



## **Basil (lat. Ócimum)**

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**Abstract.** The article discusses the main properties of basil 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 product are indicated, the use of basil in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of basil on the human body under certain medical conditions and diseases are analyzed separately. The scientific foundations of diets with its use are considered.

**Keywords:** basil, benefits, harm, beneficial properties, contraindications

## **Beneficial features**

Table 1. Chemical composition of basil (according to [Food+](#) ).

Main substances (g / 100 g):	Fresh basil <sup>[1]</sup>
Water	92.06
Carbohydrates	2.65
Sugar	0.3
Alimentary fiber	1.6
Squirrels	3.15
Fats	0.64
Calories (kcal)	23
Minerals (mg/100 g):	
Potassium	295
Sodium	four
Phosphorus	56
Calcium	177
Magnesium	64
Iron	3.17

Manganese	1.148
Zinc	0.81
Copper	0.385
<b>Vitamins (mg/100 g):</b>	
Vitamin C	eighteen
Vitamin PP	0.902
Vitamin E	0.8
Vitamin B6	0.155
Vitamin B2	0.076
Vitamin B1	0.034

In addition to vitamins and trace elements, basil leaves contain several biologically active compounds, including eugenol, ursolic acid,  $\beta$ -caryophyllene, linalool, 1,8-cineol, etc. Eugenol is considered the main biologically active metabolite, although the phytochemical composition of basil is very complex and can vary depending on a number of conditions. In addition, basil includes many other potentially active secondary metabolites - phenylpropanoids (methylugenol, rosmarinic acid), monoterpenes (ozimene), sesquiterpenes (germacrene) - which can both alone and synergistically improve the therapeutic characteristics of basil.

### Medicinal properties

In the system of traditional medicine of South Asia, basil has been used for at least three millennia. During this time, it has gained a reputation as a multifunctional medicinal plant, which in the modern world is tested and re-tested by researchers and practitioners. Over the past decade, multiple therapeutic effects of basil have been confirmed: adaptogenic, antimicrobial, anti-inflammatory, cardio- and hepatoprotective, immunomodulatory, metabolic anti-cancer, antioxidant, radioprotective, antidiabetic, antispasmodic.

Basil, thanks to a unique combination of pharmacological characteristics, is able to cope with stress of various nature:

- **physical** - relieving stress from prolonged physical exertion, exposure to cold and excessive noise,
- **chemical** - protecting organs and tissues from industrial pollutants and heavy metals,
- **metabolic** - normalizing blood glucose, blood pressure and lipid levels,
- **psychological** - positively affecting memory and cognitive functions, relieving anxiety, showing antidepressant properties.

The systematic use of basil reduces the risk of acute circulatory disorders in the brain and prevents its possible complications. <sup>[2]</sup>

The grass protects neurons from damage, prevents their death, restoring behavioral and cognitive functions. <sup>[3]</sup> Thanks to the leaves of basil, cognitive processes are activated and memory is strengthened, neuromuscular coordination improves. <sup>[4,5]</sup>

Basil extracts prevent the formation of blood clots, providing a vasodilating effect, which can be effectively used in the treatment of cardiovascular diseases. <sup>[6]</sup> They also prevent damage to myocardial cells during a heart attack. <sup>[7]</sup>

The plant oil exhibits antibacterial activity against staphylococcus, salmonella, Escherichia coli <sup>[8]</sup>, enhancing the effectiveness of antibiotics. Also, basil oil can suppress the activity of Trichomonas (pathogens of trichomoniasis) and Giardia.

In the experiment "in vitro" (in a test tube), antiviral activity was detected against the causative agent of viral diarrhea <sup>[9]</sup>, as well as against DNA-RNA viruses, enterovirus 71 (EV71) herpes virus (HSV), hepatitis B, adenovirus (ADV) . <sup>[10]</sup> Both crude aqueous and ethanolic extracts of basil and isolated constituents, apigenin, linalool, and ursolic acid, demonstrate efficacy.

