

## Medicinal properties of tropical fruits

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### SUMMARY

The information and analytical study of scientific and popular science publications carried out by the authors made it possible to reveal the reliable chemical composition and pharmacological action of fresh fruits of some types of food tropical plants used in traditional and modern medical practice in different countries of the world.

The article provides scientifically substantiated information on indications and contraindications for the use of the following plants for food and medicinal purposes: American avocado (*Persea americana* Mill.); pineapple (*Ananas comosus* (Stikm.) Merr.); Kiwi (*Actinidia Chinese*) (*Actinidia chinensis* Planch. (*A. deliciosa*)); Indian mango (mango tree) (*Mangifera indica* L.); feijoa (*Feijoa sellowiana* Berg. (*Acca sellowiana* (Berg.) Burret)); Eastern persimmon (*Diospyros kaki* Thunb.)

In previous publications (Traditional medicine No. 1, 2, 2008), materials were presented on the therapeutic use of apricot fruits and some representatives of citrus fruits, which are most widely used in our country. This article focuses on tropical fruits. Some of these fruits have recently appeared on Russian shelves, therefore, information on the possibility of their use in dietary and medical nutrition is rather limited. Others were grown for a long time on the territory of Russia or the republics of the former USSR, but reached the consumer of the middle zone of the European part of Russia only in processed form. Currently, they can be seen and purchased fresh.

In this article, we provide brief information about those tropical fruits that have become often used for dessert in any home. The correct use of these fruits in nutrition can be of real help in the treatment of patients with various diseases.

### AVOCADO AMERICAN

*Persea americana* Mill.

Fresh and processed avocado fruits, dried fruit peels and leaves are used as food products and medicinal raw materials (Fig. 1) (raw materials are unofficially in the Russian Federation). More detailed information about each of the objects is presented in our monograph "The healing properties of food plants" (Moscow: Izdvo FNEC TMDL Roszdrav, 2008. 533 p.)

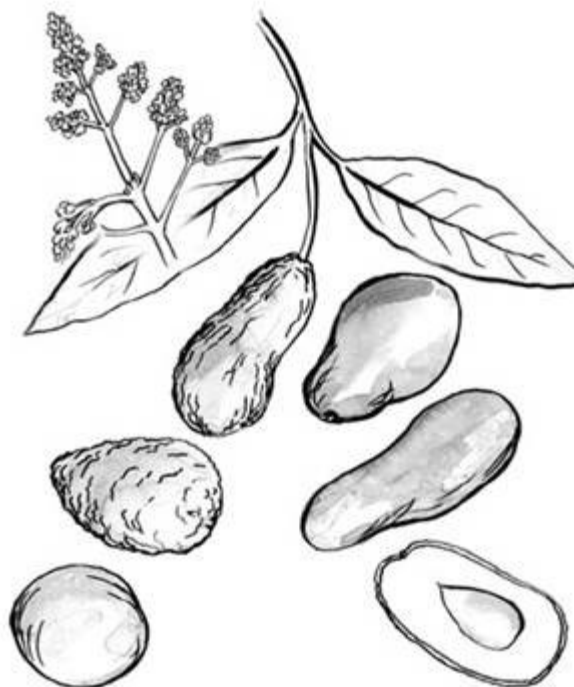
Avocado fruits contain [16; twenty]:

- from 2 to 30% fat (depending on the variety);
- 1.3-2.6% proteins;
- sugar (0.5-1.0%): glucose, fructose, sucrose;
- organic acids (0.2-0.4%): malic, citric, etc. ;
- vitamins: B1, B2, B6, PP, pantothenic acid, C,  $\beta$ -carotene, E, K1;
- minerals: salts of calcium, iron, phosphorus, etc.

The pulp of the avocado fruit, which makes up 85% of its mass, has the appearance of a delicate, oily white-yellow mass, is practically odorless and tastes like a walnut. Salads, side dishes, hot dishes, desserts, sauces are prepared from the pulp of the fruit; it is also used as butter for sandwiches.

The main feature of the avocado, which distinguishes it from other fresh juicy fruits, is the high mass fraction of lipids. Avocado vegetable fats, unlike animal lipids, are easier to digest and contain no cholesterol. In terms of digestibility, they are not inferior to butter. Due to the high content of unsaturated fatty acids and vitamin E, the use of avocado FRUIT helps to reduce blood cholesterol levels and improve the condition of the walls of blood vessels. As a result, the likelihood of the development and progression of diseases of the cardiovascular system, including atherosclerosis and increased blood pressure, decreases. The large amount of potassium in the pulp of avocado fruits also gives reason to recommend them for diseases of the heart and blood vessels.

Avocado's vegetable proteins make it indispensable in the diet of vegetarians. A high mass fraction in fruits of B vitamins, especially B1, B2 and PP, and minerals such as potassium, iron, magnesium, allow the use of avocados for baby food, in dietary food for iron deficiency anemia.



