with a diameter of 1 cm or less. It has a woody shell with 3–5 ridges.

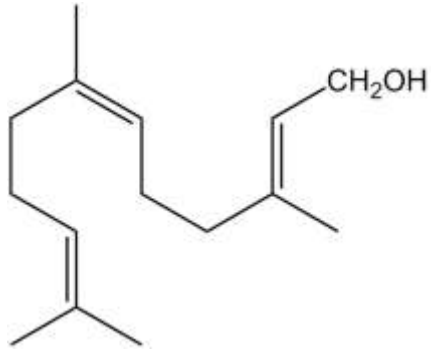
Tilia platyphyllos

Harvesting. It is collected from both wild and cultivated trees during flowering, which lasts about 2 weeks. The collection should be timed to the phase when most of the flowers have blossomed and the other part is in buds. Raw material collected at a later time, when some of the flowers have already bloomed, turns brown when dried, crumbles and becomes unusable.

Drying in the sun should not be done, as the raw material fades; tumble drying should be done carefully, due to the brittleness of the inflorescence axes.

Chemical composition. Both flowers and bracts contain polysaccharides. The amount of water-soluble polysaccharides varies between 7 and 10%; galactose, glucose, rhamnose, arabinose, xylose and galacturonic acid are found as monomers. In addition, there are phenolic compounds (4-5%); glycosides of quercetin derivatives (rutin, hyperoside, quercitrin, etc.) and kaempferol (astragalin, tiliroside, etc.) predominate among them.

An essential oil with a fine odour is present due to the presence of farnesol in it.



farnesol

The bracts contain tannins, which give an astringent flavour to the infusion.

Usage. Linden flowers are used internally in the form of infusion as diaphoretic and expectorant, which also has anti-inflammatory (essential oil, flavonoids), enveloping (polysaccharides), immunostimulating (polysaccharides).

Since ancient times linden blossom in the form of tea (hot infusion) is used as a home diaphoretic, recommended for gargling the throat and mouth in inflammatory diseases, sore throats, bronchitis, catarrh. Linden blossom is included in the diaphoretic collection (tea) in equal amounts with raspberry fruit.

RED RASPBERRY FRUITS - *RUBI IDAEI FRUCTUS*

red raspberry - *Rubus idaeus L.*

Family *Rosaceae*

Plants of *Rubus idaeus* are generally perennials, which bear biennial stems from a perennial root system. In its first year, a new, unbranched stem grows vigorously to its full height of 1.5–2.5 m, bearing large pinnately compound leaves with five or seven leaflets, but usually no flowers. In its second year, a stem does not grow taller, but produces several side shoots, which bear smaller leaves with three or five leaflets.

The flowers are produced in late spring on short racemes on the tips of these side shoots, each flower about 1 cm diameter with five white petals.

The fruit is red, edible, and sweet but tart-flavoured, produced in summer or early autumn; in botanical terminology, it is not a berry at all, but an aggregate fruit of numerous drupelets around a central core.

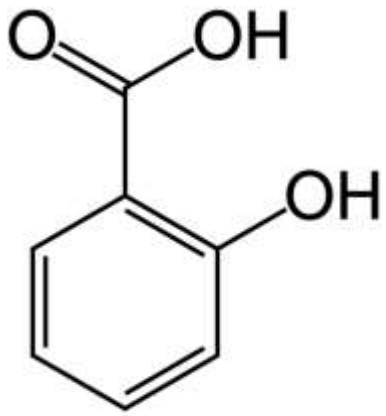
Raspberry has isolated area, the main part of which is located in the forest and forest-steppe zones of the European part of Russia and Western Siberia. Separate parts of the areal are located in the mountain forests of Talysh, Greater and Lesser Caucasus.

It belongs to plants of the forest zone, preferring rich moist soils. It grows along forest edges, in clearings, woodlots, wooded glades, along river banks, ravines, in lightened forests. It is widely cultivated as a food and medicinal plant.

They are harvested only in dry weather, fully mature, without pedicels and peduncles. They are put in small, shallow baskets or enamelled buckets, overlaid with leaves or twigs, and if possible in a short time delivered to the place of drying. Collected fruits are cleaned from leaves, twigs, as well as from unripe, overripe, crumpled and spoilt fruits, which are crumpled and spoilt by careless and untimely collection.

