

**EXPLORING SIDDHA HERBAL FORMULATION ‘VAASATHI KASHYAM’ – A
COMPREHENSIVE REVIEW OF ITS MITIGATING PROPERTIES IN MANAGEMENT
OF HYPERTENSION****Dr. Preyadarsheni K.^{1*} and Manoharan A.²**¹Final Year PG Scholar, Dept. of PG Pothu Maruthuvam, Government Siddha Medical College, Palayamkottai, Tirunelveli, India.²Head of the Department, Dept. of PG Pothu Maruthuvam, Government Siddha Medical College, Palayamkottai, Tirunelveli, India.***Corresponding Author: Dr. Preyadarsheni K.**

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ABSTRACT

India is rich in flora securing tenth position in the world and fourth in Asia in plant diversity. Siddha system of medicine is an indigenous system that inculcates the principle of ‘Whatever is in macrocosm is also in microcosm’. Hypertension ranks among the most common chronic medical condition. It has been among the most studied topics of the previous century and has been one of the most significant co morbidities contributing to the development of stroke, myocardial infarction, heart failure, and renal failure. This review throws limelight in the pharmacognostic, ethnobotanical and pharmacological activities of ingredients in Siddha herbal formulation “VAASATHI KASHAYAM”. Vaasathi Kashayam is a decoction formula stated in Siddha classical literature AGATHIYAR 2000 specifically indicated for RATHATHA PITHAM. This decoction is made from the leaves of Adhatoda (*Justicia adhatoda*. Linn, Acanthaceae) and dry grapes (*Vitis vinifera*. Linn, Vitaceae). The study methodology involves extensive research and review of siddha classical literatures, Materia medica texts from library of Government Siddha Medical College, Tirunelveli, Tamilnadu, India and published journals from PubMed, Scopus and other authenticated portals. After meticulous search using keywords such as *Justicia adhatoda*, *Vitis vinifera*, Systemic Hypertension, Preclinical studies, In-silico analysis, In-vitro studies and Clinical trials with Boolean search AND and OR in. A total of 20 fully accessed articles and 7 classical textbooks were included in this study revealing that the leaves of Adhatoda leaf has ACE inhibitory potential, marked thrombolytic properties, antagonistic vascular alpha receptors, phosphodiesterase inhibitor, direct action on endothelium to release EDRF (vasodilatory effect) and anti-thrombolytic activity. The dry fruits of *Vitis vinifera* ameliorates hypertension, oxidative stress, improves vascular function, improves arterial relaxation and attenuates cardia hypertrophy. This literature review explores the potency of Siddha herbal formulations in management of Hypertension.

KEYWORDS: Systemic Hypertension, Vaasathi Kashayam, Siddha herbal formulation, Adhatoda leaves, Dry grapes.**INTRODUCTION**

With its remarkable flora and fauna, India’s biodiversity holds greater cultural, economic and ecological significance. India is one of the 17 megadiverse countries, housing around 8% of the world’s biodiversity and homes approximately 50,000 plant species, including a wealth of medicinal plants.^[21] India has a rich heritage of traditional medicine, with Ayurveda, Siddha, and Unani being the most prominent systems. The use of herbal medicines and phytonutrients or nutraceuticals continues to expand rapidly across the world with many people now resorting to these products for treatment of various health challenges in different national healthcare settings (WHO, 2004). More than 80% of the world’s

