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FILFIL SIYAH (*PIPER NIGRUM*); THE SPICE OF MEDICINAL IMPORTANCE

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ABSTRACT

Black pepper (well known as *Filfil Siyah* in Unani system of medicine) is a flowering vine in the family *Piperaceae*, cultivated for its fruit, known as a peppercorn, which is usually dried and used as a spice and seasoning. When fresh and fully mature, the fruit is about 5 mm (0.20 in) in diameter and dark red, and contains a single seed, like all drupes. 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), or *white pepper* (ripe fruit seeds).[1] The use of *Piper nigrum* since ancient times in different alternative system of medicine like Unani, Ayurveda etc. for the treatment of *Nafakh-e-Shikam* (Flatulence in the stomach), *Waj-ul-Meda* (Gastric Pain), Zof-e-Ishteha (Anorexia) it is also used as *Kasir-r-Riyah* (Carminative), *Mudir-e-Baul* (Diuretic), *Mudir-e-Haiz* (Emmenagogue), *Muharrik* (Stimulant), *Munaffis wa Mukhrij* (Expectorant), *Muqawwi-e-Medah-wa-Jigar* (Liver and Gastric tonic), *Daf-e-Humuzat* (Antacid), *Muqawwi-e-Aasab* (Nervine Tonic), *Muqawwi-e-Bah* (Aphrodisiac) etc. Several studies have been carried out for the therapeutic evaluation of its efficacy and safety. So, I want to compile and summarized all the literature at one space.

KEYWORDS: *Filfil siyah; Black pepper; Piper nigrum; Kali Mirch; Kasir-r-Riyah; Muqawwi-e-Medah-wa-Jigar.*

INTRODUCTION

Black pepper is native to South Asia and Southeast Asia, and has been known to Indian cooking since at least 2000 BCE. J. Innes Miller notes that while pepper was grown in southern Thailand and in Malaysia, its most important source was India, particularly the Chera dynasty, in what is now the state of Kerala.[1,2] The lost ancient port city of Muziris in Kerala, famous for exporting black pepper and various other spices, gets mentioned in a number of classical historical sources.[3,4,5] The ancient history of black pepper is often interlinked with (and confused with) that of long pepper, the dried fruit of closely related Piper longum. The Romans knew of both and often referred to either as just piper. In fact, the popularity of long pepper did not entirely decline until the discovery of the New World and of chili peppers. Chili peppers—some of which, when dried, are similar in shape and taste to long pepper—were easier to grow in a variety of locations more convenient to Europe. pepper is used to improve appetite and digestion, as well as treat stomachache, heartburn, indigestion, intestinal gas, diarrhoea, and cholera. It is also used for lung problems including asthma, bronchitis, and cough. Other uses include treatment of headache, toothache, vitamin B1 deficiency (beriberi), coma, epilepsy, fever, stroke, trouble sleeping(insomnia), leprosy, extreme tiredness, enlarged spleen, muscle pain, nasal discharge, paralysis, psoriasis, intestinal worms, snakebites, tetanus, thirst, tuberculosis and tumours. Some women use Indian long pepper during childbirth and during the 3-6 weeks following childbirth while the uterus returns to normal size. Women also use Indian long pepper to stimulate menstrual flow; to cause abortions; and to treat menstrual cramps, infertility, and loss of interest in sexual activity. Several studies have been carried out for the therapeutic evaluation of its efficacy and safety.[6]

MATERIAL AND METHODS

Review material collected from the different ancient Unani books, PG Dissertation, online authentic research

Journals & different websites and summarized with the help of computer.

DRUG REVIEW

Piper nigrum is famous as the spices pungent quality.[7] Black pepper (*Piper nigrum* L.) is native of south India, popularly known as" king of spices". Pepper is mostly used in the curry recipes as masalas and also as ingredient in the prescriptions of folk medicine and traditional medicinal systems. This unani medicine is in use since thousands of years by Unani physicians, *Rhazi* (850-925A.D) and *Abu Marwan Ibn Zohr* was mention this herb in their books.[8,9,10] Black pepper can be used for different purposes such as human dietaries, as medicine, as preservative and as a biocontrol agent.[11,12]

Botanical Name
Piper nigrum

Synonyms:[13,14,15,16,17,18]

Urdu:	Filfil Siyah, Kalimirch
Arabic:	Filfil Aswad
Persian:	Filfil Siyah
Bengali:	Golmorich, Kalaorich, Morich
English:	Black Piper
Gujarati:	Kalimori
Hindi:	Kalimirch
Kannada:	Karimonaru, Menaru
Malayalam:	Kalamiri
Marathi:	Kalamiri
Punjabi:	Galmirich, Kalimirch
Tamil:	Milagu
Telugu:	Miriyalu, Marichamu

