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Exploring the Potential Role of Herbal Ayurveda Formulation *Vasadi Kashaya* in Chronic Obstructive Pulmonary Disease - A Review

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ABSTRACT

Chronic obstructive pulmonary disease (COPD) is a disease of respiratory system having chronic nature which is characterised by airway inflammation and airflow obstruction that is not fully reversible. It includes two clinical conditions, chronic bronchitis and emphysema which generally overlap in patients. It is a preventable and treatable disease that is caused by significant exposure to harmful gases or organic matter. The common clinical symptoms include dyspnoea, cough, sputum production, chest tightness. According to the global burden of disease study reports published in 2018, COPD is the second leading cause of death due to non-communicable diseases in India. COPD in Ayurveda is can be dealt in Ayurvedic clinical practice using treatment principles of *Shwasa* and *Kasa*. *Vasadi Kashaya*, a herbal Ayurveda medicine is commonly used in the treatment of respiratory disorders by Ayurveda practitioners. **Aim:** In this article, possible mode of action of *Vasadi Kashaya* in the treatment of COPD have been explored based on available Ayurvedic and scientific literature. **Methodology:** Information from Ayurveda text books and available full text articles on different medical online sources was collected using relevant keywords and are summarised in this article. **Conclusion:** Available scientific evidence supports the anti-inflammatory, bronchodilator, anti-allergic, anti-oxidant and immune-modulator properties of *Vasadi Kashaya* making it a potential herbal formulation for Ayurvedic management of COPD.

Key words: *Tamaka Shwasa, Vasadi Kashaya, Chronic Obstructive Pulmonary Disease*

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) and Asthma are the major contributors for chronic respiratory disorders in India. COPD is a chronic disease of the respiratory system affecting the central as well as peripheral airway and is characterised by

airway inflammation and airflow obstruction that is not fully reversible. It includes two clinical conditions, chronic bronchitis and emphysema which generally overlap in patients. According to Global Burden of disease study report, published in 2018 in The Lancet, 75.6% of the chronic respiratory disease related disability adjusted life years in India in 2016 were due to COPD. COPD is an obstructive airway disease where airflow obstruction is of chronic nature and is due to chronic bronchitis or emphysema or mixture of both.^[1] Smoking and environmental pollution are the most important risk factors for the development of the disease. Salient characteristics of COPD pathogenesis are oxidative stress as result of smoking and environmental pollution, leading to airway inflammation causing thickening of muscular layer of airway, hyperplasia and hypertrophy of mucus secreting cells and irreversible dilatation of distal

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airways. The most common respiratory symptoms include dyspnoea, cough, sputum production and chest tightness.

Shwasa or Dyspnoea in Ayurveda is a presenting feature of *Pranavaha Srotas* (channels circulating vital energy) vitiation. Five distinct clinical varieties of *Shwasa* viz *Maha Shwasa*, *Urdhava Shwasa*, *Chinna Shwasa*, *Tamaka Shwasa* and *Kshudra Shwasa* have been documented in Ayurvedic classics.^[2] *Shwasa* is a *Kapha-Vata* dominant disorder which originates from *Pittasthana* (seat of *Kapha*).^[3] Whenever due to responsible causative factors *Kapha* aggravates, it causes obstruction of *Srotas*, *Pranavahasrotas* in particular. *Srotas* obstruction further aggravates the vitiated *Vata* and attains *Pratiloma Gati* (abnormal movement) and thus establishes the pathogenesis of *Shwasa*. Obstruction of *Pranavaha Srotasa* by *Kapha* and *Pratiloma Gati* of *Vata* are the hallmarks in the pathogenesis of *Shwasa*.^[4] *Kapha* aggravation produces symptoms like *Pratishayay* (Nasal symptoms), Mucus production, *Aanaha* (constipation with abdominal distension), *Paarshav Shoola* (pain in flanks) and due to aggravation of *Vata* symptoms like wheezing, dyspnoea, chest tightness, etc. are produced.

Kapha-Vata pacifying diet, drugs, and nourishing (*Brihmana*) treatment modalities have been advocated for treatment of *Shwasa* in Ayurveda. Different Ayurvedic formulations used in the treatment of Dyspnoea associated clinical conditions are *Kapha & Vata Shamak*. *Vasadi Kashaya* is a herbal medication commonly prescribed for the treatment of respiratory conditions in Ayurveda. It is mainly prescribed in the form of decoction and is taken on empty stomach. In this review, effect of *Vasadi Kashaya* will be reviewed in view of COPD.

