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A REVIEW ON SIDDHA POLYHERBAL FORMULATION- GOWTHAMAR CHOORANAM FOR THE MANAGEMENT OF SWASAKASAM (BRONCHIAL ASTHMA)

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Article History	Abstract
Received on: 26-07-2023 Revised on: 09-08-2023 Accepted on: 19-09-2023	<p>Background: In Siddha system of medicine <i>Swasakasam</i> is correlated with bronchial asthma. Bronchial asthma is a common respiratory disorder. It is a chronic inflammatory disease of the airways associated with airway hyper- responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night and in the early morning which may subside spontaneously or with treatment. This review shows the potential role of <i>Gowthamar chooranam</i> a siddha polyherbal formulation from the siddha literature the pharmacopoeia of siddha research medicine for the treatment of <i>Swasakasam</i> (Bronchial asthma). Aim and Objective: This review provides information on uses, chemical components, and pharmacological properties of the medicinal herbs. It also identifies research gaps and opens up new possibilities for future study of these polyherbal formulation for treatment of <i>Swasakasam</i> (Bronchial asthma). Materials and Methods: The review conducted from the primary sources called ancient siddha literature and also the search from electronic sources called databases like Google scholar, Pubmed, Science direct with key words anti-asthmatic herbs, , pharmacological actions. The information was collected and reviewed. Result: Most of the herbs included in the siddha formulation were found to be anti-asthmatic activity Conclusion: All the ingredients present in siddha polyherbal formulation <i>gowth amarchooranamis</i> simple, easily available, inexpensive, easy to prepare. The pharmacological properties of ingredients have pungent taste, hot potency and are mostly found as anti-inflammatory, immunomodulatory, anti-allergic, anti-asthmatic. Hence it evident that the formulation was very effective in the treatment of <i>Swasakasam</i> (Bronchial asthma). Further preclinical, clinical studies and statistical data analysis helps in exploring this polyherbal siddha formulation.</p> <p>Keywords: <i>Swasakasam</i>, Bronchial asthma, <i>Gowthamar chooranam</i>, Herbs, Siddha medicine.</p>



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1. Introduction

“Siddha system of medicine is one of the traditional systems of medicine, which has been originated from India and is practiced mostly in the southern part of this country for treating various diseases including even chronic conditions” [1].

“In siddha system of medicine asthma is analogous with Swasakasam. Swasakasam is attributed to the derangement of Kaphahumour alone or otherwise associated with other deranged humours, either vatham or pitham affects the throat, nose, respiratory airways and lungs. According to Theriyar in

his Pengal Muthal Karanam, Kaphahumour is one of the major and important cause for Swasakasam. He described this as, Kathinai yandrika as was kaanadhu” [2].

“BronchialAsthmaisanobstructiverespiratorydisease.Itisachronic inflammatory disease of the airways associated with airway hyper- responsiveness that leads to recurrent episodes of wheezing, breathlessness, chest tightness and coughing, particularly at night and in the early morning which may subside spontaneously or with treatment” [3].

“Prevalence of asthma increased steadily over the later part of the last century, 300 million of people worldwide suffer from asthma and an additional 100 million may be diagnosed with asthma by 2025. India has an estimated 15 to 20 million asthmatics and rough estimates indicate a prevalence of between 10% and 15% in 5-11 year old children”[4].

“Several hundred genera of plants are used medicinally mainly as herbal preparations in the indigenous systems of medicine in different countries which have stood the test of time, and therefore, modern medicines has not been able to replace most

of them. The World Health Organization reported that 80% of the world population relies chiefly on traditional medicines involving the use of plant extracts or their active constituents" [5].

Siddha system of medicine suggests many medicinal herbs and polyherbal formulations for the treatment of *Swasakasam* (bronchial asthma). One among them was *Gowthamar chooranam* which was mentioned in the siddha ancient literature the pharmacopeia of siddha research medicine page no.113 [6].

The ingredients present in polyherbal formulation should have hot (Venmai) potency to neutralize the vaathakuttram and kabakuttram. Medicinal plants used for treatment of *Swasakasam* should have anti-inflammatory, immunomodulatory, anti-allergic activity, anti-oxidant, anti-asthmatic, anti-spasmodic and bronchodilator activity. This review explains about the scientific information which includes morphological description, chemical constituents and pharmacological properties was gathered from the books and online publications.

This review provides an information on uses, chemical components, and pharmacological properties of the medicinal herbs. It also identifies research gaps and opens up new possibilities for future study of these polyherbal formulation for treatment of *Swasakasam* (Bronchial asthma).

2. Materials and Methods

The review conducted from the primary sources called ancient siddha literature and also the search from electronic sources called databases like Google scholar, Pubmed, Science direct with key words anti-asthmatic herbs, *Swasakasam*, pharmacological actions. The information was collected and reviewed.

Study Drug – *Gowthamar Chooranam*

2.1 Ingredients

1. *Terminaliachebula* (*Kadukkaithole*) - 2 tolas (24gms)
2. *Piper longum* (*Arisithipilli*) - 2 tolas (24gms)
3. *Alpiniaofficinarum* (*Chitharathai*) - 2 tolas (24gms)
4. *Piper cubeba* (*Valmilagu*) - 4 tolas (48gms)
5. *Myristicafragans* (*Jathikkai*) - 2 tolas (24gms)
6. *Saccharumofficinalis* (Sugar) - 12 tolas (144gms)

Dosage: 10-15 grains (650 mg – 975mg)

Adjuvant: honey or ghee.

Duration: 48 days.

2.2 *Gowthamar Chooranam* – Pharmacognostic Aspect.

Botanical Name: *Terminaliachebula*

Tamil Name: *Kadukkai*

Common Name: Ink Nut, Chebulic Myrobalan.

