

REVIEW ARTICLE ON DHOOPANA KARMA IN OT**Nitika Chambial***

India.

Article Received on 14 Sept. 2026,
Article Revised on 03 Oct. 2026,
Article Published on 16 Oct. 2026,
<https://doi.org/10.5281/zenodo.23365727>

Corresponding Author*Nitika Chambial**

India.



How to cite this Article: Nitika Chambial*. (2026). Review Article on Dhoopana Karma in Ot. World Journal of Pharmaceutical Research, 15(20), 87–99.
This work is licensed under Creative Commons Attribution 4.0 International license.

ABSTRACT

Maintenance of asepsis in operation theatres is one of the most important requirements for successful surgical practice. Contamination of the surgical environment can lead to surgical site infections (SSIs), delayed wound healing, prolonged hospitalization, and increased healthcare costs.^[1] Modern operation theatres employ various sterilization methods such as formaldehyde fumigation, hydrogen peroxide vaporization, ultraviolet radiation, and chemical disinfectants to reduce microbial contamination. Although effective, many of these methods are associated with disadvantages such as toxicity, environmental hazards, high cost, and the need for specialized equipment.^[2] Ayurveda has described an indigenous method of environmental sterilization known as **Dhupana Karma**

(medicated fumigation). References regarding Dhupana are available in classical texts such as Sushruta Samhita, Charaka Samhita, Kashyapa Samhita, and Ashtanga Hridaya. Ancient Acharyas recommended fumigation of operation theatres (Shalyagara), wound care units, surgical instruments, labour rooms, and hospital wards using medicinal substances possessing Rakshoghna (protective) and Krimighna (antimicrobial) properties. Commonly used drugs include Guggulu, Nimba, Vacha, Sarshapa, Haridra, Agar, and Devadaru.^[3] Recent scientific studies have demonstrated antimicrobial, antifungal, insecticidal, and deodorizing activities of many Dhupana drugs, suggesting a scientific basis for their traditional use. The present review aims to explore the concept of Dhupana Karma, its classical references, commonly used formulations, probable mode of action, and its relevance in maintaining asepsis in Minor Operation Theatres.^[4] The available evidence indicates that Ayurvedic fumigation may serve as a cost-effective, eco-friendly, and supportive measure for infection control when used alongside standard sterilization protocols.

KEYWORDS: Anti – microbial, Ayurveda, Dhupana, Infection control.

INTRODUCTION

Surgery is one of the most important branches of medical science, and the prevention of infection has always been a fundamental concern in surgical practice. The success of any surgical procedure depends not only on the skill of the surgeon but also on the maintenance of a sterile environment before, during, and after the operation. Operation theatres are particularly susceptible to contamination from airborne microorganisms, dust particles, contaminated instruments, dressing materials, and healthcare personnel. Such contamination may result in surgical site infections (SSIs), which are among the most common healthcare-associated infections worldwide.^[6]

Modern medicine utilizes various sterilization and disinfection techniques, including autoclaving, ultraviolet radiation, formaldehyde fumigation, hydrogen peroxide vaporization, and chemical disinfectants. While these methods have significantly reduced infection rates, some of them are associated with disadvantages such as toxicity, environmental pollution, high operational costs, and technical complexity. Therefore, there is a growing interest in exploring safe, economical, and environmentally sustainable alternatives or adjunctive methods for infection control.

Ayurveda, the ancient Indian system of medicine, has long recognized the importance of environmental hygiene and infection prevention. Classical Ayurvedic texts describe concepts such as Rakshoghna Karma, Krimighna Chikitsa, and Dhupana Karma for maintaining cleanliness and preventing disease transmission. Among these, Dhupana Karma refers to fumigation with medicated smoke generated from specific herbal, mineral, or animal-origin substances.^[7] Ancient Acharyas employed this technique for purification of operation theatres (Shalyagara), labour rooms (Sutikagara), patient wards, dressing materials, and surgical instruments.

