

Medicinal properties of citrus fruits
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This article continues a series of publications devoted to the medicinal properties and contraindications for the use of the most commonly used food plants in everyday life.

In it, we cite excerpts from our monograph "The medicinal properties of food plants" (Moscow: Publishing house of FNEC TMDL Roszdrav, 2008. - 533 p.) - brief information about citrus fruits, which are often used for dessert and afternoon tea in any home.

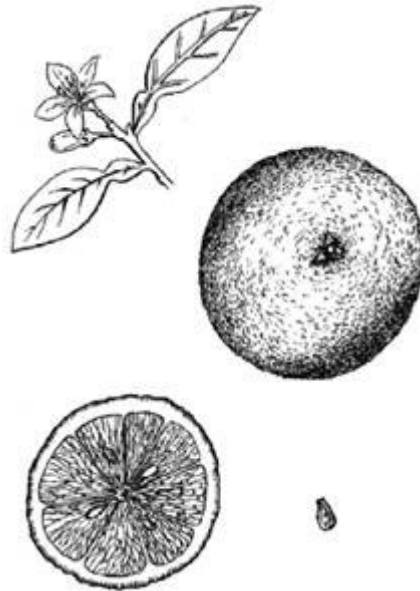
Many types of citrus fruits, previously unknown in Russia, have appeared on store shelves. Their correct application can provide real help in the treatment of patients with various diseases. The most widespread in Russia are Chinese orange, lemon, grapefruit and tangerine. These fruits have been imported to Russia for a long time, and tangerines and lemons have been widely and for a long time cultivated in Western Georgia.

Not so long ago, lime fruits appeared on the domestic market - *C. limetta* Risso (*C. aurantifolia* (L.) Swingle), as well as pomelo (pompelmus) - *C. maxima* (Berm.) Merr and sweets - a hybrid of pomelo and white grapefruit. This group also includes the fruits of the most famous representative of the closely related citrus genus *Fortunella* - kumquat (*Fortunella margarita* (Lour.) Swingle).

ORANGE CHINESE (A. SWEET)

Citrus sinensis (L.) Osbek

Fresh and processed fruits, peel and peel of orange fruits are used as a food product and medicinal raw material (Fig. 1) (raw materials are unofficially in the Russian Federation). The chemical composition of the orange fruit varies considerably depending on the variety, growing region, climatic conditions during cultivation and the degree of ripeness.



Rice. 1. Chinese orange (A. SWEET). *Citrus sinensis* (L.) Osbek.

The pulp of oranges, constituting about 70% of the weight of the fruit, contains carbohydrates (up to 5.5–8.0% sugars; 1.0–1.4% fiber; up to 12.4% pectin substances); proteins (0.9–1.1%); organic acids (0.2–2.2%), mainly citric; vitamins: C (from 29 to 70 mg%, on average 50 mg%), carotene (up to 0.25 mg%), B1 (0.03–0.04 mg%), B2, PP; flavonoids: hesperidin, eriodictiol; minerals, including significant amounts of potassium, magnesium and iron; selenium, etc. The peel of the fruit contains an essential oil, which contains about 90% limonene; vitamins (C, group B, PP, P, carotene); flavonoids and many other compounds [3; 5; 6; fourteen; 19].

Oranges are among the most famous and popular citrus plants in the world. The pulp of ripe fruits is eaten fresh as a dessert or a component of various salads. Most of the harvest is processed into juices, non-alcoholic and alcoholic drinks, jams, preserves, etc.

A freshly picked medium-sized fruit covers the daily requirement of an adult for ascorbic acid; this is one of the most readily available sources of it. Therefore, fruits and orange juice are widely used for the prevention of vitamin deficiencies and for their treatment, for the prevention of colds. Orange juice quenches thirst well in case of fever. Oranges and fruit juice contain a large amount of pectin (in this indicator they are superior to all fruits) and fiber. These compounds are combined with organic acids and essential oil of fruits stimulate appetite, stimulate motility and secretion of the organs of the gastrointestinal tract, inhibit the development of putrefactive processes in the intestine and reduce the absorption of substances harmful to the body, promote bowel movement. Fruits and orange juice are recommended for reduced

acidity of gastric juice (hypacid gastritis), colitis, decreased bile secretion and a tendency to chronic constipation.

Due to the high P-vitamin activity, the use of fruits in food prevents the development of atherosclerosis, improves the state of blood vessels with varicose veins.

