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Therapeutic Potential of *Pippalyadi Kawal* in *Mukhapaka* w.s.r. to Stomatitis: An Evidence-Based *Ayurvedic* Review

Dr. Krushna V. Zate[1*], Dr. S. R. Agarkar[2], Dr. Sayali R. Khandelwal[3]

[1]PG Scholar, Department of Kaumarbhritya,

[2]Professor & HOD, Department of Kaumarbhritya

[3]Assistant Professor, Department of Kaumarbhritya

Bhausaheb Mulak Ayurved Mahavidyalaya, Nandanwan, Nagpur, Maharashtra, India

Abstract

Background: *Mukhapaka* is a commonly encountered *Mukharoga* described in *Ayurvedic* literature, characterized by inflammation and ulcerative lesions involving the oral cavity. The clinical manifestations of *Mukhapaka* closely resemble stomatitis, a prevalent inflammatory disorder of the oral mucosa affecting individuals of all age groups, particularly children. Despite the availability of various therapeutic approaches, recurrent episodes and symptomatic burden continue to challenge effective management. *Ayurveda* advocates several local therapeutic procedures for *Mukharoga*s, among which *Kavala* occupies a significant place. *Pippalyadi Kawal*, a formulation described in *Vangasena Samhita*, has traditionally been indicated in oral disorders.

Objective: To critically review the *Ayurvedic* concept of *Mukhapaka*, correlate it with stomatitis, and evaluate the therapeutic potential of *Pippalyadi Kawal* based on classical *Ayurvedic* literature and contemporary scientific evidence.

Materials and Methods: Relevant information was collected from classical *Ayurvedic* texts including *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, *Yogaratnakara*, *Vangasena Samhita*, *Bhavaprakasha*, and *Sharangadhara Samhita*. Modern literature was reviewed through textbooks, peer-reviewed journals, and electronic databases focusing on stomatitis and the pharmacological profile of the ingredients of *Pippalyadi Kawal*.

Results: *Mukhapaka* described under *Sarvasara Mukharoga* demonstrates considerable similarity with stomatitis in terms of etiology, clinical features, and disease progression. *Pippalyadi Kawal* comprises *Pippali* (*Piper longum* Linn.), *Shweta Sarshapa* (*Brassica campestris* Linn.), *Nagara* (*Zingiber officinale* Roscoe), and *Nichula* (*Barringtonia acutangula* (L.) Gaertn.). Scientific studies have demonstrated anti-inflammatory, antioxidant, antimicrobial, and wound-healing activities of these ingredients, supporting their potential role in oral mucosal disorders.

Conclusion: Classical *Ayurvedic* evidence and contemporary pharmacological findings suggest that *Pippalyadi Kawal* possesses promising therapeutic potential in the management of *Mukhapaka* w.s.r. to stomatitis. Further clinical studies are warranted to establish its efficacy and safety.

Keywords: *Mukhapaka*, Stomatitis, *Pippalyadi Kawal*, *Sarvasara*

1. Introduction

Oral diseases constitute a significant public health concern owing to their impact on nutrition, speech, growth, psychosocial well-being, and quality of life.[13,14,16] Among these conditions, stomatitis is a frequently encountered inflammatory disorder of the oral mucosa characterized by erythema, edema, pain, burning sensation, and ulceration.[13–15] The condition may arise due to local trauma, microbial infections, nutritional deficiencies, immune dysregulation, systemic illnesses, allergic reactions, or adverse drug effects.[13,14,18] Recurrent oral ulceration often results in difficulty in eating, swallowing, speaking, and maintaining oral hygiene, particularly in pediatric populations.[16,17]

Stomatitis encompasses a spectrum of inflammatory lesions affecting the oral mucosa.[13–15] Clinically, it may present as aphthous stomatitis, herpetic stomatitis, angular stomatitis, denture stomatitis, or ulcerative stomatitis depending upon etiology and site of involvement.[13,14] Recurrent aphthous stomatitis represents one of the most common ulcerative disorders of the oral cavity and is characterized by recurrent painful ulcers of variable size and duration.[14,15] Conventional management includes topical corticosteroids, antiseptic mouthwashes, analgesics, immunomodulatory agents, and nutritional supplementation.[14,15] However, recurrence and incomplete symptomatic relief remain common challenges.[14,15]

