



# CRITICAL ANALYSIS OF THE ROLE OF *PIPPALI* IN *CHARKOKTA MAHAKASHAYA*

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## ABSTRACT

*Pippali* (*Piper longum* Linn.), commonly known as long pepper, holds a significant place in Ayurveda and has been emphasized by *Acharya Caraka* across multiple *Mahakashaya*. *Caraka* has categorized *Pippali* under *Tryptighna*, *Kasahara*, *Shwashara*, *Hridya*, and *Rasayana Mahakashaya*., highlighting its diverse pharmacological and therapeutic potential. The critical analysis of its role reveals that *Pippali* acts as a potent bioavailability enhancer (*Yogwahi*) due to the presence of piperine, thereby potentiating the efficacy of co-administered drugs. Its *ushna virya*, *madhura vipaka*, and *laghu-ruksha guna* contribute to *Dipana-Pachana*, enhancing metabolism and correcting *Agni-daurbalya*, which underlies many pathological conditions. In respiratory disorders, its inclusion in *Kasahara* and *Shwashara Mahakashaya*. justifies its mucolytic, bronchodilator, and anti-inflammatory actions, corroborated by contemporary pharmacological studies. As part of *Hridya Mahakashaya*, it supports cardiovascular health through lipid-lowering, antioxidant, and mild cardiostimulant effects. The placement of *Pippali* in *Rasayana Mahakashaya*, underscores its adaptogenic, immunomodulatory, and anti-aging attributes, aligning with modern evidence of its role in hepatoprotection, neuroprotection, and enhancement of reproductive vitality. Critical appraisal indicates that *Caraka's* inclusion of *Pippali* across diverse *Mahakashaya* is not merely repetitive but a recognition of its multidimensional therapeutic spectrum. It exemplifies the Ayurvedic principle of a single drug serving multiple pharmacodynamic roles when viewed through different pathological contexts. Modern research further validates its wide-ranging activities, bridging classical wisdom with evidence-based medicine. Thus, *Pippali* serves as a paradigmatic drug in Ayurveda, where traditional classification and modern pharmacology converge, justifying its continued exploration for integrative therapeutics.

**Keywords:** *Pippali*, *Piper longum*, *Caraka Mahakashaya*,

## INTRODUCTION

Ayurveda, the traditional system of medicine of India, emphasizes the holistic management of health and disease through principles of *dravya guna*, *doṣa-dhatu-mala* balance, and *rasayana* therapy. Among the vast *Materia medica*, *Pippali* (*Piper longum* Linn.), commonly known as long pepper, occupies a distinct and multidimensional role. Its repeated mention by *Acharya Caraka* across various *Mahakashaya* illustrates not only its therapeutic versatility but also its unique pharmacodynamic profile (*karma*). *Caraka* has enumerated *Pippali* in *Tryptighna*, *Kasahara*, *Kanthya*, *Sheetaprashama*, *Shoolaprashmana Mahakashaya*, indicating its role in digestive, respiratory, cardiovascular, and rejuvenative domains of health care. <sup>(1)</sup> *Pippali* possesses *katu rasa*, *anushna virya*, *madhura vipaka* and *laghu, singdha, tikshna guna*, which together contribute to its *deepana* (appetizer), *pachana* (digestive), and *rasayana* (rejuvenative) properties <sup>(2)</sup>. Classical texts describe its efficacy in *kasa* (cough), *shwasa* (dyspnea), *arsha* (hemorrhoids), *kuṣṭha* (skin diseases), *pravahika* (dysentery), and *jirṇajvara* (chronic fevers), thereby expanding its role across multiple systems <sup>(3)</sup>. Importantly, *Caraka's* principle of *Mahakashaya* classification groups of ten herbs based on pharmacological actions—demonstrates how single drugs like *Pippali* exhibit wide-ranging therapeutic potential depending on clinical context <sup>(4)</sup>. From a pharmacological perspective, *Piper longum* contains alkaloids such as piperine, piperlongumine, and essential oils which are reported to exert bioenhancing, hepatoprotective, immunomodulatory, and anti-inflammatory effects <sup>(5)</sup>. Piperine, the chief active principle, is particularly significant for its role as a *Yogwahi* (bioavailability enhancer), as it augments absorption of various phytochemicals and modern drugs by inhibiting hepatic and intestinal metabolism <sup>(6)</sup>. These findings scientifically substantiate the Ayurvedic claim of its potentiating action when combined with other formulations, as exemplified in *Pippali Rasayana* and *Trikaṭu* <sup>(7)</sup>. Critically, the multiple placements of *Pippali* within *Caraka's Mahakashaya* exemplify the Ayurvedic understanding that one drug can possess a spectrum of pharmacological roles rather than a unidimensional effect. This multidimensionality also supports

personalized medicine principles, where *Pippali* can be employed across diverse pathological states depending on dosic predominance and systemic involvement.