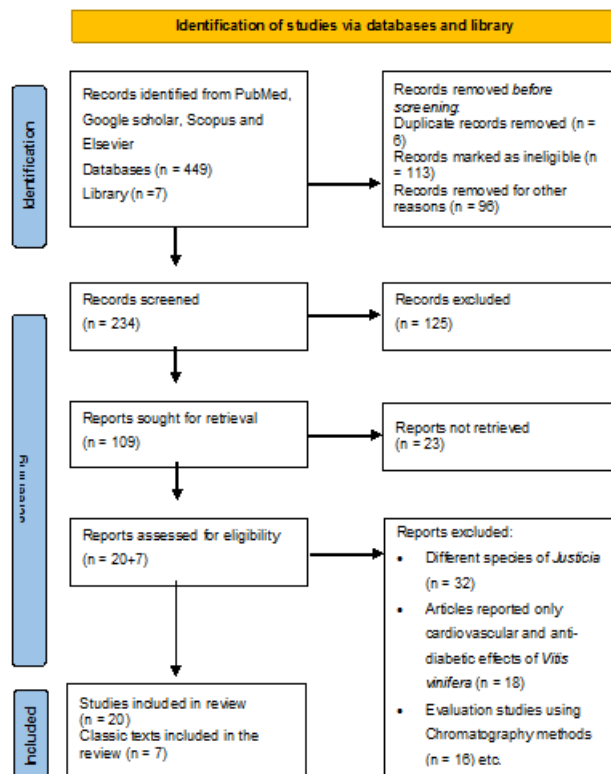
population in over 170 of WHO’s 194 Member States currently use some form of traditional medicine. The WHO Traditional Medicine Strategy 2014–2023 was developed and launched in response to the World Health Assembly resolution on traditional medicine (WHA62.13). The strategy aims to support Member States in developing proactive policies and implementing action plans that will strengthen the role traditional medicine plays in keeping populations healthy.^[15] An ancient system primarily practiced in Tamil Nadu emphasizing a connection between microcosm and macrocosm (Whatever is in microcosm is in macrocosm – Saint Sattamuni), Siddha system of medicine offers solution to several life-style disorders. Hypertension

being one of the major causes of cardiovascular deaths, is alarmingly growing necessitating the reduction in prevalence as global targets.^[16] Combat of this driving force of global epidemic is crucial and to conjugate this gap comes Siddha system of medicine with distinctive formulations that alleviates hypertension. The primary objective of this review is to explore the anti-hypertensive properties of ingredients of ‘*Vaasathi kashayam*’, a Siddha herbal formulation mentioned in classic Siddha text *Agathiyar 2000* indicated specifically for raththapitham (Hypertension).

METHODOLOGY

To investigate the documented effects and therapeutic claims of these ingredients, a comprehensive search

strategy was implemented using Boolean operators to filter and refine results. Searches were conducted with keywords such as "Justicia adhatoda," "Vitis vinifera," "clinical and pre-clinical studies," "in-silico and in-vitro studies," and "anti-hypertensive activities." Boolean operators like AND and OR were employed to narrow or expand the search outcomes. The databases PubMed and Google Scholar were selected for their extensive collections of peer-reviewed articles and scholarly papers. The methodology adapted was depicted in the below given flowchart in norms with PRISMA guidelines.



Flowchart 1.1: Methodology employed according to PRISMA flowchart.

VAASATHI KASHAYAM

Purified drugs are soaked in water (8 times the amount of drug) overnight. Equal parts of the leaves of *Justicia*

adhatoda and dry fruits of *Vitis vinifera* (5 grams each) were ground and about 240 ml of water was added to this mixture. This mixture was boiled to 30 ml.

DETAILS	DRUG	<i>Justicia adhatoda</i> ^[3,13,19,20]	<i>Vitis vinifera</i>
Trial Drug	Vaasathi Kasayam	Alkaloids: Vasicoline, Vasicolinone, Vasicinone, Vasicine, Adhatodine and Anisotine. Flavonoids, Glycosides, Cardiac Glycosides, Coumarins, Xanthoprotein, Phenols, Vitamin C, Resins and Volatile Oils	Flavonoids, Polyphenols, Anthocyanins, Proanthocyanidins, Procyanidines
Dosage	30-60ml twice a day (Orally)		
Indication	Hypertension / Raththa pitham		
Reference	Agathiyar 2000 ^[10]	PHAMACOLOGICAL ACTIONS IN JOURNALS Anti-hypertensive ^[26] , Thrombolytic ^[23] , Antimutagenic,	PHAMACOLOGICAL ACTIONS IN JOURNALS Antihypertensive ^[22] , Vasodilator ^[2] , Antioxidant ,
Author	Agathiyar		
Publisher	Dr. S. VENKATRAJAN, L.I.M.,		
Year of	2014		

publication		Cardioprotective , Hypoglycemic, Anti-Bleeding , Anticholinesterase , Antioxidant ^[4] , Hepatoprotective, Bronchodilator, Antitussive, Anti-microbial, Anti-allergy activity	Anti-Inflammatory, And Antimicrobial, Hepatoprotective and Neuroprotective
Edition	7th Edition		
Page No.	218		