It has been established that orange fruits normalize fat metabolism, and the absence of purine substances in oranges with a high content of vitamins and potassium makes them useful in case of imbalance in water-salt balance.

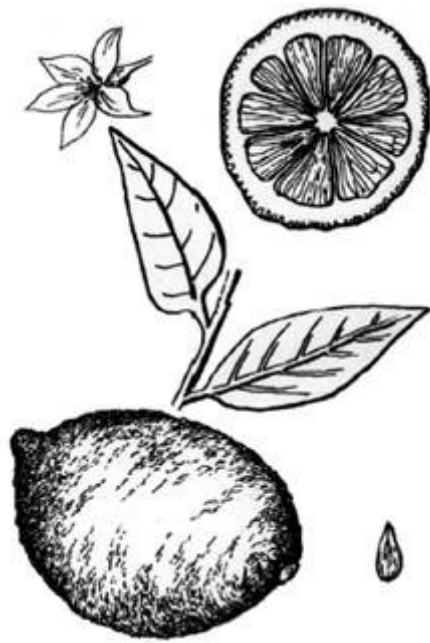
Oranges are rich in potassium. Their use in sufficient quantities helps to prevent edema, remove excess fluid from tissues (especially in cardiovascular diseases, accompanied by deficiency of this element) and, accordingly, a decrease in the load on the heart muscle.

Outwardly, juice, which has antimicrobial effect (phytoncides), is used in the treatment of wounds and ulcers [3; 5; 6; 13; 16; eighteen; 19]. However, there are a number of contraindications for using orange fruits and juice for food: exacerbation of gastric ulcer and Duodenal ulcer, chronic enterocolitis, pancreatitis, gastritis with increased secretory activity. Quite often, eating oranges purchased from a commercial network causes an allergic reaction, manifested primarily in the form of hives. In this case, it is necessary to give up the use of these fruits. Interestingly, in the same patients, but consuming the fruits immediately after they were removed from the tree, often an allergic reaction does not occur. Essential oils contained in the peel, getting on the skin (for example, when peeling fruits), can also cause allergic reactions [5; nine; 12; 16; 17; eighteen; 19].

LEMON

Citrus limon (L.) Burm. fil.

Fresh and processed fruits, peels and fresh and processed peel of lemon fruits are used as food products and medicinal raw materials (Fig. 2) (raw materials are unofficially in the Russian Federation). The chemical composition of lemon fruits varies greatly depending on the variety, growing region, climatic conditions during cultivation and the degree of ripeness.



Rice. 2. Lemon. *Citrus limon* (L.) Burm. fil.

Lemon pulp contains carbohydrates (2.0–2.6% of sugars, pectin (0.5%), fiber (0.8%)); organic acids (3.4–8.3%), mainly citric; vitamins (up to 80 mg% ascorbic acid, B1, B2, B6, P, PP, beta-carotene); proteins (0.6-0.9%) and free amino acids; fats (0.5-0.6%); essential oil; phytoncides of various chemical nature; minerals: a lot of potassium (163 mg%), calcium, magnesium; sodium, copper, phosphorus, iron, etc. Bthe peel contains an essential oil (up to 2%), the main component of which is limonene, citral (its presence is caused by a specific "lemon" smell) and other terpenoids; flavonoids (0.3%); furocoumarins; carbohydrates (8.1%): incl. up to 5.9% sugars, 0.9% pectin substances and 1.3% fiber; organic acids (0.3%); vitamins: C (up to 140 mg%), B1, PP, carotene and other compounds [4; 5; 6; eight; ten; fourteen; twenty]

Lemon juice and pulp are widely used in nutrition. In addition, juice rich in organic acids can be used for preserving various products. The peel (zest) serves as a fragrant seasoning for bakery and confectionery products. Fruit jelly, candied fruits are made from fruits. The high quantitative content and a wide range of biologically active substances in lemon fruits make it a unique therapeutic and prophylactic agent [5; 6; 7; nine; ten; 13; 16; eighteen; twenty]. Antipyretic, antimicrobial and diureticthe properties of FRUITS are widely used in the symptomatic treatment of manydiseases accompanied by high fever and intoxication.

Juice quenches thirst well and serves as a source of vitamins. It is prescribed for the prevention and treatment of vitamin deficiencies, with anemia, as a tonic for asthenia, insomnia and increased nervous excitability. In the pulp, juice and peel of fruits, substances with P-vitamin activity are present in combination with ascorbic acid, which makes it possible to recommend lemons and

products of their processing as capillary strengthening agents. With their regular use, some hypotensive effect is observed with high blood pressure and the activity of the cardiovascularthe vascular system as a whole. For optimal effect lemonsit is better to eat with the peel (if the fruits were not treated with chemicals during storage) or at least with the zest, which contains more P-active substances than the pulp of the fruit.