Ayurveda provides a comprehensive description of oral diseases under the heading of *Mukharoga*.[2] *Acharya Sushruta* has elaborately described *Mukharoga*s and classified them according to the anatomical structures involved.[2] Among these disorders, *Mukhapaka* is described under *Sarvasara Mukharoga*, indicating diffuse involvement of the oral cavity.[2,3] Classical signs and symptoms such as *sphota* (ulceration), *daha* (burning sensation), *toda* (pricking pain), *vedana* (pain), and *kandu* (itching) exhibit remarkable similarity to the clinical manifestations of stomatitis described in modern medicine.[2,3,6]

According to *Ayurvedic* principles, *Mukhapaka* develops due to vitiation of *Doshas*, predominantly *Pitta, Kapha,* and *Rakta*, resulting from improper dietary habits, incompatible food intake, poor oral hygiene, excessive consumption of irritant substances, and other etiological factors. [1–3] Depending upon *Dosha* predominance, *Mukhapaka* has been classified into *Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*, and *Sannipataja* varieties. [2,3,8]

The management of *Mukhapaka* in *Ayurveda* includes *Nidana Parivarjana*, *Shodhana*, *Shamana*, and local therapeutic measures such as *Kavala*, *Gandusha*, *Pratisarana*, and *Mukha Dhavana*. [1–3] Among these procedures, *Kavala* is a unique local therapeutic intervention wherein medicated substances are retained and moved within the oral cavity, facilitating direct contact with affected tissues and promoting local therapeutic action. [3,6]

Pippalyadi Kawal, described in *Vangasena Samhita*, is one such formulation indicated in *Mukharoga*s.[5] The formulation contains *Pippali* (*Piper longum* Linn.), *Shweta Sarshapa* (*Brassica campestris* Linn.), *Nagara* (*Zingiber officinale* Roscoe), and *Nichula* (*Barringtonia acutangula* (L.) Gaertn.).[5] These ingredients possess properties traditionally utilized in oral diseases and have been reported to exhibit anti-inflammatory, antimicrobial, antioxidant, and wound-healing activities in modern scientific studies.[21–30]

Although *Pippalyadi Kawal* has classical indications in *Mukharoga*, scientific reviews evaluating its therapeutic relevance in *Mukhapaka* w.s.r. to stomatitis remain scarce. [5,34–40] Therefore, the present review aims to critically analyze the *Ayurvedic* concept of *Mukhapaka*, correlate it with stomatitis, and

explore the therapeutic potential of *Pippalyadi Kawal* through available classical and contemporary evidence. [1–6,13–30]

2. Materials and Methods

The present review was carried out through a comprehensive analysis of classical *Ayurvedic* literature and contemporary scientific publications. *Ayurvedic* information regarding *Mukhapaka*, *Mukharoga*, *Kavala*, and *Pippalyadi Kawal* was collected from *Charaka Samhita*, *Sushruta Samhita*, *Ashtanga Hridaya*, Ashtanga Sangraha, *Yogaratnakara*, *Vangasena Samhita*, *Bhavaprakasha*, *Sharangadhara Samhita*, and relevant *Nighantus*. [1–12]

Modern literature pertaining to stomatitis, oral ulcerative disorders, oral inflammatory diseases, and medicinal properties of the constituent drugs of *Pippalyadi Kawal* was collected from standard medical textbooks and peer-reviewed scientific publications.[13–20] Electronic databases including PubMed, Scopus, Google Scholar, and other indexed sources were searched using keywords such as "*Mukhapaka*," "stomatitis," "oral ulcer," "Piper longum," "Zingiber officinale," "Brassica campestris," and "Barringtonia acutangula." Relevant studies evaluating anti-inflammatory, antimicrobial, antioxidant, and wound-healing activities of these drugs were reviewed and analyzed.[21–30]