Given the confluence of classical wisdom and modern evidence, a systematic review of *Pippali*'s role in *Caraka's Mahakashaya* is pertinent. Such an analysis not only validates traditional claims but also identifies its relevance in contemporary therapeutics, including respiratory, metabolic, and degenerative disorders. This review critically examines the position of *Pippali* in different *Mahakashaya* of *Caraka Samhita*, correlates its *Ayurvedic* pharmacodynamics with modern phytopharmacology, and highlights its potential as a bridge between traditional and integrative medicine. This article critically evaluates the rationale behind *Pippali*'s inclusion in *Charakokta Mahakashayas*, its pharmacological properties, clinical applications, and possible limitations.

## MATERIAL AND METHODS

All *Ayurvedic* treatises including *samhitas*, lexicons, textbook and modern texts, publications are refereed for the information regarding *Pippali*, its role in critical analysis.

The classification of *Mahakashayas* in *Charaka Samhita* is based on the predominant actions of herbs, and the presence of *Pippali* in nine different *Mahakashayas* suggests its diverse therapeutic potential. A critical analysis of its role is necessary to understand whether its inclusion is based on pharmacodynamics, therapeutic indications, or synergistic actions with other herbs.

### *Pippali* in *Mahakashayas* <sup>(8)</sup>

#### 1. *Deepaniya Mahakashaya*

पिप्पलीपिप्पलीमूलचव्यचित्रकशृङ्गवेराम्लवेतसमरिचाजमोदाभल्लातकास्थिहिङ्गुनिर्यासा इति दशेमानि दीपनीयानि भवन्ति ।

#### 2. *Kanthya Mahakashaya*

सारिवेक्षुमूलमधुकपिप्पलीद्राक्षाविदारीकेट्यहंसपादीबृहतीकण्टकारिका इति दशेमानि कण्ठयानि भवन्ति ।

#### 3. *Truptighna Mahakashaya*

नागरचव्यचित्रकविडङ्गमूर्वागुडूचीवचामुस्तपिप्पलीपटोलानीति दशेमानि तृप्तिघ्नानि भवन्ति ।

#### 4. *Asthapanopaga Mahakashaya*

त्रिवृद्धिल्वपिप्पलीकुष्ठसर्षपवचावत्सकफलशतपुष्पामधुकमदनफलानीति दशेमान्यास्थापनोपगानि भवन्ति ।

#### 5. *Shirovirechana Mahakashaya*

ज्योतिष्मतीक्षकमरिचपिप्पलीविडङ्गशिग्रुसर्षपापामार्गतण्डुलश्वेतामहाश्वेता इति दशेमानि शिरोविरेचनोपगानि भवन्ति ।

#### 6. *Hikkanigrahan Mahakashaya*

शटीपुष्करमूलबदरबीजकण्टकारिकाबृहतीवृक्षरुहाभयापिप्पलीदुरालभाकुलीरशृङ्ग्य इति दशेमानि हिककानिग्रहणानि भवन्ति ।

#### 7. *Kasahara Mahakashaya*

द्राक्षाभयामलकपिप्पलीदुरालभाशृङ्गीकण्टकारिकावृश्चीरपुनर्नवातामलक्य इति दशेमानि कासहराणि भवन्ति ।

#### 8. *Sheetaprashamana Mahakashaya*

तगरागुरुधान्यकशृङ्गवेरभूतीकवचाकण्टकार्यग्निमन्थश्योनाकपिप्पल्य इति दशेमानि शीतप्रशमनानि भवन्ति ।

#### 9. *Shoolaprashamana Mahakashaya*

पिप्पलीपिप्पलीमूलचव्यचित्रकशृङ्गवेरमरिचाजमोदाजगन्धाजाजीगण्डीराणीति दशेमानि शूलप्रशमनानि भवन्ति ।

