

EFFICACY OF *PIPER NIGRUM* (BLACK PEPPER): A REVIEW

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ABSTRACT

Considerable literature on medicinal uses of black pepper is available in the traditional system of medicine. Black pepper has been used in many traditional, particularly Unani system of medicine. In this review paper, the study of black pepper, its medicinal uses along with pharmacological actions is being presented. The plant description, its chemical constituents, and properties have also been included. The paper also demonstrates the geographical distribution of black pepper across the world. The analysis shows that black pepper could be used as an effective medicine for various ailments in both as single as well in compound formulations.

Keywords: Black pepper, Filfil siyah, Unani medicine.

INTRODUCTION

Often referred as “king of spice,” black pepper is incredibly popular spice since ancient times. Black pepper fruits are the source of one of the world’s most widely and frequently used spices. Botanically, peppercorn belongs to the family of Piperaceae, in the genus of piper and known scientifically as *Piper nigrum*. Peppercorn is native to the tropical evergreen rain forest of South Indian state, Kerala. Black pepper is very commonly used remedy in the traditional system of medicine. Medicinal uses of black pepper are mentioned in different folk and alternative medicine such as Unani, Ayurveda, and Siddha. They are most frequently used as an appetizer and to treat problems associated with the digestive system. Black pepper (Filfil Siyah) has been used in Unani System of medicine since the time immemorial. Great ancient physicians such as Galen, Dioscorides, and Ibn-e-Baitar have mentioned it for the treatment of various diseased conditions. With considerable benefits, this is used in treating various gastric disorders and phlegmatic ailments. It also occupies an important place in Vedic literature. As a culinary spice and condiment, it is well known throughout the world.

Scientific classification

Kingdom: *Plantae*
Sub-kingdom: Tracheobionta
Super-division: *Supermatophyta*
Division: Magnoliophyta
Class: Magnoliopsida
Subclass: *Magnoliidae*
Order: Piperales
Family: Piperaceae
Genus: *Piper L.*
Species: *P. nigrum L.* [1]

Vernacular names

Arabic: Filfil aswad, babary
Bengal: Golmorich, Kolukung
Bombay: Kalamiri, Miri
Ceylon: Molavu
Chinese: Fou Tsiao, Hu Chiao
Deccan: Choca, Kali mirchingai
English: Black pepper, pepper
German: Pfeffer
Greek: Peperi

Gujrati: Kalmari, Kalomirich
Hindi: Habush, Kali mirch
Italian: Pepe, pepe nero
Kashmir: Martz
Konkani: Miriam
Malayalam: Kolakam, Maricham
Marathi: Kalimirch
Persian: Filfil-e-aswad, Filfil-e-gard
Punjab: Golmirch
Russian: Peretz
Sanskrit: Dharmapattana, Katuka
Spanish: Pimienta negra
Tamil: Aguttam, Arisu, Kari
Telugu: Marichamu, Miremu
Urdu: Kalimirch

Plant description

In the book, “Indian medicinal plant” it has been described that black pepper is stout glabrous climber, stems terete, sparingly rooting, and much thickened at the nodes. Leaves are coriaceous, 10-18 by 5-12.5 cm, broadly ovate, acuminate, glabrous, 5-9 nerved, the supra basal nerves usually alternate, base is usually rounded which is more or less oblique; petioles 1.3-2.5 cm. Flowers in slightly interrupted lobarous spikes of variable length (5-15 cm) and sometimes polygamous; bracts of the female spike are more or less adnate to the rhachis and forms a short hemispheric cup beneath the ovary. Flowers have two stamens and 2-4 stigmas. Fruit is globose, 6 mm or less in diameter, at first it is yellow, afterward becoming red when fully ripen [2].

Bhattacharjee in his book “Handbook of medicinal plant” has described that the dried mature but unripe berries are known as black pepper. Plant requires warm and humid climate and temperature ranging from 10°C to 39°C [3].

Distribution

A branching, climbing perennial shrub, mostly found cultivated in the hot and moist parts of India, Ceylon, and other tropical countries. Black pepper is one of the most cultivated crops in India and has probably originated in the hills of Southern-Western India [4]. It is mostly found in Southern India and is cultivated in Tamil Nadu and Kerala and also found in Singapore, Acheen and Lampong districts of Sumatra, Sri Lanka, France, Indonesia, Thailand, South America, and West Indies [5]. It is indigenous to Malabar Travancore coasts, i.e. western coast of

India [6]. Black pepper has been found throughout India in evergreen forests up to 1500 m [7].

