



## **Plantain (lat. Plantágo)**

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**Abstract.** The article discusses the main properties of plantain and its effect on the human body. A systematic review of modern specialized literature and relevant scientific data was carried out. The chemical composition and nutritional value of the plant are indicated, the use of plantain in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of psyllium on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

**Keywords:** plantain, useful properties, potentially harmful effects, side effects, beneficial properties, contraindications, diets

## **Beneficial features**

### **Chemical composition and presence of nutrients**

#### **100 g of fresh plantain stalks contain <sup>[4]</sup> :**

Proteins 1.6 g

Dietary fiber 1.6 g Vitamin C 33.3 mg Potassium 382 mg Magnesium 22 mg Calcium 241 mg Iron 5.6 mg Phosphorus 41 mg

#### **100 g of fresh plantain leaves contains:**

Water 84 g

Proteins 2.5 g Fats 0.3 g Carbohydrates 14.6 g Calories 61 Kcal Calcium 184 mg Manganese 1.2 mg Vitamin PP 0.8 mg Vitamin C 44.9 mg Vitamin B2 0.28 mg Vitamin A 0.08 mg

#### **100 g of psyllium seeds contains:**

Carbohydrates 59.5 g

Proteins 17 g Dietary fiber 13.7 g Fats 7.6 g Water 11 g

### **What exactly is used and in what form**

For medicinal purposes, the leaves and seeds of psyllium are used. The juice from fresh plantain leaves is used to relieve inflammation. Decoctions, infusions, tinctures, syrups are prepared from the leaves. On the basis of plantain, medicinal ointments are created. Seeds are part of the official preparations. For the preparation of medicines, an aqueous or alcoholic extract of plantain is also used. Outwardly, poultices are made from freshly picked leaves. Decoctions are used for rinsing. Essence from a fresh plant is used in homeopathy <sup>[5]</sup>.

### **Medicinal properties**

- The leaves of plantain large and lanceolate plantain contain aucubin glycoside, flavonoids (baicalin, scutellarin), polysaccharides, tannins, mucus, carotenoids (xanthophylls), silicic, oleanic, citrine and ascorbic acids, vitamin K, salts of minerals, zinc, hydroxycinnamic acids <sup>[6]</sup>.
- Psyllium seeds contain mucus, fatty acids and plantose carbohydrate <sup>[3]</sup>.
- Among the biologically active substances contained in plantain leaves are pectin, iridoids, flavonoids and saponins. Pectin has healing properties. The glycoside aucubin and its decomposition products exhibit a pronounced anti-inflammatory effect. Saponins, pectins, flavonoids and hydroxycinnamic acids help lower blood cholesterol and have a hypocholesterolemic effect <sup>[7]</sup>.
- The internal purpose is explained by the expectorant, antibacterial, hemostatic properties of plantain. Also, plant-based preparations improve the secretory gastric function, have an enveloping effect <sup>[6]</sup>.
- Preparations and fresh plantain leaves (juice) have a bacteriostatic effect on pathogenic microbes of wound infections, on hemolytic streptococcus and staphylococcus aureus, Pseudomonas aeruginosa, Proteus, E. coli. Under the influence of fresh plantain juice, the surface of wounds is cleaned faster from suppuration, the inflammatory process is suspended and granulation is accelerated <sup>[7]</sup>.

Along with this, preparations based on plantain leaves are used in medicine as anti-inflammatory, hypnotic, analgesic, anti-allergic agents. A decoction of plantain is used in the treatment of diseases of the respiratory system, an alcohol-based plantain extract reduces blood pressure.

Plantain is an integral part of various breast fees. Traditional healers recommend an infusion of plantain leaves for diarrhea, hay fever, inflammatory processes in the bladder, hemorrhoids, fever. Ointment with the addition of dried plantain powder is effective for pustular lesions of the skin.

Psyllium seeds are useful for men and women with reproductive problems. Plantain root extract is recommended for coughs of tuberculous etymology, for fever, as an analgesic, for insect and reptile bites. In the form of wet compresses, plantain is used in folk medicine in the treatment of cancerous tumors, infusion on plantain leaves is used to treat cancer of the stomach and lungs <sup>[5]</sup>.