Acharya Sushruta, regarded as the Father of Surgery, emphasized fumigation of surgical rooms and instruments before operative procedures. He recommended the use of substances such as Guggulu, Sarjarasa, Vacha, Sarshapa, Nimba Patra, Lavana, and Ghrita for eliminating harmful organisms and maintaining aseptic conditions.^[8] Similarly, Charaka Samhita mentions fumigation as a preventive measure during epidemics (Janapadodhwansa), while Kashyapa Samhita provides detailed descriptions of Dhupana formulations used for protecting newborns, mothers, and hospital environments from infections.

Many drugs used in Dhupana possess documented antimicrobial, antifungal, antiviral, and insect-repellent properties. Modern pharmacological studies have shown that compounds present in Neem, Clove, Mustard, Guggulu, and Vacha exhibit significant inhibitory effects against pathogenic microorganisms.^[9] These findings support the traditional Ayurvedic belief that medicated fumigation can reduce microbial contamination and improve environmental hygiene.

Considering the increasing burden of antimicrobial resistance and the need for eco-friendly infection-control measures, Dhupana Karma deserves scientific attention.^[10] Therefore, the present review has been undertaken to evaluate the classical concept of Dhupana Karma and explore its potential role in maintaining asepsis in Minor Operation Theatres from both Ayurvedic and modern perspectives.

CONCEPT OF DHUPANA KARMA

The word Dhupana is derived from the Sanskrit root “Dhupa”, which means fumigation or the generation of medicated smoke. In Ayurveda, Dhupana Karma is a specialized procedure in which fumes produced by burning medicinal substances are used for environmental purification, disinfection, and protection from disease-causing organisms.^[11] It is one of the important external therapeutic procedures (Bahirparimarjana Chikitsa) described in Ayurvedic classics.

Ayurveda scholars recognized the role of invisible disease-producing agents described as Krimi, Bhuta, Rakshasa, and Graha. To prevent their spread and maintain a healthy environment, various fumigation procedures were recommended. Dhupana Karma is therefore considered an ancient method of sterilization and environmental disinfection.

The procedure involves burning herbal, mineral, or animal-derived substances either individually or in combination to generate medicinal smoke.^[12] The smoke spreads volatile active compounds throughout the surroundings, helping to purify the air and reduce contamination. Depending on its purpose, Dhupana may be used for preventive, therapeutic, or environmental sanitation measures.

Classical texts describe Dhupana for fumigation of operation theatres (Shalyagara), labour rooms (Sutikagara), paediatric wards (Kumaragara), patient rooms, surgical instruments, dressing materials, wounds, and even entire residential premises during epidemics. Thus, the scope of Dhupana extends beyond surgery and includes preventive medicine, obstetrics, paediatrics, and public health.

Dhupana Karma is classified on several bases. According to purpose, it may be preventive or curative. According to mode of administration, it may be external fumigation of the environment or internal administration in the form of medicated smoking (Dhumapana). According to origin, the drugs used may be of herbal (Sthavara), animal (Jangama), or mineral (Khanija) origin.

From a modern perspective, Dhupana may be considered a form of herbal fumigation that releases bioactive volatile compounds possessing antimicrobial, antifungal, antiviral, deodorizing, and insect-repellent activities.^[13] Therefore, it serves as a bridge between traditional Ayurvedic principles and contemporary infection-control practices.

SYNONYMS

Various terms such as Rakshavidhi, Raksha karma, Nirjantukikarana are used as synonyms for Dhoopana Karma.^[14,15]

DHUPANA IN SHALYA TANTRA

Shalya Tantra is one of the most advanced branches of Ayurveda dealing with surgical disorders and operative procedures. Acharya Sushruta emphasized the importance of maintaining cleanliness and asepsis before, during, and after surgery. Although microorganisms were not described in modern terminology, Ayurvedic texts recognized disease-causing entities under terms such as Krimi, Bhuta, Rakshasa, and Graha.^[16] To protect patients from these harmful factors, several preventive measures collectively known as Rakshoghna Karma were recommended, among which Dhupana Karma occupied a central position. Sushruta advised that the Shalyagara (operation theatre) should be clean, well-ventilated, adequately illuminated, and regularly fumigated with medicinal substances possessing antimicrobial properties. Fumigation was performed before surgical procedures to purify the atmosphere and reduce the risk of wound contamination.^[17] In addition to the operation theatre, surgical instruments, dressing materials, bandages, postoperative wards, and patient rooms were also fumigated.