Dry the raw material after pre-drying in dryers at a gradual increase in temperature (30-50-60 ° C), spreading a thin layer on a cloth or paper and carefully turning.

Chemical composition. Fruits contain sugars up to 7.5%, organic acids (malic, citric, salicylic, tartaric, sorbic) up to 2%, pectin substances 0.45-0.73%, ascorbic acid up to 0.45 mg%, vitamins B2, P, E, carotenoids, anthocyanins, flavonoids, catechins, triterpene acids, benzaldehyde, tannins and nitrogenous substances, sterols, mineral salts.



Salicylic acid

Raspberries are characterised by a high content of purines, the amount of which is highest in dried berries.

Usage. Dried raspberry fruit used in the form of infusion as diaphoretic and antipyretic in colds, are part of diaphoretic collections. Raspberry juice has a diuretic and expectorant. Syrup from fresh fruit is used to improve the taste of medicines.

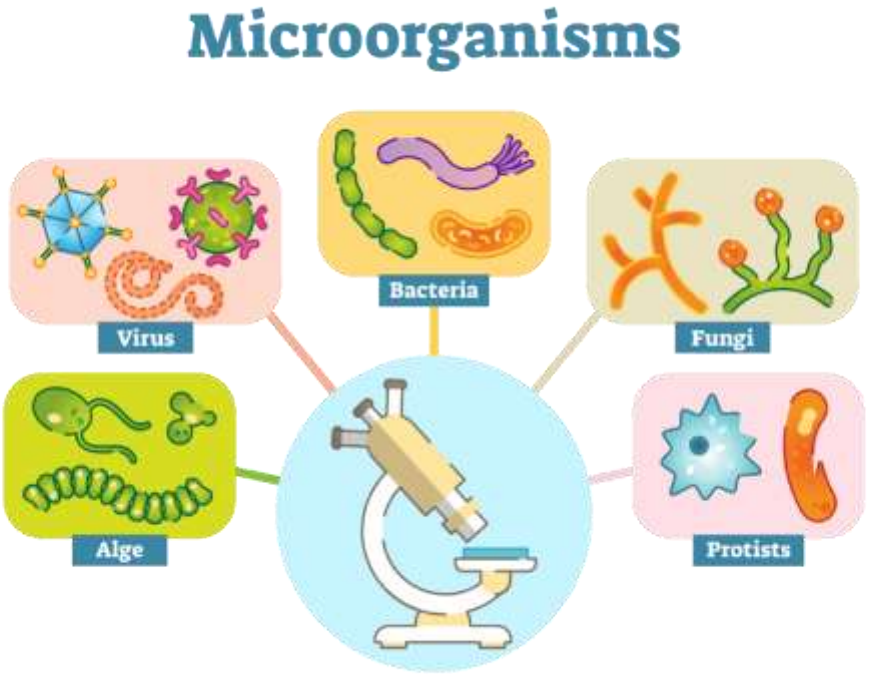
Fresh fruit is recommended for atherosclerosis, hypertension, hypovitaminosis.

In view of the large amount of purines raspberries should not be used by patients with gout and nephritis.

Antimicrobial and antiparasitic medicines

Bacterial infections are a large class of infectious diseases caused by prokaryotic organisms - bacteria.

Bacteria (from Greek bakterion-stick) are microorganisms with prokaryotic type of structure. The size of most bacteria ranges from a few tenths of a micro-metre to 10-13 µm.



Therapy of bacterial infections includes the use of specific drugs with bacteriostatic and bactericidal action of natural (antibiotics) or synthetic origin. Most medicinal plants with antibacterial activity belong to essential oil plants (sage, eucalyptus, chamomile). These plants are used for bacterial infection of various localisations. In addition to essential oils, tannins have pronounced antimicrobial properties.

There are medicinal plants used for microbial diseases of certain organ systems. Thus, in diseases of the digestive system are used plants that in addition to the antimicrobial effect also have an astringent effect (St John's wort herb, tormentil herb, oak bark, etc.), and in diseases of the kidneys and urinary tract - plants with antibacterial and diuretic effect (cowberry, bearberry, juniper).