### **The use of plantain in official medicine**

Plantain-based preparations that can be found in a pharmacy:

1. Plantain leaves.
2. Plantain juice. Liquid in vials, which is a juice remedy. It is prescribed for gastritis with low acidity, three times a day a quarter of an hour before meals. The course of treatment is a month.
3. Granular agent for the preparation of the solution "Plantaglucid". With **hypoacid gastritis**, gastric ulcer with normal or low acidity, half or a whole teaspoon of granules diluted in a quarter cup of heated water is prescribed up to 3 times a day for half an hour before meals <sup>[6]</sup>.

### In folk medicine

- With gastric achilia, subacute and chronic diseases of the digestive system with associated minor bleeding, as a weak expectorant for children and externally, the following decoction is used to make compresses on poorly healing wounds: half a tablespoon of plantain leaves is poured into 200 ml of water. Boil over low heat for about 10 minutes, let it brew. Take in small sips, half a glass up to three times a day <sup>[6]</sup>.
- Plantain juice is used for asthma, cough, whooping cough, malaria, to cleanse the blood - they drink a tablespoon of juice three times a day. Plantain juice canned as follows: 1 kg of pre-washed and dried plantain leaves is passed through a meat grinder. The juice extracted at the same time is mixed with 1 kg of granulated sugar and 1 liter of water (sugar can be replaced with 1.5 kg of honey). The mixture is boiled over low heat until a thick consistency is obtained, then poured into jars and stored in a cool place. Plantain juice prepared in this way is also useful for a weak bladder, hemorrhoids, anemia and pulmonary tuberculosis.
- For catarrhs of the throat, rinsing with juice from the lanceolate plantain, flowers of forest rolls (*Althea officinalis*) and larkspur root (1: 1: 1) is used. A tablespoon of a mixture of these juices is diluted with one third of a glass of warm boiled water. Rinse 4 times a day <sup>[8]</sup>.
- As a restorative tea, saturated with vitamins, the following drink is recommended: mix 300 g of plantain leaves and licorice root and 400 g of coltsfoot leaves. Pour a tablespoon of this collection with 400 ml of boiling water, let it brew for a quarter of an hour and take it warm, 100 ml every three hours.
- For the stomach, a collection is useful: combine 100 g of knotweed grass and goose cinquefoil and 200 g of plantain. Pour two tablespoons of this herbal mixture into 400 ml of boiling water and let it brew for 60 minutes. Strained drink is taken three times a day, 100 ml 40 minutes before meals.

In the treatment of chronic bronchial diseases and bronchial asthma, tea is advised: 4 tablespoons of herbal collection from elder flowers, sundew grass, plantain leaves and tricolor violet grass (take 100 g of each ingredient), pour 200 ml of boiling water and infuse for 60 minutes. Strained infusion drink three times a day for a third of a glass <sup>[9]</sup>.

Plantain tea: To make this tea, you will need a cup of crushed plantain leaves, 2 cups of water. Wash the leaves thoroughly and dry. Boil water, pour plantain, leave in a container with a tight-fitting lid and let it brew until completely cooled. Store this tea in the refrigerator. You can add honey to taste. Tea is an excellent tonic. Helps with diarrhea, relieves cold symptoms. It can be used for washing wounds, boils, burns, for treating skin affected by eczema, rashes.

- Plantain ointment: you will need a small bunch of plantain leaves (washed and dried), 120 ml of coconut oil, 15 g of beeswax, a glass jar (1 liter volume). Coarsely chop the plantain leaves, fill the jar with them halfway. Pour the coconut oil into the jar, filling to the brim. Cook the mixture in a water bath, over low heat, for 2 hours. After strain. Add melted beeswax to the filtered light green liquid. To stir thoroughly. Coconut oil and wax help to moisturize the skin,

while psyllium helps to heal it. This ointment heals cracks, softens burned and chapped skin.  
[10]

- In stomach cancer, plantain juice is effective inside: finely chopped fresh plantain leaf is mixed in equal proportions with granulated sugar, insisted in a warm place for 14 days. The resulting juice is taken in a tablespoon three times a day 20 minutes before meals.
- In case of peptic ulcer, an infusion is prescribed: two tablespoons of a mixture of plantain leaves and sage officinalis pour 400 ml of boiling water. Let it brew, drink one-third of a glass three times a day before meals for the first 10 days of treatment. Then 0.5 cups during a course lasting one or two months.
- For constipation and chronic colitis, take a decoction of Indian plantain seeds: pour 10 g of seeds with a glass of boiling water. Drink a tablespoon a day, always on an empty stomach [11].