### Pharmacological Actions of *Pippali* <sup>(9)</sup>

- **Ayurvedic Pharmacology**
  - *Rasa: Katu* (Pungent)
  - *Guna: Laghu* (Light), *Tikshna* (Sharp), *Snigdha* (Unctuous)
  - *Veerya: Ushna* (Hot)
  - *Vipaka: Madhura* (Sweet)
  - *Doshaghnata*: Balances *Vata-Kapha*, may increase *Pitta* in excessive use
- **Modern Pharmacology**
  - **Active Constituents**: Piperine, essential oils, alkaloids.
- **Therapeutic Actions**
  - Bioavailability enhancer: Improves absorption of nutrients and medicines.
  - Anti-inflammatory & Immunomodulatory: Supports chronic disease management.
  - Hepatoprotective: Assists in liver detoxification.
  - Neuroprotective: Enhances cognition and memory.

Fig. Pipli (*Piper longum*)

Fig. Pipli Fruit

- **Critical Analysis of Pippali's Role in Mahakashayas**

### 1. Why is Pippali included in multiple Mahakashayas?

**Versatility in Action:** Unlike herbs that serve a singular function, *Pippali* acts at multiple physiological levels, including digestive, metabolic, respiratory, and nervous systems.

**Synergistic Nature:** Enhances the efficacy of other herbs when used in combinations.

### 2. Comparison with Other Herbs in Mahakashayas

In *Deepaniya Mahakashaya*, it is used alongside *Shunthi* and *Maricha*, which also stimulate *Agni*, but *Pippali* uniquely provides long-term *Rasayana* benefits.

In *Kanthya Mahakashaya*, it differs from licorice and cinnamon, as *Pippali* has a more pronounced *Kapha*-reducing and scraping (*Lekhana*) action.

In *Kasahara Mahakashaya*, *Pippali* acts both as an expectorant and bronchodilator, unlike *Vasa*, which primarily reduces inflammation.

### 3. Synergistic Effects in Formulations

Often used in *Trikatu* (*Pippali*, *Shunthi*, *Maricha*) for enhancing digestion and metabolism

In *Sitopaladi Churna*, it synergizes with sugar and *Vanshlochan* to improve respiratory health.

### 4. Limitations and Precautions

Excessive use may increase *Pitta*, causing gastric irritation.

Contraindicated in hyperacidity, peptic ulcers, and high *Pitta* conditions.

Prolonged use without proper *Rasayana* support may lead to depletion of *Dhatu*s (tissue loss).

### 5. Clinical Applications & Research Evidence

**Respiratory Disorders:** Studies confirm its efficacy in *asthma*, COPD, and chronic bronchitis.

**Metabolic Disorders:** Research supports its role in lipid metabolism and insulin sensitivity.

**Cognitive Benefits:** Recent studies suggest neuroprotective properties, improving focus and memory.

### *Pippali* in Charaka Samhita – Inclusion in Mahakashayas

*Pippali* is classified under the following *Mahakashayas*, each representing a specific therapeutic category:

#### 1. *Deepaniya Mahakashaya* (Digestive Enhancer Group)

- Stimulates *Agni* (digestive fire) and enhances digestion.
- Helps in *Ama pachana* (detoxifying undigested metabolic waste).
- **Constituents:** Piperine, volatile oils.
- **Action:** Stimulates gastric secretions, enhances salivary amylase, improves intestinal enzyme activity.
- **Modern role:** Appetite stimulant, carminative, improves nutrient bioavailability (esp. curcumin, rifampicin).

**2. Kanthya Mahakashaya** (Throat-Soothing Group)

- Acts as an expectorant, beneficial in hoarseness of voice, sore throat, and chronic cough.
- Used in formulations for laryngitis and pharyngitis.
- **Constituents:** Essential oils, piperine
- **Action:** Anti-inflammatory and soothing on mucosa; expectorant action clears pharyngeal secretions
- **Modern role:** Effective in pharyngitis, laryngitis, and hoarseness of voice

**3. Truptighna Mahakashaya** (Satiety-Reducing Group)

- Helps reduce excessive satiety, heaviness, and sluggish digestion.
- Useful in *Mandagni* (low digestive fire) and *Kapha*-related metabolic imbalances
- **Constituents:** Piperine, piperlongumine
- **Action:** Enhances metabolism, prevents fat accumulation, improves gut motility.
- **Modern role:** Anti-obesity, hypolipidemic, prevents metabolic sluggishness and heaviness after meals.