Description in Unani Literature: Piper plant as a weak climbing or trailing shrub with adventitial root, reaching a length of about 9 meters. It has ever green leaves and very small one seeded berry like drupes. The fruits are globular about 4-6 mm in diameter. In ripening they change in colour from green to bright red and then to yellow. Leaves have typical aromatic and have a pungent smell.[8,18]

Botanical Description: Piper as a woody climbing vine growing up to 9m (30 ft) 0r more in length. The greyish stem may reach 1.2 cm (0.5in) diameter. Numbers of rootlets grow from swollen stem nodes. These stem roots allow the vine to attach to other surface such as other plants or structure for support so that they climb over them. Leaves are Dark green above and pale green beneath. They are glossy, ovate and acutely tipped, and range in size from 13-25 cm in length. Elongated, slender spikes or catkins bear minute, white flowers. Each flower spike producing 50-60 single seeded berries, appears on stem opposite the leaves. Therefore, yield of the berries depends upon leaf number.[19]

Habitat and Distribution: *Piper nigrum* is a widely available species of the genus Piper. It is found extensively in the evergreen forest of the Western Ghats and adjoining areas almost from sea level up to an elevation of 1300m. As it is available in such a vast altitudinal diversity and shows great adaptability to a wide range of climatic and soil condition, it is possible that there will be a good inter-species diversity. Piper is currently cultivated in the tropics worldwide. In the Pacific, it is an important cash crop in the Federated States of Micronesia Worldwide leaders in piper production are Singapore, Sri Lanka, France, Indonesia Thailand, West Indies and South America. In India mostly found in Southern India, cultivated in Tamil Nadu and Kerala.[18,19]

Chemical Constituents: A number of components have been isolated from piper nigrum plant. It is observed that the major component of the essential oil obtained from the aerial parts of Piper nigrum were Globulol, alpha-pinene, betacaryophyllene and alpha-terpinene and nerolidol. In which beta-caryophyllene and nerolidol are the two important volatile oil constituents present in the leaf oil in varied percentage in different accessions. Alkaloids (Piperine, Chavicine; Piperidine. Piperetine), Essential oil. Steroids, Saponin, glycoside, Polysaccharides and Sugar. Apart from all these composition Potassium, Magnesium, Iron, Magness, Phosphorus, Chlorin, Brass and Iodine is also present. Different field investigator isolated valuable compound from this specie including Phenolics, various derivatives of Lignans, Terpenes, Chalcones, Flavonoid, Alkaloid and Steroid. Brachyamide B, Dihydropipericide, benzamide group. As well as Isobutyl-eicosaterienamide, isobutyldecadienamide, piperamide, piperamine, piperettine, pipericide, piperine, piperolein B, Trichostachine, sarmentine, sarmentosine are also present.[7,17,20,21,22,23,24,25,26,27,28,29]

Mizaj: Hot and Dry.[17] Hot 3 and Dry 3.[8,15,18]
Parts Used: Berries collected as soon as becoming red and dried.[18]

FUNCTION AND USES

Externally: *Jali, Jazib-e-Khoon, Musakkin*

Internally: Carminative, Diuretic, Emmenagogue, Stimulant, Expectorant, Liver and Gastric tonic, Antacid, Nervine Tonic, Aphrodisiac.[16,17,18,20]

Therapeutic Uses: Used for the treatment of flatulence in the stomach, gastric pain, anorexia. It has good results in the patients suffering from *Zof-e-Meda*. It is considered as diuretic and emmenagogue. It is very frequently prescribed as Liver and digestive tonic. It is also useful in some type of skin diseases for example *Bars-o-Bahaq*. In patient suffering from cough and nerve weakness, the powder of *Filfil Siyah* mix with honey is beneficial.[15,16,17,20]

Dose: 4-9 gm.[8,18]

Adverse Effect: For Kidney, external wounds.[15,16]
Corrective: Pure Honey (Sahed Khalis).[15,16]
Alternative: Zanjabeel, Safed Mirch.[76]

Importannt Formulation: *Dawa-ul-Shifa, Jawarish Kamoni, Jawarish Kamooni Kabir, Jawarish Falafali Habb-e-Kabid Naushadri Jawarish Jalinoous.*[8,17,18,20]

Scientific Research

1. The biological role of this specie is explained in different experiments that peppercorn and secondary metabolites of Piper nigrum can be used as Antiapoptotic, Antibacterial, Anti-Colon toxin, Antidepressant, Antifungal, Antidiarrhoeal, Anti-inflammatory, Antimutagenic, Anti-metastatic activity, Antioxidative, Antiriyretic, Antispasmodic, Antispermatogenic, Antitumor, Antithyroid, Ciprofloxacin potentiator, Cold extremities, Gastric ailments, Hepatoprotective, Insecticidal activity, Intermittent fever and Larvicidal activity.[30]