3. *Mukhapaka* in *Ayurveda*

3.1 Definition of *Mukhapaka*

Mukhapaka is a disease affecting the oral cavity and is described under *Sarvasara Mukharoga* in *Ayurvedic* classics. [1–3] The term "*Sarvasara*" implies involvement of the entire oral cavity. *Acharya Charaka* has referred to the condition as *Mukhapaka*, whereas *Acharya Sushruta* and *Vagbhata* have described it under *Sarvasara Mukharoga*. [1–3]

Arunadatta, while commenting on the term *Sarvasara*, explains it as a condition that spreads throughout the oral cavity and affects the entire buccal mucosa.[3]

3.2 Nidana of *Mukhapaka*

Ayurvedic texts describe various *Aharaja* and *Viharaja* factors responsible for the development of *Mukha Paka*. [1–3,6]

- ***Aharaja Nidana***
  - Excessive consumption of meat preparations.
  - Excessive intake of curd and other fermented foods.
  - Consumption of black gram (*Masha*).
  - Excessive use of irritant, hot, and incompatible foods.
  - Excessive intake of sour and pungent substances. [1–3]
- ***Viharaja Nidana***
  - Improper oral hygiene practices.
  - Excessive use of *Kavala* and *Gandusha*.
  - Excessive *Dhumapana*.
  - Sleeping in prone position. [1–3]

The above factors lead to vitiation of *Dosha*s, especially *Pitta, Kapha, and Rakta*, ultimately resulting in *Mukha Paka*. [1–3]

3.3 Samprapti of *Mukhapaka*

The pathogenesis of *Mukhapaka* begins with exposure to *Nidana Sevana*, resulting in *Dosha Prakopa*. Owing to the predominance of *Bodhaka Kapha* in the oral cavity, the vitiated *Dosha*s localize in the *Mukha Pradesh* and produce pathological changes in the oral mucosa. [1,3] Depending upon *Dosha* predominance, ulceration, burning sensation, pain, itching, discoloration, and inflammation develop, culminating in *Mukha Paka*.[1–3]

3.4 Classification of *Mukhapaka* [2,3,8]

Table 1. Classification of *Mukhapaka* According to *Ayurvedic* Classics

Acharya	**Types of *Mukhapaka***
Sushruta	*Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*
Vagbhata	*Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*, *Sannipataja*
Sharangadhara	*Vataja*, *Pittaja*, *Kaphaja*, *Raktaja*, *Sannipataja*

3.5 Lakshana of *Mukhapaka*

Mukhapaka is characterized by ulceration, pain, burning sensation, itching, and inflammatory changes affecting the oral cavity. [2,3]

- ***Vataja Mukhapaka***

Vataja Mukhapaka is characterized by dryness of lips (*Ruksha Oshthata*), intolerance to cold, heaviness of tongue, roughness of tongue, pricking pain (*Toda*), splitting pain (*Bheda*), and severe oral discomfort. [2,3]

- ***Pittaja Mukhapaka***

Pittaja Mukhapaka presents with burning sensation (*Daha*), bitter taste (*Tikta Vaktrata*), thirst (*Trishna*), fever (*Jwara*), erythematous ulcerative lesions, tearing pain, and discoloration of the oral mucosa. [2,3]

- ***Kaphaja Mukhapaka***

Kaphaja Mukhapaka is characterized by itching (*Kandu*), slimy lesions, mild pain, swelling, and lesions having the same colour as the surrounding mucosa. [2,3]

- ***Raktaja Mukhapaka***

Raktaja Mukhapaka exhibits clinical manifestations similar to *Pittaja Mukhapaka* and is characterized by redness, burning sensation, inflammatory changes, and ulcerative lesions.[2]

- ***Sannipataja Mukhapaka***

Sannipataja Mukhapaka manifests with a combination of symptoms produced by all three *Dosha*s and is considered comparatively severe in nature. [3,8]

General Clinical Features

The common clinical manifestations of *Mukhapaka* include: [2,3]

- *Sphota* (ulceration)
- *Toda* (pricking pain)
- *Daha* (burning sensation)
- *Vedana* (pain)
- *Kandu* (itching)

- *Mukhashotha* (inflammation)
- Difficulty in eating
- Difficulty in speaking
- Oral discomfort