Justicia adhatoda

Tamil name: Adhathodai

Family: Acanthaceae

Parts used: Leaves

Vitis vinifera

Tamil name: Trakshai palam

Family: Vitaceae

Parts used: Dry fruits

SIDDHA PATHOPHYSIOLOGY

Regarding the relationship between Siddha terminology and hypertension, there are various schools of thought within the Siddha medical system. In the postgraduate dissertations (2010-2024), hypertension is often identified as Uraththa pitham, Vaathapitham (as mentioned in Yugi muni texts)^[8] and raththakothippu noi.^[11] As per modern pathophysiology, increased dietary sodium intake triggers the 'pressure natriuresis' phenomenon, which causes blood pressure to rise in response to vascular volume expansion. Apoptosis, low-grade inflammation, and vascular fibrosis all contribute to remodelling, which is the geometric alterations in the vessel wall that cause vascular stiffness. Vascular endothelial function controls vascular tone by releasing the vasoactive dilator nitric oxide, which is diminished in hypertension individuals. The RAAS mechanism causes blood pressure to rise due to renin's vasoconstrictor properties and aldosterone's sodium-retaining properties. This mechanism is activated when NaCl transport in afferent arterioles decreases, baroreceptors change, and sympathetic stimulation occurs via β adrenoreceptors. According to Siddha system of medicine, reducing in lumen diameter can be considered as decrease in Aagaya bootham (Ether) which in turn alleviates Vaatham. This decrease in Vaatham contributes to derangement of Pitham causing increased blood pressure. If decrease in vascular compliance and geometrical alterations of vessel wall is considered to be a structural modification, Mann bootham (Earth) is supposedly decreased causing derangement of Vaatham and in turn increase in blood pressure as given in figure 1.2. Hypertension is mostly asymptomatic until it reaches a very high blood pressure (180/120)^[24], at which point the patient begins to

experience symptoms such as severe headaches, chest pain, dizziness, difficulty breathing, nausea, vomiting, blurred vision or other vision changes, anxiety, confusion, buzzing in the ears, nosebleeds, and abnormal heart rhythm, the majority of which are caused by the vitiation of the Pitham and Vaatham humours of the body.

- Symptoms of Vaatham include anxiety, confusion, ear ringing, irregular heart rhythm, chest pain, and severe headaches.
- Symptoms of Pitham include nausea, vomiting, blurred vision, and nosebleeds.

Cardiac output increases as blood volume increases (for a variety of causes), indicating that there is a problem with fluid removal (neer kooru) in the body. The concept of Kabham as the origin of fluid rise can be applied to secondary hypertension, where renal failure (sobai) is the primary reason.

However, in primary, there is no discernible rise in kabham or influence of Kabham on disease pathology. Even in Sobai, the primary cause remains Vaatham. The elimination is mostly caused by the activity of Vaatham since the fluid part of circulation is 'saaram', which is regulated by vatham, and 'seneer' is managed by Pitham. Also, when it comes to elimination, 'malam' is Vaatham, and 'neer' is Pitham. As a result of Vaatham and Pitham vitiation, the body's saaram and seneer components grow, and they are not adequately managed by elimination via malam and neer. This operates as the primary cause of hypertension as depicted in figure 1.1.