Among all citrus fruits, lemons have the highest organic acid content. Therefore, the use of fruits, juice, fruit peels, cooked with sugar, increases appetite, renderssokogonnoe, antimicrobial action, beneficial effect on secretion and motilitygastrointestinal tract. It is useful for hypoacid gastritis, constipation and flatulence.

Expressed choleric action defines expediency the use of lemon juice for diseases of the biliary tract without exacerbation.

In the modern so-called healing practice, or folkmedicine, there are techniques for expelling sand and stones from the liver and gallbladder based on the use of lemon juice and olive oil. It is not recommended to get carried away with them for many reasons, including to avoid the development of hepatic and renal colic and obstruction (blockage) of the bile and urinary tract with the need for surgical treatment. Cases of the development of acute intestinal obstruction when large gallstones enter the lumen of the small intestine after the so-called "cleaning course" are described.

Lemon relieves nausea well and prevents vomiting. In the absence of individual intolerance, it is used for nausea in pregnant women. However, there is always a risk of allergic reactions to citrus fruits in children whose mothers ate lemons, limes, oranges and, especially, tangerines during pregnancy. For diseases accompanied by metabolic disorders: urolithiasis, gout, arthritis and others, use lemon juice or fruits, crushed together with the zest, sometimes mixed with honey.

Diluted juice gargle with sore throats, pharyngitis, oral cavity with inflammatory diseases of the gums, fungal stomatitis.

Lemon juice is used to moisten the affected skin to relieve itching, including insect bites. The juice is included in creams, ointments and lotions for facial skin care.

ESSENTIAL OIL obtained from lemon peel has a pronounced antiviral activity, therefore in traditional medicine it is used for the prevention and in the complex treatment of acute respiratory diseases, viral hepatitis and herpes infection.

Lemon oil helps dissolve some types of gallstones and renal pelvis.

Lemon essential oil is used in aromatherapy. Lemon aroma improves mood and tones, relieves headache caused by spasm

vessels of the brain. Lemon and products based on it are mostly non-toxic. However, in patients with a hyperacid form of gastritis, peptic ulcer of the stomach and duodenal ulcer, fruits and juice from them cause heartburn and severe pain. This is due to the fact that lemon increases secretion of gastric juice. Such patients can eat no more than 1-2 slices of lemon with tea and only after meals.

Due to the fact that natural citric acid is found only in the form of sodium salt, excessive consumption of lemon can lead to alkalization of urine [1; 7; 12; 17].

GRAPEFRUIT

Citrus paradisi Macf.

Fresh and processed grapefruit is used as a food product and medicinal raw material (Fig. 3) (raw material is unofficial in the Russian Federation).



Rice. 3. Grapefruit. *Citrus paradisi* Macf.

The fruits of grapefruit contain carbohydrates (7.3-9.8%) (sugars, pectin substances); proteins (0.6-0.7%); fats (0.15-0.2%); organic acids (1.3-2.5%); vitamins (up to 60 mg% ascorbic acid, carotenoids (including lycopene), B1, B2, B3, P); compounds of a polyphenolic nature: flavonoids (naringin glycoside - mainly in the films of juice sacs, determines the bitter taste of the fruit, etc.), anthocyanins and minerals.

The essential oil contains limonene, pinene, citral, geraniol, etc. In the seeds

there are essential oil, fatty oil, substances with phytoncidal activity [2; 5; 6; 16].

The juicy, aromatic pulp of grapefruit is eaten both fresh and in the form of juices, marmalade, jelly, and preserves. The pink and red color of the FRUIT pulp is due to the presence of the carotenoid lycopene and anthocyanins. The higher the mass fraction of lycopene, the more intense the color of the pulp. Therefore, fruits with intensely pink and red flesh are more useful, their antioxidant and the antihypoxant activity is higher, and the radioprotective effect is stronger.

The high content of P-active substances (anthocyanins, glycosides of a flavonoid nature - especially in red-fruited varieties) in combination with ascorbic acid and carotenoids, as well as the low calorie content of the fruits, allow them to be used in dietary nutrition for various diseases heart, hypertension, atherosclerosis, tendency to disorders metabolic processes and for the prevention of such violations.