4. Modern Perspective of Stomatitis

4.1 Definition

Stomatitis is defined as an inflammatory condition affecting the oral mucosa, with or without ulceration.[13–15] The inflammation may involve the lips, tongue, gingiva, palate, buccal mucosa, floor of the mouth, or multiple sites within the oral cavity.[13,14] Clinically, stomatitis may present with erythema, edema, pain, ulceration, burning sensation, and difficulty in mastication and swallowing.[13–15]

4.2 Epidemiology

Stomatitis is one of the most common oral mucosal disorders encountered in clinical practice. [13,14] Recurrent aphthous stomatitis affects approximately 5–25% of the population and is among the most prevalent ulcerative diseases of the oral cavity. [14,15] The condition frequently affects children, adolescents, and young adults, although it may occur at any age. [14–17]

4.3 Etiology

Stomatitis is a multifactorial disorder resulting from the interaction of local and systemic factors. [13–15]

Local Factors

- Mechanical trauma
- Thermal injury
- Chemical irritation
- Poor oral hygiene
- Tobacco consumption
- Dental procedures
- Ill-fitting orthodontic appliances [13,14]

Infectious Causes

- **Viral**
  - Herpes simplex virus
  - Varicella-zoster virus
  - Coxsackie virus [13–15]
- **Bacterial**
  - Streptococcal infections
  - Secondary bacterial contamination [13,14]
- **Fungal**
  - Candida albicans [13–15]

Nutritional Deficiencies

- Iron deficiency
- Folic acid deficiency
- Vitamin B12 deficiency
- Zinc deficiency [13–17]

Immunological Factors

- Autoimmune disorders
- Hypersensitivity reactions
- Immunodeficiency states [13–15]

Systemic Disorders

- Celiac disease
- Inflammatory bowel disease
- Behçet's disease
- Hematological disorders
- Human immunodeficiency virus infection [13–15,19]

Drug-Induced Stomatitis

Several medications have been implicated in the development of stomatitis, including cytotoxic agents, immunosuppressive drugs, non-steroidal anti-inflammatory drugs, and certain antibiotics. [13–15]

4.4 Pathogenesis

The pathogenesis of stomatitis varies depending upon the underlying etiology. However, mucosal injury and inflammation represent the common pathological events. [13,18,19]

Initially, local trauma, infection, nutritional deficiency, or immune dysregulation results in epithelial damage. [13,18] This leads to activation of inflammatory mediators including tumor necrosis factor-alpha (TNF-α), interleukins, prostaglandins, and reactive oxygen species. [18,19] These mediators increase vascular permeability, promote leukocyte infiltration, and contribute to tissue destruction. [18,19]

Subsequently, epithelial breakdown leads to ulcer formation. Secondary microbial colonization may further aggravate inflammation and delay healing. [13,18] Persistent inflammation may result in recurrent ulcerative episodes. [14,15]

Flowchart 1. Pathogenesis of Stomatitis

Etiological Factors

↓

Mucosal Injury

↓

Activation of Inflammatory Mediators

↓

Inflammatory Cell Infiltration

↓

Epithelial Damage

↓

Ulcer Formation

↓

Pain, Burning Sensation and Difficulty in Feeding

4.5 Clinical Features

The clinical presentation of stomatitis varies according to severity and etiology. [13–15]

Common manifestations include: oral ulcers, pain, burning sensation, erythema, swelling, excessive salivation, halitosis, difficulty in eating, difficulty in swallowing, irritability in children, and reduced oral intake.[13–17]

Severe cases may be associated with dehydration, nutritional compromise, and secondary infections. [16,17]

4.6 Diagnosis

Diagnosis of stomatitis is primarily clinical and based on history and oral examination. [13–15]

Clinical Evaluation

- Number of ulcers
- Size of ulcers
- Site of involvement
- Duration of lesions
- Frequency of recurrence
- Associated systemic symptoms [13–15]

Laboratory Investigations

- Complete blood count
- Serum ferritin
- Serum vitamin B12
- Serum folate
- Iron profile
- Culture studies
- Autoimmune markers [13–15]

Differential Diagnosis

- Recurrent aphthous stomatitis
- Herpetic gingivostomatitis
- Oral candidiasis
- Behçet's disease
- Oral lichen planus
- Traumatic ulcers
- Drug-induced ulcers [13–15]