Dhupana was extensively used in wound management (Vrana Chikitsa). Fumigation of wounds was believed to remove foul odour, reduce excessive discharge, destroy worms and insects, prevent infection, and accelerate healing. Specific formulations were prescribed according to the condition of the wound.^[18] For example, Agar and Chandana were used in hard wounds, while Ghrita, Vasa, and Majja were employed to soften excessively hard tissues. Rakshoghna Dhupa containing Guggulu, Agar, Sarjarasa, Vacha, Sarshapa, Hingu, Lavana, Nimba Patra, and Ghrita was recommended for protection of wounds from contamination.

In anorectal procedures described in Ayurveda, including Arsha (haemorrhoids), Bhagandara (fistula-in-ano), and postoperative wound care, Dhupana was used as an adjunctive procedure to maintain cleanliness and reduce the possibility of infection.^[19] Thus, Dhupana formed an integral component of surgical asepsis in ancient Ayurvedic practice.

From a contemporary viewpoint, Dhupana in Shalya Tantra may be considered an early form of environmental sterilization and infection control. The principles described by Acharya Sushruta show remarkable similarity to modern concepts of operation theatre disinfection and postoperative wound.

CLASSICAL REFERENCES OF DHUPANA KARMA

1. Atharvaveda

The earliest references related to fumigation are found in Atharvaveda, where aromatic substances such as Guggulu and Ajashringi were used for purification of the environment and destruction of harmful organisms. These references indicate that the concept of environmental disinfection existed even during the Vedic period.

2. Charaka Samhita

Acharya Charaka emphasized environmental purification during epidemics (Janapadodhwansa). He advocated fumigation of houses, treatment rooms, and surrounding areas to prevent the spread of communicable diseases. Charaka described various Krimighna (antimicrobial) drugs useful for maintaining a healthy environment and reducing disease transmission.^[20]

3. Sushruta Samhita

Acharya Sushruta, the pioneer of surgery, provided the most practical application of Dhupana in surgical practice. He advised fumigation of operation theatres (Shalyagara), surgical instruments, dressings, and postoperative wards using Rakshoghna drugs such as Guggulu, Agaru, Sarjarasa, Vacha, Sarshapa, Nimba Patra, Lavana, and Ghrita. The objective was to prevent infection, repel insects, eliminate foul odour, and promote healthy wound healing. These recommendations closely resemble modern concepts of operation theatre sterilization and asepsis.^[21]

4. Kashyapa Samhita

Kashyapa Samhita contains extensive descriptions of fumigation procedures, particularly in paediatric and obstetric practice. The famous Gana Dhupa formulation consisting of Ghrita,

Madhu, Akshata, Jatipushpa, Siddharthaka, and Vacha was used for fumigation of delivery rooms, neonatal wards, cradles, and patient surroundings. This demonstrates the importance given to infection prevention in newborns and mothers.^[22]

5. Ashtanga Hridaya

Acharya Vagbhata emphasized fumigation of houses, treatment rooms, and hospital environments using drugs such as Agaru, Vacha, and Haridra. He considered Dhupana an important preventive measure for maintaining environmental hygiene and preventing infectious diseases.

6. Sharangadhara Samhita

Sharangadhara described various formulations for wound fumigation (Vrana Dhupana) and highlighted their usefulness in reducing wound discharge, foul smell, pain, and microbial contamination. These formulations were employed as supportive measures for wound management.

7. Yogaratnakara

Yogaratanakara mentions several Dhupana formulations used in infectious diseases, wound management, obstetric disorders, and environmental purification. It also describes specific fumigation procedures for prevention of disease transmission and maintenance of cleanliness.

8. Bhavaprakasha

Bhavaprakasha describes medicinal substances possessing Krimighna, Kandughna, and Rakshoghna properties that can be utilized in fumigation procedures. These formulations were intended to prevent microbial growth and improve environmental sanitation.