Thanks to the action of jasmine and arachidonic acids, basil exhibits anti-inflammatory properties. Over the past decades, the antioxidant activity of alcoholic extracts of the plant has been well studied (taking into account varietal differences) in vitro. <sup>[11]</sup> Due to its ability to protect liver cells from damage, basil acts as a hepatoprotector. Animal experiments show that the essential oil of the plant stops liver cirrhosis by blocking the effects of hepatotoxins. <sup>[12]</sup>

The betulinic acid contained in basil exhibits antitumor properties. Thanks to it, as well as a dozen other components, the essential oil of the plant in laboratory test tubes destroys cancer cells of the cervix, cells of epithelial carcinoma of the human larynx <sup>[13]</sup>, and water-alcohol extracts of the plant demonstrate anti-melanoma activity in experiments on mice. <sup>[fourteen]</sup>

Basil oil eliminates bronchospasm and exhibits a moderate sedative effect, reducing the excitability of the cough center of the nervous system. Taking into account the fact that basil oil also has anti-inflammatory, secretolytic (expectorant), antiseptic effects, demonstrates antifungal and antiviral activity against adenoviruses that cause acute respiratory diseases, the herbal component is considered as a complex and multifunctional remedy in getting rid of both symptoms and causes respiratory diseases in children. <sup>[fifteen]</sup>

Already today, researchers are considering the possibility of using the pronounced antioxidant potential of basil to create a multi-purpose drug for diabetes, obesity and oxidative stress. <sup>[16]</sup>

### **In medicine**

Basil oil is included in the "Broncholitine" as an additional component. The main effect of the drug, aimed at relaxing the smooth muscles of the bronchi, removing mucosal edema and suppressing the cough center, is due to the presence of the main components (glaucine and ephedrine), but basil oil also acts as an effect-enhancing agent.

One of the key components of basil essential oil, eugenol, has long been widely used in dentistry. It is part of zinc oxide eugenol cement and as such is used in insulating pads, temporary fillings, and impression material. Eugenol is also included in a number of painkillers and antiseptics.

Since essential oils in general and basil in particular have an active influence on the activity of the neuropsychic and cardiovascular systems, they are used in aromatherapy in the treatment of children with autonomic dysfunction (in cases of vagotonia). In a differentiated selection of oil, basil is recommended in the variant of autonomic dysfunction, accompanied by hypotension, fears (anxiety), difficulty falling asleep and mental overload. <sup>[17]</sup>

### **In folk medicine**

In the recipes of traditional medicine, basil appeared in ancient India, Egypt and Greece. Not all doctors of that time recognized the healing potential of the basil - for example, the ancient Greek pharmacologist and military doctor Pedanius Dioscorides did not see any special medical value in it.

However, with rare exceptions, representatives of ancient medicine actively included this herb in various drugs. Moreover, hairy basil was then considered the most effective in therapy, although other types of plants (small-leaved, garden, fibrous) are also found in recipes.

The plant was used in different ways (nutrition, aromatherapy, compresses) and in different forms (raw grass, infusion, juice, slurry, mixtures, powder of dry blanks).

- **Eating herbs.** In the most common use of basil, it was supposed to help with disorders of the cardiovascular system (caused by mucus and black bile), as well as problems of the head and nervous system: relieve pain, open blockages in the brain and give it strength.
- **Aromatherapy.** Inhaling the smell of grass was also supposed to improve brain function, relieve fears and neuroses, and remove one from a state of intoxication. In the same way, the patient's condition was relieved with a cold.
- **Porridge compresses.** It was believed that such compresses contribute to the maturation of the spleen tumor, when introduced into the vagina, they accelerate menstruation, and in combination with poppy seeds, they treat inflammation of the testicles.
- **Juice therapy.** They drank basil juice (sometimes with sugar) in order to improve heart function, reduce excessive salivation, and normalize lung function. When applied externally in the form of eye drops, it could help restore vision, and when instilled into the nose, it could stop nosebleeds and treat epilepsy (epilepsy). At the same time, it should be noted that today epilepsy, as a rule, falls into the list of diseases in which basil is contraindicated.
- **Treatment with basil powder.** Mixed with honey, dry basil powder was considered an excellent remedy for the rapid healing of bruises and bruises. Sometimes in the bath, in combination with henna, it was applied to the head to relieve pain. And with a mixture of vegetable powder with wax and oil in the form of compresses, both pain in the genitals and lung diseases were treated.