Thanks to the set of pectin substances, it is grapefruits that are actively used in special pectin diets for weight loss, which do not involve rejection of food and great self-restraint. Clinical trials have shown that fruit juice enhances the action of insulin on sugard diabetes. Grapefruit juice has a choleric and moderate diuretic effect, helps relieve spasm and normalize biliary motility ducts, intestines. Directions for using freshly squeezed grapefruit juice along with olive oil to clear kidney, gallbladder, and intestinal stones can be found in almost all popular health guides. However, you should be very careful with this kind of advice.

Grapefruit and grapefruit juice support recovery normal muscle tone after physical exertion, improve the overall including psychological, state, appetite.

ESSENTIAL GRAPEFRUIT OIL, obtained from the peel by cold pressing, has a fresh scent reminiscent of lemon. When taken internally (2-3 drops per glass of fruit or vegetable juice), the functional state of the liver and gallbladder improves. Inhaling the aroma of grapefruit essential oil has a tonic effect on the body and improves mood. According to modern experimental data, the extract from SEEDS of grapefruit has a wide range of antiparasitic and antimicrobial activity. It acts on pathogens of amoebic dysentery and malaria, lamblia, chlamydia; inhibits the growth of staphylococci, streptococci, Klebsiella, Shigella, Proteus, Mycobacterium tuberculosis [2; 5; 6; nine; 13; 16; 17; eighteen].

Due to the high content of organic acids, it is undesirable to consume a large amount of fruits and juice for gastritis with increased acidity of gastric juice, gastric ulcer and 12 duodenal ulcer. Many medications cannot be taken with grapefruit juice, since it inhibits a number of isoenzymes of microsomal oxidation. This can lead to

artificial overdose of many drugs [1; 5; 17].

MANDARIN

Citrus unshiu (Swingle) Marc. (C. *deliciosa* Ten .; C. *reticulata* Blanco)

Fresh and processed fruits and peels of mandarin fruits are used as food products and medicinal raw materials (Fig. 4) (raw materials are unofficial in the Russian Federation).



Rice. 4. Mandarin. Citrus unshiu (Swingle) Marc. (C. *deliciosa* Ten .; C. *reticulata* Blanco).

The fruit pulp contains carbohydrates (8.2–12.1%) (up to 10% sugars, pectin substances, fiber (0.6%)); proteins (0.6–0.8%); fats (0.4%); organic acids (0.6–2.0%): mainly citric; vitamins: C (28–38 mg%), B1, B2, B3, PP (0.2 mg%), carotene; flavonoids; --sitosterol; minerals: salts of potassium, calcium, phosphorus, magnesium, iron, etc. The peel of the fruit contains up to 2.5% of essential oil, the peculiar taste and smell of which is given by the methyl ester of anthranilic acid [5; 6; 16].

Juicy, with a sour-sweet aromatic pulp, tangerines are eaten both fresh and processed. A wide variety of biologically active substances in mandarin fruits with its low calorie content makes it irreplaceable in dietary nutrition.

Fresh mandarins and fruit juice as a tonic and product that improves appetite and digestion are included in dietary diets in children's sanatoriums and other medical institutions, in obesity diets.

The range of application of these fruits and products of their processing is very wide [2;

6; nine; 16; 17; eighteen]. Tangerine juice and fruits contain easily digestible organic iron, so they are successfully used for iron deficiency anemia.

Due to the phytoncidal properties of the components of tangerine essential oil and organic acids contained in the pulp, fruits and juice provide antimicrobial action, suppress the pathogenic flora in the intestine and thus contribute to the normalization of digestion.

Pectin substances and a small amount of fiber in the fruit also help to optimize the intestinal microflora and do not cause flatulence. Such a successful combination of properties allows tangerines to be used in nutrition. elderly and weakened people, as well as people prone to chronic constipation, accompanied by the processes of decay and fermentation. At the same time, the fruits contribute to the weakening of the motility of the gastrointestinal tract in colitis and enterocolitis with diarrhea.

According to experimental data, the content of polyphenolic substances in tangerine juice is higher than in orange and grapefruit. Therefore, tangerine juice is recommended to be included in the diet for cardiovascular diseases. vascular system and for the prevention of atherosclerosis.

The high potassium content in mandarin fruits has a beneficial effect on the work of the heart, prevents the accumulation of excess fluid in the bloodstream.

Due to the high content of alkaline compounds, tangerines are also useful for various acidosis. They are included in the menu when uric acid, calcium oxalate and cystine urolithiasis with precipitation of salts in acidic urine. As an anti-inflammatory and mild diuretic, tangerines are useful for cystitis and pyelonephritis, since they do not irritate the epithelium of the kidney and urinary tract tubules.

