



Blackberry (lat. *Rubus caesius*)

Eliseeva Tatyana, editor-in-chief of the project EdaPlus.info

Yampolsky Alexey, nutritionist

Email: eliseeva.t@edaplus.info, yampolsky.a@edaplus.info

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

Keywords: blackberry, benefit, harm, beneficial properties, contraindications

Beneficial features

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

Main substances (g / 100 g):	Fresh Blackberry [1]
Water	88.15
Carbohydrates	9.61
Sugar	4.88
Alimentary fiber	5.3
Squirrels	1.39
Fats	0.49
Calories (kcal)	43
Minerals (mg/100 g):	
Potassium	162
Calcium	29
Phosphorus	22
Magnesium	twenty
Sodium	one
Manganese	0.646
Iron	0.62
Zinc	0.53

Copper	0.165
Vitamins (mg/100 g):	
Vitamin C	21
Vitamin E	1.17
Vitamin PP	0.646
Vitamin B6	0.03
Vitamin B2	0.026
Vitamin B1	0.02

A study of the composition of blackberries shows that the berries contain quite a lot of vitamins E, K and C - about 15%, 17% and 25% of the recommended daily requirement (RDI), respectively. In particular, vitamin K, which promotes blood clotting and strengthens bones, in one 100-gram serving of raw blackberries contains an average of 19.8 micrograms.

The mineral composition of blackberries is widely represented. Magnesium (5-7% RDI), potassium (5-8% RDI) and especially manganese (30-40% RDI) are found in relatively high concentrations in the berries, which helps prevent osteoporosis, control blood sugar levels, and reduce epileptic manifestations. In addition, one of the enzymes found in blackberries helps manganese form collagen and heal wounds.

Laboratory analysis shows that the fruits also contain malic, tartaric, citric, salicylic acids, and the seeds contain about 9-12% fatty oils.

Medicinal properties

The ink-black color of blackberries is due to anthocyanins - polyphenols. They help keep blood vessels healthy, protect cells from mutation and cancer, and the antioxidant properties of plant compounds can reduce the risk of certain chronic conditions, including diabetes.

Blackberry extracts also exert antimutagenic effects in vitro (in vitro, out of a living organism) and in vivo (inside a living organism) by altering cell signaling pathways and inhibiting tumor stimulating factors.

In support of this, scientists evaluated berry extracts for their ability to inhibit the growth of a number of human cancer cells: oral adenosquamous carcinoma (CAL-27), breast (MCF-7), colon (HT-29, HCT116), and tumor cell lines. prostate cells (LNCaP) at concentrations of 25 to 200 µg/ml. The researchers confirmed that with increasing concentration of the berry extract, there was an increase in inhibition of cell proliferation in all cell lines with varying degrees of activity between cell lines.^[2]

Blackberry phenolic compounds have a protective effect on brain cells, preventing age-related neurodegenerative diseases^[3], cognitive and motor problems caused by aging. Barbara Schuckitt-Hale, Ph.D. from the Tufts HNRCA Neuroscience and Aging Laboratory, who is experimenting with the polyphenols of various berries, also tested 2% blackberry extracts to test the effectiveness of this diet in combating age-related changes in laboratory animals. The results showed that the blackberry diet improved motor performance on balance, coordination, and memory tasks. Animals fed blackberries showed better short-term memory and greater performance.

Blackberry extracts help reduce the chance of blood clots. The antithrombotic effects found in laboratory experiments were associated with the regulation of the active substance of the vascular endothelium, activation of blood flow and a decrease in blood clotting (anticoagulant effect).^[four]

There is also evidence that adding blackberries to your diet every day can reduce the number of visits to the dentist. A 2013 study showed ^[5] that blackberry extract has antibacterial and anti-inflammatory properties against certain types of bacteria that cause oral diseases. The researchers warn that more research is needed, but suggest that blackberry extract may help prevent cavities and control gum disease.

In addition to antimicrobial properties, the antidiabetic and anti-inflammatory properties of blackberry phenolic compounds require further study. It is also necessary to establish the exact physiologically effective concentrations of blackberry phenolic compounds in vivo. However, it is already clear that the therapeutic potential of blackberry concentrates is very high.

The possibilities of blackberry extracts are also highly appreciated in therapeutic programs aimed at stopping hair loss and activating the growth of hair follicles. Moreover, positive results are demonstrated by extracts of various parts of the plant: fruits, seeds, flowers, roots, although the most pronounced effect is achieved with blackberry leaf extracts.