Anthelmintics

SAGE LEAVES - FOLIA SALVIAE
Common Sage - Salvia officinalis L.
Family Lamiaceae

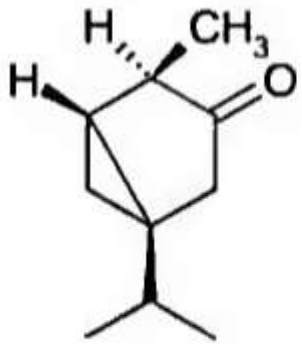
Sage, is a perennial, evergreen subshrub, with woody stems, grayish leaves, and blue to purplish flowers. It is a member of the mint family Lamiaceae and native to the Mediterranean region, though it has been naturalized in many places throughout the world. It has a long history of medicinal and culinary use, and in modern times it has been used as an ornamental garden plant. The common name "sage" is also used for closely related species and cultivars.

Cultivars are quite variable in size, leaf and flower color, and foliage pattern, with many variegated leaf types. The Old World type grows to approximately 60 cm tall and wide, with lavender flowers most common, though they can also be white, pink, or purple. The plant flowers in late spring or summer. The leaves are oblong, ranging in size up to 65 mm long by 25 mm wide. Leaves are grey-green, rugose on the upper side, and nearly white underneath due to the many short soft hairs. Modern cultivars include leaves with purple, rose, cream, and yellow in many variegated combinations

Area of distribution. Native in the Mediterranean region, especially in the Adriatic; cultivated to some extent in various European countries. Imports of the drug come from Albania and former Yugoslavia.

Description. The petiolate 3–10 cm long and up to 3 cm wide, oval, oblong-ovate, to lanceolate leaves are densely pubescent on both surfaces; they have a distinctly crenulate margin and deeply depressed venation, which is very prominent on the lower surface, and a lamina, which is rounded and sometimes singly or doubly auriculate at the base. The odour is intensely spicy and aromatic; the taste is spicy, bitter, and astringent.

Constituents. The characteristic components of sage, to which its traditional uses can be attributed, are the volatile oil and tannins. It contains 1–2.8% of volatile oil (α- and β-thujones, 1,8-cineole, borneol, camphor, caryophyllene, linalyl acetate and various terpenes). Others include phenolic — caffeic, chlorogenic, ellagic, ferulic, gallic and rosmarinic acids; flavonoids; diterpenes, including carnosic acid and derivatives; triterpenes: oleanolic acid and derivatives and hydrolysable and condensed tannins 3–8%.



alpha-Thujone
((-)-thujone)

1,8-Cineole

Uses. Leaves are used in the form of infusion as an anti-inflammatory, astringent for gargling the mouth, pharynx, larynx in catarrh of the upper respiratory tract and stomatitis. Leaves are included in chest medicinal tea collections. Cineole essential oil has a bactericidal effect, with which the phytoncidal properties of the plant are associated.

Fresh sage leaf has a strong bactericidal effect. The antiseptic properties of sage leaves are due to the plant antibiotic salvin. From the leaves of sage leaves are obtained total preparation ‘Salvin’, which has antimicrobial and astringent action.

The property of the leaves of the plant to inhibit sweating has long been known. Sage is not recommended to take in case of kidney inflammation and severe cough.

EUCALIPTUS LEAVES - EUCALYPTI FOLIA
Eucalyptus globulus Labill.
Eucalyptus cinerea F. Muell ex Benth.

EUCALYPTI VIMINALIS FOLIA
Eucalyptus viminalis Labill.

Family Myrtaceae

Eucalyptus is a genus of over seven hundred species of flowering trees, shrubs or mallees in the myrtle family, Myrtaceae. Along with several other genera in the tribe Eucalypteae, including *Corymbia*, they are commonly known as eucalypts. Plants in the genus *Eucalyptus* have bark that is either smooth, fibrous, hard or stringy, leaves with oil glands, and sepals and petals that are fused to form a "cap" or operculum over the stamens. The fruit is a woody capsule commonly referred to as a "gumnut".