ROLE OF DHUPANA IN MINOR OPERATION THEATRE

Maintenance of sterility in a Minor Operation Theatre is essential for preventing surgical site infections and ensuring successful outcomes of surgical procedures. Minor operation theatres are commonly used for procedures such as incision and drainage of abscesses, excision of cysts, biopsies, suturing of wounds, Ksharasutra procedures, and minor anorectal surgeries. These procedures involve tissue handling and exposure of wounds, making infection control a critical requirement.^[23]

Dhupana Karma can contribute to asepsis in a Minor OT through several mechanisms. The medicinal smoke generated from fumigation disperses volatile phytochemicals throughout the

environment, helping to reduce airborne microbial contamination. The smoke may also settle on surrounding surfaces and reduce microbial growth on walls, floors, furniture, dressing materials, and equipment.

The major roles of Dhupana in Minor OT include

Reduction of Airborne Microorganisms: Medicinal fumes may decrease bacterial and fungal contamination present in the air.

Environmental Purification: Fumigation improves overall cleanliness and reduces unpleasant odours within the operation theatre.

Surface Disinfection: Active compounds released during fumigation may inhibit microbial growth on surrounding surfaces and instruments.

Prevention of Surgical Site Infections: By reducing environmental contamination, Dhupana may lower the risk of postoperative infections.

Insect and Pest Control: Several Dhupana drugs possess insect-repellent activity that helps maintain a hygienic surgical environment.

Improvement of Wound-Healing Environment: A cleaner atmosphere supports better postoperative wound healing and patient recovery.

Eco-friendly Alternative: Unlike some chemical fumigants, Ayurvedic fumigation utilizes natural substances and may have fewer environmental hazards.

Cost-effective Method: Most Dhupana drugs are inexpensive and easily available, making the procedure economical for healthcare settings.^[24]

Although Dhupana cannot currently replace standard sterilization procedures such as autoclaving and chemical disinfection, it can be used as a complementary measure to enhance environmental hygiene and infection control. Future microbiological studies and clinical trials may further establish its effectiveness in modern Minor Operation Theatre.

INDICATIONS OF DHOOPANA KARMA

Ayurvedic literature describes Dhoopana Karma as a versatile therapeutic procedure with preventive, curative, and several other beneficial applications. Classical texts indicate its importance in maintaining environmental hygiene and preventing the spread of diseases. Acharya Charaka advocated the performance of purificatory practices such as Yagya and related rituals during outbreaks of epidemic diseases (Janapadodhwansa) to safeguard public health. Among the various applications mentioned in Ayurvedic scriptures, the preventive aspect of Dhoopana Karma is particularly significant. It has traditionally been employed for large-scale environmental

purification and disinfection. The procedure is considered especially useful for maintaining asepsis in operation theatres, labour rooms, and other healthcare settings. In Shalya Tantra, Dhoopana is extensively recommended as a supportive measure in wound care, where it helps prevent secondary microbial contamination and facilitates proper wound healing. The primary objective of Dhoopana is to inhibit the proliferation and dissemination of pathogenic as well as opportunistic microorganisms present in the surrounding environment and on different surfaces. By creating a cleaner atmosphere, it contributes to infection control and promotes a healthier clinical environment. Apart from its medical applications, Dhoopana Karma has also been described for various socio-cultural and reproductive purposes. Classical references associate it with promoting auspiciousness, prosperity, and healthy progeny. Certain formulations have additionally been mentioned for contraceptive purposes; for example, Nimba Kastha Dhoopa described in Yogaratnakara. Furthermore, Ayurvedic texts on plant science, particularly Vrikshayurveda, highlight the use of fumigation practices for protecting plants from microbial infestations and enhancing their healthy growth and productivity.^[25-32]

COMMONLY USED DRUGS

Guggulu is valued for its deodorizing and antimicrobial properties; Nimba possesses antibacterial and antifungal effects; Vacha is traditionally recognized for its Krimighna activity; Sarshapa contributes antimicrobial action; Haridra provides antiseptic and anti-inflammatory benefits; Agar and Devadaru are aromatic substances with disinfectant potential; Hingu exhibits antimicrobial and insect-repellent properties; Ghrita acts as a carrier medium; and Jatipushpa is known for antibacterial and antifungal activity.^[33-40]

DISCUSSION

Dhoopana Karma, the Ayurvedic practice of medicinal fumigation, represents an ancient method of environmental purification aimed at minimizing microbial contamination and maintaining hygienic surroundings. The concept has been extensively described in classical Ayurvedic literature, particularly in the works of Acharya Sushruta and Acharya Kashyapa. These scholars emphasized the use of herbal smoke for protecting individuals from disease and for preserving the cleanliness of healthcare environments. The traditional practice of Yajna can also be viewed as a form of large-scale medicinal fumigation intended to promote public health and environmental sanitation.