In animal experiments, preparations containing plant extract at a concentration of 90-300 mg / ml, after application for 5-7 days, begin to stimulate the development of hair in the selected area. It is important that noticeable changes were recorded both in the phase of hair follicle regression (telogen) and in the phase of active hair growth (anagen).

Use in medicine

In official scientific medicine, blackberry preparations are not yet used, but extracts of the berries of this plant are widely represented in the dietary supplement industry. For example, blackberry CO₂ extract is positioned by manufacturers as a remedy for diarrhea and gastritis, tonsillitis and pharyngitis, hysteria and insomnia, as well as for the treatment of various skin pathologies.

Cosmetic brands produce berry extract to combat rosacea as a remedy that, when applied externally, can strengthen the walls of blood vessels, improve microcirculation and eliminate skin redness.

Blackberry leaves can also be purchased pre-packaged as an herbal supplement or tea substitute. The product description lists the bactericidal, anti-inflammatory, antipyretic, sedative and restorative properties of the plant.

In folk medicine

In folk medicine, blackberries are famous for their anti-inflammatory, antibacterial, tonic, blood-purifying and wound-healing properties. Due to the sedative effect that is found when eating berries, blackberries are often recommended for use in disorders of the nervous system (hysterical and pre-hysterical states, neuroses). But in general, this plant is considered as a universal remedy for internal and external use.

The fruits and leaves of blackberries in folk medicine have long been in demand as a therapeutic agent for normalizing the state of the gastrointestinal tract:

- relief from stomach pain,
- improve intestinal motility,
- stop bloody diarrhea and stomach bleeding,
- treatment of inflammatory diseases of the stomach and small intestine (gastroenteritis).

For enteritis, diarrhea, gastritis and gastric bleeding, crushed leaves (1 tablespoon) were poured with boiling water (250 ml) and infused for about 3 hours. The therapeutic effect was achieved with a 3-time intake of the drug in a volume of 100-150 ml before meals. Bleeding was also stopped with a decoction of blackberry roots in the ratio of 100 g of raw material to 500 ml of water. This mixture was first evaporated by half, and after straining, about 250 ml of infused red wine was added to it.

Ukrainian herbalists in the treatment of chronic enteritis prescribed the use of steam from the leaves and flowers of calendula in a ratio of 2: 1 - this remedy was taken three times a day for a teaspoon. Bulgarian folk healers decoction of leaves (up to 20 g of raw materials per 1 liter of water) was prescribed for gastritis, ulcers, diarrhea.

Blackberries in folk medicine are still used today to restore the functioning of the gastrointestinal tract, but unripe berries are recommended for a fixing effect in diarrhea, and overripe ones, on the contrary, as a laxative for constipation.

In addition to gastrointestinal pathologies, blackberries are included in therapeutic programs for:

- colds, sore throats, chronic coughs (gargle with a mixture of leaf decoction and fruit juice in a ratio of 4: 1, and drink blackberry leaf tea as a diaphoretic),
- kidney and liver diseases,
- bleeding and inflammation of the gums (in a mixture of infusions of St. John's wort and blackberry leaves),
- female diseases, accompanied by menstrual irregularities (using an infusion of blackberry leaves in the form of douching), with chronic inflammation of the vagina, whites,
- physiological sexual dysfunction in men.

Blackberries in folk medicine are also treated for dropsy. Moreover, as a urine and diaphoretic, modern healers less often use infusions of dried blackberries and more often - decoctions and infusions of the leaves or roots of the plant. To do this, crushed blackberry root (15 g) is poured with boiling water (300 ml) for 15-20 minutes and then taken 1 tbsp. l. every two hours.

Outwardly, in the form of leaf compresses, blackberry remedies are used to heal purulent wounds, eczema, chronic trophic ulcers, remove lichen and eliminate bacterial skin infections.

Ripe blackberries and young leaves are harvested for the preparation of medicines throughout the summer. Dry the leaves in shady ventilated rooms or in ovens at a temperature not exceeding 50 ° C. At the same time, the leaves should retain their natural color even after drying.

There is another way to prepare blackberry leaves for medicinal teas:

1. First, fresh leaves are left in a closed jar until they wither.
2. Then the leaves are kept under steam for several minutes until they turn black.
3. The resulting hardwood blanks are dried in air.

Such a blackberry leaf is stored in the same way as classic tea leaves - in a closed glass container.

