



ISSN (E): 2320-3862

ISSN (P): 2394-0530

www.plantsjournal.com

JMPS 2024; 12(4): 429-434

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Received: 22-07-2024

Accepted: 28-08-2024

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Kabābchīnī (Piper cubeba L.F.): A comprehensive review of its medicinal and therapeutic applications in Unani medicine

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DOI: <https://doi.org/10.22271/plants.2024.v12.i4e.1737>

Abstract

Piper cubeba, commonly known as cubebs, is a fruit obtained from the woody climber *Piper cubeba* of the Piperaceae family. This versatile plant has been extensively used in Unani medicine, serving as a condiment and a therapeutic agent. It has shown diuretic, emmenagogue, antitussive, analgesic actions. Therapeutically, it has been used to treat conditions like gonorrhoea, cystitis, rheumatism and urinary incontinence. Therefore, *Piper cubeba* emerges as a multifaceted botanical resource within Unani medicine, offering diverse therapeutic applications. This review provides valuable insights into its pharmacological composition and potential clinical implications.

Keywords: *Piper cubeba*, *Kabābchīnī*, Unani Medicine, Essential Oils, Anti-inflammatory, Emmenagogue.

1. Introduction

Unani medicine (UM), is a traditional system of healing and health maintenance observed primarily in South Asia. Unani medicine has deeply integrated into the Indian civilization over centuries, becoming an integral part of India's healthcare delivery system. Its holistic approach continues to influence health practices and treatment modalities. UM has a vast range of drugs including flowers, fruits, seeds, leaves etc. obtained from various plant sources. *Kabābchīnī* commonly known as cubebs, is a fruit obtained from a woody climber *Piper cubeba* of Piperaceae family. Two varieties of cubeba are found, the larger one is called *Habb-ul-'Urus*, while smaller ones are called *Falanja*. According to *Masīh ibn Hakam*, cubeb also known as *Kabāba* in Arabic is known to possess dual nature i.e., have warm and cold properties but warmth is more dominant. ^[1-2] Fruit is globular with a slender stalk like portion at its base, hence known as cubebs. Cubebs possess spicy, aromatic odour with acrid and bitter taste. ^[3-4] Fruit is globular and resemble black pepper but is differentiated by the presence of stalk. Other piper species like *Piper clusii* D.C and *Piper guineense* are called false cubebs and are used as substitutes. The name *Kabābchīnī* is referred to its Chinese variety. In terms of superiority, fresh and fragrant Chinese variety is best, followed by Roman and then Indian variety ^[2]. Cubeb is extensively used as a condiment and as medicine. It is used as an aromatic stimulant, local irritant, diuretic, emmenagogue, antitussive, analgesic, anti-inflammatory, deobstruent lithotriptic, stomachic, mouth freshening and carminative ^[5]. It contains an essential oil cubebin which is used in lozenges ^[3, 6, 7]. The therapeutic action of drug is said to be largely due to cubebic acid. ^[3] Shelf life of cubeb is two years as mentioned in Unani classical books ^[2, 3, 8]. In this article, an effort has been made to emphasize the therapeutic applications of *Piper cubeba* in accordance with Unani classical literature and scientific studies done on it. Main phytoconstituents in essential oils, and lignans like cubebin have been found to be responsible for its pharmacological actions.

2. Material and Methods

The study on *Kabābchīnī (Piper cubeba L.)* involved collecting relevant literature from both classical Unani medicine texts and modern sources. A total of 30 books were consulted, comprising 19 Unani texts and 11 modern references.

During the review process, three Unani books were excluded due to redundancy. Additionally, information was retrieved from 11 research and review papers available on platforms such as ResearchGate, Google Scholar, Scopus, and Springer. These papers were carefully selected from a pool of approximately 20 sources. The details about the plant were searched by using keywords like *Kabābchīnī*, *Piper cubeba* and cubeb. Appropriate Unani terminologies were taken from the Standard Unani Medical Terminology published by CCRUM in collaboration with the World Health Organisation.