4.7 Management

Management depends upon identification and correction of the underlying cause. [13–15]

General Measures

- Maintenance of oral hygiene
- Adequate hydration
- Avoidance of irritant foods
- Nutritional correction [13–17]

Pharmacological Management

- Topical corticosteroids
- Local anesthetic preparations
- Antiseptic mouthwashes
- Antimicrobial agents
- Vitamin supplementation
- Immunomodulatory therapy [13–15]

Despite these therapeutic measures, recurrence remains common, particularly in recurrent aphthous stomatitis. [14,15]

5. Correlation of *Mukhapaka* and Stomatitis

The description of *Mukhapaka* available in *Ayurvedic* literature demonstrates remarkable similarity with stomatitis described in modern medicine. [2,3,13–15] Both conditions involve inflammation and ulceration of the oral mucosa and present with pain, burning sensation, difficulty in feeding, and impairment of oral function. [2,3,13–15]

Table 2. Correlation Between *Mukhapaka* and Stomatitis

***Ayurvedic* Feature**	**Modern Correlation**
Sphota	Oral ulcer
Daha	Burning sensation
Toda	Pricking pain
Vedana	Pain
Kandu	Irritation/itching
Mukhashotha	Inflammation
Pitta-Rakta Dushti	Inflammatory pathology
Sarvasara involvement	Diffuse oral mucosal involvement

The symptomatological similarity, site of involvement, disease progression, and therapeutic objectives strongly support the correlation of *Mukhapaka* with stomatitis. [2,3,13–15]

6. *Ayurvedic* Management of *Mukhapaka*

The management of *Mukhapaka* in *Ayurveda* is based on the principles of *Nidana Parivarjana*, *Shodhana*, *Shamana*, and *Sthanika Chikitsa*. [1–3] The primary objectives are elimination of vitiated *Dosha*s, reduction of inflammation, promotion of ulcer healing, relief from pain and burning sensation, and prevention of recurrence. [1,2]

6.1 *Nidana Parivarjana*

Nidana Parivarjana is considered the first line of management in all diseases and involves avoidance of causative factors responsible for *Dosha* vitiation.[1]

Table 3. *Pathya* and *Apathya* in *Mukharoga*

Pathya	***Apathya***
Yava (Barley)	*Dadhi* (Curd)
Mudga (Green gram)	*Matsya* (Fish)
Kulattha (Horse gram)	*Kshira* (Milk)
Jangala Mamsa Rasa	*Guda* (Jaggery)
Karavellaka (Bitter gourd)	*Masha* (Black gram)
Patola (Snake gourd)	*Abhishyandi Ahara*
Tender radish	Excessively sour foods
Ushna Jala	Excessively spicy foods

Tambula	Day sleep
—	Sleeping in prone position

6.2 *Shodhana Chikitsa*

Depending upon *Dosha* predominance, different *Shodhana* procedures have been advocated. [1–3]

Vamana

Vamana is beneficial in *Kapha*-dominant conditions and facilitates elimination of vitiated *Kapha Dosha*. [1,3]

Virechana

Virechana is considered the principal treatment for *Pittaja* and *Raktaja* disorders and helps eliminate vitiated *Pitta* and *Rakta*. [1,3]

Nasya

Nasya aids in the elimination of vitiated *Dosha*s from the *Urdhwajatrugata* region and is beneficial in diseases affecting the oral cavity.[3]

Raktamokshana

Raktamokshana is indicated when *Rakta Dushti* predominates and helps reduce inflammatory manifestations.[2]

Siravedha

Siravedha is specifically mentioned in the management of *Mukhapaka* and helps remove vitiated *Rakta* and *Pitta*. [1,2]

6.3 *Sthanika Chikitsa*

Local therapeutic procedures play a vital role in the management of *Mukharoga*s. [1–3]

Gandusha

Gandusha involves retaining medicated liquid in the oral cavity without movement for a specified period. [3,6] It helps cleanse the oral cavity, reduce inflammation, improve healing, and maintain oral hygiene.

Kavala

Kavala involves retaining and moving medicated substances within the oral cavity.[3,6] It provides prolonged contact between the medicine and oral mucosa, facilitating local therapeutic action.