In scientific research

Blackberry in recent years has increasingly become the object of scientific study. Scientists are also interested in the opportunity to use the potential of berries in medicine, and progressive ways to protect plants and crops, and new formats for using blackberries in the food industry. In the last year alone, dozens of works have appeared in which the central place is occupied by blackberries or extracts

derived from them. As an example, here is a list of just five recent works of 2019 related to the healing effects of blackberries:

- *"Antioxidant potential and phenolic profile of blackberry anthocyanin extract followed by human gut microbiota fermentation"*. In this study, the scientists showed that blackberry anthocyanins, under the influence of intestinal microbiota enzymes, are able to form active metabolites with potential antioxidant activity against oxidative stress. ^[6]
- *"Effect of blackberry (Rubus fruticosus L.) juice on anxiety behavior in rats"*. As a result of experiments with different dosages of juice, and observations of animals under conditions of acute stress, scientists concluded that blackberry juice has a potential therapeutic effect on anxiety associated with a stressful event. ^[7]
- *"Blackberry extract inhibits telomerase activity in human rectal cancer cells"*. In this study, the antibodymerase activity of crude blackberry extract was analyzed in six human colorectal cancer (CRC) cell lines by TRAP assay. The scientists noted that blackberry extract significantly inhibited the growth of six CRC cell lines in a dose-dependent manner and concluded that telomerase inhibition is a key mechanism by which blackberry exerts its anti-cancer effect on CRC cells. ^[eight]
- *"A blend of blackberry leaf and fruit extracts alleviates non-alcoholic fatty liver disease (steatosis), improves gut integrity, and increases beneficial Lactobacillus and Akkermansia bacteria in rats."* In the experiment, rats with artificially induced steatosis were fed 50% ethanolic extracts of blackberry fruits or leaves (450 mg/kg body weight) for 12 weeks. As a result, scientists concluded that blackberry extract reduces the level of triglycerides and lipid peroxides in the liver, increases the number of genes associated with beta-oxidation, and reduces the number of those genes that are involved in the biosynthesis of fatty acids. In addition, blackberry extract will also alleviate intestinal dysbiosis by increasing the amount of Lactobacillus and Akkermansia in the stool. ^[9]

Weight regulation

Blackberries, like some other anthocyanin-rich berries, prevent weight gain in laboratory rodent models of obesity. However, this does not mean that people will experience the same effect when eating berries. Therefore, the researchers set out to evaluate the effect of blackberry consumption on energy substrate utilization and glucoregulation in human volunteers on a high-fat diet.

27 overweight or obese men were included in a randomized, placebo-controlled, two-stage crossover study. ^[ten]

The diet followed by the volunteers contained 600 g of blackberries per day, introduced into the diet in a complex enough program to allow a comprehensive analysis of the effect of berries on obesity rates. Measurements of various markers indicated that blackberry consumption may promote increased fat oxidation and increased insulin sensitivity in overweight men.

Blackberries with their 43 kcal/100 g are indeed often included in healthy diet programs aimed at weight loss. This berry is quite low - up to 25 units. - glycemic index (GI), - which allows even diabetics to use it in their nutrition plans. Moreover, according to a more progressive system for assessing the effect of a product on blood sugar levels, indicating not only the quantity, but also the quality of carbohydrates - Glycemic Load (GL) - blackberries gain only 4 units, which is also very small.

In cooking

Blackberries have a sweet and sour taste, but the sourness in the berries is more pronounced. A tarry flavor may also be perceived, although the exact combination of flavors varies greatly depending on plant species, cultivar, and growing conditions. Creeping varieties of blackberries are considered sweeter. More sour and spicy - upright plant varieties.

Blackberries are eaten both raw and processed. Berries are used to make jam, marmalade, filling or decoration for baking (puddings, cakes, pies). Blackberries are often added to fruit salads, mixed with milkshakes.

The preparation of blackberry wine has recently become a separate and very popular culinary trend. Moreover, it is produced both industrially and at home. To create wine at home, you need 1 kg of blackberries, 1 liter of water, 250-300 g of sugar and 3-4 g of yeast.

1. Ripe berries are pre-peeled from the stalks, put in a glass jar and poured with water heated to a boil.
2. Blackberries are infused for 4-5 days in a dark, warm place.
3. At the end of the period, the infusion is filtered through gauze to separate the berries from the juice mixed with water.
4. The liquid (juice + water) is poured into a clean glass jar, where sugar and yeast are added.
5. In a dark place at room temperature, the mixture is aged for about a month until fermentation is completed.
6. After that, the wine is bottled, tightly corked and infused for about 4 more months until fully ripened in a dark, but already cool room.