### Externally:

For the treatment of malignant tumors, compresses are applied from the juice of the plantain large. For rinsing, washing, lotions and compresses, an infusion is prepared at the rate of 50 g of raw materials per glass of boiling water. For purulent skin diseases and skin lesions, an ointment is recommended: 10 g of large plantain leaves ground into powder are mixed with 90 g of petroleum jelly.

Poultices from crushed psyllium psyllium seeds soaked in hot water are used for inflammation of the mucous membrane of the eyes, for skin ulcers, and for cracked nipples of the mammary glands in nursing mothers (poultices are applied to cracks after each feeding) [11].

With inflammation of the eyes and purulent discharge from them, compresses from an aqueous infusion of psyllium lanceolate leaves are recommended.

With a toothache, cotton wool soaked in an alcohol tincture of plantain is put into the hollow of a diseased tooth [7].

### in oriental medicine

In China, plantain has long been used as a remedy for intestinal disorders in children. They also used it as a birth aid and attributed to it the power to change the incorrect position of the fetus (with breech presentation, etc.)

In Burma, plantain is used to treat high blood pressure and manifestations of tropical fever.

Avicenna in his practice used both wound healing and hemostatic properties of the plant. He used parts of plantain in the treatment of tumors, non-healing ulcers of a malignant nature, in inflammatory processes in the kidneys and liver, and in eye diseases. The healer recommended psyllium seeds for intestinal disorders and for deep focal lesions of the lungs [5].

### In scientific research

In the 18th century, the British explorer and physician, author of the famous "Botanology" (1710), William Salmon wrote about plantain in the Herbal of England ("History of Plants") : *remedy for debilitating cough, lung diseases. It is believed that plantain can be used for epilepsy, dropsy, jaundice, diseases of the liver, spleen ... It relieves the inflammatory process in the eyes ... Plantain juice, buried in the ears, alleviates pain and restores damaged hearing ... Powdered plantain root in equal parts with chamomile relieves toothache. Crushed psyllium seeds stop vomiting, stop epilepsy*

*attacks and convulsions... An ointment made from psyllium juice and rose oil relieves headaches... ”*  
[12]

The Podorozhnikov family is a topical object of study for scientists representing modern medicine.

A comparative analysis of the chemical components and nutrients of the large plantain, lanceolate plantain and medium plantain (growing in the southeastern regions of Spain) is given in a study by J. L. Gil-Guerrero. [13]

The work of F. Hassan, A.S. Mansur et al. [14]

Hepatoprotective and anti-inflammatory functions of the substances contained in the large plantain are described in the article by I. Turel, H. Ozbek, R. Erten and others [15]

Biologically active substances, the chemical composition and the use of plantain in medicine are the subject of research by A. B. Samuelsen. [16]

I. Stanisavlevich, S. Stozhievich, D. Velikovich and others studied the antimicrobial and antioxidant properties of the extract obtained from the leaves of the plantain. [17]

The question of the chemical composition, pharmacological effects, medicinal properties of Asian plantain is covered in the article by K. Liu, K. Wu, H. Huang. [eighteen]

The use of plantain in traditional medicine is analyzed in the scientific work of K. Haddadian, M. Zakhmatkash. [19]

The study of Olennikova D., Samuelsen A.B., Tankhaeva L.M. [20]

## **In cooking**

- Plantain smoothie

You will need: one cup of young, freshly picked plantain leaves, two sprigs of mint, a little honey, two cups of almond milk, one banana and one apple. Puree all ingredients in a blender and drink chilled.

Sauce a la "pesto" of onion arrows and plantain

200 g of onion shooters, one small bunch of plantain leaves, half a cup of olive oil, a small handful of walnut kernels. Puree all ingredients and season with salt to taste. You can add some grated cheese. Serve with pasta, fish or use as a sandwich spread [21].

- Pizza with plantain

For the test you will need: 1.5 cups of warm water, 2 cups of flour, 1.5 teaspoons of sea salt, 0.5 teaspoons of dry yeast.

To fill the pizza, you need products: 150 g of mozzarella cheese, 1 tomato, a few plantain leaves, a little olive oil and tomato sauce.

Dissolve yeast in water, mix flour with salt. Combine yeast diluted in water with flour and knead for a long time. Shape the dough into a ball and keep in a warm place for 4 hours. Divide into 2 parts.

Cut the mozzarella into thin slices, slice the tomato, chop the plantain leaves.

