



Medicinal and Health Benefits of Black Pepper

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ABSTRACT

Black pepper and white pepper are made from the *Piper nigrum* plant. Black pepper is ground from dried, whole unripe fruit. White pepper is ground from dried, ripe fruit that has had the outer layer removed. The black pepper and white pepper powder are used to make medicine. People take black pepper for stomach upset, bronchitis, and cancer. They take white pepper for stomach upset, malaria, cholera, and cancer. Black pepper is sometimes applied directly to the skin for treating nerve pain (neuralgia) and a skin disease called scabies. Black pepper and white pepper are also used topically as a counterirritant for pain. In foods and beverages, black pepper, white pepper, and pepper oil (a product distilled from black pepper) are used as flavoring agents. Many people are ignorant about the numerous health benefits of black pepper. It contains potent antioxidant, antibacterial, anti-inflammatory and anti-carcinogenic properties. It contains iron, potassium, manganese, vitamin C and fiber in large quantities. However, beside these, it does contain other nutritional components.

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Introduction

Incredibly popular black pepper, often referred as “king of spice” is a well-known spice since ancient times. The peppercorn plant is native to tropical evergreen rain forest of South Indian state, Kerala, from where it spread to rest of the world. The Pepper fruit, also known as the peppercorn, is actually a berry obtained from this plant. Botanically, peppercorn belongs to the family of *Piperaceae* of the genus of piper; and known scientifically as *Piper nigrum*. This perennial vine and climber requires supporting tree or pole to grow in height; thus has similar growth characteristics that of *beetle leaf* plant. It begins to bear small round berries after about three to four years of implantation. Technically, the pepper fruit is a drupe, measuring about 5 mm in diameter, containing a single large seed at its center. Black pepper (*Piper nigrum*) is a flowering vine in the family Piperaceae, cultivated for its fruit, which is usually dried and used as a spice and seasoning. The fruit, known as a peppercorn when dried, is approximately 5 millimetres (0.20 in) in diameter, dark red when fully mature, and, like all drupes, contains a single seed. Peppercorns, and the ground pepper derived from them, may be described simply as pepper, or more precisely as black pepper (cooked and dried unripe fruit), green pepper (dried unripe fruit) and white pepper (unripe fruit seeds). Black pepper is native to south India, and is extensively cultivated there and elsewhere in tropical regions. Currently Vietnam is the world's largest producer and exporter of pepper, producing 34% of the world's *Piper nigrum* crop as of 2008. Dried ground pepper has been used since antiquity for both its flavour and as a medicine. Black pepper is the world's most traded spice. It is one of the most common spices added to European cuisine and its descendants. The spiciness of black pepper is due to the chemical piperine, not to be confused with the capsaicin that gives fleshy peppers theirs. It is ubiquitous in the modern world, often paired with salt. Black pepper is defined as a small and unripe fruit of *Piper Nigrum*, a weak climbing plant, which is

dried to be used in the form of spice and seasoning. One of the earliest and the most widely used spices, it smells extremely pungent. In India, its production is largely concentrated in South India and other tropical regions. It is derived from the vine of *Piper Nigrum*. To get black pepper, the berries from the plant are picked when they are still not fully ripe, fermented and then dried in the sun till the time they dehydrate and turn brownish-black in colour. Known as the 'king of spices', black pepper has remained the most precious and valuable form of spices in the world. It is the 3rd most added ingredient in food among the wide range of spices. India is one of the largest producers of black pepper, after China and Vietnam. Black pepper has played a pivotal role in India's international trade and it is said that the Europeans came to India primarily for this very spice. A wide variety of black pepper is traded at an international level, with India as one of the top five exporters of black pepper, along with Vietnam, Indonesia, Brazil and Malaysia.

History of Black Pepper

Black pepper is one of the first form of spices to have been cultivated since pre-historic times. It has been addressed as a master spice because it has the ability of being stored for years without losing its flavor or aroma. The importance of black pepper can be judged from the fact that in the ancient times, it was used as a form of currency to pay taxes, dowry, rent, etc. In ancient times, black pepper was found in the nostrils of the Ramesses II, the third Egyptian pharaoh of the nineteenth dynasty. The black pepper was placed there to mummify his corpse as part of the Egyptian ritual. In the Middle Ages, it was used as a means to conceal the foul smell of meat. Black pepper is known to be a native to India and has been used since 2000 BCE. Its production was primarily concentrated in the Malabar coast of Kerala in India. After the Middle Ages, black pepper traveled from this Malabar Coast to Europe, North Africa and Middle East. Malaysia and Indonesia have been growing black pepper for the last 2000 years. The importance of black pepper