In cosmetology

Among the most common cosmetic effects of blackberries when applied externally are the ability of various parts of the plant to:

- fight skin inflammation
- reduce sebum production
- soften the epidermis, providing conditions for regeneration,
- nourish and moisturize the upper layers of the skin.

Berry extracts are positioned by manufacturers as an effective vasoconstrictor to improve microcirculation and get rid of rosacea. Blackberry seed oil is widely represented in natural cosmetics as an antioxidant that inhibits the destructive processes of oxidation, due to which it is included in the composition of anti-aging creams and masks, therapeutic preparations for problem skin, ulcer and wound healing agents.

Dangerous properties of blackberries and contraindications

Blackberries have few contraindications. But with increased acidity of gastric juice, the use of these berries and juice should be limited. In addition, blackberries can potentially harm allergy sufferers by causing skin rashes, swelling, diarrhea, or vomiting.

In the list of products containing oxalates (salts and esters of oxalic acid), blackberries are included in the "red zone", which includes those berries that it is desirable to exclude from the diet to reduce the likelihood of exacerbation of urolithiasis, rheumatoid arthritis, and gout. However, blackberries cannot be called the record holder for the "oxalate" indicator, therefore, in the absence of obvious contraindications, the fruits of this plant can be eaten in moderation (about ½ cup per day).

Selection and storage

When choosing a blackberry, black and dry berries should be preferred. If you come across a wet blackberry covered with its own juice, then this means that it has been lying on the counter for at least three days and, most likely, has begun to deteriorate. An indirect sign of a spoiled product may be the presence of a swarm of flies near the tray. But the sour smell of spoiling berries, if you sniff, can be caught on your own.

Usually blackberries are sold without stalks, but if you come across a berry with “tails”, then it’s better not to take one, since it is likely that the crop was harvested too early and it will no longer be able to ripen at home “on the windowsill”.

It is better to wash blackberries immediately before eating. In addition, to rid the fruits of natural moisture, they can be laid out on a paper towel in one layer.

When buying blackberries, keep in mind that fresh berries do not store for a long time. Even in the refrigerator they should not be kept for more than 3-4 days. The exception is low temperatures close to 0°C, at which the berry can lie for almost a week, as well as temperatures below zero, which allow the berries to be frozen until the next season. In order to easily extract the right amount of blackberries from the freezer later, it is advisable to freeze the berries on a baking sheet or cutting board laid out in one layer, and when they are frozen, pour them into a common container.

Also, for long-term storage, blackberries can be dried. In the traditional way, such drying is carried out under the sun or on special dryers heated by fire at a temperature of about 60 ° C. Similarly, blackberries can also be dried in ovens with the door slightly ajar to allow evaporating moisture to escape. Store dried fruits in paper bags or cardboard boxes.

Varieties and cultivation

As a fruit plant, blackberries have been cultivated only since the end of the 18th century. In Mexico, the USA, Serbia, Hungary, England, Romania, Poland, Croatia, Germany and some other countries, it is grown on an industrial scale, but the number of blackberry-producing countries has recently been growing.

Today there are many species, varieties and hybrids of blackberries. Breeders have also bred thornless varieties of blackberries, which bear fruit even more actively than thorny varieties, however, as a rule, they tolerate frosts worse.

One of the most popular varieties of thornless blackberries, Thornfree, is valued precisely for its ability to withstand temperatures down to -20°C. In this variety, up to 20-30 fruits grow on each brush, so that it is possible to collect up to 30 kg of berries from one bush.

In the United States, Marionberry berries are very popular, a blackberry variety (a cross between Chehalem and Olallie varieties), developed as part of a joint breeding program between the US Department of Agriculture and the University of Oregon.

Blackberry and raspberry hybrids are also widespread. So, back in 1883, lawyer James Harvey Logan accidentally crossed Texas Early blackberries and Red Antwerp raspberries on his plot, resulting in a product that was later named after him Logan berry. Another common hybrid was the Boysenberry (Ezhemalina, bred in 1923 by Rudolf Boysen). Sweet taste, pronounced blackberry-raspberry aroma and rich dark cherry color of large (average 8.5 g) fruits ensured high consumer demand for them.

In our country, preference is more often given to such varieties of kumanika (upright form) as "Ruben", "Ouachita", "Apache". Among the dewdrops (creeping forms), "Abundant", "Lucretia", "Oregon Thornless" are popular. But in general, from several hundred options for erect, creeping and transitional plant forms, each gardener can choose the most suitable ones.