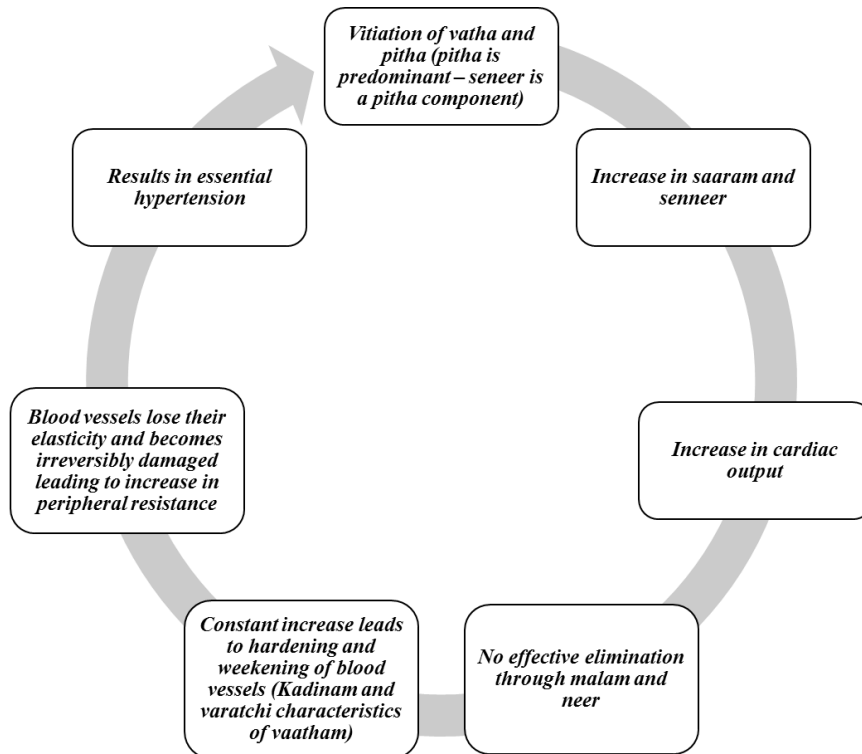


Figure 1. 1.

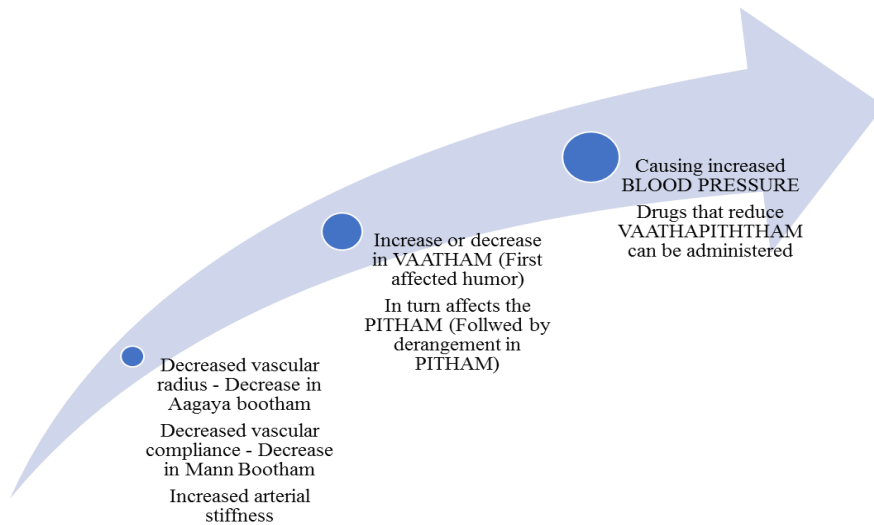


Figure 1. 2.

RESULTS

<i>Justicia adhatoda (Acanthaceae)</i>				
AUTHOR	SOURCE	TITLE	RESEARCH DESIGN	FINDINGS
DESCRIPTIVE - ETHNOBOTANY				
Mushtaq Ahmad 2016	PubMed	Ethnopharmacological survey on medicinal plants used in herbal drinks among the traditional communities of Pakistan	Descriptive	An ethnomedicinal field study conducted from various traditional communities of Pakistan to document usage of medicinal plants as herbal drinks in which <i>Justicia (0.17)</i> was used as anti-hypertensive drink. ^[1]
Muhammad Ishtiaq 2021	PubMed	Ethnomedicinal and folklore inventory of wild plants used by rural communities of valley	Descriptive	An ethnobotanical (EB) and traditional ethnomedicinal (TEMs) uses of medicinal plants (MPs) of Tehsil