Chemical constituents

Black pepper contains moisture 13.2%; protein 11.5%; fat 6.8%; fiber 14.9%; carbohydrates 49.2%; mineral matter 4.4%; calcium 460 mg/100 g; phosphorus 198 mg/100 g; phytin phosphorus 115 mg/100 g; Iron 16.8 mg/100 g. Vitamin A value 1,800 I.U./100 g. The presence of oxalic acid (00.4-3.4%) has been reported. Starch is the predominant constituent of black pepper; it accounts 34.1% in it. The alkaloid piperine (C₁₇ H₁₉ O₃ N, m.p.129-30) is considered to be the major constituent responsible for the bitter taste of black pepper. Other pungent alkaloids, occurring in pepper in smaller quantity, are chavicine, piperidine, and piperettine. Oil of the pepper is an almost colorless to slightly greenish liquid with a characteristic odor of pepper and also of phellandrene [8].

Temperament

- Hot³ Dry³ [9,10].

Taste

- Pungent [9,10].

Dosage

- 4.5-9 g [9].

Substitute

- Zanjabeel (*Zingiber officinalis*) [11].
- White pepper [9].
- Peepal (*Ficus religiosa*) [11].

Pharmacological actions

- Antiperiodic [2,6,9,10].
- Acrid [6,9].
- Antihelmenthic [2,7].
- Alterative [2,7].
- Alexipharmic [2].
- Anti-inflammatory [2].
- Abortifacient [2,12].
- Aphrodisiac [2,9].
- Appetizer [13].
- Antiblennorrhagic [3].
- Antacid [3].
- Antipyretic [10].
- Absorbent [12].
- Antidote [7,12].
- Aromatic [2,14,15].
- Bacteriostatic [4].
- Carminative [2,3,6,7,10,14].
- Cardiac stimulant [12,14].
- Detergent [9,12].
- Deobstruent [10,14].
- Digestive [7,9,10,12-13].
- Diaphoretic [2].
- Diuretic [7,9,12].
- Emmenagogue [2,7,9].
- Energetic [2].
- Expectorant [6,9,13,16].
- Fungistatic [4].
- Liver tonic [7,11,13].
- Nervine tonic [9,11,14,13].
- Purgative [2].
- Resolvent [2,6,10-14].
- Rubefacient [2,4,6,7,15].
- Stomachic [2-4,9,11].
- Stimulant [2,3,6,7,10,14,15].
- Sedative [9,16].

Medicinal uses

In the classical literature, many Unani scholars have mentioned various medicinal uses of black pepper. It has been described for its efficacy in cholera, dyspepsia, flatulence, diarrhea, and other gastrointestinal ailments. It is a useful ingredient in tooth powders. In "Ilaj-ul-Ghurba" a pill is recommended for syphilis, which is prepared by taking black pepper (*P. nigrum*), *Calotropis gigantea*, and jiggery. Externally, it is applied to boils. It is also used in case of sore throat, alopecia, skin disorders, and piles. Finely powdered black pepper and sesame oil well mixed and heated, when applied over the paralytic area, is proved to be effective. A preparation made with black pepper leaves of *Cassa occidentalis* is good for night blindness. It is also used in the treatment of gonorrhoea. The drug is used as an antidote for scorpion sting [6].

The plant *Cissampelos pareira*, in combination with black pepper, has been claimed to be useful in birth control when given immediately after delivery. In Cambodia, it is also used as cure for dysentery [2].

In reference with Dioscorides, it is mentioned in Al-Jama-al-Mufradat-al-Advia-wo-al-Aghzia, that it is beneficial for the treatment of cough and chest pain when given in the form of sharbat (Syrup) or lauj (Paste). Along with honey, it is good for diphtheria. The combination of black pepper, onion, and salt, when applied on the bald area, is effective for curing alopecia. When used along with vinegar, it is good for teeth [12].

Pharmacological studies

Various studies have been conducted and proved different pharmacological actions of *P. nigrum*. Some among them are *in vivo* and *in vitro* as well animal studies. Some pharmacological studies of *P. nigrum* are listed below:

- Analgesic and anti-inflammatory [17]
- Antidiarrheal [18]
- Antimicrobial [19]
- Antioxidant [20].

Summary

While going through the details of *P. nigrum* in classical Unani literature, it has been observed that it is a medicine that has multiple uses in treating various disorders such as cholera, dysentery, dyspepsia, and flatulence. It has also noted that *P. nigrum* has been an important constituent in the formulations to treat dermatological disorders. It goes in consonance with the available studies describing the bioavailability properties of *P. nigrum*.

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