

A Critical Review on *Pippali* (*Piper longum* Linn.)

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Abstract

Pippali (*Piper longum* Linn.) belongs to the family Piperaceae and it is a prominent drug of Indian Medicine. It is most common and highly valuable medicine, finding clinical pharmaceutical and therapeutical uses in early classical texts of ancient medical system and presently the role of *Pippali* as an effective and potential drug predominantly continues in medical practice carrying support of experimental studies and multi-disciplinary investigations. *Pippali* is chiefly an esteemed drug in cough, hiccup and asthma, bronchitis, pulmonary tuberculosis and allied diseases of respiratory system. It is specifically useful in chronic fever. As a rasayana drug, *Pippali* has its important place in the field of Indian Medicine in order to achieve both types of objectives of medicine that is protective or preventive and curative and its use as *VardhamanaPippali* is well appreciated for the purpose of rasayana. Current article elaborates the extensive information on *Pippali*.

Keywords

Pippali, Fruiting Spikes, Rasayana, Formulation, Root



Greentree Group

Received 04/03/16 Accepted 03/04/16 Published 10/05/16

INTRODUCTION

Pippali is a very old drug known to Indians for a long time and its antiquity goes beyond 2000-3000 yrs, which is frequently mentioned in Vedic literature. In *Atharavaveda*, *Pippali* is mentioned as *Rasayana*, *KsiptaBhesaji*, *AtividdhaBhesaji* and *VatikrtaBhesaji* (valuable drug). Hindu mythology reveals that *Pippali* has its origin during *Samudramathana* along with *Amrta* (nectar)¹.

The drug *Pippali* is a prominent drug of Indian Medicine and it is most common and highly valuable medicine finding clinical, pharmaceutical and therapeutical uses in early classical texts of ancient medical system and presently the role of *Pippali* as an effective and potential drug predominantly continues in medical practice carrying support of experimental studies and multi-disciplinary investigations.

It is a component of a prominent triad known as *Trikatu* (Comprising *Shunti*, *Marica* and *Pippali*) which is much used in clinical practice as well as pharmaceutical preparations of many compounds. Simultaneously *Pippali* is also component of *Pancakola* (consisting of five drugs) and *Sadushana* (consisting of six

drugs) which are also frequently used in indigenous medicine².

Pippali is chiefly an esteemed drug in cough, hiccough and asthma, bronchitis, pulmonary tuberculosis and allied diseases of respiratory system. It is specifically useful in chronic fever. *Pippali* acts as *Rasayana* (anti-ageing) and its use as *VardhamanaPippali* is well appreciated for the purpose of rasayana. The drug *Pippali* is administered for treatment of several diseases. It is frequently used in liver disorders, splenic enlargement, anaemia, haemorrhoids, worms, dyspepsia, anorexia, loss of appetite, constipation, abdominal colic, gout, rheumatism, urinary complaints, dysmenorrhoea, chronic fever, seminal disorders and general debility³.

MORPHOLOGY

This is a glabrous undershrub/climber with erect or subscandent rough stem and slender branches. Rootstock erect, thick, jointed, branched, stems numerous, 0.6-0.9 m., ascending or prostrate, much branched, stout, cylindrical, thickened above nodes, finely pubescent. Leaves simple, alternate, stipulate and petiolate or nearly sessile according to their position on the plant, numerous, 6.3-9 cm. long, 3-5 cm. wide, lower ones broadly ovate, very cordate with broad rounded

lobes at base; upper ones oblong-oval, cordate at base, all subacute, entire, glabrous, thin, bullate with reticulate venation sunk above and raised beneath, dark green and shining above, pale and dull beneath; petiole of lower leaves 5-7.5 cm., stout, of upper leaves very short or none; stipules about 1.3 cm., membranous, lanceolate, obtuse, soon falling. Inflorescence and Flowers: Flowers unisexual, dioecious, minute, sessile, bracteate, without perianth very densely packed in spike inflorescence, the male and female on separate thickness⁴.

Spikes solitary, pedunculate, male larger and slender, 2.5 to 7.5 cm, bracts narrow, female spikes 1.3-2.5 cm. long and 4-5 mm. diameter; bracts circular, flat, peltate; stamens 2; stigmas 3 or 4, short, spreading, persistent. Fruits: Small about 2.5 mm. in diameter, greyish green or nearly blackish when ripe and are partially sunk in the fleshy axis of the spike. The fruiting spikes are 2.5 to 3 cm. long and 2.5 to 3.5 mm. thick, erect, blunt, ovoid-oblong.

Flowering and Fruiting season:

Plant bears flowers during rainy season and fruiting afterwards, in autumn months.

HABITAT

Pippali plant is indigenous to North-Eastern and Southern India and Ceylon and cultivated in Eastern Bengal. It occurs in hotter parts of India from Central Himalayas to Assam, Khasi and Mikir hills, lower hills of Bengal and evergreen forests of Western Ghats from konkan to Travancore.