Preheat the oven to 280 degrees, roll out half of the dough into a thin layer, bake for 5 minutes, then grease the pizza with olive oil, tomato sauce, put cheese, tomatoes, sprinkle with plantain and bake for another 3 minutes <sup>[22]</sup>.

- plantain salad

To prepare this amazingly tasty dish, you will need: a bunch of plantain leaves, a tablespoon of sesame oil and soy sauce, a clove of garlic and sesame seeds. Rinse the plantain, boil the leaves in salted water for 4 minutes, then dip them in very cold water for a couple of seconds. Season the leaves with soy sauce, sesame oil, sprinkle with crushed garlic and sesame seeds.

- Plantain leaves stuffed with meat and rice

Required ingredients: 400 g ground beef, two cups of boiled rice, one clove of garlic, a bunch of plantain leaves, 1 egg, salt, pepper to taste. Blanch plantain leaves. Mix ground beef, rice, beaten egg, salt and pepper. Wrap the filling in plantain leaves (one tablespoon per leaf), bake in the oven at 160 until cooked.

- Plantain chips

To prepare chips you will need: 2 cups of fresh young plantain leaves, 2 teaspoons of sesame oil, 0.5 teaspoon of ground fennel seeds, 0.5 teaspoon of ground cumin, 0.25 teaspoon of ground ginger, 0.5 teaspoon of salt. Mix all the ingredients, spread plantain leaves, oiled and sprinkled with spices, in a single layer on a roasting pan covered with baking paper and bake for 6 minutes at a temperature of 220 degrees <sup>[23]</sup>.

## **In cosmetology**

Plantain is popular for cosmetic purposes: on the basis of the plant, masks are created for facial skin, decoctions for washing hair, and various cosmetic care products are produced.

Herbal ice tones and rejuvenates the skin: a decoction of plantain is frozen in molds and pieces of such ice are rubbed on the face.

For problematic skin, steam baths with plantain are useful.

Plantain for the face is used in the form of masks. The following mask is suitable for owners of normal skin: steam a tablespoon of finely chopped plantain leaves with boiling water. Squeeze out the infused plantain, mix with a tablespoon of sour cream and egg yolk. Apply the mixture to the face and neck area. Wash off after a quarter of an hour.

Dry skin will favorably accept a mask based on plantain, aloe and sunflower oil: heat 65 ml of oil in a water bath, add two teaspoons of finely chopped plantain leaves, boil for a couple of minutes, pour 0.5 tablespoon of aloe juice into the decoction. Apply the mask with a cotton swab to the face and

décolleté. Keep the mask for 20 minutes, then gently wipe your face and wash off the remnants of the mask with warm water.

### **Plantain-based masks for oily skin**

- Face mask of plantain, wild rose, nettle and mint: steam the herbal mixture with 50 ml of boiling water and leave for half an hour in a thermos. Take 2 teaspoons of plantain leaves, rose hips and nettle herb - one teaspoon each, mint - 0.5 tablespoons. Squeeze out the infused gruel and apply on the face and neck. Remove the mask after 20 minutes.
- Plantain helps with comedones (black dots): pour a tablespoon of a mixture of equal parts of plantain leaves, dandelion and sorrel with a small amount of boiling water. Mix the cooled mixture with egg white and apply on the face. Remove the mask from the skin after 20 minutes.
- A mask of plantain, oatmeal and lemon juice cleanses problematic oily skin well. Pour a teaspoon of crushed plantain leaves with one third of a glass of boiling water. Insist for half an hour. Strained infusion pour a tablespoon of oatmeal. Mix softened flakes with a teaspoon of lemon juice. Apply to a cleansed face for a quarter of an hour, then rinse with warm water.
- With increased work of the sebaceous glands, a mask of plantain, starch and kefir is useful. Pour a teaspoon of plantain leaves with 0.3 cups of boiling water. Let it brew, strain. In 0.5 cups of kefir, dilute 1.5 tablespoons of starch. Heat over low heat until thickened. Add strained infusion of plantain to the kefir-starch mixture, mix. Apply the mask to your face with a cotton swab. Wash off with warm water after 25 minutes.

### **Plantain for hair**

The plantain mask strengthens the hair: two tablespoons of plantain leaves pour 0.5 cups of milk in a state of boiling water. Insist plantain in milk for 20 minutes. Rub the paste-like mass into the scalp. Wrap your head with polyethylene and a towel. After an hour, wash off the mask, thoroughly rinsing the hair with warm water.