When growing, after choosing the type and variety of blackberries, it is necessary to allocate a sunny area closed from the wind from the south or southwest side in the garden. At the same time, by the time the fruits appear next year, it will be necessary to consider the possibility of shading the bushes, since the bright sun can burn the berries and spoil their appearance. Blackberries are planted in April-May in well-drained light soil saturated with humus with an optimal pH of 6.

In general, it is considered that it is not difficult to grow blackberries on the site. Previously, gardeners often did this not so much for the sake of the harvest, but to create a decorative and at the same time irresistible hedge. However, now, with the spread of information about the medicinal, nutritional and cosmetic properties of blackberries, people have begun to appreciate the beneficial fruits of this still underestimated plant.

What is the difference between blackberries and black raspberries?

Despite the growing popularity of blackberries, for many people it is still an unfamiliar berry, although more experienced consumers can easily confuse blackberries with black raspberries that look very similar to them.

Black raspberries are a special variety of the more common red raspberries native to North America. Most commercially produced black raspberries are located in the northwestern United States, near the Pacific coast. This plant prefers cooler climates and is not as common as the blackberry. In addition, black raspberries are harvested once a year - in July, which also distinguishes them from blackberries, which are available several months a year.

It is believed that it is even more difficult to distinguish blackberries from black raspberries on a bush than when assembled. And the thorny stems of the plant do not help with this, since different types of blackberries can be with more or less thorns. But after harvesting, the difference between the fruits is more noticeable:

- At the junction of the berry with the stalk, black (as well as red) raspberries will have a cavity. It appears because the core of the fruit (fruit bed) remains on the plant part. But the fruits of the blackberry are completely separated from the stalk, keeping inside the white or greenish fruit, with the help of which the berries were attached to the "tail".
- Both black raspberries and blackberries are soft to the touch when ripe and do not store for a long time. However, black raspberries are even softer and spoil even faster than blackberries.
- The fruits of both plants, at first glance, seem smooth, but if they are placed side by side, then, unlike blackberries, which are really absolutely smooth, a barely noticeable white pile can be seen on black raspberries.
- When comparing tastes, blackberries will be distinguished by a slight astringency, and black raspberries by a pronounced sweetness of the fruit.

In language:

- By the typical name of the blackberry, you can understand what form of the bush we are talking about: an upright plant is called a kumanika, and a creeping plant on the ground is called a dewdrop.

- The Russian name "blackberry" was apparently due to its "hedgehog" thorns on the branches. In related languages and regional dialects, it is called *ozhina*, *azhina*, *syrbalina*, *chill*, *deaf raspberry*, *turquoise* (probably for the bluish tint of the fruit).
- The very name "berry" in relation to blackberries is botanically incorrect. It is more correct to call the fruit of this plant a polydrupe, since it consists of many fruitlets with a stone (drupes) fused together.

In myths and beliefs:

- Celtic mythology ascribes to the blackberry the ability to communicate with the fairies.
- In England, superstitious locals try not to pick blackberries after October 11, because, according to legend, on this day the devil spits on blackberries, and the person who eats them will be cursed or defiled.
- But the fruits collected before September 29 could be used in rituals to add wealth. To do this, the blackberry was placed on the altar and a spell was pronounced, after which the well-being should have grown with the same activity as the thickets of the plant.
- The impenetrable thorny thickets served another purpose in the mythical rites: blackberry bushes planted along the edge of the forest were supposed to protect the villagers from forest spirits.
- Some peoples have a ritual of getting rid of rheumatism, according to which, on a sunny day, a sick person must crawl three times under thorny blackberry bushes, first with his back from west to east, and then face forward - from east to west.

The fashion for blackberry gardening in Western Europe, which peaked in the 60-80s. XX century, led to the fact that thorny bushes began to spread uncontrollably throughout the territories of cities. This, among other things, was facilitated by birds, which, together with the fruits of the plant that they loved, spread the seeds. As a result, now on the outskirts, wastelands and industrial areas of large European cities, one can find large-scale impenetrable blackberry "wilds", which is sometimes used by beekeepers, since light and tasty honey is obtained from blackberry nectar.

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Blackberries - useful properties, composition and contraindications

Eliseeva Tatyana, editor-in-chief of the project EdaPlus.info

Yampolsky Aleksey, nutritionist

E-mail: eliseeva.t@edaplus.info, yampolsky.a@edaplus.info

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