Most species of *Eucalyptus* are native to Australia, and every state and territory has representative species. About three-quarters of Australian forests are eucalypt forests. Wildfire is a feature of the Australian landscape and many eucalypt species are adapted to fire, and resprout after fire or have seeds which survive fire.

A few species are native to islands north of Australia and a smaller number are only found outside the continent.

Plant. A large tree with a smooth bark, very pale or ash-grey, up to 3–20 m high. Branchlets are quadrangular, glaucous. Leaves of young trees and first leaves of young shoots are opposite, sessile, oval-oblong, with a cordate base, farinaceous-glaucous; older leaves are dangling, spirally arranged, lanceolate-falcate, up to 30 cm long. Flowers are with very short pedicels, mostly umbellate, sometimes 2–3 in a fascicle. The calyx tube is double: outer tube drops early, smooth; inner tube is semipersistent and warty. Stamens are about 1.5 cm long. The fruit is turbinate, angular, 2.0–2.5 cm in diameter.

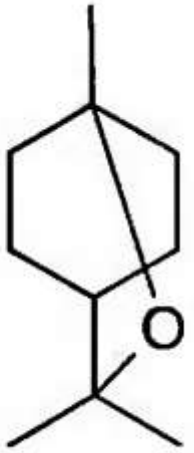
Area of distribution. Indigenous to Australia, cultivated in subtropical regions of the world, including Africa, South America (e.g. Argentina, Brazil and Paraguay), Asia (e.g. China, India and Indonesia), southern Europe and the United States of America.

Harvesting. Leaves formed in the current growing season can be harvested no earlier than November, when the content of cineole in the essential oil will not be less than 60%, and wintering leaves can be harvested at any time of the year, but the best raw materials are obtained in autumn. The leaves of each species of Eucalyptus are harvested separately.

Drying. In the open air or in rooms with good ventilation, spreading a layer up to 10 cm thick and periodically stirring. Heat drying at temperatures not exceeding 40 ºC is possible.

Description. The leaf is lanceolate-falcate, bifacial, 8–30 cm long, 2–7 cm wide; the petiole is twisted, strongly wrinkled, 2–3 cm, occasionally 5 cm, in length; apex, when present, is acute or acuminate; base is unequal, obtuse or somewhat rounded, margin is uneven, revolute; ventral and dorsal surfaces are greyish-green to pale yellowish-green, coriaceous, glaucous, glabrous, glandular-punctate, with numerous small, rounded, brown dots of cork; venation is pinnate-reticulate, veins of the first order are running to a short distance from margin where they are anastomosed and form a vein nearly parallel with the margin.

Constituents. Dried leaves contain 1–3% (v/w) essential oil (fresh leaves contain 0.4–1.6%), the major constituent of which is 1,8-cineole (54–95%). In addition, there are moderate amounts of other monoterpenes, including β-pinene (2.6%), *p*-cymene (2.7%), aromadendrene, cuminaldehyde, globulol and pinocarveol. Gas chromatography and gas chromatography-mass spectroscopy of the oil indicated the presence of more than 70 components, 48 of which were identified. The concentration of α-terpineol was estimated to be 28%. The leaves are rich in tannins and ellagitannins, and also contain 2–4% triterpenes (ursolic acid derivatives), a series of phloroglucinol-sesquiterpene-coupled derivatives (macrocarpals B, C, D, E, H, I and J) and flavonoids (rutin, quercetin, quercitrin and hyperoside).



1,8-Cineole (eucalyptol)

Uses. As an expectorant for symptomatic treatment of mild inflammation of the respiratory tract and bronchitis. Also for symptomatic treatment of asthma, fever and inflammation of the throat. Treatment of cystitis, diabetes, gastritis, kidney disease (unspecified), laryngitis, leukorrhoea, malaria, pimples, ringworm, wounds, ulcers of the skin, urethritis and vaginitis. Drugs are Volatile oil — bactericidal; infusion, tincture, Ephcamon, Gevcamen, Alorom, Cameton, Ingalipt, Pektussin, tea Elecosol — bactericidal, anti-inflammatory, astringent; Chlorophyllipt — antistaphylococcal.