Several Ayurvedic texts highlight the significance of fumigation. Acharya Vagbhata recommended fumigation of clothing, bedding, and living areas to maintain cleanliness and

prevent disease transmission. Kashyapa Samhita provides detailed descriptions of numerous Dhupana formulations, each designed for specific preventive and therapeutic purposes.

References to Rakshoghna Karma found in Vedic literature further demonstrate the historical importance of smoke-based purification methods in controlling harmful organisms and maintaining a healthy environment.

One of the primary objectives of Dhupana Karma is the reduction of pathogenic microorganisms present in the surrounding atmosphere. For this reason, it has traditionally been employed in operation theatres, labour rooms, patient wards, and wound-care settings. In Shalya Tantra, fumigation was considered an important supportive measure for wound management, helping to prevent secondary infections and facilitating healthy wound healing. Its relevance becomes even more significant in situations where infectious agents may spread through airborne droplets, aerosols, coughing, sneezing, speaking, or environmental dust.

Ancient Ayurvedic scholars described disease-causing organisms using terms such as Krimi, Jantu, Graha, and Bhuta. Although these descriptions differ from modern microbiological terminology, they indicate a clear understanding of invisible agents responsible for disease transmission. Dhupana was therefore recommended as a protective measure to destroy or suppress such harmful entities and limit the spread of communicable diseases.

A review of classical formulations reveals that most fumigation substances possess properties such as Rakshoghna (protective), Krimighna (antimicrobial), Kushthaghna, Kandughna, and Vranahara. Modern scientific investigations have supported many of these traditional claims by demonstrating antibacterial, antifungal, antiviral, antiseptic, anti-inflammatory, insecticidal, and disinfectant activities of several Dhupana ingredients. These findings provide a scientific basis for the continued exploration of Ayurvedic fumigation as an adjunctive infection-control measure.

The majority of Dhupana drugs are rich in volatile constituents and aromatic compounds that readily disperse into the environment during combustion. Their volatile nature may contribute to a reduction in airborne microbial load and facilitate penetration into areas that are difficult to disinfect through conventional cleaning methods. Ingredients such as Guggulu, Nimba, Sarshapa, Nirgundi, Agar, and Vacha have been reported to possess significant antimicrobial activity, supporting their traditional use in environmental purification.

CONCLUSION

Dhupana Karma is a unique Ayurvedic fumigation procedure that possesses considerable potential in environmental sanitation and infection prevention. The medicinal substances used in Dhupana exhibit a wide range of biological activities, including antimicrobial, antiseptic, anti-inflammatory, anti-infective, and Krimighna properties. These actions suggest that Ayurvedic fumigation may play a supportive role in reducing microbial contamination within healthcare settings.

In the present era, where healthcare-associated infections and antimicrobial resistance are major concerns, Dhupana Karma offers a natural, economical, and environmentally sustainable approach to infection control. The use of herbal fumigants may help improve environmental hygiene while reducing dependence on chemical disinfectants that can produce adverse effects and environmental hazards.

Although traditional Ayurvedic texts strongly advocate the use of Dhupana for maintaining asepsis in operation theatres, labour rooms, wards, and wound-care units, scientific validation through well-designed experimental and clinical studies remains essential. Future research should focus on identifying active constituents, evaluating antimicrobial efficacy against various pathogens, establishing safety profiles, and comparing outcomes with contemporary sterilization methods.

Development of standardized formulations, dosage schedules, fumigation procedures, and quality-control guidelines will be crucial for the wider acceptance and integration of Dhupana Karma into modern healthcare practice. With adequate scientific evidence and protocol standardization, Ayurvedic fumigation may emerge as a valuable complementary strategy for maintaining a cleaner and safer hospital environment.