At the turn of the first and second millennia of our era, the famous Avicenna saved from gout with a mixture of basil and vinegar, and with a compress of the same mixture eliminated local inflammation after scorpion stings. Half a millennium later, the famous Armenian physician Amirdovlat Amasiatsi, at the court of the Turkish Sultan, used basil seeds in the treatment of toothaches, intestinal ulcers and diarrhea. To prevent toothache, the seeds of the plant simply had to be chewed several times a year - preferably during the period when the Sun passes the zodiac sign Aries. And as a fastening and antiulcer agent, fried seeds washed down with water were better suited. At the same time, according to the healer, it was not necessary to abuse such a remedy, since this led to memory problems in the patient.

Modern folk medicine has to some extent preserved the ancient traditions of the use of basil. Today, most often it is included in the composition of means for healing wounds (including bleeding gums), eliminating fungal infections, manifestations of the common cold, as well as for the treatment of the respiratory tract (for colds, bronchitis, asthma).

In Central Asia, the herb in the form of a distillate is used for diseases of the cardiovascular system. In Turkic folk medicine, the leaves of the plant are used for the same purpose.

In some peoples of Europe (for example, in the Bulgarian healing practice), basil juice, by instillation, relieves inflammation of the outer and middle ear. In the same place, the juice of the plant with daily use (in the amount of 2 tablespoons) is considered an effective contraceptive.

In different parts of the world, basil-based remedies correct various gastrointestinal disorders: diarrhea, inflammation of the intestinal mucosa, etc. And the astringent and carminative properties of this plant are in demand in the treatment of flatulence.

## Decoctions, infusions and distillates

In home treatment, basil is most often used in various concentrated forms:

- **Infusions** are recommended to be prepared in thermoses with glass flasks. For a weaker infusion, dry grass - in the proportion of 1 tsp. for 250 ml of boiling water - kept in a thermos for half an hour. For a more saturated - within an hour when laying 1 tbsp. spoons of raw materials. This infusion is then gargled with sore throat (2-3 times a day), impregnated with gauze for compresses in case of otitis, drink a quarter cup 3-4 times a day for coughing and inflammation of the urinary system.
- **A decoction** of basil is obtained from a glass of fresh basil leaves, filled with a liter of water. After the water boils, the raw material is kept on low heat for another quarter of an hour and infused for 30-60 minutes. After cooling and straining, decoctions are used to wipe infected wounds, rinse the feet with excessive sweating, take a soothing bath for stress and insomnia. In the case of urolithiasis, a decoction of basil is drunk half a cup three times a day.
- **Basil oil** at home is prepared by mixing the juice of the plant and olive oil in equal proportions, then slowly boiling the mixture to evaporate the water. This oil is applied to the body with paralysis, inhaled for migraines, instilled into the eyes when purulent inflammation occurs.
- **distillate** of the plant known as "basil vodka" (in Central Asia it is called "Araki raikhon") is prepared from fresh juice or from a thick saturated infusion. The raw materials are poured into a double boiler and boiled, and then, after cooling, the condensed basil vapors are collected. (In Asia, pressure cookers are commonly used to obtain distillate). The collected liquid is drunk 2-3 times a day for 1-2 tsp. to slow down palpitations, equalize rhythms, and in general for the treatment of various heart diseases.

## in oriental medicine

Basil is considered the key medicinal plant in the ancient therapeutic system of the peoples of India - Ayurveda, which combines the physical and spiritual practices of maintaining and restoring health. As part of this teaching, basil is able to significantly increase a person's vital energy (Prana) by influencing the three fundamental changing doshas (primary elements responsible for the distribution of energies) - Pitta, Kapha and Vata. It's believed that:

- Basil helps to balance the dosha of Fire and Water, but it is not recommended for people of this type, as it can lead to an excess of energy.
- The plant reduces the energy of Kapha, removing it from the respiratory tract, and thereby cures colds, asthma, and coughs.
- The use of basil eliminates excess Vata energy in the digestive tract, improving the process of digestion and absorption of nutrients. With a clear imbalance of Vata, basil is used to treat candidiasis and hemorrhoids. With an increase in this energy, it is recommended to use decoctions and powders for inhalation. But an increased concentration of the herbal remedy can lead to arousal and provoke greed.

The complex regulation of the balance of energies over time has led to the creation of an extended therapeutic practice in which basil is presented as a multifunctional healing agent. Today, extracts of the leaves of the plant are used to treat bronchitis, rheumatism, hyperthermia, epilepsy, asthma, shortness of breath, hiccups, cough, hematological diseases, parasitic infections, neuralgia, headaches, wounds, inflammation, diseases of the oral cavity. The juice of the leaves is instilled for pain in the ears. The herbal infusion is used to treat stomach and liver disorders, while the roots and stems are used to treat mosquito and snake bites.