		Samahni, District Bhimber Azad Jammu and Kashmir, Pakistan		Samahni area of Azad Jammu and Kashmir, Pakistan showed <i>Justicia (1.00) was used to cure 'Hypertension and Hyperlipidemia'</i> ^[18]
PRE-CLINICAL – IN-SILICO/NETWORK PHARMACOLOGY				
Syeda Tehreem 2021	PubMed Central	A UPLC-DAD-Based Bio-Screening Assay for the Evaluation of the Angiotensin Converting Enzyme Inhibitory Potential of Plant Extracts and Compounds: Pyrroquinazoline Alkaloids from vasica as a Case Study	Pre-clinical molecular docking study	Among three pyrroquinazoline alkaloids identified by UPLC-based enzymatic bio-assay, <i>vasicine showed the highest ACE inhibitory potential.</i> ^[28]
Zongchao Hong 2021	PubMed	Reveals of candidate active ingredients in Justicia and its anti-thrombotic action of mechanism based on network pharmacology approach and experimental validation	Network pharmacology and experimental research	On construction of herb-compound-target network, protein-protein interaction network of disease and prediction targets and cluster analysis, the core bio-active components especially <i>Justicidin D showed anti-thrombolytic activity and inhibitory effect on platelet aggregation.</i> ^[14]
PRE-CLINICAL – IN-VITRO/IN-VIVO				
Vaisman 2015	Pub Med	Daily consumption of red grape cell powder in a dietary dose improves cardiovascular parameters: A double blind, placebo-controlled, randomized study	Clinical study	12-week consumption of grape powder was effective in lowering blood pressure in individuals with pre hypertension and mild hypertension; the antihypertensive effect of grape powder in these subjects was associated with <i>improvement in vascular function and lowering of oxidative stress.</i> ^[31]
Fahad Hussain 2014	PubMed	In vitro thrombolytic potential of root extracts of four medicinal plants available in Bangladesh	Pre-clinical in-vitro study	<i>Justicia</i> extracts showed <i>marked thrombolytic properties</i> that could lyse blood clots in-vitro in drawn venous blood samples from 10 healthy volunteers. Streptokinase and saline water are used as positive and negative control. ^[17]
Selvakumar S 2018	Google scholar	Antihypertensive and diuretic action of adathodai ilai chooranam - a siddha mono-herbal formulation	Pre-clinical animal study	ALC was experimented in adult male Wistar rats with standard drug captopril for anti-hypertensive activity and diuretic activity. The study concluded that ALC has <i>ACE inhibitor activity, antagonistic vascular alpha-receptors, phosphodiesterase inhibition, direct action on vascular endothelium to increase the release of EDRF producing vasodilation.</i> ^[25]

Vitis vinefera (Vitaceae)

AUTHOR	SOURCE	TITLE	RESEARCH DESIGN	FINDINGS
PRE-CLINICAL ANIMAL STUDY				
R Soares De Moura 2002	Pub Med	Antihypertensive, vasodilator and antioxidant effects of a vinifera grape skin extract	Pre-clinical animal study	Oral administration of GSE significantly reduced <i>systolic, mean and diastolic arterial pressure in Wistar rats</i> with deoxycorticosterone acetate-salt and N(G)-nitro-L-arginine methyl ester (L-NAME) induced experimental hypertension. ^[27]

Sandip Godse 2010	Pub Med	Effect of myricetin on blood pressure and metabolic alterations in fructose hypertensive rats	Pre-clinical animal study	the effect of myricetin (100 and 300 mg/kg, p.o. for 6 weeks) isolated from <i>Vitis vinifera</i> Linn. (Vitaceae) could prevent the development of high blood pressure induced by a diet rich in fructose. ^[12]
Pravin Borde 2011	Pub Med	Effect of myricetin on deoxycorticosterone acetate (DOCA)-salt-hypertensive rats	Pre-clinical animal study	Chronic administration of myricetin (100 and 300 mg kg ⁻¹ , p.o., for 4 weeks) isolated from <i>Vitis vinifera</i> (Vitaceae) ameliorated hypertension and oxidative stress induced by deoxycorticosterone acetate (DOCA)-salt in rats. ^[5]
Siji J Thandapilly 2012	Pub Med	Vascular and cardiac effects of grape powder in the spontaneously hypertensive rat	Pre-clinical animal study	Treatment with whole grape powder elicited a significant reduction in blood pressure, improved arterial relaxation, increased vascular compliance, and attenuated cardiac hypertrophy. ^[30]
Giselle Franca da Costa 2020	Pub Med	<i>Vitis vinifera</i> L. Grape Skin Extract Prevents Development of Hypertension and Altered Lipid Profile in Spontaneously Hypertensive Rats: Role of Oxidative Stress	Pre-clinical animal study	Skin grape aqueous extract (<i>Vitis vinifera</i> L.) could prevent increasing systolic blood pressure in spontaneously hypertensive rats measured using the tail-cuff method. The results demonstrated that hypertensive rats had blood pressure > 200 mmHg, and hypertensive rats treated with grape skin extract had blood pressure < 150 mmHg. ^[6]
CLINICAL STUDY				
Vaisman 2015	Pub Med	Daily consumption of red grape cell powder in a dietary dose improves cardiovascular parameters: A double blind, placebo-controlled, randomized study	Clinical study	12-week consumption of grape powder was effective in lowering blood pressure in individuals with pre hypertension and mild hypertension; the antihypertensive effect of grape powder in these subjects was associated with improvement in vascular function and lowering of oxidative stress. ^[31]

