

REVIEW ARTICLE

Effectiveness of Chukku Thiri in the Management of Peenisam

Divya Jayachandran¹, Senthamil Veni S¹, Susmitha T¹, Abarna Balasubramani^{2*} Suresh Ramasamy³,
Thiyagasundaram T⁴

¹Medical officer, National Institute of Siddha, affiliated to Tamilnadu Dr MGR Medical University, Chennai-47

²Department of Nanju Maruthuvam (Siddha Toxicology), National Institute of Siddha, (Affiliated with The Tamil Nadu Dr.M.G. R Medical University) Ministry of Ayush, Chennai-47, Tamil Nadu, India.

³ Central Council of Research in Siddha, Ministry of Ayush, Chennai-47, Tamil Nadu, India.

⁴Department of Noi Nadal (Siddha Pathology), Sri Sairam Siddha Medical College and Research Centre, (Affiliated with The Tamil Nadu Dr.M.G. R Medical University) Ministry of Ayush, Chennai-47.

***Correspondence Author: Abarna Balasubramani**

Email: abu.abarna96@gmail.com

ORCID ID: <https://orcid.org/0009-0005-1157-7205>

ABSTRACT

Chukku Thiri is a traditional Siddha fumigation therapy used in the management of Peenisam (sinusitis) and related upper respiratory tract conditions. It is prepared using Zingiber officinale (dry ginger), Curcuma longa (turmeric), and Cinnamomum camphora (camphor), all of which possess well-documented anti-inflammatory, antimicrobial, mucolytic, and analgesic properties. The medicated wick, when ignited, releases therapeutic fumes that are inhaled, allowing direct action on the nasal and sinus mucosa. This method helps to clear mucosal congestion, reduce inflammation, and alleviate pain and pressure in the head and sinuses. Literature from both classical Siddha texts and modern pharmacological research supports the efficacy of this therapy. The formulation helps restore balance to the deranged Kabam and Vatham humors, in line with Siddha principles, while also aligning with current scientific understanding of respiratory relief. Thus, Chukku Thiri presents itself as a safe, accessible, and effective supportive treatment for sinusitis and related respiratory ailments.

KEYWORDS: Chukku Thiri, Fumigation, Siddha medicine, External Therapy, Pugai.

Received 28.04.2026

Revised 21.06.2026

Accepted 20.07.2026

How to cite this article:

Divya J, Senthamil V S, Susmitha T, Abarna B, Suresh R, Thiyagasundaram T. Effectiveness of Chukku Thiri in the Management of Peenisam. Adv. Biores. Vol 17 [7] July 2026. 15-19

INTRODUCTION

Fumigation involves the intentional infusion of the atmosphere with the fumes or smoke of aromatic or medicinal plants [1]. These fumes are often utilized in inhalation therapy. When medicinal herbs are used in fumigation, especially as part of specific rituals, they can positively impact both the individuals participating and the surrounding environment [2]. Traditionally, these fumigation practices incorporate medicinal plants that have long been recognized for their beneficial effects. Inhalation of medicated fumes also known as "Thiri Oothal" or "Thoopam" in Siddha is one among the 32 traditional external therapies used for managing *Peenisam* (sinusitis and related nasal conditions), *Suram* (fever), *Thalai Vedhanai* (headache), and other upper respiratory tract disorders [3]. The practice involves burning a wick or cloth (*Thiri*) infused with specific herbal formulations, producing medicinal smoke that the patient inhales in a controlled manner [2]. This technique is valued for its ability to deliver volatile, bioactive compounds directly to the mucosal surfaces of the nasal and sinus cavities, thereby offering rapid relief from congestion, inflammation, and infection [3]. In Siddha medicine, the human body is governed by three fundamental humors *Vatham*, *Pitham*, and *Kabam* [4, 5]. Respiratory ailments such as *Peenisam* (sinusitis) are typically considered *disorders* arising from the imbalance of *Kabam* and *Vatham*, primarily due to the accumulation of cold, and mucosal elements in the head region. As described in Siddha literature, the

practice of *Pugai* (fumigation therapy) is indicated to expel vitiated *Kabam* and regulate *Vatham* within the cranial and respiratory pathways. The therapeutic process helps dissolve thickened mucus and remove nasal congestions [1].