Rice. 1. American avocado. *Persea americana* Mill.

Avocado promotes neutralization redundant acidity gastric juice, therefore it is included in medical nutrition for diseases gastrointestinal tract: gastritis with high acidity, gastric ulcer, etc.

Since there are practically no sugars in the pulp of the fruit, avocado dishes help to stabilize blood glucose levels, they can be used for diabetes mellitus. The peel of fruits and LEAVES is sometimes used to treat enteritis. Described the antihelminthic properties of drugs from these parts of the plant [6; 16; twenty]. There is evidence that unripe avocados are poisonous. However, unripe fruits are able to ripen not only in specially equipped storage facilities, but also at home. When stored for 1–2 weeks, by the time the peel begins to give in to light pressure, they acquire a characteristic taste and a soft, oily texture [11].

#### A PINEAPPLE

*Ananas comosus* (Stikm.) Merr.

Fresh, dried and processed pineapple fruits are used as a food product and medicinal raw material (Fig. 2) (raw materials are unofficial in the Russian Federation).

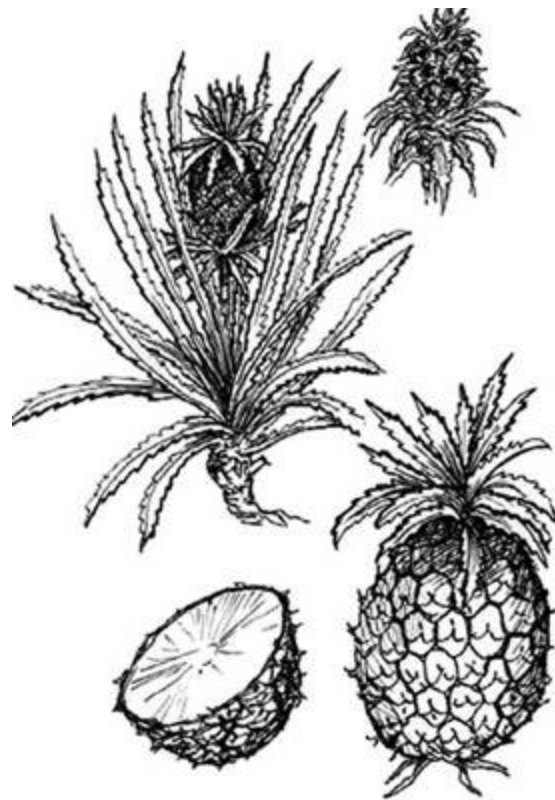
Fresh pineapple fruit contains [4; 6; eleven; 15; 16; eighteen]:

- carbohydrates (11-20%): mainly sugars (8-18%, mainly sucrose), as well as fiber (0.5-1.6%) and pectin (0.1-0.3%);
- organic acids (0.5-1.6%): citric, maleic;
- vitamins: C (5.5–63.0 mg%), B1 (0.03 mg%), B2 (0.03 mg%), carotenoids (0.06 mg%, impart color to the pulp of the fruit);
- proteins (0.25-0.40%);
- enzymes: bromelain;
- fats (0.1-0.2%);
- minerals: calcium, magnesium, potassium, manganese, iodine, iron, phosphorus, copper, etc.

The pulp of fully ripe fruits, after removing the peel, is eaten fresh - as a dessert, a component of salads, exotic dishes with curries, meat or poultry. Sliced and dried pulp is the original dried fruit.

During storage, pineapples do not ripen and do not become sweeter. When choosing a ripe pineapple, you need to pay attention first of all to the presence of a strong sweet aroma. The fruit should be heavy (relative to size) and have a rosette of fresh green leaves.

The main feature of pineapples is the presence of proteolytic enzyme bromelain (bromelain), which, like the better known papain from papaya, improves digestion. Therefore, fresh fruits or juice from them are recommended to be consumed after overeating, accompanied by a feeling of heaviness in the stomach, with some diseases of the gastrointestinal tract (gastritis with low acidity, hypofunction of the pancreas).



Rice. 2. Pineapple. *Ananas comosus* (Stikm.) Merr.

Bromelin has anti-inflammatory and fibrinolytic action, in connection with which pineapple and drugs from it are useful for varicose veins and a tendency to form blood clots. However, this enzyme is destroyed during heat treatment, so canned pineapple fruits do not contain it.

Pineapples are rich in pectin and fiber, therefore they accelerate removal of toxins from the body. They can be used in cleansing diets for body and weight loss.

Fresh pineapple fruit and fruit juice have antipyretic effects. The pulp of the fruit contains a significant amount of ascorbic acid (80 g of pulp provide a quarter of the body's daily need for vitamin C), therefore pineapple is effective as an antiscorbutic agent, useful during the recovery period after suffering respiratory diseases.