## In scientific research

Thanks to its reputation as a proven medicinal plant, basil (its parts and derivatives) has recently been studied very actively. Studies are carried out both in vitro (in vitro), and in animals, and in humans, however, the proportion of experiments involving humans is noticeably smaller. At the same time, if we evaluate the range of interests of scientists, then researchers are most often interested in the effects of basil on metabolic disorders, immunity, and human neurocognitive functions.

### Metabolic disorders

Studies over the years tested the effect of basil (30 ml juice, 300 mg extract, 2 g leaf powder) on various metabolic disorders associated with type 2 diabetes, blood glucose measurement, lipid levels, blood pressure, excess uric acid in people with gouty arthritis.

The effect of basil extracts was evaluated over a period of time from 2-5 to 12-13 weeks. Moreover, with an increase in the study period to 12-13 weeks, a sharper decrease in fasting blood glucose and postprandial glucose levels was observed compared to these indicators in the control group. In addition, the level of glycohemoglobin (a biochemical blood indicator that shows the content of sugar in the blood over a long period) decreased significantly (by 1.5-3.2 times) when basil was added to the hypoglycemic drug (compared to the indicators of using the drug alone).<sup>[18]</sup> However, even a 4-week basil powder supplement already significantly reduced blood glucose, glycated proteins, uric acid, and improved lipid profiles in participants with type 2 diabetes.<sup>[19]</sup> Overall, the combined basil-drug approach was most effective in reducing diabetes symptoms.

Some studies have reported a significant improvement in blood pressure in hypertensive patients who received 30 ml of fresh basil leaf juice once daily for 10 days or 30 ml twice daily for 12 days. But it is also important that the improvement in lipid parameters in the blood serum was also observed in healthy adult participants in the experiment, who consumed 300 mg of the ethanol extract of the leaves for 4 weeks.<sup>[twenty]</sup>

### Immunomodulation and inflammation

An enhanced immune response to the introduction of basil into the diet has been observed in many clinical studies. One of them, a randomized, double-blind, placebo-controlled study, showed an enhanced immune response with an increase in natural killer (TK) and helper T cells in healthy adult participants compared with placebo volunteers after 4 weeks of taking 300 mg of an ethanolic leaf extract, daily taken before meals.<sup>[21]</sup>

In other clinical trials, the effect of daily administration of 10 g of an aqueous extract of fresh basil leaves in the diet of patients with acute viral infections (hepatitis, encephalitis) was studied. In the first case, symptomatic improvement was reported after 2 weeks, in the second case, an increase in survival after 4 weeks in the basil group compared with patients in the dexamethasone group. Treatment with basil in asthmatic patients has shown that 500 mg of dried herb leaves thrice daily reduced asthmatic symptoms as early as 3 days.

### Neurocognitive effect

In all studies of the neurocognitive effects of basil, subjects experienced significant improvements in mood and/or cognitive function, regardless of age or gender. For example, cognition was tested in a randomized, placebo-controlled clinical trial that showed improvement in mental flexibility, short-term memory, and attention in 40 healthy people (17-30 years old) after taking 300 mg of basil extract daily for 4 weeks. At the same time, positive effects were observed already from the 2nd week after the start of taking the drug.<sup>[22]</sup>

A number of clinical studies have also demonstrated a significant reduction in anxiety and stress levels with higher doses of basil given over a long period of time. In some of them, a decrease in the number of manifestations of general symptoms associated with stress in patients with psychosomatic problems was recorded (by 32–39% compared with the control group). [23]

### **Weight regulation**

The effect of basil on the health of overweight people has been studied in various studies. Recently, there have been studies evaluating the effect of basil supplementation on body weight changes.

For example, a study by Indian scientists demonstrated the positive effect of basil on weight and obesity in 30 people (men and women) aged 17 to 30 years with a body mass index greater than 23 kg / m<sup>2</sup>. Scientists have tried to exclude third-party factors in the form of concomitant diseases, alcohol, tobacco, drugs, etc. as much as possible. All participants in the study received basil capsule supplements twice daily for 8 weeks.