MATERIAL AND METHODS

Data collection

The information on Siddha herbomineral formulation was acquired from prehistoric Siddha text books and by literature searching in electronic databases such as Science Direct, PubMed, PubMed Cochrane, Google-Scholar and other electronic databases using the keywords “*Pugai*”, “Fumigation”, “*Dhoopam*”, “*Zingiber officinale*”, “*Curcuma longa*”, “*Cinnamomum camphora*”, “anti-inflammatory”, “anti-microbial”, “mucolytic” and “analgesic”, “Phytochemical constituents”, or its combinations. Articles were included based on their relevance to ingredients of Chukku thiri and its indications, availability of full text, and study design, including clinical trials, mechanistic studies, and reviews. Exclusion criteria included duplication, lack of relevance to the subject, and insufficient methodological details. Studies that did not focus on herbal therapies or lacked direct applicability to the topic were also excluded. The article selection process involved multiple stages: screening titles and abstracts, reviewing full texts, and applying inclusion and exclusion criteria to ensure relevance and quality. The analysis and article writing took about 8 months.

Ingredients of Chukku Thiri

The ingredients are depicted in Table 1.

Table 1: Ingredients of Chukku Thiri

S. No	The vernacular name of the ingredients	Botanical name/Chemical name	Quantity
1.	Chukku	<i>Zingiber officinale</i> Roscoe	100 g
2.	Manjal	<i>Curcuma longa</i> Linn	100 g
3.	Karpooram	<i>Cinnamomum camphora</i> (Linn.) Presl	10 g

Preparation of Chukku Thiri

Dry ginger, camphor, and turmeric were powdered individually and mixed together. The mixture was ground with water and applied onto a cloth, which was then rolled and sun-dried to form a wick.

LITERATURE REVIEW

A summary of detailed Siddha literature on Chukku thiri, as noted in Table 2

Table 2: Siddha Literature References for Chukku Thiri

Botanical Name	Vernacular Name	Active Principle	Taste	Potency	Division	Action
<i>Zingiber officinale</i> Roscoe	Chukku	gingerols, β -bisabolene, shogaols, zingiberene, α -curcumene and paradols [6]	Pungent [7]	Hot [7]	Pungent [7]	Stimulant, Stomachic, Carminative [7]
<i>Curcuma longa</i> Linn	Manjal	curcumin, tumerone, atlantone, zingiberene, curcumin, demethoxycurcumin, bisdemethoxycurcumin α -zingiberene and cineole [8,9]	Pungent, bitter [7]	Hot [7]	Pungent [7]	Carminative, Stimulant, Hepatic tonic [7]
<i>Cinnamomum camphora</i> (Linn) Presl	Camphor	bicyclic monoterpene, (E)- α -atlantone, linalool, 1,8-cineole (eucalyptol), nerolidol and safrole [10]	Pungent [7]	Hot [7]	Pungent [7]	Anti-pyretic, Anti-bacterial and Anti-inflammatory [7]

PHARMACOLOGICAL ACTIVITY

Zingiber officinale (Chukku)

Ginger has strong anti-inflammatory and analgesic effects. Its constituents inhibit COX-1/2 and 5-LOX pathways and block NF- κ B signaling, reducing pro-inflammatory cytokines and mediators [11]. 6-gingerol suppresses TNF- α and iNOS expression via NF- κ B inhibition and shogaols dose-dependently inhibit nitric oxide production in activated macrophages. Gingerols also act on vanilloid pain receptors: they agonize

TRPV1 (VR1) causing analgesia [11]. Clinically, randomized trials report that ginger relieves pain in dysmenorrhea, osteoarthritis, and migraine. In fact, ginger was as effective as common analgesics in some migraine studies [11]. Ginger exhibits broad antimicrobial and respiratory benefits. Ginger essential oil (rich in zingiberene) inhibits bacteria such as *Staphylococcus aureus* and *E. coli* (e.g. MIC ~1.0 mg/mL for *S. aureus*), primarily by disrupting microbial membranes [12]. Fresh ginger extract also blocks respiratory viruses in airway cells: its dose-dependently inhibited RSV and rhinovirus attachment and replication in human respiratory epithelia likely by inducing antiviral interferon- β [13]. In airway tissue, ginger has a bronchodilation, mucolytic effect: human tracheal strips relaxed by ~60–90% when exposed to 6-gingerol or 6-shogaol [14]. This smooth-muscle relaxation can ease bronchospasm and help clear mucus. In summary, ginger provide antioxidant, anti-inflammatory, antimicrobial and analgesic actions validating its use in steam inhalation for cold, sinus and headache relief [11]. Studies on ginger-based nasal formulations have demonstrated significant reduction in nasal mucosal inflammation, supporting its use in sinusitis management. Safety and tolerability of Nasiyam therapies have been favorable, with clinical trials reporting minimal adverse effects, comparable to placebo [15].