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was one of the many important reasons that attracted the Europeans to come to India. Like many eastern spices, pepper was historically both a seasoning and a medicine. Long pepper, being stronger, was often the preferred medication, but both were used. Black Pepper (or perhaps long pepper) was believed to cure illness such as constipation, diarrhea, earache, gangrene, heart disease, hernia, hoarseness, indigestion, insect bites, insomnia, joint pain, liver problems, lung disease, oral abscesses, sunburn, tooth decay, and toothaches. Various sources from the 5th century onward also recommend pepper to treat eye problems, often by applying salves or poultices made with pepper directly to the eye. There is no current medical evidence that any of these treatments has any benefit; pepper applied directly to the eye would be quite uncomfortable and possibly damaging. Nevertheless, Black pepper, either powdered or its decoction, is widely used in traditional Indian medicine and as a home remedy for relief from sore throat, throat congestion, cough etc. Pepper is known to cause sneezing. Some sources say that piperine, a substance present in black pepper, irritates the nostrils, causing the sneezing; Few, if any, controlled studies have been carried out to answer the question. It has been shown that piperine can dramatically increase absorption of selenium, vitamin B, beta-carotene and curcumin as well as other nutrients. As a medicine, pepper appears in the Buddhist Samāñaphala Sutta, chapter five, as one of the few medicines allowed to be carried by a monk. Several color pepper corns found in the markets are nothing but the same fruit, which picked up from the plant at different stages of maturity and subjected to different methods of processing. Generally, the peppercorns are harvested when they are half-matured and just about to turn red. They are then left to dry under the sun light that causes them to shrivel and turns black. Alternatively, green pepper corns are picked while the berries still unripe and green. The white peppercorns are derived when fully ripe berries soaked in brine to remove their dark outer coat, leaving the inner white-color pepper seed. Black peppers have a strong spicy taste that comes to them from volatile-oils such as piperine. In ground peppers, these volatile oils may evaporate if kept open in the air for longer periods. Cubeb or tailed pepper berries are dried unripe fruits of the *Piper cubeba* vine that is grown mainly Indonesian rain forest. They appear similar to black peppercorns but have a characteristic stalk which is often interpreted as a "tail." Cubeb berries have a distinctive flavor rich in monoterpene essential oil, *cubebene*.

Scientific Classification

Scientific classification	
Kingdom:	Plantae
(unranked):	Angiosperms
(unranked):	Magnoliids
Order:	Piperales
Family:	Piperaceae
Genus:	<i>Piper</i>
Species:	<i>P. nigrum</i>
Binomial name	
<i>Piper nigrum</i> L.	

Chemical Constituents

The presence of monoterpenes like sabinene, beta-pinene, limonene, terpinene, alpha-pinene, myrcene, delta-3-carene and monoterpene derivatives are largely responsible for the pungent and hot aroma that comes from the black pepper. It also contains 3% essential oil, with about 20% of this essential oil being made up of volatile oil like beta-caryophyllene, humulene, beta-bisabolone and caryophyllene ketone. Apart from these basic ingredients, black pepper also contains about 8% to 14% moisture, 1.55% to 2.60% nitrogen and 28% to 49% starch which is obtained by acid hydrolysis.

Health Benefits Of Black Pepper

Listed below are some of the effective Health Benefits of Black Pepper:

Black pepper is known to improve digestion. Consume 5gm of black pepper powder mixed in a cup of buttermilk in case of digestive problems and intestinal infections. It treats these problems effectively as well as gives relief. Pepper helps stomach to produce hydrochloric acid which is needed to digest food. This prevents food staying in the stomach for a long time which ultimately cures flatulence and stomach irritations.

➤ In case of anorexia (loss of appetite), a decoction of black pepper taken helps solving the problem by stimulating the taste buds.

➤ In case of fever with chills, drink little warm water boiled with pepper seeds. It effectively reduces the high temperature.

➤ Chewing the seeds, gargling with warm water boiled with the seeds, relieves toothaches.

➤ A decoction of black pepper taken twice a day alleviates constipation.

➤ Sucking few pepper corns provides immediate relief from throat irritations and dry cough.