Pratisarana

Pratisarana refers to local application of medicinal paste or powders over affected lesions.[2,6]

Mukha Dhavana

Mukha Dhavana involves medicated mouth washing and helps reduce inflammation, maintain oral hygiene, and promote healing.[1–3]

7. *Pippalyadi Kawal*

7.1 Classical Reference

Pippalyadi Kawal is described in *Vangasena Samhita* for the management of *Mukharoga*s.[5]

"पिप्पलीसर्षपाः श्वेता नागरं नैचुलं फलम्।
सुखोदकेन संसृष्टं कवलञ्चापि धारयेत्॥"

The formulation consists of four ingredients namely *Pippali*, *Shweta Sarshapa*, *Nagara*, and *Nichula*.[5]

7.2 Ingredients of *Pippalyadi Kawal*

Table 4. Ingredients of *Pippalyadi Kawal*

Sr. No.	Drug	Botanical Name	Family
1	*Pippali*	*Piper longum* Linn.	Piperaceae
2	*Shweta Sarshapa*	*Brassica campestris* Linn.	Brassicaceae
3	*Nagara*	*Zingiber officinale* Roscoe	Zingiberaceae
4	*Nichula*	*Barringtonia acutangula* (L.) Gaertn.	Lecythidaceae

7.3 Rasapanchaka of Ingredients

Table 5. Rasapanchaka of *Pippalyadi Kawal* Ingredients

Drug	*Rasa*	*Guna*	*Virya*	*Vipaka*	*Karma*
Pippali	*Katu*	*Laghu, Snigdha*	*Anushna-Sheeta*	*Madhura*	*Vata-Kapha Shamaka*
Shweta Sarshapa	*Katu, Tikta*	*Snigdha, Ruksha*	*Ushna*	*Katu*	*Kapha-Vata Shamaka*
Nagara	*Katu*	*Laghu, Snigdha*	*Ushna*	*Madhura*	*Vata-Kapha Shamaka*
Nichula	*Tikta, Katu*	*Laghu, Ruksha*	*Ushna*	*Katu*	*Vata-Kapha Shamaka*

The ingredients of *Pippalyadi Kawal* predominantly possess *Katu and Tikta Rasa, Laghu-Ruksha/Snigdha Guna, Ushna Virya, and Vata-Kapha Shamaka* properties, which may be beneficial in the management of oral inflammatory conditions.[9,10]

8. Scientific Evidence Supporting the Therapeutic Potential of *Pippalyadi Kawal*

8.1 *Pippali* (*Piper longum* Linn.)

Pippali is an important medicinal drug widely used in *Ayurveda* for its *Deepana, Pachana, and Rasayana* properties.[9–12] Piperine, the principal bioactive constituent of *Pippali*, has demonstrated significant anti-inflammatory, antioxidant, antimicrobial, immunomodulatory, and analgesic activities.[21–23]

Experimental studies have shown that piperine suppresses inflammatory mediators, reduces oxidative stress, and inhibits microbial proliferation.[21–23] These properties may contribute to reduction of inflammation and acceleration of ulcer healing in *Mukhapaka*.

8.2 *Shweta Sarshapa* (*Brassica campestris* Linn.)

Shweta Sarshapa contains glucosinolates, flavonoids, phenolic compounds, and essential oils that contribute to its medicinal properties.[24,25] Studies have demonstrated antimicrobial, antioxidant, antibacterial, and anti-inflammatory activities of mustard species.[24,25]

The antimicrobial and antioxidant activities of Sarshapa may help reduce microbial colonization and oxidative stress associated with oral ulcerative lesions.[24,25]

8.3 *Nagara* (*Zingiber officinale* Roscoe)

Nagara is a well-known medicinal drug possessing *Deepana, Pachana, and Shothahara* properties.[9,10] The major active constituents include gingerols, shogaols, and zingerone.[26–28]

Recent studies have demonstrated significant anti-inflammatory, antioxidant, antimicrobial, analgesic, and immunomodulatory activities of ginger and its bioactive compounds.[26–28] These actions may help reduce pain, inflammation, and oxidative damage in stomatitis.