DISCUSSION

Vaasathi kashayam constitutes *Justicia adhatoda* and *Vitis vinifera*. *Justicia adhatoda* is bitter in taste exhibiting aagayam (Ether) and kaatru (Air) bootham while *Vitis vinifera* is sweet in taste contributing to Mann (Earth) and Neer bootham (Water). Even though both their potency (veeriyam) and post-digestive transformation (pirivu) is contraindicating with each other (Hot-Cold), their special pharmacological action (magimai) and synergistic action might contribute in attenuation of hypertension. Literature evidences manifest the anti-hypertensive activity of *Justicia adhatoda* via ACEI potential, phosphodiesterase inhibitor and release of endothelium derived releasing factors asserting the restoration of deranged aagaya bootham (Bitter taste). Furthermore, evidences ascertain that *Vitis vinifera* lowers blood pressure with improvement in vascular function, arterial relaxation and lowering of oxidative stress representing the action of Mann and Neer bootham in reduction of Vathapiththam.

Adhatoda is mentioned in Materia medica^[9] and several Siddha classical books^[7] as a treatment for raththapitham and other bleeding problems. Siddha Materia medica claims that *Vitis vinifera* has cardioprotective properties. This review revealed that pyroquinazoline alkaloids such as vasicinol, vasicine and vasicinone exhibited ACEI potential. *Justicia adhatoda* reduces hypertension via anti-thrombolytic activity, platelet aggregation inhibition, α -1 adrenergic receptor antagonistic activity and release of Endothelium-derived relaxing factor (EDRF). In several indigenous medical practices, *Justicia adhatoda* are used against hypertension. The phytochemicals found in the ingredients of Vaasathi kashayam and the above given literature evidences demonstrate the potential of this decoction against hypertension as indicated in Siddha texts.

CONCLUSION

In conclusion, the comprehensive literature review of Vaasathi Kashayam reveals a compelling profile as a

multifaceted therapeutic agent against hypertension, substantiated by its diverse pharmacological activities. The findings indicate a strong potential for Vaasathi Kashayam to function as an angiotensin-converting enzyme inhibitor (ACEI), which is crucial in modulating the renin-angiotensin system, a key player in blood pressure regulation. This action is complemented by its role as a phosphodiesterase inhibitor, which further enhances vascular relaxation and reduces systemic vascular resistance. Additionally, Vaasathi Kashayam exhibits significant antioxidant properties, crucial for mitigating oxidative stress, a recognized contributor to endothelial dysfunction and hypertension. Its cardioprotective effects underscore its potential in preventing cardiovascular complications associated with prolonged high blood pressure. Furthermore, the anti-thrombolytic activity, along with the inhibition of platelet aggregation, suggests that Vaasathi Kashayam could reduce the risk of thromboembolic events in hypertensive patients, promoting overall cardiovascular health. The documented α -1 adrenergic receptor antagonistic activity of ingredients of Vaasathi Kashayam provides another layer of efficacy, as it may contribute to vasodilation and a decrease in peripheral resistance, which are essential in lowering blood pressure. Importantly, the release of endothelium-derived relaxing factor (EDRF) highlights its role in enhancing endothelial function, further supporting its antihypertensive effects. The integration of these pharmacological actions aligns with traditional claims found in Siddha texts, which advocate the use of Vaasathi Kashayam in managing hypertension. This alignment between modern scientific findings and traditional knowledge not only reinforces the credibility of Vaasathi Kashayam as a therapeutic agent but also opens avenues for its incorporation into contemporary clinical practices. Given the multifactorial nature of hypertension, the diverse mechanisms of action exhibited by Vaasathi Kashayam make it a promising candidate for further pre-clinical and clinical research. Future studies should focus on rigorous clinical trials to evaluate its efficacy, optimal dosing strategies, and safety profiles in hypertensive populations. Such investigations could lead to the establishment of Vaasathi Kashayam as a standardized therapeutic option within integrative medicine, bridging the gap between traditional practices and modern healthcare.

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