3. Observations

The details of various aspects of the plant are as follow:

3.1 Mutarādīfāt (Vernacular names)

Arabic: *Kabābash*, *Habb-ul-Urūs*, *Kabābah* ^[9-10]

Ayurveda: *Sugandhamuricha* ^[10]

Bengali: *Sītal-chīnī* ^[8]

English: *Cubeba*, *Tailed Pepper* ^[10]

Gujarat: *Kabābchīm*, *Tadāmīrī* ^[6]

Hindi: *Kabābchīnī* ^[6]

Latin: *Cubis* ^[9]

Persian: *Kebābah*, *Kabāb chīnī* ^[10]

Roman: *Farīghaliyūn* ^[9]

Sanskrit: *Sugandha muricha* ^[7]

Tamil: *Vālmilākū* ^[8]

Greek: *Qāqsanūn*, *Qarqīsūn*, *Mahīliyūn* ^[9]

Urdu: *Kabābchīnī* ^[8]

3.2 Shinākht, Māhiyat wa Ḥusūl (Identification,

Description and Collection): Cubeb is a fruit of size as *Filfil* (*Piper nigrum*) and also have resemblance to *Habb-i-Balsān* (*Commiphora opobalsamum* L.), as it appears black outside and whitish inside ^[2, 4]. The plant is woody, climbing and perennial with dioecious flowers in spike, cultivated to a small extent in India, especially in the Karnataka state; fruits are collected when mature but still unripe and carefully dried in sun until turn black and wrinkled ^[8].

3.3 Habitat

It is found in places like China, Rome and India ^[2]. Native to Java and the Moluccas, cultivated to some extent in India mostly Assam and Karnataka ^[8]

3.4 Taxonomical classification ^[11-12]

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Piperales

Family: Piperaceae

Genus: *Piper*

Species: *cubeba*

3.5 Botanical description

A perennial woody climber about 5-15m high. Stem climbing, branched ash-coloured smooth and rooting at the joints ^[13]. Leaves are glabrous, ovate oblong and rounded base smooth and shining with veins proceeding from side of midrib not from its base. Lower side is densely provided with minute sunken glands ^[11]. Flowers are unisexual, diecious, small and sessile. Fruit is sub-globose, apiculate and stalked ^[8, 14].



https://en.wikipedia.org/wiki/Piper_cubeba

Fig 1: Showing Illustrated a. image and live plant b. of *Piper cubeba*

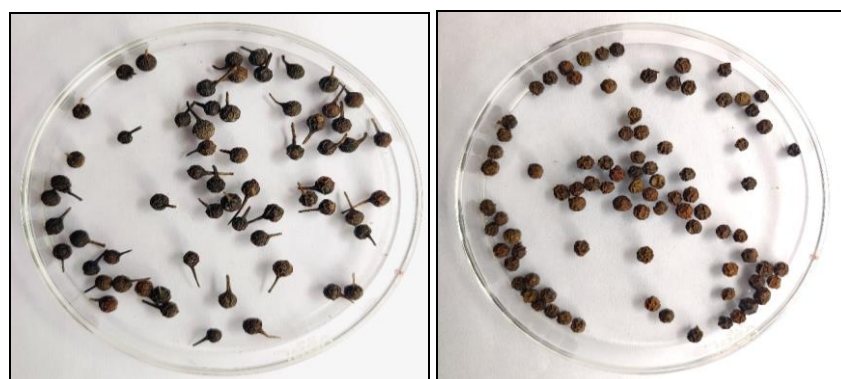


Fig 2: Showing difference between *Piper cubeba* and *Piper nigrum* fruits (*P.C self*)

3.6 Ajzā-i-Musta'mala (Parts used)

Dried immature full grown fruits (berries) [8, 10]

3.7 Mizāj (Temperament)

The temperament of *Kabābchīnī* is mentioned as *Hārr Yābis* (hot and dry) in 2nd degree [4] and some mentioned it *Hārr Yābis* (hot and dry) in 3rd degree [9].