***Curcuma longa* (Manjal)**

Curcumin is a potent anti-inflammatory agent. It inhibits NF- κ B, AP-1 and MAPK pathways, thereby downregulating COX-2, iNOS and inflammatory cytokines (TNF- α , IL-6, IL-4, IL-8) [16]. In allergic rhinitis patients, oral curcumin significantly improved nasal symptoms (sneezing, rhinorrhoea, congestion) and reduced nasal airflow resistance; these effects were accompanied by lowered IL-4, IL-8 and TNF- α and increased IL-10 [17]. In a rat sinusitis model, curcumin treatment preserved near-normal mucosal structure and dramatically reduced cellular inflammation compared to untreated controls [16]. Thus inhaled turmeric fumes could similarly dampen sinus inflammation and decongest passages. Curcumin also shows analgesic/neuroprotective effects in a double-blind RCT on migraine, 8-week curcumin supplementation (1 g/day) significantly reduced headache severity and duration suggesting anti-inflammatory migraine relief.

Turmeric has antimicrobial action as well as Curcumin and turmeric oil inhibit a broad spectrum of microbes. Studies report antibacterial and antifungal activity against many pathogens (e.g. *Staphylococcus*, *E. coli*, fungi, viruses) [8]. Antiviral effects of Curcumin (e.g. against influenza) and ability to enhance interferon responses may help clear sinus infections. For example, curcumin blocks influenza replication in vitro and synergizes with antibiotics to kill bacteria. Though curcumin is poorly water-soluble, inhaling its volatile components (turmerones) may still impart modest antimicrobial effects. Curcumin and turmerones act via antioxidant and immunomodulatory mechanisms to reduce mucosal inflammation, clear microbes and relieve pain. Their demonstrated benefits in rhinitis, sinusitis and migraine support the traditional use of turmeric fumigation for head and nasal ailments [17].

***Cinnamomum camphora* (Camphor)**

Camphor is well known for analgesic and anti-inflammatory properties. Topical or inhaled camphor activates sensory TRPV1 channels and desensitizes pain fibers; linalool similarly reduces inflammation and pain in animal models. In a mouse migraine model, *C. camphora* essential oil markedly reduced pain behaviors and lowered nitric oxide and iNOS levels by inhibiting NF- κ B signaling. Biochemical testing shows *C. camphora* extracts have antibacterial, anti-inflammatory and analgesic activities [10]. Camphor's action on TRPV1/TRPA1, combined with cytokine suppression, plausibly explains relief of headache and sinus pain when inhaled. Camphor oil is also an antimicrobial. In vapor-phase, it kills bacteria: for example, vapor from a linalool-rich camphor oil inhibited *E. coli* growth (MIC ~200 μ L/L) by compromising the cell membrane [18]. Other studies report broad-spectrum antibacterial and antifungal effects of camphor constituents. In practice, the scent of camphor is known to clear nasal passages and is often used as a decongestant. The combined antimicrobial and anti-inflammatory actions likely help sterilize the nasal mucosa during fumigation. Camphor delivers rapid decongestion and analgesia. Its cooling vapor stimulates airflow sensation, while camphor and linalool chemically quench inflammation and pain [10]. In steam inhalation, camphor synergizes with ginger and turmeric: it enhances mucosal blood flow and blocks pain signals, complementing the antimicrobial and anti-inflammatory effects of the other herbs.