During the experiment, scientists assessed a variety of obesity-related characteristics (from cholesterol levels of various densities and the state of liver enzymes to insulin and blood glucose levels). But in this case, it is important that the diet with basil supplements led to a significant decrease in body weight in the participants of the experiment compared to the representatives of the control group. [24]

In weight loss diets, basil is popular as a way to reduce salt intake and as a low-calorie food (only 20-25 kcal/100 g) in salads. In Asia, diets with the inclusion of Thai basil seeds in the diet are common. The peculiarity of basil seeds is that they absorb liquid, accumulating it around them in a kind of jelly-like capsule. When ingested, such seeds become a natural absorbent, filling the stomach, improving digestion and cleansing the body.

The seeds filled with water have a slight grassy taste and aroma, but the shell after swelling looks unusual and aesthetically pleasing. Therefore, often, in order to prepare both tasty and beautiful desserts, juice, sugar, and fruits are added to basil seeds. However, since such desserts are often made too sweet (non-diet), weight loss programs usually use either seeds filled with low-fat kefir, or dry seeds in general, which are then washed down with tea or low-fat milk.

### **In cooking**

Due to its bittersweet taste and piquant aroma, basil leaves are often added to salads, sandwich mixes, baked goods, marinades, vegetable and meat dishes, and desserts for a fresh mint note. In dried form, basil herb can replace pepper, be included in the composition of spices with which pasta, pizza, and eggs are served.

With basil herb at the base, Italy's favorite pesto sauce is prepared. In Azerbaijani cuisine, in addition to herbs, basil seeds are used to flavor salads, soups, pates. Also, recently, some confectionery enterprises have begun to mass-produce drinks thickly seasoned with basil seeds.

Different varieties of the plant are distinguished by their recognizable flavors, which are used by experienced chefs to create unexpected combinations: vanilla basil, as the name suggests, has a vanilla flavor, Baku has a mint flavor, Yerevan has a clove flavor and black tea aroma, and spoon-shaped basil resembles bay sheet.

### **In cosmetology**

In ancient times, basil mixed with vinegar was smeared on the face in order to more effectively remove freckles and age spots. The body was rubbed with the same mixture to get rid of the smell of sweat.

Today, essential oil is more commonly used in cosmetology. Such an oil remedy relieves inflammation, heals damage, and has a rejuvenating effect by smoothing fine wrinkles. But, in addition to lotions and skin creams, fragrant basil oil can be found in hair rinses, as this herbal ingredient helps accelerate hair growth and eliminate dullness.

### **Dangerous properties of basil and contraindications**

Among the main dangerous properties of basil, as a rule, is its toxicity, due to the content of mercury salts in the plant. Purple basil is especially often blamed for this. Despite the prevalence of such a statement, the question of whether there is mercury in the basilica still causes active controversy.

Indian researchers in their work assessed the amount and degree of distribution of heavy metals in different plant parts of three types of basil (sweet, black and dwarf), collected in Central India. For analysis, they took powder preparations (after drying) and medicinal infusions based on basil after extraction. Moreover, before studying, all samples were thoroughly washed with distilled water. <sup>[25]</sup>

The scientists did find that the concentrations of mercury (Hg) and lead (Pb) in the leaves of some plants exceeded the allowable level: by 0.05 mg/kg and 1.2 mg/kg, respectively. Moreover, heavy metals passed during extraction into aqueous infusions of basil. Depending on the type of plant, the concentration of mercury varied, but the amount of heavy metals in the leaves of the plant always exceeded their amount in flowers, stems, and especially roots. That is, the roots of the plant, in this respect, turned out to be the safest.

According to the results of the work, on average, the content of mercury in the flowers of basil of different types (in mg per 1 kg of dry weight) was 0.17-0.21 mg, and in the leaves - 1.2-2.1 mg. For lead, these figures were in the range of 5.3-15.3 mg (flowers) and 8-18.5 mg (leaves). But the researchers noted that the main sources of heavy metals should be considered as pollution of soil, groundwater, and dust. And, therefore, in environmentally friendly conditions, the risk of toxic contamination will be minimal.