3.8 Af'al wa Khawas (action and uses)

The functions of *Kabābchīnī* are *Muhalil* (resolvent), *Mulatīf* (demulcent), *Mufattih-Sudad* (deobstruent), *Mutayyib-i-Dahan* (mouth freshener), *Muqawwi-i-mi'da* (stomachic), *Mudir-i-bawl* (diuretic), *Mudir-i-Hayd* (emmenagogue), *Munaqqī Qurūh* (Ulcer cleaning), *Mufattit-i-Hasāt Mukhrij-i-Hasāt Gurda wa Mathāna* (Lithotriptic), and *Muharrīk* (stimulant) [2, 8, 15].

Therapeutically, it is used for *Amrād-i-Ālāt-i-Tanāsul wa bawl* (genitourinary diseases), *Suzāk* (gonorrhoea), *Iltihāb-i-Mathāna* (cystitis), *Zahīr* (dysentery), *Waja' al-Mafāṣil* (rheumatism) and as *Munaqqī-i-Balgham* (expectorant) [8]. It also relieves *Khafaqān* [16]. Oil is used in lozenges [8]. Its main actions are *Munaqqī-i-Majārī-i-bawl* (urinary tract cleanser) [4] and *Muqawwi-i-Mi'da* (stomachic), *Hābis Ishāl* (antidiarrheal) [17].

3.9 Tarkīb Iste'māl (Methods of use)**3.9.1 Amrād-i-Rās (diseases of head)**

Powdered *Kabābchīnī* is mixed with *Āb-i-Mūlī* (radish water) and used as inhaler for at least seven days gives relief in headaches [2, 16].

3.9.2 Amrād-i-Fam (diseases of oral cavity)

It acts as a mouth freshener by resolving bad breath. It strengthens gums and resolve inflammations of oral cavity. For oral diseases, dosage form preferred is *La'ūq* (linctus) [4, 16, 18].

3.9.3 Amrād-i-Udhun, Anf wa Halaq (diseases of ear, nose and throat)

It relieves sore throat and clarifies the voice when used alone or along with honey. Its tablets are therefore anti-tussive. Its powder inhalation is beneficial in *Nazla wa Zukām* (coryza and catarrh) [4, 16].

3.9.4 Amrād-i-Tanaffus (diseases of respiratory system)

Inhalation of cubeb vapours is very beneficial in *Dam'a* (asthma) [16].

3.9.5 Amrād-i-Nizām-i-Haḍm (diseases of gastrointestinal system)

Tablets of cubeb are made along with *Afiyūn* has anti-diarrheal action. It also has carminative action therefore it relieves flatulence [16].

3.9.6 Amrād-i-Nizām-i-bawl (diseases of urinary system)

It has diuretic action, and therefore increase urination. Powder of cubeb is found to be useful in *Salas al-bawl* (urinary incontinence), and *Bawl fi'l Farāsh* (Bed wetting) [2, 17].

3.9.7 Amrād-i-Jild (diseases of skin)

In case of urticaria, preparation of cubeb with *Sikanjabīn* (oxymel) is prescribed orally or as linctus [4, 16]. Ointment of cubeb made with animal fats is applied locally over swelling,

ulcers or other eruptions [17].

3.9.8 Venereal diseases

It has remarkable results in genitourinary diseases like gonorrhoea and syphilis.

3.5gm to 4.5 gm of finely powdered cubeb is sprinkled over sour curd and covered with a thin cloth. The vessel is kept under sky and consumed for 3 to 7 days consecutively. During this period salt less curd with dry rice should be consumed as diet. This is efficient treatment for treating ulcers of urinary tract and *Ātashak* (syphilis) [2, 10].