2. Piper nigrum L and its active constituent 'Piperine' exhibits diverse pharmacological activities like antihypertensive, antiplatelet, antioxidant, antitumor, anti-asthmatics, analgesic, anti-inflammatory, anti-diarrheal, antispasmodic, antidepressants, immunomodulatory, anticonvulsant, anti-thyroids, antibacterial, antifungal, hepato-protective, insecticidal and larvicidal activities etc. The current review article is aimed to provide an updated literature review on recent advancement of pharmacognosy, chemistry and pharmacological activities of Piper nigrum.[31]

3. Among the various species of the Piperaceae family, black pepper is one of the most popular due to its principle pharmacological component, piperine. Which is an alkaloid that has diverse pharmacological activities like antioxidant, anti-obesity, antitumor, antipyretic, anticonvulsant, anti-thyroid, antifungal, antibacterial, insecticidal, hepatoprotective, anti-asthmatic, larvicidal, antihypertensive, anti-inflammatory, antidiabetic, antidiarrheal, bio-availability enhancer, immunomodulator, antiepileptic, antifertility, GI stimulant, lipid metabolism accelerator, anticancer, CNS stimulant, diuretic, aphrodisiac, blood purifier and antiplatelet activities, *etc*.[32]

4. *Piper nigrum* and its bioactive compounds were also found to possess important pharmacological properties. Antimicrobial activity was recorded against a wide range of pathogens via inhibition of biofilm, bacterial efflux pumps, bacterial swarming, and swimming motilities. Studies also reported its antioxidant effects against a series of reactive oxygen and nitrogen species including the scavenging of superoxide anion, hydrogen peroxide, nitric oxide, DPPH, ABTS, and reducing effect against ferric and molybdenum (VI). Improvement of antioxidant enzymes *in vivo* has also been reported. *Piper nigrum* also exhibited anticancer effect against a number of cell lines from breast, colon, cervical, and prostate through different mechanisms including cytotoxicity, apoptosis, autophagy, and interference with signalling pathways. Its antidiabetic property has also been confirmed *in vivo* as well as hypolipidemic activity as evidenced by decrease in the level of cholesterol, triglycerides, and low-density lipoprotein and increase in high-density lipoprotein. *Piper nigrum* also has anti-inflammatory, analgesic, anticonvulsant, and neuroprotective effects.[33]

5. Black pepper (*Piper nigrum*) is a spice used widely in many traditional cuisines. Recently, the alkamides present in piper have been studied for their antioxidant and anticholinesterase activities (Tu *et al*., 2015). Among the alkamides isolated from *P. nigrum* extract, piperine, piperettine, and piperettyline exhibited inhibitory activities against both acetylcholinesterase and butyrylcholinesterase, while feruperine was a potent inhibitor only of butyrylcholinesterase (Tu *et al*., 2015). *Piper nigrum* and piperine improved cognitive functions and exerted antiamyloidogenic activities in animal models of AD (Subedee *et al*., 2015). Pharmacological research is now aiming to improve piperine bioavailability to develop possible treatments for AD, and there are reports of formulations that have effects similar to donepezil in animal models (Yusuf *et al*., 2012; Elnaggar *et al*., 2015).[34]

6. The chemical composition and antimicrobial mechanism of action of black pepper chloroform extract (BPCE) were investigated, as well as the potential antibacterial activities of BPCE against Escherichia coli and Staphylococcus aureus. The results showed that 1H-Cycloprop[e]azulen-7-ol, decahydro-1,1,7-trimethyl-4-methylene-, (8.39%) and 2-methylene4,8,8-trimethyl-4-vinyl-bicyclononane (6.92%) were identified as the two primary components of BPCE. The release of intracellular transaminases from bacteria after being incubated with BPCE revealed that the bacterial cell walls and membranes were degraded and that protein synthesis was inhibited to some extent. The inhibition of bacterial Na+/K+-ATPase activity upon the addition of BPCE also indicated an enhanced permeability of bacterial cell membranes. Moreover, an analysis of hexokinase and pyruvate kinase activities showed that BPCE affected the metabolic rate of glycolysis and disrupted the normal metabolism of bacteria. Tis phenomenon was supported by an observed accumulation of lactic acid (LA) in the treated bacterial cells. Overall, our results indicated that BPCE damaged bacterial cell walls and membranes, which was followed by a disruption of bacterial cell respiration.[35]

7. Black peppercorns (*Piper nigrum* L.) elicit a pungent and tingling oral impression. Their pungency is partially explained by the agonist activity of some of their active principles, especially piperine, on TRP channels. However, we recently showed that piperine, as well as other pungent compounds, also possess a marked effect on two-pore domain (KCNK, K_{2P}) K^+ channels.[36]

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CONFLICT OF INTEREST

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