REFERENCES

1. Srikanthamurthy, K.R., editor. Ashtanga Sangraha, Rogabhediyaadhyaya, SuthraSthana, Chapter22, Verse 5, 6th ed. Varanasi: Chaukambha Orientalia; 2002: 398.
2. Agnivesa, Charakasamhita, Vyadhitarpuraniyam Vimanam Adhyaya, Vimana Sthana, Chapter 7, Verse 9-13, edited by R.K.Sharma and B h a g a w a n D a s h . R e p r i n t e d . Varanasi: Chaukambha Sanskrit series office; 2003: 199-203.
3. Ibdem Charakasamhita(2), Chapter 9, Verse 26; 138.
4. Ibdem Susruthasamhita(4), Chapter 3, Verse 17; 23.

5. Ibdieem Susruthasamhita(4), Chapter 5, Verse 18; 31.
6. Ibdieem Susruthasamhita(4), Chapter 10, Verse 13; 155.
7. Ibdieem Susruthasamhita(4), Chapter 10Verse 13; 158.
8. Ibdieem Susruthasamhita(4), Chapter 21, Verse 56; 117.
9. Gupta Atridev, editor. Ashtanga Sangra of Vagbhata, 2nd ed, Part-1. Varanasi, India: Choukhamba Bharati Acadamy. 1999; 131.
10. Sharma Anantram, editor. Sushruta Samhita of Sushruta, Volume II, Nidana sthana, Chapter 4, 1 ST ed. Varanasi, India: Chaukhambha Surbharati Prakashan. 2004; 181.
11. IbdieemAstanga Hridaya(20), Chapter 6, Verse 40; 494.
12. Harita, Haritasamhita, Dvithiya Sthana, Chapter 7, Verse 5, edited by Pt Harihara Prasad Tripathi; 9th ed. Varanasi: Chaukhambha Orientalia; 2009: 474.
13. Sarangadhara, Sarangadhara samhita , Uttara khanda, Chapter 9, Verse 1, edited by Brahmanad Tripathi, Reprint ed.,Varanasi; Chaukhambha Orientalia: 2007: 104.
14. Sushruta, Sushrut Samhita with the N i b a n d h a s a n g r a h a C o m m e n t a r y Dalhanacharya, Dhoom-Nasya-Kavalgraha Chikitsa, Chikitsa Sthana, Chapter 40, Verse 19, edited by Yadavji Trikamji Acharya, 6th ed., Varanasi: Chaukhamba Publication; 1997: 554.
15. Tripathi Brahmananda, Pandey, editor. Charak Samhita of Agnivesha, elaborated by Charak & Dridhbala with Charaka Chandrika hindi commentary, Volume II, Chikitsasthana, Chapter 25, verse 108, reprint ed. Varanasi, India: Chaukhamba Surbharti Prakashana. 2011; 859.
16. Murthy Srikantha, editor. Ashtanga Sangraha of Vagbhata, 9th ed, Part-1. Uttarasthana 30/37, Varanasi, India: Choukhamba Bharati Acadamy. 2005; 502.
17. Shastri Kaashinath, Chaturvedi Gorakhnaath, editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by Chakrapani. Vol I, Vimana Sthana, Chapter 3, Verse 24. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 114.
18. Shastri Kaashinath, Chaturvedi Gorakhnaath, Editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by Chakrapani. Vol I, Sharira Sthana, Chapter 8, verse 61. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 312.
19. Sharma Hemraj, editor. Kashyapa Samhita of Vrudhhjivajaka, Reprint ed. Kalpa sthana, 1st Adhyaya, Dhoopa kalpa adhyaya Varanasi, India: Chaukhamba Publication. 2013; 172.