Polish scientists, evaluating various factors affecting the accumulation of mercury in medicinal plants, analyzed 20 types of various medicinal raw materials collected in northern Poland. <sup>[26]</sup> Like the Indian researchers, they found the highest levels of mercury in the leaves of the collected samples. But besides this, they noted a number of other factors contributing to the increase in mercury concentrations:

- **Proximity to the road.** Proximity to the roadway significantly increases the mercury content.
- **collection time.** Samples collected in spring have less mercury than samples collected in autumn.
- **type of ontogeny.** There is less mercury in annual plants than in perennials. In this regard, it becomes important which type of basil is considered in a particular case as a raw material, since the genus Basil is represented by approximately 70 species of annual and perennial herbs and shrubs. (By the way, the most common basil in our country - it is also fragrant, garden and camphor - belongs to annual herbs, that is, it is safer).

Thus, the degree of contamination of basil with heavy metals is, to a greater extent, a matter of growing conditions, environmental conditions, place and time of collection of raw materials.



The restriction for pregnant women on the use of basil for food is also widespread on the Internet. The restriction is associated either with the content of mercury in the composition, or with a possible increase in the tone of the uterus. No reference is made to any studies demonstrating the side effects of moderate consumption of basil. Therefore, the rigid prohibitive position causes justified criticism.

However, the constituents of basil in a concentrated dosage form have the potential to cause a number of complications during pregnancy. For example, basil oil (especially eugenol basil) contains up to 70-80% eugenol, which can have a negative impact on the development of the fetus. The seeds of the plant (and especially their decoctions and extracts) can increase blood flow and slow down blood clotting, which increases the risk of bleeding not only in pregnant women, but in all people with bleeding disorders.

Thus, it is now considered safe to moderate the introduction of fresh basil leaves into the diet of pregnant and lactating women, and unsafe - the use of plant seeds and their concentrated forms: infusions, decoctions, extracts, oils and medicines.

Due to the ability of basil extracts to lower blood pressure, they are not advised to use hypotensive patients.

The potential danger of infection by parasitic organisms remains with the use of poorly washed basil. In particular, outbreaks of cyclosporiasis that occurred in Sweden, the United States and Canada after the export of basil, lettuce and raspberries infected with the parasite *Cyclospora cayetanensis* from endemic countries are described. The disease presents with watery diarrhea, flatulence, abdominal pain, fever, and loss of appetite. <sup>[27]</sup>

### **Selection and storage**

To select fresh and fragrant basil, you should look for plants with evenly saturated leaf color. The color of the leaves may vary depending on the variety (it happens to be green, purple, blue, brown), but there should be no growths, no spots (gray, white, green), no yellow streaks on them. Spots can indicate contamination with chemicals during the growing process, growths can indicate a disease, and veins can indicate that the plant has begun to dry out. Individual sluggish leaves in a bunch of basil are also a reason to refuse to buy, because there is a high probability that the rest of the plants in the bunch have begun to deteriorate.

Before buying basil, it's a good idea to tear off one leaf to make sure it's not sticky (a sign of improper growing or storage) and to sniff it. The smell is better revealed if you lose the leaf in your hands. A rich and strong aroma without putrefactive notes indicates the freshness of the plant.

The younger the plant, the more tender and sweeter its taste, the older, the rougher and sharper it is. In addition, the leaves of overripe grass begin to be very bitter, so before buying it is advisable not only to smell, but also to taste the basil. The difficulty is that for tasting the plant must be washed, and in a store or in the market this is far from always possible. Therefore, the freshness of basil is often evaluated only in appearance and aroma.

You can store basil in many ways:

1. Place the bunch in the water, after cutting the stems.
2. Place the basil in the refrigerator, wrapping it in cling film (in this and previous cases, for up to a week).
3. Place the washed and dried bunch in the freezer (whole or chopped) in a glass jar for a long time.

4. In dry form - for this, the grass is collected in small bunches and hung in a dark, ventilated room.

Subsequently, basil, thanks to its healing properties and widespread use in cooking, has already created a good name for itself. Today, with the help of basil, people have learned to solve a number of physical and psychological problems, and the list of proven medicinal properties of the herb only grows over time.