There is a lot of vitamin B1 in the pulp and freshly squeezed pineapple juice, therefore they are used in the complex treatment of functional disorders of the central nervous system. Pineapple juice has a diuretic and, accordingly, anti-edema effect and is indicated for diseases of the cardiovascular systems, with kidney disease outside the stage of exacerbation [1; 4; 6; eleven; 14-16; 18-19]. However, it is not recommended to eat unripe pineapple fruits, as they can cause acute diarrhea.

Since the pulp contains the proteolytic (protein breakdown) enzyme bromelain, fresh pineapple should not be used in

foods containing milk or gelatin. When using fresh fruits in food must be borne in mind that bromelain also affects the proteins of the oral mucosa, causing painful tingling. Eating a lot of fresh fruit can even lead to bleeding from gums, so after eating pineapple, be sure to rinse your mouth.

Pineapple stimulates the secretory activity of the stomach, therefore it is not recommended to use it for persons with increased secretory activity of the stomach, with ulcerative processes in the stomach and intestines.

According to some reports, pineapple is used as an abortifacient in the Maluku Islands, so it is advisable to use fresh fruits with caution during pregnancy [4; 6; eleven; 16].

KIWI (ACTINIDIA CHINESE) *Actinidia chinensis* Planch. (*A. deliciosa*)

Fresh, dried and processed kiwi fruits are used as a food product and medicinal raw material (Fig. 3) (raw materials are unofficial in the Russian Federation).

Ripe fruits contain [6; 7; 13; 19; twenty]:

- carbohydrates (9.0-11.3%): sugars (glucose, fructose, sucrose), pectin substances (0.3-0.7%), starch (3.9%), fiber (2.3%);

- organic acids (0.8-1.8%): mainly citric, quinic and apple;

- proteins (0.62-1.75%);

- proteolytic enzymes: actinidin, etc.;

- vitamins: C (50-300 mg%), E (1.2 mg%), B1, B2, PP, carotenoids (violaxanthin, auroxanthin, antheraxanthin, lutein,  $\beta$ -carotene);

- fats (0.2-0.6%);

- minerals: a lot of potassium, calcium, iron, magnesium, etc.



Rice. 3. Kiwi (Chinese actinidia). *Actinidia chinensis* Planch. (*A. deliciosa*)

Kiwi is used in food both fresh and processed. Fresh fruits are used in fruit salads or side dishes. The vitamin properties of these fruits are well known. Kiwis stand out among other fruits with a high content of ascorbic acid, which varies significantly depending on the type of fruit, storage period, transportation, country of origin. However, the content of vitamin C in an amount of about 300 mg%, often mentioned in the literature, is actually observed in fruits extremely rarely and is rather an exception.

Modern research has shown that in most cases, the content of ascorbic acid in ripe fruits is on average 90-110 mg%, and during storage it even decreases. But even these values of the natural content of vitamin C are very high, especially among food plants. And although the content of other vitamins in kiwi fruits is low, their effect on the body in combination makes it possible to recommend fruits for the treatment and prevention of winter-spring beriberi and during the recovery period after acute respiratory diseases.

The high content of potassium in fruits, when eaten regularly, has a beneficial effect on the activity of the cardiovascular system.

An important feature of kiwi is the presence in the fruit of the proteolytic enzyme actinidin, which promotes digestion. When consumed as a dessert fruit, kiwi eliminates the feeling of heaviness in the stomach after

overeating. It is often included in weight loss diets. It is better to use ripe kiwi, since the activity of the enzyme in them increases 3 times compared to hard unripe fruits.

Due to the presence of proteolytic acid, eating kiwi fruit leads to the elimination of cholesterol from the body and improves blood circulation [6; 19; twenty]. Kiwi fruits, especially immature ones, have high acidity, therefore it is undesirable to use them for exacerbations of gastritis with increased secretory activity [6; 7; 19; twenty].

### MANGO INDIAN (MANGO TREE)

*Mangifera indica* L.

Fresh and processed mango fruits are used as a food product and medicinal raw material (Fig. 4) (raw materials are unofficially in the Russian Federation). Fresh pulpfruit contains [6; nine; eleven; 15; 19]:

- carbohydrates: 10-16% sugars (mainly sucrose, less glucose and fructose), a lot of fiber;
- proteins (0.4-0.9%);
- lipids (0.1-0.4%);
- organic acids (0.2-0.5%): mainly citric, in small amounts of apple, amber;
- vitamins: C (on average 20-50 mg%, but the amount may fluctuate in within 14-180 mg% depending on the variety and country of origin), carotenoids ( $\beta$ -carotene 1.4-3.1 mg%, violaxanthin, luteoxanthin, mutatoxanthin), B1, B2, PP;
  
- chlorophyll (in the skin);
- volatile aromatic compounds;
- minerals (0.3-0.5%): iron, etc.



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