➤ A decoction of black pepper taken twice a day helps common cold and cough.

➤ It promotes proper urination and sweating that helps get rid of harmful toxins from the body.

➤ In case of minor cuts, sprinkle little black pepper powder on the area. It stops bleeding and its antibacterial properties promote immediate healing by killing the germs.

Medicinal Importances of Black Pepper

Peppercorns contain an impressive list of plant derived chemical compounds that are known to have disease preventing and health promoting properties. Peppers have been in use since ancient times for its anti-inflammatory, carminative, anti-flatulent properties. Peppercorns are composed of health benefiting essential oils such as piperine, an amine alkaloid, which gives strong spicy pungent character to the pepper. It also contains numerous monoterpenes hydrocarbons such as *sabinene*, *pinene*, *terpinene*, *limonene*, *myrcene*, etc., which gives aromatic property to the pepper. The above-mentioned active principles in the pepper may increase the gut motility as well as the digestion power by increasing gastro-intestinal enzyme secretions. It has also been found that piperine can increase absorption of selenium, B-complex vitamins, beta-carotene, as well as other nutrients from the food. Black peppercorns contain a good amount of minerals like potassium, calcium, zinc, manganese, iron, and magnesium. Potassium is an important component of cell and body fluids that helps controlling heart rate and blood pressure. *Manganese* is used by the body as a co-factor for the antioxidant enzyme, *superoxide dismutase*. *Iron* is essential for cellular respiration and blood cell production. They are also an excellent source of many vital B-complex groups of vitamins such as Pyridoxine, riboflavin, thiamin and niacin. Peppercorns are a good source of many antioxidant vitamins such as vitamin-C and vitamin-A. They are

also rich in flavonoid polyphenolic anti-oxidants like carotenes, cryptoxanthin, zeaxanthin and lycopene. These compounds help the body remove harmful free radicals and help protect from cancers and diseases.

Nutrition Value

Black peppers (Piper nigrum), Nutritional value per 100 g. (Source: USDA National Nutrient data base)		
Principle	Nutrient Value	Percentage of RDA
Energy	255 Kcal	13%
Carbohydrates	64.81 g	49%
Protein	10.95 g	19.5%
Total Fat	3.26 g	11%
Cholesterol	0 mg	0%
Dietary Fiber	26.5 g	69%
Vitamins		
Choline	11.3 mg	2%
Folic acid	10 mcg	2.5%
Niacin	1.142 mg	7%
Pyridoxine	0.340 mg	26%
Riboflavin	0.240 mg	18%
Thiamin	0.109 mg	9%
Vitamin A	299 IU	10%
Vitamin C	21 mg	35%
Vitamin E- γ	4.56 mg	30%
Vitamin K	163.7 mcg	136%
Electrolytes		
Sodium	44 mg	3%
Potassium	1259 mg	27%
Minerals		
Calcium	437 mg	44%
Copper	1.127 mg	122%
Iron	28.86 mg	360%
Magnesium	194 mg	48.5%
Manganese	5.625 mg	244.5%
Phosphorus	173 mg	25%
Zinc	1.42 mg	13%
Phyto-nutrients		
Carotene- β	156 mcg	--
Carotene- α	0 mcg	--
Crypto-xanthin- β	48 mcg	--
Lutein-zeaxanthin	205 mcg	--
Lycopene	6 mcg	--

Selection And Storage

Black Peppers are available year around. In the store, buy whole peppercorns instead of pepper powder since, oftentimes it may contain adulterated spicy powders. The peppercorns should be wholesome, heavy, round and compact. Peppercorns can be stored at room temperature for many years and can be milled using hand mill as and when required. It can be kept in the refrigerator for up to a month or so. Powdered pepper should be stored in the refrigerator in airtight containers.

Medicinal Uses

Peppers have been used therapeutically in dentistry as an antiseptic for tooth-decay and gum swellings. Peppercorns are also being used as traditional medicines in treating flatulence and indigestion, however, there is little or no data to support these claims in modern medicine. Apart from tantalizing the taste buds, black pepper has plenty of medicinal properties as well. Let us discuss most important medicinal characteristics of black pepper.

Digestive aid: Black pepper is proved to aid digestion and improve the appetite. Black pepper contains piperine, that can dramatically increase absorption of selenium, vitamin B, beta-carotene and curcumin as well as other nutrients. It is also found that the outer layer of the peppercorn stimulates the breakdown of fat cells and thus reduce fat build up in body.