Anthelmintics medicines

Anthelmintics used against intestinal helminths are divided into two groups:

1) substances acting on roundworms, which include ascarids, pinworms, vlasoglev, ankylostomas, etc.;
2) substances acting on flat worms, which include broad lenticles, bovine, porcine and dwarf chains.

The mechanism of action of most anthelmintics of plant origin is that they cause either intense contraction or paralysis of the musculature of the parasite, depriving it of the ability to retain in the intestine. With sufficient intensity of action of the drug can lead to the death of helminths.

Many anthelmintics have great biological activity and when absorbed into the bloodstream have a harmful effect on the human body.

PUMPKIN SEEDS – CUCURBITAE SEMINA

Pumpkin – Cucurbita pepo

Family Cucurbitaceae

Cucurbita pepo is an annual, monoecious climber native to Mexico and cultivated worldwide for its edible fruits. The stems are fleshy, stout, setose and develop series of multifid tendrils. The leaves are simple. The petiole is stout, fleshy, setose and up to 10 cm long. The blade is triangular, 20–30 cm across, irregularly five-lobed, setose, cordate at base, dentate at base and acute at apex.

The flowers are massive and solitary on a 2–20-cm-long, setose pedicel. The corolla is orangish, membranaceous, infundibuliform and five-lobed and can grow up to 10 cm long. In male flowers the calyx is campanulate and develops five linear segments which are 1–2.5 cm long. The androecium includes three stamens with 1.5-cm-long filaments. Female flowers present a reduced calyx and an ovary which is ovoid and unilocular.

The fruiting pedicel is robust and pentagonal. The fruit is a berry which has a multitude of shapes and colors according to the varieties. The seeds are ovoid, flattened, 1–1.5 cm × 0.5–1 cm, white and smooth.


3.
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(Cucurbita pepo)

Pumpkins are native to North and South America. In our country, pumpkin is widely cultivated as a fodder and food plant and a source of carotene. In Russia, there are three types of pumpkin, represented by many varieties: Cucurbita pepo, Cucurbita maxima, Cucurbita moschata.

The ripe, removed from the pericarp pulp and dried seeds of the Cucurbita pepo, Cucurbita maxima, Cucurbita moschata are used as a medicinal agent.

Seeds are harvested from mature fruits. The fruit is cut by hand, seeds are cleaned from the pericarp pulp, discarding the empty ones. Contamination of seeds with soil is inadmissible. In case of contamination, seeds are thoroughly washed in cold water.

Dry in the open air under a canopy or in attics with good ventilation or under sheds, spreading them in a thin layer (2 cm) on paper or cloth, stirring occasionally. Pumpkin seeds usually dry out in 5 - 7 days. The end of drying is determined by the bulkiness of the seeds and their brittleness when bent. Drying in ovens and on ovens is not allowed.

Chemical composition. Pumpkin seeds contain up to 50% of fatty oil, which includes triglycerides of linoleic, oleic, palmitic, stearic acids.

The main pharmacologically active substance that determines the antihelminthic effect of pumpkin seeds is an amino acid cucurbitin, the content of which in the seeds reaches 0.1 - 0.3% depending on the variety of pumpkin.

The seeds contain vitamins B2, B12, E (α-tocopherol), ascorbic acid, phytosterols (cucurbitol), organic acids. Pumpkin fruits contain carotenoids (α - carotene), vitamins B2, B12, C, E (□-tocopherol), pantothenic and folic acids, pectins, sugars (up to11%).

Pumpkin seeds are an antihelminthic (anthelmintic) remedy. Pumpkin fruit pulp has choleretic, diuretic and loosening properties.

Uses. Peeled pumpkin seeds are used as an antihelminthic remedy, most often against tapeworms. Pumpkin remains one of the best remedies for the treatment of worm diseases in children: it is non-toxic and poses no danger.

From the seeds, a fatty oil is obtained, which under the name '**Tycveolum**' is allowed for medical use as a choleretic, anti-inflammatory agent.

The pulp and juice of pumpkin fruit improve intestinal function in constipation, increase chloride excretion from the body, increases diuresis without irritating the renal tissue.

The pulp of the fruit is used in kidney and liver diseases, gout.