**4. Asthapanopaga Mahakashaya** (*Basti*-supporting Group)

- Supports *Asthapana Basti* (therapeutic enema therapy) by enhancing the absorption and efficacy of medicinal enemas.
- Useful in *Vata* disorders, constipation, and detoxification therapies.
- **Constituents:** Alkaloids (piperidine derivatives).
- **Action:** Carminative, antispasmodic, improves colonic motility
- **Modern role:** Facilitates bowel clearance, reduces flatulence and pain, supports laxative/enema therapy.

**5. Shirovirechana Mahakashaya** (*Nasya*-supporting Group)

- Aids in eliminating excessive *Kapha* from the head region.
- Used in *Nasya* therapy for sinusitis, chronic headaches, and congestion.
- **Constituents:** Essential oils, piperine.
- **Action:** Nasal decongestant, mucolytic, anti-inflammatory on sinuses.
- **Modern role:** Relieves sinusitis, rhinitis, headache of *kapha* origin.

**6. Hikkanigrahan Mahakashaya** (Hiccup-Relieving Group)

- Known for its action in suppressing persistent hiccups.
- Beneficial in spasmodic respiratory conditions and gastroesophageal disorders.
- **Constituents:** Piperine, volatile oils.
- **Action:** Neuro-modulatory (acts on vagus nerve reflex), smooth muscle relaxant.
- **Modern role:** Suppresses hiccup reflex and spasmodic cough via central antitussive and bronchodilatory activity

**7. Kasahara Mahakashaya** (Cough-Relieving Group)

- Acts as a potent bronchodilator and expectorant.
- Indicated in chronic bronchitis, *asthma*, and respiratory allergies.
- **Constituents:** Piperine, piperlongumine, volatile oils.
- **Action:** Antitussive (acts on cough reflex center), bronchodilator (calcium channel blockade), mucolytic.
- **Modern role:** Effective in bronchitis, *asthma*, tuberculosis (also as bioenhancer for anti-TB drugs).

**8. Sheetaprashamana Mahakashaya** (Cold-Alleviating Group)

- Counteracts excessive cold, chills, and *Kapha*-related disorders.
- Used in post-viral fatigue, seasonal allergies, and immune support.
- **Constituents:** Piperine, piperlongumine.
- **Action:** Thermogenic (stimulates thermogenesis & mitochondrial activity), decongestant, immunomodulatory.
- **Modern role:** Counters chills, cold intolerance, recurrent cold-related respiratory infections.

**9. Shoolaprashamana Mahakashaya** (Pain-Relieving Group)

- Provides relief from colicky abdominal pain and spasmodic conditions.
- Beneficial in dysmenorrhea, gastrointestinal cramps, and *Vata-Pitta*-related pain syndromes.
- **Constituents:** Piperine, piperlongumine, piperlongumine.
- **Action:** Analgesic via opioid and serotonin pathways; antispasmodic on smooth muscles; anti-inflammatory.
- **Modern role:** Relieves colicky pain, abdominal cramps, musculoskeletal pain, and neuropathic pain.

**CONCLUSION**

*Pippali*'s classification in nine *Mahakashayas* of *Charaka Samhita* showcases its broad-spectrum therapeutic potential in Ayurveda. Its pharmacological actions support its role in digestion, respiratory health, metabolic regulation, and pain management. However, its *Pitta*-aggravating nature requires careful application in specific conditions. From the modern scientific perspective, phytoconstituents such as piperine, piperlongumine, pipartine, and essential oils have demonstrated a broad pharmacological spectrum: digestive stimulation, thermogenesis, mucolytic and bronchodilatory effects, analgesic and antispasmodic action, anti-inflammatory and immunomodulatory properties, as well as bioavailability enhancement of co-administered drugs. These findings strongly validate the traditional claims of *Pippali* in diverse *Mahakashya*. Further pharmacological validation and controlled clinical trials are essential to integrate its *Ayurvedic* wisdom into contemporary medicine. This study provides a foundation for future research exploring *Pippali*'s synergistic potential in holistic and modern therapeutic approaches.

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