Psyllium is used in body lotions, body wraps, whitening and softening cosmetics <sup>[9]</sup>.

### **Other uses**

Plantain is in demand in the veterinary business: based on the leaves of the plant, preparations are made that accelerate the time of blood clotting in animals, to heal open and festering wounds in them <sup>[3]</sup>.

### **Dangerous properties of plantain and contraindications**

Patients taking lithium should be aware that the simultaneous use of this drug with psyllium significantly slows down the absorption of lithium, reducing its effectiveness <sup>[24]</sup>.

When using psyllium, the following side effects may occur: a feeling of tightness, squeezing in the chest, an allergic reaction - sneezing, tearing, asthma development <sup>[25]</sup>.

Plantain also has contraindications **for gastritis resulting from increased secretory function of the gastric glands (hyperacid gastritis)** ; gastric and duodenal ulcers, **accompanied by hyperacid gastritis** (gastritis with high acidity); and with increased blood clotting and a predisposition to the formation of blood clots <sup>[26]</sup>.

## Botanical description

It is a perennial herb of the Plantain family.

## origin of name

Among the people, the plantain received the names: *traveler*, *tripartite*, *rannik*, *roadside*, *cutter*. The official name of the genus in Latin is **Plantago** (from *planta* - "sole of the foot", "foot"), referring to the shape of the leaves of the plant, resembling a footprint. It is noteworthy that the American Indians also called the plantain "white man's footprint", since this plant was not found there before the arrival of Europeans on the American continent.

## Kinds

Botanists count **158 species of plantain**, among which the most common are:

1. **Plantain large** - the area of growth is very wide. A plant with numerous healing properties, used both in official and in folk medical practice.
2. **Plantain flea** - the species is common in Transcaucasia. Has medicinal value.
3. **Indian plantain (sandy)** - grows in Europe, in northern Africa, in India, in the temperate zone of Asia. The seeds of the plant are used for the preparation of medicinal material.
4. **Plantain lanceolate** is a representative of the flora of the temperate climatic zone of the Northern Hemisphere. Widely used in medicine.
5. **Plantain average** - found in the European region, Siberia, Central Asian countries. Medicinal properties are similar to those of the plantain.
6. **Plantain ovoid** - grows in the Mediterranean regions, in India, Pakistan, Iran, Afghanistan, in the Canary Islands. Used in medicine.
7. **Kornut's plantain** is a rare species that can be found in the east of Europe, in Central and Asia Minor countries, in the Caucasus, in the Siberian regions. It is included in the Red Books of a number of regions.
8. **Sea plantain** is a species with an extensive habitat, has found application in cooking <sup>[1]</sup>.

**Plantain is a** perennial herbaceous plant. The rhizome is short, vertical, with multiple filiform roots extending from it. The stems are bare, arrows separated by furrows, from 15 cm to almost 0.5 meters high. The leaves are broadly ovate, with veins-arcs, connected in a basal rosette. The inflorescence is a simple spike on a long petiole. The flowers are small, dim, the fruit is a box. Plantain blooms from late spring to early autumn. The fruits are formed in August, ripen until mid-autumn. Plantain grows in yards, in abandoned areas, in areas planted with weeds, along roads, in clearings, in meadows. One plant produces several thousand seeds, which are distributed in the atmosphere over long distances <sup>[2]</sup>.

## Growing conditions

The method of reproduction is seed. Plantain does not take root well on heavy, structureless, floating soils. With the onset of winter, the plot is plowed to a depth of 0.27 m. The optimal depth for sowing is 5 cm. If sowing occurs in the spring, the seeds must be stratified, and dry seed material can be sown in summer and autumn <sup>[3]</sup>.

Harvesting the leaves of plantain large falls on the flowering period. Leaves are torn off by hand, or harvested with sickles, knives. It is forbidden to pluck the entire outlet, along with the rhizome, since this is a direct path to the "extinction" of the plant in this area. The collected raw materials are placed



in a loose, light layer in portable devices. Dry the plantain, spreading it in a thin layer, shaking from time to time. A sufficient degree of dryness is determined by the fragility of the petioles. Plantain leaves can be stored for up to 3 years (if the raw materials were not crushed) or up to 2 years (if the leaves were cut during processing) <sup>[2]</sup>.

## Power circuit

The nutritional value of plantain is that the plant is a food product for numerous species of butterflies.

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## Plantain - useful properties, composition and contraindications

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