METHODOLOGY

Ayurvedic texts and electronic sources like Pub med, Google scholar were searched using key words *Shwasa*, COPD and Alternative medicine, complementary and alternative medicine, *Vasa*, *Guduchi*, *Kantkari*, etc. Full text articles were reviewed and important information was collected and

compiled for their effect on respiratory inflammation, bronchodilation, anti-oxidant and immune modulation properties.

Contents of Vasadi Kashaya

Different types of *Vasadi Kashaya* have been mentioned in Ayurvedic texts. In this review *Vasadi Kashaya* mentioned in *Sodhala Nighantu*, *Gadnigraha*, *Shavyathu Adhikar* is included.^[5]

Table 1: Contents of Vasadi Kashaya

SN	Contents	Latin name	Part used	Ratio
1.	<i>Vasa</i>	<i>Adhathoda vasica</i> Nees	<i>Panchanga</i> (Five parts)	1 part
2.	<i>Guduchi</i>	<i>Tinospora cardifolia</i> (Willd.) Miers ex Hook. f. & Jhoms.	<i>Kaanda</i> (Stem)	1 part
3.	<i>Kantakari</i>	<i>Solanum xanthocarpum</i> Schrad & Wendl.	<i>Panchanga</i> (Five parts)	1 part

Method of Preparation of decoction

Vasa, *Guduchi* and *Kantakari* are taken in equal parts and their coarse powder is prepared. The coarse powder of drugs is boiled by adding sixteen times of water under low heat and is reduced to 1/8th part and is then filtered. The prepared decoction is usually given in the dose of 40 ml twice or thrice a day.

Table 2: Ayurvedic properties of Vasadi Kashaya^[6]

Nam e	Ras a	Gun a	Vir ya	Vipa ka	Dosha ghnata	Karma	Rogag hnata
<i>Guduchi</i>	<i>Tikta, Kas hay a</i>	<i>Guru, Snigdha</i>	<i>Ushna</i>	<i>Madhura</i>	<i>Tridosha-shamaka</i>	<i>Kaphaghna, Rasayana, Hridaya, Anulomana, Deepana</i>	<i>Shwasa, Kasa, Agni mandya, shoola,</i>
<i>Vasa</i>	<i>Tikta,</i>	<i>Ruksha,</i>	<i>Sheeta</i>	<i>Katu</i>	<i>Kapha pitta</i>	<i>Shothahara</i>	<i>Kasa, Shwas</i>

	Kas hya	Lag hu			shama ka,	Kasaha ra, Shwash ara, Shlesh mahar a	a, Yaksh ma, Hridar oga
Kant akari	Katu , Tikt a	Lag hu, Ruk sha, Tiks hna	Us hn a	Katu	Kaphav ata shama ka	Deepan a, Shotha hara, Pachan a,	Shotha , Pratish yaya, Kasa, Shwas a

Pharmacological properties of Vasadi Kashaya

Vasa (*Adhathoda vasica*)

Vasa has potent anti-allergic,^[7] anti-inflammatory,^[8,9] antioxidant,^[10] anti-tussive,^[11] anti-asthmatic,^[12] bronchodilator activity.^[13] Bronchitis, bronchiectasis, common coughs and colds, may be treated with *Adhatoda* leaf and root extracts. A decoction of *Adhatoda* leaves soothes inflammation in the throat and serves as an expectorant, removing phlegm from the respiratory passages.^[14] The antitussive activities of *Adhatoda* extract was found to be similar to codeine against coughing induced by irritant aerosols in anaesthetized guinea pigs and rabbits, as well as in unanesthetized guinea pigs.^[14] In in vitro and in vivo studies, vasicine showed bronchodilator activity.^[15]

Guduchi (*Tinospora cardifolia*)