8.4 *Nichula* (*Barringtonia acutangula* (L.) Gaertn.)

Nichula contains tannins, flavonoids, triterpenoids, and saponins which contribute to its pharmacological activities.[29,30] Experimental studies have demonstrated anti-inflammatory, antimicrobial, antioxidant, and wound-healing effects of *Barringtonia acutangula* extracts.[29,30]

These activities support its potential role in promoting tissue repair and reducing inflammation in ulcerative disorders of the oral cavity.[29,30]

Table 6. Scientific Evidence Supporting *Pippalyadi Kawal*

Ingredient	Major Active Constituents	Reported Activities
Pippali	Piperine	Anti-inflammatory, antioxidant, antimicrobial
Shweta Sarshapa	Glucosinolates, flavonoids	Antimicrobial, antioxidant
Nagara	Gingerols, shogaols	Anti-inflammatory, analgesic, antioxidant
Nichula	Tannins, flavonoids	Wound healing, antimicrobial, anti-inflammatory

9. Therapeutic Potential of *Pippalyadi Kawal* in *Mukhapaka* w.s.r. to Stomatitis

The therapeutic potential of *Pippalyadi Kawal* can be understood on the basis of both *Ayurvedic* principles and contemporary scientific evidence. The formulation contains drugs possessing *Katu* and *Tikta Rasa, Laghu and Snigdha/Ruksha Guna,* predominantly *Ushna Virya, and Vata-Kapha Shamaka* properties. [9,10] These properties make the formulation suitable for alleviating *Dosha* vitiation associated with *Mukhapaka*.

9.1 Anti-inflammatory Potential

Inflammation is a major pathological event in both *Mukhapaka* and stomatitis.[13,18,19] The constituent drugs of *Pippalyadi Kawal* possess significant anti-inflammatory activities. Piperine from *Pippali* and gingerols from *Nagara* have been shown to inhibit inflammatory mediators such as TNF-α, interleukins, cyclooxygenase enzymes, and other inflammatory pathways.[21–23,26–28]

Similarly, flavonoids and phenolic compounds present in *Sarshapa* and *Nichula* contribute to suppression of inflammatory responses. [24,25,29,30] These actions may help reduce erythema, edema, pain, and ulceration associated with stomatitis.

9.2 Antimicrobial Activity

Secondary microbial colonization frequently aggravates oral ulcerative lesions and delays healing.[13–15] The constituent drugs of *Pippalyadi Kawal* have demonstrated broad-spectrum antimicrobial activity against various bacterial and fungal pathogens.[21,24,27,29]

Pippali exhibits antibacterial and antifungal activity, while *Sarshapa* contains glucosinolate derivatives known for antimicrobial effects.[21,24] Ginger extracts have shown inhibitory activity against several oral pathogens.[27,28] *Nichula* has also demonstrated antimicrobial activity in experimental studies.[29,30]

These activities may help reduce microbial load within the oral cavity and facilitate healing of ulcerative lesions.

9.3 Antioxidant Activity

Oxidative stress is considered an important factor in mucosal injury and delayed wound healing.[18,19] *Pippali*, *Sarshapa*, *Nagara*, and *Nichula* possess significant antioxidant activity due to the presence of piperine, flavonoids, gingerols, phenolic compounds, and tannins.[21,24,26,29]

Reduction of oxidative stress may help prevent tissue damage, accelerate epithelial regeneration, and improve overall healing of oral ulcers.

9.4 Wound-Healing Potential

Healing of oral ulcerative lesions requires rapid epithelial regeneration, collagen synthesis, and reduction of inflammation.[13,18] Experimental studies have demonstrated wound-healing activities of *Pippali*, *Nagara*, and *Nichula* through enhancement of tissue repair mechanisms and reduction of inflammatory injury.[21,27,29,30]

The combined effect of these drugs may contribute to faster healing of oral ulcers and restoration of normal mucosal integrity.