## Literature

1. US National Nutrient Database, [source](#)
2. Bora KS, Arora S., Shri R. Role of *Ocimum basilicum* L. in prevention of ischemia and reperfusion-induced cerebral damage, and motor dysfunctions in mice brain - J. Ethnopharmacol. 2011, Oct 11, 137(3), 1360-1365. DOI: 10.1016/j.jep.2011.07.066
3. Tsyvunin V.V. Shtrygol S.Yu., Prokopenko Yu.S. Neuroprotective properties of dry extracts of *schleicher fume* and camphor basil - Clinical Pharmacology and Drug Therapy Reviews 2013, 11, 3, 66-71. DOI: 10.17816/RCF11366-71
4. Sarahroodi S., Esmaeili S., Mikaili P., Hemmati Z., Saberi Y. The effects of green *Ocimum basilicum* hydroalcoholic extract on retention and retrieval of memory in mice - Anc. sci. life. 2012, Apr., 31(4), 185-189. DOI: 10.4103/0257-7941.107354
5. Zahra K., Khan MA, Iqbal F. Oral supplementation of *Ocimum basilicum* has the potential to improve the locomotory, exploratory, anxiolytic behavior and learning in adult male albino mice. - Neurol. sci. 2015, Jan., 36(1), 73-78. DOI: 10.1007/s10072-014-1913-3
6. Tohti I., Tursun M., Umar A., Turdi S., Imin H., Moore N. Aqueous extracts of *Ocimum basilicum* L. (sweet basil) decrease platelet aggregation induced by ADP and thrombin in vitro and rats arterio-venous shunt thrombosis in vivo - Thromb. Res. 2006, 118(6), 733-739. DOI: 10.1016/j.thromres.2005.12.011
7. Fathiazad F., Matlobi A., Khorrami A., Hamedeyazdan S., Soraya H., Hammami M., Maleki-Dizaji N., Garjani A. Phytochemical screening and evaluation of cardioprotective activity of ethanolic extract of *Ocimum basilicum* L. (basil) against isoproterenol induced myocardial infarction in rats - Daru 2012, Dec 5, 20(1), 87. DOI: 10.1186/2008-2231-20-87
8. Hossain MA, Kabir MJ, Salehuddin SM, Rahman SM, Das AK, Singha SK, Alam MK, Rahman A. Antibacterial properties of essential oils and methanol extracts of sweet basil *Ocimum basilicum* occurring in Bangladesh - Pharm. Biol. 2010, May, 48(5), 504-511 DOI: 10.3109/13880200903190977
9. Kubiça TF, Alves SH, Weiblen R., Lovato LT In vitro inhibition of the bovine viral diarrhoea virus by the essential oil of *Ocimum basilicum* (basil) and monoterpenes - Braz. J. Microbiol. 2014, April 11, 45(1), 209-214. DOI: 10.1590/S1517-83822014005000030
10. Chiang LC, Ng LT, Cheng PW, Chiang W., Lin CC Antiviral activities of extracts and selected pure constituents of *Ocimum basilicum* - Clin Exp Pharmacol Physiol. 2005, Oct. 32(10), 811-816. DOI: 10.1111/j.1440-1681.2005.04270.x
11. Elansary HO, Mahmoud EA In vitro antioxidant and antiproliferative activities of six international basil cultivars - Nat. Prod. Res. 2015, Nov., 29(22), 2149-2154. DOI: 10.1080/14786419.2014.995653
12. Ogaly HA, Eltablawy NA, El-Beairy AM, El-Hindi H., Abd-Elsalam RM Hepatocyte Growth Factor Mediates the Antifibrogenic Action of *Ocimum bacilicum* Essential Oil against CCl<sub>4</sub>-Induced Liver Fibrosis in Rats - Molecules 2015, Jul 23, 20( 8), 13518-13535. DOI: 10.3390/molecules200813518
13. Kathirvel P., Ravi S. Chemical composition of the essential oil from basil (*Ocimum basilicum* Linn.) and its in vitro cytotoxicity against HeLa and HEP-2 human cancer cell lines and NIH