Guduchi showed Antioxidant,^[16] Anti-allergic activity,^[17] Immunomodulatory,^[18,19] Anti-inflammatory,^[20, 21] Anti-stress activity,^[22] Hepato-protective,^[23] and Anti-asthmatic^[24] properties. The anti-oxidant activity of a methanolic extract of *T. cordifolia* stem has been documented, with increased erythrocyte membrane lipid peroxide, free radical scavenging properties and catalase activity.^[25] In alloxan-induced diabetic rats, it also reduces Super Oxide Dismutase and GPx activity.^[26] N-methyle-2-pyrrolidone, 11-hydroxymuskatone, cordifolioside A, Nformylannonain, tinocordioside, magnoflorine, and syringin are only a few of the compounds found in *Tinospora Cordifolia* that have immunomodulatory

and cytotoxic properties.^[27] *T. cordifolia* extract has strong analgesic, anti-inflammatory and anti-pyretic effects.^[22] At 100 mg/kg, ethanol extracts of *T. Cordifolia* showed strong antistress activity.^[28] During CCl₄ intoxication, *T. cordifolia* treatment resulted in a substantial reduction in serum levels of SGOT, SGPT, ALP, and bilirubin.^[24] Cetirizine, a well-known antiallergic drug, has only H1-antihistamine activity and no effect on mast cell stabilisation, whereas *T. cordifolia* had both H1-antihistamine and mast cell stabilisation.^[20]

Kantakari (*Solanum xanthocarpum*)

Kantkari was found to possess Anti allergic,^[29] Antiasthmatic,^[30] Anti-inflammatory^[31] properties. On histamine-induced airway constriction, ethanolic extract of *Solanum xanthocarpum* leaves demonstrated substantial bronchodilator activity and reversed allergen-induced bronchospasm.^[30] On acute systemic ingestion, an ethanol extract of *S. xanthocarpum* was unable to reduce inflammation caused by carrageenan and histamine; however, long-term administration shows a poor reduction in granuloma development, implying a role in the inhibition of the proliferative process of inflammation.^[31] In patients with mild to severe asthma, treatment with *Kantkari* significantly enhanced their pulmonary functions. Patients reported subjective relief from asthmatic symptoms an hour after receiving *Kantkari* powder, which lasted for around 6–8 hours. However, as compared to deriphylline or salbutamol, the responses were reportedly lower.^[32,34]

DISCUSSION

Various drugs have been mentioned in *Ayurvedic* classics for the management of *Tamaka Shwasa*. *Vata* and *Kapha* are predominant *Doshas* involved in the pathogenesis of *Tamaka Shwasa*. Henceforth, *Kapha-Vata shamak* and *Vatanulomana Chikitsa* is the main line of treatment of *Shwasaroga*.^[34] *Vasadi Kashaya* is *Kapha-Vata Shamaka* in nature and has potential to break or reverse the *Samprapti* of *Shwasa Roga*. *Vasadi Kashaya* is having *Tikta, Katu & Kashya Rasa, Ruksha, Laghu & Tikshna Guna, Katu Vipaka, Ushna*

Veerya which help in alleviating the responsible *Doshas* in pathogenesis of *Shwasa*.

The drugs have potential properties of alleviating both *Kapha* by *Katu rasa* and *Ushna Veerya*, *Laghu Tikshna* and *Ruksha* quality and *Vatadosha* by virtue of *Ushna Veerya*. Thus, *Kapha Shamaka* properties of drug help in breaking the *Srotorodha* and helps in breathing process. The *Tikta Rasa* helps in the *Pachana* of *Ama Dosh*. This property checks the initial *Ama* formation. *Katu Rasa* reduces *Kapha* due to its *Ushna*, *Tikshna*, *Vishada Guna*. *Vishada Guna* helps in absorption of *Kleda*. *Katu Rasa* also has *Deepana*, *Pachana*, and *Sroto Prakashaka* (clears the obstruction in channels) action.

Anti-oxidant and anti-inflammatory activities of *Vasa*, *Guduchi* and *Kantkari* check the free radicals generated as a result of harmful gases, thus suppressing the inflammation of the respiratory tract. All three ingredients of *Vasadi Kashaya* by reducing the inflammation, might help in reducing the mucus production and also help in expectoration of the mucus from the airways. Anti-inflammatory, anti-tussive, anti-asthmatic, bronchodilator, antioxidant, Anti-allergic, immunomodulatory, and hepato-protective properties of *Vasa*, *Guduchi* and *Kantkari* validates this drug as an effective medicine against COPD.

CONCLUSION

Ayurvedic properties and available scientific evidences of the ingredients of *Vasadi Kashaya* indicate that it is a potential herbal drug in relieving the symptoms of COPD and associated airway inflammation. Anti-oxidant, immune-modulator, anti-inflammatory, bronchodilators, anti-tussive actions of the drug make it a potential herbal candidate which should be further explored for its action in COPD patients through various experimental and clinical studies.

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