Anti-inflammatory properties: Black pepper powder or decoction is a proven home remedy for cold, cough and sore throat. Alkaloids (mainly piperine) in black pepper acts as a central nervous system depressant and thus have anti-fever, pain relieving, anti-inflammatory effects.

Antioxidant properties: Extracts from black pepper have been found to have many powerful antioxidants making it one of the most important spices for preventing and curtailing oxidative stress.

Anti-carcinogenic effects: With respect to cancer, black pepper is the most important spice. Piperine found in black pepper slows down some of the cytokines (Cytokines are a category of signaling molecules used extensively in intercellular communication) that are produced by cancer cells. This prevents cancer cells from communicating with each other and thus slows down further spreading of cancer.

Thermogenic Properties: Piperine present in black pepper acts as a thermogenic compound. Piperine enhances the thermogenesis of lipid and accelerates energy metabolism in the body and also increases the serotonin and beta-endorphin production in the brain.

With all these amazing properties, no wonder why black pepper is called "The King of All Spices"

Culinary uses

Black pepper is one of the most versatile spices used in virtually in all kinds of savory cooking. In order to keep their fragrance and flavor intact, they are generally ground just before preparing dishes and added at the last minutes in the recipes (since prolonged cooking results in evaporation of essential oils).

Here are some preparation tips:

Black peppercorns along with other spices and seasonings are used to marinate chicken, fish, and meat.

The spice is used liberally in Indian vegetarian and chicken curries and in the Middle-East, in meat and rice dishes.

They can be used in the preparation of soups, barbecue sauces, pickling and as a main ingredient in variety of curry powders.

Although preferred in savory foods, this spice is also used in tiny quantities in sweet preparations like fruitcakes, breads, pies to add a spicy note.

In India and Pakistan, black peppercorn powder is mixed with salt, and the mixture is a common item on serving table in restaurants. The mixture is used as sprinkle over vegetable/fruit salads, chats, lemonades, in soups, etc. Lassi (churned yogurt) is often flavored with this spice-salt mixture in the Punjab province.

Cubeb peppers mainly feature in Indonesian curries.

In Ayurvedic traditions, black pepper or marich is named after the Sanskrit word for the sun. Black pepper contains very potent solar energy and is a powerful digestive stimulant. Black pepper is rajasic or energy-producing, in nature. The plant is native to South India, where the white-flowered shrub grows wild. The yellow berries, which are dried for peppercorns, turn red when they mature and are ready for harvesting.

Black pepper has a heating and drying effect. The taste is pungent and bitter; both properties are good for balancing an overabundance of kapha. The part of the plant used is the actual pepper kernel and the oil made from it. Black pepper stimulates the plasma and the blood, the nervous system, the spleen, and reduces body fat. It is beneficial for chronic indigestion, toxins in the colon, sinus congestion, and can stimulate the circulation to help warm cold hands and feet. Black pepper is taken as a spice, as an oil, a tea, or a compress. Black pepper easily combines well with orange, ginger, cypress, anise, sandalwood, lemon, and basil; which all complement each others healing abilities.

Black pepper has the following effects on the three Ayurvedic Bio energies. It has been known to reduce kapha, it increases pitta and vatha. Black pepper can also be used when cooking as a stimulant because black pepper's qualities are enhanced by heating. The oil made from black pepper can be used to clear sinus congestion and stimulate fat reduction. To assist in weight loss, blend 10 drops of lavender oil with 10 drops of black pepper oil, 5 drops sandalwood oil, and 5 drops frankincense oil. Mix all of these ingredients with 3 fluid ounces of almond oil. Store this mixture in a dark glass container. Clearly label the mixture to show it is for weight reduction use and massage into areas where you want to lose weight.

There are specific cautions associated with the medical use of black pepper that you need to be aware of before using it. Do not use black pepper medically when your Ayurvedic practitioner has diagnosed you with a case of high pitta or in cases where your digestive organs are inflamed. The overuse of any stimulant herbs has been known to impair the body's natural balancing systems. If you find that you are attracted to adding pepper to almost all of your food, you should probably make an attempt to cut back.

Conclusion

Pepper is known to cause sneezing. Some sources say that piperine, a substance present in black pepper, irritates the nostrils, causing the sneezing. It has been shown that piperine can dramatically increase absorption of selenium, vitamin B, beta-carotene and curcumin as well as other nutrients.

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