Possible Mechanism of Fumes:

Inhalation of *Chukku Thiri* fumes delivers heat and volatile bioactive to the nasal and sinus mucosa, producing various benefits. Warm steam hydrates and loosens mucus, aiding decongestion. The volatile oils then exert direct pharmacological effects: they suppress mucosal inflammation (via NF- κ B and cytokine inhibition) reduce sinus swelling, and relieve headache pain [16,11]. A study exhibited that curcumin (turmeric) inhalation preserved near-normal sinus mucosa and reduced inflammatory infiltrates in a rat sinusitis model [16]. At the same time, the fumes carry potent antimicrobials: vapor-

phase camphor oil showed strong bactericidal action (MIC ~200 µL/L) against *E. coli* by disrupting membranes, and ginger vapors (rich in zingiberene) inhibit pathogens like *S. aureus* and RSV in vitro [18, 12, 13]. Finally, analgesic terpenes activate nociceptive TRP channels: camphor and linalool desensitize TRPV1/TRPA1 sensory nerves, and gingerols act as TRPV1 agonists. Together, these actions (anti-inflammatory, antimicrobial, mucolytic and analgesic) exhibit *Chukku thiri* fumigation clears nasal congestion and soothes head ache. These actions are particularly beneficial in relieving nasal congestion, reducing mucosal inflammation, fighting pathogens, and alleviating headache and facial pressure. Fumigation delivers these bioactive compounds as vapor directly to the nasal and sinus mucosa, allowing for rapid absorption and localized therapeutic effects. Thus, *Chukku Thiri* represents a valuable integrative approach, combining the wisdom of Siddha medicine with evidence-based pharmacological actions for safe and effective relief of sinus-related symptoms.

CONCLUSION

Chukku Thiri fumigation is an effective traditional Siddha therapy for managing *Peenisam* (sinusitis) and related respiratory conditions. The herbal fumes from the wick provides anti-inflammatory, antimicrobial, mucolytic, and pain-relieving effects. This therapy helps clear nasal congestion, reduce sinus inflammation, and restore balance to *Kabam* and *Vatham*. Safe, simple, and fast-acting, *Chukku Thiri* serves as a valuable supportive treatment for sinus and upper respiratory disorders.

ACKNOWLEDGEMENT

The authors acknowledge the support and facilities provided by the National Institute of Siddha, Tambaram sanatorium, Chennai for their support in this study.

FUNDING

The author(s) received no financial support for the research, authorship and/or publication of this article

ETHICAL APPROVAL

As the present study is a Literature review, it does not involve the use of human or animal subjects and therefore, ethical clearance is not applicable.

CONFLICT OF INTEREST

The author(s) declared no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

AUTHOR CONTRIBUTION

Conceptualization: DJ, AB; Data collection and compilation: AB, SR; Manuscript Writing: AB, SR; Proofreading and editing: DJ, SS, ST, AB, SR, TT

REFERENCE

1. Uthamarayan KS. (2009): Siddhar Aruvai Maruthuvam. 6th ed. Chennai: Department of Indian Medicine and Homeopathy; .p. 236.
2. S. Lalitha, V. Anavarathan, V. Mahalakshmi, N. J. Muththu kumar. (2018): Pugai (Fumigation) As a Pura Maruthuvam (External Therapy) in the Siddha System of Medicine, International Journal of Ayurveda and Pharma Research. ;6 (7):1-5.
3. S. Mohamed Ajmal, M. Naga Lakshmi, M. Nandhini, G. Meena Dharshini, P.J. Kowshika shree, T. Keerthiga, A.P. Uma. (2017). Standard Operative Procedure on Pugai (Fumigation) in Siddha system of medicine. Int. J. Curr. Res. Med. Sci. 3(7): 66-69. <http://dx.doi.org/10.22192/ijcrms.2017.03.07.011>
4. Dr. P. M. Venugopal H.B.I.M, Udal Thathuvam, (2013): Indian Medicine and Homeopathy Department, Chennai, pg no- 377
5. Uthamarayan KS, Thotragrama Araichiyum Siddha Maruthuva Varalarum, (2000): Indian Medicine and Homeopathy Department, Chennai, pg no – 344, https://archive.org/details/dli.jZY9lup_2kZl6_TuX_GlZQd_jZp1kuty.TVA_BOK_0007029
6. Mao QQ, Xu XY, Cao SY, Gan RY, Corke H, Beta T, Li HB. (2019): Bioactive Compounds and Bioactivities of Ginger (*Zingiber officinale* Roscoe). Foods. May 30;8(6):185. <http://dx.doi.org/10.3390/foods8060185>. PMID: 31151279; PMCID: PMC6616534.
7. Dr.R. Thiyagarajan, (2013): Gunapadam Mooligai part 1, Indian Medicine and Homeopathy Department, Chennai.
8. Moghadamtousi SZ, Kadir HA, Hassandarvish P, Tajik H, Abubakar S, Zandi K. (2014): A review on antibacterial, antiviral, and antifungal activity of curcumin. Biomed Res Int. :186864. <http://dx.doi.org/10.1155/2014/186864>. Epub 2014 Apr 29. PMID: 24877064; PMCID: PMC4022204