Mandarin fruits differ from the fruits of other citrus fruits in the highest content of carbohydrates, including easily digestible sugars. This leads to their use as a dietary remedy for diseases. liver, as well as endogenous and exogenous intoxications.

It was found that tangerine juice has a fungicidal effect on the causative agents of trichophytosis and microsporia. The juice is repeatedly rubbed into the affected skin. An expectorant is known from the experience of traditional medicine, emollient, anti-inflammatory effect of water extracts from Tangerine peels, based mainly on the action of essential oil. Infusions and decoctions of the peel are effective in treating bronchial diseases.

Mandarins are not used in the diet for urolithiasis with the formation of phosphate stones in alkaline urine, as well as with individual intolerance [5; 17].

LANDSCAPE (POMPELMUS)

C. maxima (Berm.)

Merr. (*C. grandis* Osbeck)

The pomelo fruit is the largest of all citrus fruits (Fig. 5). Their diameter can reach 25 cm, and their average weight is about 1 kg (sometimes up to 6 kg). Fruit

rich in vitamins: C, - carotene, P-active substances and essential oil. As a rule, pomelos are eaten fresh, for which they are divided into slices and the dense skin is removed from the juice bags. The taste of the pulp is sweet-sour, reminiscent of grapefruit, but somewhat sweeter and practically without bitterness. Candied fruits, marmalade, and preserves are made from the thick peel of the pomelo.



Rice. 5. Pomelo (pompelmus)*C. maxima* (Berm.) Merr. (*C. grandis* Osbeck)

The fruits and juice are traditionally used in Chinese and Malaysian medicine. They are considered useful for the prevention of colds, used in the complex therapy of diseases of the digestive, cardiovascular, nervous and urinary systems. Due to the high content of lipolytic (fat-breaking) enzyme in the pulp, pomelo is a component of some weight loss diets. [6; nine; eleven; eighteen]

In some countries, the name "pomelo" is also a hybrid of pompelmus and grapefruit (the size of the fruit is only slightly larger than the grapefruit, the peel is quite thick, the pulp is dense, juicy, but drier than that of the latter).

LIME

C. limetta Risso

(*C. aurantifolia* (L.) Swingle)

Compared to lemons, limes have a subtle, refined, specific aroma and can serve as an alternative to lemon. Lime juice is mainly used to add a sour taste and refreshing aroma to a variety of foods and drinks. Lime is distinguished by a lower mass fraction of vitamin C (up to 40 mg%) and a lower carbohydrate content (up to 1.9%). In the traditional medicine of the countries supplying these citrus fruits to the international market, lime juice is used for headaches, coughs, rheumatism, arthritis,

palpitations, hemorrhoids. Regularly eating lime is believed to be improves mood and general well-being, accelerates recovery after infectious diseases [5; 6; 7; nine; 10, 13; 16; eighteen; twenty].

KUMQUAT

Fortunella margarita (Lour.) Swingle

Kumquat is the smallest citrus fruit. Its fruits are similar to miniature oranges 2.5-4.0 cm in length and 2-3 cm in diameter. They are eaten fresh together with edible peel. Fruits contain 14-17% carbohydrates, 0.7-1.0% protein, 0.3-0.4% fat, rich in vitamins C, group B (B1 - up to 0.09 mg%, B2 - 0.08 mg %), A and microelements. The pulp contains furocoumarin, which has antifungal activity. Since ancient times, the fruits of kumquat have been used in folk medicine in the countries of the East. The essential oil from the peel has an antimicrobial effect, therefore, in case of infectious diseases of the upper respiratory tract, it is recommended to inhale the aroma of the fruit peel. In traditional Vietnamese medicine, several fruits are eaten to relieve hangover syndrome [6; nine; 16; 17].

Currently on the Russian market you can find fruits of other citrus plants and interspecific hybrids, but they are still little known to the population. One of the most common is "sweetie" - a hybrid of pomelo and white grapefruit. He was born quite recently, in 1984, thanks to the efforts of Israeli scientists to make grapefruit sweeter. And although they succeeded quite well, sweetie has not yet become a popular citrus fruit - perhaps because it, like the pomelo, has too much "waste". Sweets have the same calorie and vitamin C content as grapefruit. The sweet taste of this citrus fruit is due to its low acid content and high sucrose. Ideal for dietetic food [15].

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