CHEMICAL CONSTITUENTS

The plant contains essential oil consisting of long-chain hydrocarbons, mono and sesquiterpenes, caryophyllene being the main product. Other constituents are piperine, pipartine, piperlongumine, piperlonguminine and its dihydro-derivative, piperonaline, piperundecalidine, piperidine and guineensine, sesamin, dieudesmin, β -sitosterol and dihydrostigmasterol. Four aristolactams (cepharanone B, aristolactam AII, piperlactam A and piperlactam B) and five 4, 5 – dioxoaporphines (cepharadione A, cepharadione B, norcepharadione B, piperadione (2 – hydroxy-1-methoxy-6-methyl-4H-dibenzo quinoline-4, 5-(6H)-dione), its 6-demethyl derivative and aminoacids, dehydropiperonaline from the fruit and tetrahydropiperine from the plant have been isolated. Two alkaloids Piper longumine and Piper longuminine characterized as N-(3,4,5-trimethoxy

cinnamoyl)-piperidin-2-one and isobutylamide of piperic acid respectively (stem and roots); n-hexadecane, n-heptadecane, n-octadecane, terpinolene, zingiberene, p-cymene, p-methoxy acetaphenone, traces of dihydrocarveol, phenylethyl alcohol and two sesquiterpenes (essential oil from the dried fruit); piperine, pipartine, triacantane, dihydro-stigmasterol, an unidentified steroid, reducing sugars, glycosides, sesamin and methyl 3,4,5-trimethoxycinnamate (roots); major alkaloid piperine 4-5% and sesamin (stem and fruits); sesquiterpene hydrocarbon, caryophyllene, a sesquiterpene alcohol, carbonyl compound (essential oil); N-isobutyldeca-trans-2-trans-4-dienamide, piperine, pipartine, and a lignin d-sesamin, two piperidine alkaloids-piperundecalidine (fruit); sylvatin, sesamin and diaeudesmin (seed). Resin, volatile oil, starch, gum, fatty oil, inorganic matter. The dried fruit (on steam-distillation) yields 0.7% of an essential oil with spicy odour resembling that of pepper and ginger oil⁵.

Parts Used: Dried unripe fruits or fruiting spikes and Roots.

ACTIONS AND USES

Dried spikes are acrid, vermifuge, mildly thermogenic, stomachic, aphrodisiac, carminative, expectorant, febrifuge, tonic, laxative, digestive, emollient and antiseptic. They are useful in anorexia, dyspepsia, vomiting, flatulent colic, diarrhea, cholera, dysentery, asthma, bronchitis, coryza, hiccough, consumption, gastric disorders, epilepsy, insomnia, fever, gonorrhoea, haemorrhoids, gout and lumbago.

The root is pungent; heating, stomachic, laxative, anthelmintic, carminative; improves the appetite; useful in bronchitis, abdominal pains, diseases of the spleen, tumours, ascites.

The fruits as well as roots are attributed with numerous medicinal uses and may be used for diseases of respiratory tract viz., cough, bronchitis, asthma and other allied ailments. It is used as counter-irritant and analgesic when applied locally for muscular pains and inflammations. A snuff in coma and drowsiness is used and internally as carminative; as sedative in insomnia and epilepsy. It is given as general tonic and haematinic. As cholagogue in obstruction of bile duct and gall bladder it is taken. It is used as an emmenagogue and abortifacient, and for miscellaneous purpose as antihelmintic and in dysentery and leprosy⁶.

PHARMACOLOGY

Antibacterial, anti-inflammatory, insecticidal, antimalarial, CNS stimulant, antitubercular, antihelmintic, hypoglycaemic, antispasmodic, cough suppressor, anti-giardial, immune stimulatory, hepatoprotective, analeptic, antinarcotic, antiulcerogenic⁷.

KINDS AND VARIETIES

The fruits of *Pippali* as crude drug (in trade) appear to be derived from two or more species, including one which is Indonesian. Indian Long Pepper is a product either of *Piper longum* Linn or *Piper prepuoides*, while the Indonesian or Java Long Pepper imported from Malaysia is *Piper retrofractum*. The products of these species are used for the same purposes, though they vary in their effectiveness. Indian Long Pepper is mostly procured from the wild plants grown in some particular regions of its availability in more or less quantity. Some other relevant species include *Piper sylvaticum* Roxb.

SUBSTITUTES AND ADULTERANTS

The fruiting spikes of *Piper longum* are often adulterated with other *Piper* species

like *Piper peepuloides* Roxb., *Piper retrofractum* Vahl and *Piper betle* Linn., the roots of *Piper longum* are adulterated with its stem pieces.

THERAPEUTIC FORMULATIONS⁸

Curna:

Asvagandhadichurna, *Eladicurna*,
katphaladicurna, *Kalyanakacurna*,
Drakshadicurna, *Dusivisadicurna*,
Punarnavadyacurna, *Pancakolacurna*,
Balacaturbhadracurna, *Bilvamuladicurna*,
Visvadyacurna, *Sitopaladicurna*,
Haridradicurna, *Talisadicurna*,
Hingwashtakacurna, *Avipatticurna*.

Avaleha-paka:

Narikelakhanda, *Brahma rasayana*,
Vasavaleha, *Vasaharitakiavaleha*,
saubhagyasunthipaka,
Agastyaharitakiavaleha, *Drakshadilehyam*,
Cyavanaprasham.