9.5 Local Therapeutic Action of *Kavala*

Kavala is a unique local therapeutic procedure that allows prolonged contact of medicinal substances with the oral mucosa.[3,6] Retention and movement of medicated formulations within the oral cavity facilitate local drug delivery, mechanical cleansing, improved salivary secretion, and direct action upon diseased tissues.[3]

This local mode of administration may enhance the effectiveness of *Pippalyadi Kawal* by ensuring sustained contact of active phytoconstituents with the affected mucosal surfaces.

Flowchart 2. Therapeutic Basis of *Pippalyadi Kawal*

Pippalyadi Kawal

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Anti-inflammatory Activity

↓

Antimicrobial Activity

↓

Antioxidant Activity

↓

Wound-Healing Activity

↓

Reduction in Pain, Burning and Ulceration

↓

Healing of Oral Mucosa

↓

Relief in *Mukhapaka*/Stomatitis

10. Discussion

Mukhapaka is a commonly encountered oral disorder described in *Ayurvedic* literature under *Sarvasara Mukharoga*.[2,3] The symptomatology of *Mukhapaka* closely resembles stomatitis described in modern medicine, particularly with respect to ulceration, pain, burning sensation, inflammation, and impairment of oral functions.[2,3,13–15]

Ayurvedic texts attribute the pathogenesis of *Mukhapaka* primarily to vitiation of *Pitta, Kapha, and Rakta Dosha*s resulting from improper dietary and lifestyle practices.[1–3] Modern understanding of stomatitis also recognizes inflammation as the central pathological process, involving activation of inflammatory mediators, oxidative stress, epithelial injury, and ulcer formation.[18,19] Thus, a significant conceptual correlation exists between the *Ayurvedic* and modern perspectives.

The management of *Mukhapaka* in *Ayurveda* emphasizes both systemic and local therapeutic measures.[1–3] Among local therapies, *Kavala* is considered highly beneficial due to its direct action on the affected oral tissues.[3,6] *Pippalyadi Kawal* is one such formulation specifically indicated in *Mukharoga*s by Vangasena.[5]

The constituent drugs of *Pippalyadi Kawal* possess pharmacological properties that are highly relevant to the pathophysiology of stomatitis. *Pippali* contains piperine, which exhibits anti-inflammatory, antioxidant, and antimicrobial activities.[21–23] Sarshapa contains glucosinolates and flavonoids with antimicrobial and antioxidant properties.[24,25] *Nagara* contains gingerols and shogaols that have demonstrated anti-inflammatory, analgesic, antioxidant, and antimicrobial activities.[26–28] *Nichula* contains tannins and flavonoids with proven wound-healing, antimicrobial, and anti-inflammatory actions.[29,30]

The combined action of these ingredients may help reduce inflammation, suppress microbial growth, alleviate pain and burning sensation, reduce oxidative stress, and accelerate mucosal healing. Furthermore, administration through *Kavala* ensures prolonged local contact of the formulation with the diseased oral mucosa, enhancing therapeutic effectiveness.[3,6]

Thus, both classical *Ayurvedic* principles and modern pharmacological evidence support the potential utility of *Pippalyadi Kawal* in the management of *Mukhapaka* w.s.r. to stomatitis. However, further randomized controlled clinical studies are required to establish its efficacy, safety, and mechanism of action in larger populations.[34–40]

11. Conclusion

Mukhapaka is an important *Mukharoga* described in *Ayurvedic* classics and demonstrates considerable similarity with stomatitis in terms of etiology, symptomatology, and disease progression.[2,3,13–15] The condition significantly affects oral health and quality of life due to pain, burning sensation, ulceration, and difficulty in feeding.

Pippalyadi Kawal, a classical formulation described in *Vangasena Samhita*, contains *Pippali*, *Shweta Sarshapa*, *Nagara*, and *Nichula*, which possess anti-inflammatory, antimicrobial, antioxidant, and wound-healing properties supported by contemporary scientific evidence.[21–30] The local administration of the formulation through *Kavala* further enhances its therapeutic potential by facilitating direct action upon the affected oral mucosa.[3,6]

Based on classical indications and available pharmacological evidence, *Pippalyadi Kawal* appears to be a promising therapeutic option for the management of *Mukhapaka* w.s.r. to stomatitis. Well-designed clinical trials are required to further validate its efficacy and establish its role in evidence-based *Ayurvedic* oral healthcare.

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