3.10 Maḍarrat (Adverse effects)

It is harmful for bladder [4, 15] and its excess can cause headache also [2].

3.11 Musleh (Correctives)

Sandal Safed (*Santalum album* L.), *Gulāb Khāliṣ* (*Rosa damascene* L.) is corrective for headache, and *Masṭagī* (*mastic*) is used as corrective for bladder toxicity [2, 4, 8, 17].

3.12 Badal (substitute): *Dārchīnī* (*Cinnamomum zeylanicum* Blunc.), *Ila'ichī Kalān* (*Ammomum subulatum* Roxb.), *Ila'ichī Khurd* (*Elettaria cardamomum* L. Maton) [8, 17], *Dār-i-filfil* (*Piper longum* L.) are used as substitute for liver; *Āqir Qarha* (*Anacyclus pyrethrum* D.C) for throat ache and *Rāsan* (*Inula racemosa* Hook. F) for stomach [2].

3.13 Adulterants: *Piper cubeba* is adulterated usually with *Mirabilis jalapa* L., *Piper nigrum* L., *Carica papaya* L. and *Asparagus racemosus* L. due to similar morphology. [19]

3.14 Miqdār-i-Khūrāk (dosage)

Fruits are used 3-5g orally [2, 4, 8, 15, 17]. For decoction it is used 9 g. [16]

3.15 Phytochemistry

Phytochemistry of cubeb reveals a diverse range of organic acids, phenolic acids, and flavonoids, while its mineral content includes sodium, iron, and zinc, among others. [11] Unripe fruits contain volatile oil known as oil of cubeb which consist of sesquiterpene hydrocarbons; lignans mainly cubebene, cubebinin and kinokinin; and cubebic acid. In addition, the fruits contain resinous matter, gum, fixed oil and nitrogenous substances [10, 12]. The oil of cubeb is viscous liquid, light green to blue green in colour with spicy odour and acrid taste [10]. The details of bioactive and nutritional compound available in *P. cubeba* is given in Table 1.

3.16 Pharmacological Studies

Piper cubeba and their different products are scientifically proved for various pharmacological activities.

3.16.1 Anti-microbial activity: The antimicrobial activity of *Piper cubeba* extracts is effective against selected bacteria and fungi. Essential oil of cubeb shows antibacterial activity against various bacteria. Different extracts of *P. cubeba* fruit powder demonstrated antibacterial activity against gram negative and gram-positive bacteria. The fruit oil of *Piper cubeba* exhibits significant antifungal activity against various fungi [25].

Table 1: Showing bioactive and nutritional compounds

S. No	Bioactive compounds		Nutritional compounds
1.	Alkaloids	Piperine ^[11]	Magnesium ^[20]
2.	Lignans	Hinokinin; Cubebin; Yatein Isoyatein Neo-lignans: Kadsurin A; Piperenone ^[21]	Phosphorous ^[20]
3.	Flavonoids	Rutin; Catechin ^[11]	Iron ^[20]
4.	Phenolic acids	Gallic acid; Caffeic acid; Syringic acid; Ferulic acid.	Zinc ^[20]
5.	Essential oils	Sesquiterpenes β-caryophyllene (3.1%) Epi-cubebol (4.3%) Cubebol (5.6%) D-cadinene α-cubebene β-cubebene Cubebinolide Cubebol ^[21] Monoterpenes Sabinene (9.1%) β-elemene (9.4%) Linalol Sabinol ^[11]	Manganese ^[20]
6.	Resinoids	Present	Selenium ^[20]
7.	Tannins	Present	Sodium ^[20]

Table 2: Compound formulations having *Kabābchīnī* as one of the important ingredients, their dose and method of administration and indication.