Ghrita:

AmritadiGhrita, *AstamangalaGhrita*,
IndukantaGhrita, *KamadevaGhrita*,
kumarakalyanakaGhrita,
DasamulasatpalaGhrita, *DadimadyaGhrita*,
DhanvantaraGhrita, *PatoladyaGhrita*,
PancakolaGhrita, *BrihatShatavariGhrita*,
BrihatAsvagandhaGhrita,
MahakhadirakaGhrita,

*MahatriphalaGhrita, SarasvataGhrita,
SukumaraGhrita, PippalyadiGhrita.*

Rasayogas:

*Agnitundivati, Agnimukha rasa, Ajirnari
rasa, Antravrddhinasaka rasa,
Abhrakadivati, Arsakuthara rasa,
Anandabhairava rasa, Kanakasundara rasa,
Kaphaketu rasa, Kasturibhairava rasa,
Jalodarari rasa, Dantodbhedagadantaka
rasa, Nagavallabha rasa, Brahmivati,
Mritasanjivana rasa, Shirashuladrivajra
rasa, Svachchandabhairava rasa,
Hingulesvara rasa.*

Vati:

*Sarpagandhaghanavati, Sansamanivati,
Suvarnamuktadivati, Apatantrakanasinivati,
Akarakarabhadigutika, Eladivati,
Gorocanadigutika, Vidalavanadigutika,
Maricyadigutika, Mahalaksmivilasavati.*

Guggulu:

*Amrita guggulu, Triphalaguggulu,
Kancanaraguggulu, Kaishoraguggulu,
Gokshuradiguggulu, Yogarajaguggulu,
Mahayogarajaguggulu,
Saptavimsitakaguggulu, Simhanadaguggulu.*

Asava-Arishta:

*Pippalyasava, Vidangarishta,
Sarasvatarishta, Candanasava,
Rohitakarishtha, Kanakasava, Khadirarishta,
Draksharishta, Asvagandharishta,*

*Dashamularishta, Kumaryasava,
Punarnavasava.*

Lauha:

*Candanadilauha, Pippalyadilauha,
Raktapittantakalauha.*

Kwatha:

*Citrakadikwatha, Trptighnakwatha,
Devadarvadikwatha, Pippalyadikwatha,
Bharngyadikwatha, Bhunimbadiqwatha,
Maharasnadikwatha, Vyoshadikwatha,
Elakanadikwatham,
Dashamulakatutrayakwatham,
Dhanadanayanadikwatha.*

Anjana-Netravartti:

*Candrodayavartti, Candrakalanjana,
Candraprabhavartti, Maricyadicurnnanjana.*

Nasya:

Pinasaharanasya, Madhukasaradinasya.

Taila:

*Kacchuraditaila, kasisaditaila,
Pippalyaditaila, Vasacandanaditaila,
Ksarataila, Nagaraditaila, Arimedaditaila,
Balataila.*

PIPPALIRASAYANA:

Person desirous of availing the benefits of rasayana effects should take *Pippali* in numbers of five, seven, eight or ten with honey and ghee for a year. There is also another course where the use in terms of number of fruits is gradually increased such

as three *Pippali* fruits should be taken in morning, after meal and before meal. These fruits should first be impregnated with alkali of palasha and then fried in ghee.

These should be taken (in the morning) with honey by those who want rasayana effect particularly in order to alleviate cough, wasting, pthisis, dyspnoea, hiccup, throat disorders, haemorrhoids, disorders of grahani, anaemia, intermittent fever, disorders of voice, chronic rhinitis, swelling, abdominal lump and vatabalasaka ailments.

This kind of provision of rasayana has been made by Caraka in order to achieve both types of objectives of medicine that is protective or preventive and curative, through oral administration of drug *Pippali*. As rasayana drug, *Pippali* has been prescribed for getting results of promotive therapy and simultaneously its applications as clinical measure has been indicated in various diseases⁹.

PippaliVardhamanaRasyana:

On the first day ten *Pippali* fruits should be taken with milk. From the second day, onwards upto the tenth day ten fruits of *Pippali* should be decreased gradually in the same order till it comes back to ten (on the nineteenth day). After the drug is digested the person should take sastika rice with ghee

extracted from milk. Thus, the use of *Pippali* is total number of one thousand prescribed for rasayanapalasalpa for rasayana effects of *Pippali* based promotive therapy.

The *Pippali* fruits should be taken by the person with high strength in the form of paste, by those with medium strength in that of decoction and by those with low strength in the form of powder keeping the dosas and diseases in view. The initial use of ten *Pippali* fruits is superior, that of six ones is medium and that of three fruits is inferior. These numbers are also applicable according to the degree of strength of the patient.

The rasayana use of *Pippali* is bulk promoting, beneficial for voice, increases life span, alleviates splenomegaly, sustains age and promotes intellect¹⁰.

CONCLUSION

Hence it can be concluded that *Pippali* is a very important drug present in various formulations having wide range of therapeutic uses used for both curative and preventive aspects.

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