20. Charaka Samhita. Edited by Vaidya Jadavji Trikamji Acharya. Varanasi: Chaukhambha Surbharati Prakashan, 2015; Sutra Sthana 5/15.
21. Sushruta Samhita. Edited by Vaidya Jadavji Trikamji Acharya. Varanasi: Chaukhambha Surbharati Prakashan, 2017; Sharira Sthana 5/12.
22. Kashyapa Samhita. Edited by P.V. Tewari. Varanasi: Chaukhambha Vishvabharati, 2016
23. Astanga Samgraha of Vagbhata. Nasyavidhi Adhyaya, Page 525. Chaukhamba Orientalia, Varanasi, ninth edition 2005.
24. Shastri L, editor. Yogratnakara with VidyotiniTika, Uttarardh, Chapter 5 Yonivyapadachikitsa. Reprint ed. Varanasi, India: Chaukhambha Prakashana. 2013; 409.
25. Murthy Srikantha, editor. Ashtanga Sangraha of Vagbhata, 9th ed, Part-1. Uttarasthana 30/37, Varanasi, India: Choukhamba Bharati Academy. 2005; 502.
26. Shastri Kaashinath, Chaturvedi Gorakhnaath, editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by Chakrapani. Vol I, Vimana Sthana, Chapter 3, Verse 24. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 114.
27. Shastri Kaashinath, Chaturvedi Gorakhnaath, Editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by Chakrapani. Vol I, Sharira Sthana, Chapter 8, verse 61. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 312.
28. Sharma Hemraj, editor. Kashyapa Samhita Of Vrudhhjivajaka, Reprint ed. Kalpa Sthana, 1st Adhyaya, Dhoopa kalpa Adhyaya Varanasi, India: Chaukhamba Publication. 2013; 172.
29. Shastri Ambikadutta, editor. Sushruta Samhita of Sushruta, Volume I, Sutra Sthana, Chapter 19, verse 28. 12th ed. Varanasi, India: Chaukhambha Publication. 2001; 275.
30. Tripathi Harihara Prasad, editor, Harita Samhita of Sushruta, Volume I, 2nd Sthana, Chapter 7. Reprint ed. Varanasi, India: Chaukhambha Publication. 2009; 275.
31. Shastri Kaashinath, Chaturvedi Gorakhnaath, editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by Chakrapani. Vol I, Sharira Sthana, Chapter 8, verse 61. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 312.
32. Sharma Hemraj, editor. Kashyapa Samhita Of Vrudhhjivajaka, Reprint ed. Kalpa Sthana, 1st adhyaya, Dhoopa kalpa Adhyaya Varanasi, India: Chaukhamba Publication. 2013; 172.
33. Ath. 4th kanda, sukta 37, 1-3.
34. Shastri Kaashinath, Chaturvedi Gorakhnaath, editor. Charak Samhita of Agnivesa Elaborated by Charaka and Dridhbala with the AyurvedDipika Commentary by

- Chakrapani. Vol I, Sutra Sthana, Chapter 4, verse 15. Reprint ed. Varanasi, India: Chaukhamba Publication. 2009; 149.
35. Raghuveer, Nageshwara Rao V. Ayurvedic concept of kṛmi. Journal of Biotechnology and Biosafety. 2(5): 150-155.
36. Sharma Anantram, editor. Sushruta Samhita of Sushruta, Volume I, 1st ed. Varanasi, India: Chaukhambha Surbharati Prakashan. 2004; 149.
37. Shastri Ambikadutta, editor. Sushruta Samhita of Sushruta, Volume I, Sutra sthana, Chapter 5, verse 17. 12th ed. Varanasi, India: Chaukhambha Publication. 2001; 165.
38. Bhishagcharya Shrisatyapal, editor. Kashyapa Samhita of Vrudhhjivajaka, fourth ed. Kalpa sthana, 1st adhyaya, Dhoopa kalpa adhyaya Varanasi, India: Chaukhamba Sanskrit Sansthan. 1992; 170.
39. Babu S Suresh. Textbook of the principles and practice of Kayachikitsa, Reprint ed. Varanasi, India: Chaukhamba Orientalia. 2017; 221.
40. Sharma Anantram, editor. Sushruta Samhita of Sushruta, Volume III, Uttaratanttra, Chapter 39, verse 262, 1st Ed. Varanasi, India: Chaukhambha Surbharati Prakashan. 2018; 283.
- 41.