S.No	Name of compounds	Dose and method of administration	Indication
1.	<i>Habb-i- Hiltūt</i>	Two pills twice a day after meals (orally)	Indigestion, anorexia, flatulence ^[10]
2.	<i>Jawārish Zar'unī Ambarī Ba Nuskha Kalān</i>	5g alone or with one tablet of <i>Kushta-i-Fawlād</i> in morning for liver, kidney and urinary track ailments. (orally)	Hepatotonic, renal tonic, lumbago, sexual weakness, Frequency of micturition, gout, flatulence ^[10]
3.	<i>Jawārish Zar'unī</i>	7g – 9 g (orally)	Hepatic weakness, renal weakness, brain weakness, indigestion, strangury, gout, pityriasis, hemorrhoids ^[22]
4.	<i>Jawārish Bakrmājīt</i>	70g (orally)	Stomach weakness, sexual weakness ^[22]
5.	<i>Jawārish Mastagī Kalan</i>	5g in morning and evening. (orally)	Sialorrhoea, hydrosis, frequency of micturition ^[10]
6.	<i>Labūb Saghīr</i>	7g with water or milk in morning (orally)	Sexual debility, renal tonic ^[23]
7.	<i>Labūb Kabīr</i>	5g with water or milk in morning (orally)	sexual weakness, nervine disorders, brain disorders, cardiac weakness, general weakness ^[23]
8.	<i>Ma'jūn Mubahī Antākī,</i>	12g with water in morning (orally)	sexual weakness, spermatorrhoea, general weakness ^[23]
9.	<i>Ma'jūn Murawah al- Arwāh</i>	1g with water or milk (orally)	sexual weakness, liver disorders, renal weakness, weak memory ^[23]
10.	<i>Ma'jūn Sīr Alvi Khan,</i>	5g with water in morning (orally)	Phlegmatic and melancholic disorders. antidote ^[23]
11.	<i>Ma'jūn Nishāra-i-Āj Wali</i>	5g in morning with 250ml water (orally)	Abortion ^[10]
12.	<i>Ma'jūn Nisyān</i>	5g in morning and night (orally)	Amnesia, weak memory, retarded growth ^[10]
13.	<i>Ma'jūn 'Ushbā</i>	5g-10g in the morning with water. (orally)	Skin diseases, leprosy, scrofula and gout. ^[10]
14.	<i>Ma'jūn Shīr-i-Bargad wali</i>	5g in morning with 250ml of milk. (orally)	Spermatorrhoea, decreased ejaculatory period, decreased viscosity of semen ^[10]
15.	<i>Safūf Indrījūlāb,</i>	5g with yoghurt (orally)	Syphilis, strangury, oliguria/anuria ^[10]
16.	<i>Safūf Sandal</i>	5g with yoghurt in morning (orally)	Syphilis, strangury, urinary tract ulcers ^[10]
17.	<i>Safūf Shora Qalmī</i>	5g with yoghurt in morning (orally)	Oliguria/anuria, syphilis, strangury ^[10]
18.	<i>Safūf Suzāk</i>	5g with 250ml of milk (orally)	Syphilis ^[10]
19.	<i>Safūf Burg Hīnā Wala</i>	5g with 250ml of milk (orally)	Syphilis ^[10]
20.	<i>Sunūn Mujalli</i>	Locally applied on gums in morning and evening	Weak gums, halitosis, dental plaque ^[10,22]
21.	<i>Sunūn Kalān</i>	Locally applied on gums in morning and evening.	Dental root tonic, bleeding gums ^[10]
22.	<i>Dharūr Kath</i>	Locally sprinkled over buccal mucosa	Stomatitis ^[22]
23.	<i>Dharūr Chālon Wala</i>	Locally sprinkle a pinch of powder on the affected part of mouth (orally)	Mouth ulcers, pustules or boils ^[10]
24.	<i>Dimād-i-Ajīb</i>	Locally applied over forehead as a paste	Headache ^[24]

3.16.2 Anti-inflammatory activity: Studies indicate that extracts from *Piper cubeba* L. exhibit anti-inflammatory effects by reducing IL-6 levels in THP-1 cells, which are stimulated by lipopolysaccharide (LPS). This reduction leads to the inhibition of cyclooxygenases (COX-1 and COX-2) and 5-lipoxygenase (5-LOX) ^[11].