- 3T3 mouse embryonic fibroblasts - Nat. Prod. Res. 2012, 26(12), 1112-1118. DOI: 10.1080/14786419.2010.545357
14. Monga J., Sharma M., Tailor N., Ganesh N. Antimelanoma and radioprotective activity of alcoholic aqueous extract of different species of *Ocimum* in C(57)BL mice - Pharm. Biol. 2011, Apr., 49(4), 428-436. DOI: 10.3109/13880209.2010.521513
15. Kramarev S. A. A differentiated approach to the treatment of cough. Child health. 2013 - No. 6 (49). With. 100-104.
16. Zoy I Noor, Dildar Ahmed, Hafiz Muzzammel Rehman, Muhammad Tariq Qamar, Matheus Froeyen, Sarfraz Ahmad, Muhammad Usman Mirza. In Vitro Antidiabetic, Anti-Obesity and Antioxidant Analysis of *Ocimum basilicum* Aerial Biomass and in Silico Molecular Docking Simulations with Alpha-Amylase and Lipase Enzymes. Biology (Basel). Dec 2019; 8(4): 92. doi: 10.3390/biology8040092
17. Belyaeva L.M., Kolupaeva E.A., Korol S.M., Mikulchik N.V. Autonomic dysfunction syndrome in children: myths and reality. Medical news. 2013 - No. 5. With. 5-15.
18. Subramani Parasuraman, Subramani Balamurugan, Parayil Varghese Christapher, Rajendran Ramesh Petchi, Wong Yeng Yeng, Jeyabalan Sujithra and Chockalingam Vijaya. Evaluation of Antidiabetic and Antihyperlipidemic Effects of Hydroalcoholic Extract of Leaves of *Ocimum tenuiflorum* (Lamiaceae) and Prediction of Biological Activity of its Phytoconstituents. Pharmacognosy Res. 2015 Apr-Jun; 7(2): 156–165. doi: 10.4103/0974-8490.151457
19. Rai V., Iyer U., Mani UV Effect of Tulasi (*Ocimum sanctum*) leaf powder supplementation on blood sugar levels, serum lipids and tissues lipids in diabetic rats. Plant Foods for Human Nutrition. 1997;50(1):9–16. doi:10.1007/bf02436038
20. Mondal S., Mirdha B., Padhi M., Mahapatra S. Dried leaf extract of Tulsi (*Ocimum sanctum* Linn) reduces cardiovascular disease risk factors: results of a double blinded randomized controlled trial in healthy volunteers. Journal of Preventive Cardiology. 2012;1(4):177–181.
21. Mondal S., Varma S., Bamola V.D., et al. Double-blinded randomized controlled trial for immunomodulatory effects of Tulsi (*Ocimum sanctum* Linn.) leaf extract on healthy volunteers. Journal of Ethnopharmacology. 2011;136(3):452–456. doi: 10.1016/j.jep.2011.05.012
22. Sampath S., Mahapatra SC, Padhi MM, Sharma R., Talwar A. Holy basil (*Ocimum sanctum* Linn.) leaf extract enhances specific cognitive parameters in healthy adult volunteers: a placebo controlled study. Indian Journal of Physiology and Pharmacology. 2015;59(1):69–77.
23. Saxena RC, Singh R., Kumar P., et al. Efficacy of an extract of *ocimum tenuiflorum* (OciBest) in the management of general stress: A Double-blind, Placebo-controlled Study. Evidence-based Complementary and Alternative Medicine. 2012;2012:7 . doi:10.1155/2012/894509.894509
24. Swayamjeet Satapathy, Namrata Das, Debapriya Bandyopadhyay, Sushil Chandra Mahapatra, Dip Sundar Sahu and Mruthyumjayarao Meda. Effect of Tulsi (*Ocimum sanctum* Linn.) Supplementation on Metabolic Parameters and Liver Enzymes in Young Overweight and Obese Subjects. Indian J Clin Biochem. 2017 Jun; 32(3): 357–363. doi:10.1007/s12291-016-0615-4
25. Jena V, Gupta S. Study of heavy metal distribution in medicinal plant basil. J Environ Anal Toxicol. 2012;2:161 . doi: 10.4172/2161-0525.1000161
26. M. Ordak, M. Wesolowski, I. Radecka, E. Muszynska, and M. Bujalska-Zazdrozny. Seasonal Variations of Mercury Levels in Selected Medicinal Plants Originating from Poland. Biol Trace Elem Res. 2016; 173(2): 514-524. doi:10.1007/s12011-016-0645-z
27. T. I. Avdyukhina, A.S. Dovgalev, K.D. Imamkuliev, T.N. Konstantinova, T.M. Guzeev. Parasitoses are parasitic diseases transmitted through food. Infection and immunity. 2012. T2. No. 1-2. With. 350.

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## **Basil - useful properties, composition and contraindications**

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**Abstract.** The article discusses the main properties of basil 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 product are indicated, the use of basil in various types of medicine and the effectiveness of its use in various diseases are considered. The potentially adverse effects of basil on the human body under certain medical conditions and diseases are analyzed separately. Considered scientific basics diets With his application .