9. Poudel DK, Ojha PK, Rokaya A, Satyal R, Satyal P, Setzer WN. (2022): Analysis of Volatile Constituents in *Curcuma* Species, viz. *C. aeruginosa*, *C. zedoaria*, and *C. longa*, from Nepal. *Plants* (Basel). Jul 26;11(15):1932. <http://dx.doi.org/10.3390/plants11151932>. PMID: 35893636; PMCID: PMC9332366
10. L. Y. FAN, Q. LIN, N. Y. YANG* AND L. H. CHEN, (2020): Analgesic Effects of the Essential Oil from *Cinnamomum camphora* Against Nitroglycerin-induced Migraine in Mice, *Indian Journal of Pharmaceutical Sciences*, ;82(1):166-170
11. Rondanelli M, Fossari F, Vecchio V, Gasparri C, Peroni G, Spadaccini D, Riva A, Petrangolini G, Iannello G, Nichetti M, Infantino V, Perna S. (2020): Clinical trials on pain lowering effect of ginger: A narrative review. *Phytother Res*. Nov;34(11):2843-2856. <http://dx.doi.org/10.1002/ptr.6730>. Epub May 20. PMID: 32436242; PMCID: PMC7754412.
12. Wang X, Shen Y, Thakur K, Han J, Zhang JG, Hu F, Wei ZJ. (2020): Antibacterial Activity and Mechanism of Ginger Essential Oil against *Escherichia coli* and *Staphylococcus aureus*. *Molecules*. Aug 30;25(17):3955. <http://dx.doi.org/10.3390/molecules25173955>. PMID: 32872604; PMCID: PMC7504760
13. Chang JS, Wang KC, Yeh CF, Shieh DE, Chiang LC. (2013): Fresh ginger (*Zingiber officinale*) has anti-viral activity against human respiratory syncytial virus in human respiratory tract cell lines. *J Ethnopharmacol*. ;145(1):146-151. <http://dx.doi.org/10.1016/j.jep.2012.10.043>
14. Townsend EA, Siviski ME, Zhang Y, Xu C, Hoonjan B, Emala CW. (2013): Effects of ginger and its constituents on airway smooth muscle relaxation and calcium regulation. *Am J Respir Cell Mol Biol*. Feb;48(2):157-63. <http://dx.doi.org/10.1165/rcmb.2012-0231OC>. Epub 2012 Oct 11. PMID: 23065130; PMCID: PMC3604064.
15. Stoelzel K, Linde K, Schneider A, Barth A, Reinhold T. (2014): Herbal nasal spray vs placebo in allergic rhinitis: a randomized controlled trial. *Clin Transl Allergy*. ; 4:41.
16. Birdane L, Cingi C, Muluk NB, San T, Burukoglu D. (2016): Evaluation of the efficacy of curcumin in experimentally induced acute sinusitis in rats. *Ear Nose Throat J*. ;95(12): E21-E27.
17. Wu S, Xiao D. (2016): Effect of curcumin on nasal symptoms and airflow in patients with perennial allergic rhinitis. *Ann Allergy Asthma Immunol*. ;117(6):697-702.e1. <http://dx.doi.org/10.1016/j.anai.2016.09.427>
18. Wu K, Lin Y, Chai X, Duan X, Zhao X, Chun C. (2019): Mechanisms of vapor-phase antibacterial action of essential oil from *Cinnamomum camphora* var. *linaloofera* Fujita against *Escherichia coli*. *Food Sci Nutr*. 2019;7(8):2546-2555. Published 2019 Jul 4. <http://dx.doi.org/10.1002/fsn3.1104>

Copyright: © 2026 Author. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.