3.16.3 Anti-oxidant activity: Piper species were evaluated for antioxidant potential in diet and traditional medicine. A

study found high DPPH free radical scavenging activity in methanol extract of *Piper cubeba*. Ethanol extracts of *Piper cubeba* also showed high antioxidant activity according to another study. *Piper cubeba* was found to have antioxidant action by searching free radicals in different systems ^[26].

3.16.4 Hepatoprotective activity: Piper species have gastrointestinal and hepatoprotective effect. *Piper cubeba* fruit extract reduced CCl₄-induced serum markers and total

protein. Liver histology after treatment showed normal cords and no necrosis. The extract also lowered SGPT and SGOT levels, repairing hepatic tissue damaged by CCl₄ [25-27].

3.16.5 Nephroprotective activity: The fruit powder of *Piper cubeba* was administered orally in suspension form at 800 mg/kg and 100 mg/kg doses in rat model. It showed a decrease in serum urea and serum creatinine levels in gentamycin induced nephrotoxicity. The nephroprotective effect was evaluated through biochemical analysis and kidney histopathology [28].

3.16.6 Anti-diabetic activity: Ahmed *et al.* studied effect of *Piper cubeba* extracts on digestive enzymes in vitro. Inhibition of these enzymes important for diabetes regulation. Aqueous extracts showed better diabetic control than methanol extracts. Higher inhibition of α -glucosidase compared to α -amylase observed [11].

3.16.7 Anti-depressant activity: The antidepressant potential of *P. cubeba* was examined in mice with Fluoxetine as the standard drug. Animals treated showed weight gain, increased mobility, and decreased immobility, indicating its antidepressant-like effect. Piperine from *P. nigrum* was also investigated for its antidepressant-like effect in a mouse depression model. Animals treated with Piperine exhibited reduced sucrose utilization, increased immobility time, and maintained levels of brain-derived neurotrophic factor. Seven compounds from *P. nigrum* were tested on receptors to evaluate their anxiolytic and antidepressant activities, interacting with target proteins [29].

3.16.8 Anti-cancerous activity: Numerous studies have highlighted the inhibitory effects of bioactive compounds from Piper species on tumour cell lines, suggesting their potential as sources for novel anticancer drugs. These compounds exhibit activity against cancer cells and may serve as chemo-preventive agents in the context of malignancy. Alkaloids and amides are the predominant constituents in Piper species responsible for suppressing the growth of cancer cell lines [30].

4. Conclusion

Kabābchīnī (Cubeb) is one of the well-known drugs of Unani System of Medicine for the treatment of genitourinary disorders viz. strangury, frequency of micturition, urinary tract ulcers, spermatorrhoea, and sexual weakness has been known to be effective treatment of gonorrhoea and syphilis. In the light of scientific studies, *Kabābchīnī* has been proved to have anti-microbial, anti-cancerous, anti-depressant, anti-inflammatory, anti-diabetic and hepatoprotective, nephroprotective properties. This makes it seem worthwhile to conduct more thorough clinical research to fully investigate the therapeutic potential of this medication in order to establish it as a standard treatment. This review provides extensive information on the medicinal or therapeutic uses of *Kabābchīnī* (Cubeb) and supports the potential of *Kabābchīnī* as a multifaceted Unani drug that needs further research.

5. Acknowledgement

Authors are highly thankful to the Deputy Director In-charge RRIUM, Srinagar for providing facilities e.g., books and literatures in the library of RRIUM Srinagar. We are also thankful to all the editors and authors of the books and research papers from where the material for this paper was

consulted, discussed and used herein.

6. Competing interests: Authors declare no conflict of interest.

7. Authors' contributions: All authors have accepted responsibility for entire content of this manuscript and approved its submission.

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