Family: Combretaceae

Morphological Description

"*Terminaliachebula* is a medium to large highly branched deciduous tree with a height up to 30m and girth 1-1.5m. Leaves are 10-30cm long elliptical with an acute tip and cordate base. The vasculature of the leaves consists of 6-8 pairs of veins. Flowers are short stalked, monoecism, dull white to yellow with a strong unpleasant odour and are found in simple terminal spikes or short panicles. Fruits are 3-6cm long and 1.3-1.5cm broad yellowish-green ovoid drupes containing one oval seed" [7].

Parts Used: Dried Fruit

Chemical constituents

"chebulic acid, chebulagic acid, corilagin and gallic acid. Tannin of *Terminaliachebula* is of pyrogallol type. A group of researchers found 14 components of hydrolysable tannins (gallic acid, chebulic acid, punicalagin, chebulanin, corilagin, neochebulin acid, ellagic acid, chebulinic acid, 1, 2, 3, 4,6-penta- O- galloyl- b-D- glucose, 1,6,-di-O-galloyl-D-glucose, casuarinin, 3,4,6,tri-O-galloyl-D-glucose, terchebulin) from *terminaliachebula*" [8].

Botanical Name: *Piper longum*

Tamil Name: *Arisithipilli*

Common Name: Long pepper

Family: Piperaceae

Morphological Description

"*Piper longum* Linn is a slender, climbing, under shrub, creeping and rooting below. The young shoots are downy; the leaves are 5-9cm long, 5cm wide, ovate, cordate with broad rounded lobes at the base, sub-acute, entire, glabrous. The plant bears unisexual flowers in solitary, erect spikes during or just after the rainy season. The male spikes are larger, slender and are 2.5 to 7.5cm long, while the female spikes are 1.25 to about 2cm long when in flower, growing to about 3cm when in fruit. The berries are ovoid, yellowish orange, sunk in thick rachis about 0.25cm in diameter." [9]

Parts used: Fruit

Chemical constituents

"The fruit contains a large number of alkaloids and related compounds, the most abundant of which is piperine, followed by methyl piperine, piperonaline, piperettine, asarinine, pellitorine, piperundecalinine, piperlongumine, piperlonguminine, retrofractamide A, pergumidiene, brachystamide-B, a dimer of desmethoxy piperidine, N-isobutyl decadienamide, brachyamide-A, brachystine, piperide, piperderidine, longamide, dehydropiperonaline piperidine, and tetrahydropiperine. Piperine, piperlongumine, tetrahydropiperlongumine, trimethoxycinnamoyl-piperidine, and piperlonguminine have been found in the root. Newly identified chemical constituents are 1-(3',4'-methylenedioxyphenyl)-1E-tetradecene, 3-(3',4'-methylenedioxyphenyl)-propenal, piperonic acid, 3',4'-dihydroxy-biobol-1, 10-diene, eudesm-4(15)-ene-1beta, 6-alpha-diol, 7-epi-eudesm-4(15)-ene-1beta, 6beta-diol, guineesine, and 2E,4E-dienamide, (2E, 4E, 8E)-N-isobutylhenicosa-2,4,8-trienamide" [10].

Botanical Name: *Alpiniaofficinarum*

Tamil Name: *Chitrathai*

Common Name: Galangal the lesser

Family: Zingiberaceae

Morphological Description

"It is a perennial herb with thick, creeping reddish-brown rhizomes, lineolate acuminate ornamental leaves, and showy white flowers in racemes" [11].

Parts Used: Rhizome

Chemical Constituents

Tectochrysin, apigenin, galangin, kaempferol, Kaempferide, quercetin, sorhamnetin, rutin.

Botanical Name: *Piper cubeba*

Tamil Name: *Valmilagu*

Common Name: Tail pepper

Family: Piperaceae

Morphological Description

"*Cubeba* is a woody climbing perennial that has stem and ash-grey climbing branches. The length is 5–15 m high. The leaves are ovate with cordate or rounded base, glabrous with a thick pedicle, simple, smooth, and pointed at the apex, the lower surface is densely provided with tiny glands embedded. They are completely margined, tough and up to 15 cm long and 6 cm wide. The flowers are small, dense unisexual that are glued to the peduncles, arranged in 4 cm long scaly spikes that have 2–3 stamens. The female tips have about 50 individual flowers with an ovary of 4 carpels fused with 4 sessile stigmas. Flowering takes place in winter. The fruits are globose from 6 to 8 mm in diameter. The upper part of the fruit has a diameter of 3–6 mm and covered by grayish brown, pericarp that extends at the base into a straight stem. They have a spicy, aromatic smell and a bitter taste. The fruit has a single dark brown sub-globose seed with a width of 3–4 mm" [12].

Parts used: Fruit

Chemical Constituents

"The fruits of *Piper cubeba* are mainly composed of Sesquiterpene hydrocarbons and specifically β -caryophyllene (3.1%), epi-cubebol (4.3%), cubebol (5.6%), d-cadinene, α and β -cubebene, copaene, germacrene, cubebinolide, cubenol, nerolidol, bicyclosesquiphellandrene [19,20] and minor amounts of Monoterpenes which includes Sabinene (9.1%), β -elemene (9.4%), α -thujene, carene, 1, 4-cineol and 1, 8-cineol, limonene, linalol, myrcene, safrole and sabinol" [13].

Botanical Name: *Myristicafragrans*

Tamil Name: *Jathikkai*

Common Name: Nutmeg

Family: Myristiceae

Morphological Description

Myristicafragrans is an evergreen tree, grown up to 20–25 feet high with greyish brown soft bark and spreading branches. The nut is oval or broadly ovate, with a hard, rough, dark-brown, glossy shell that is pale and smooth on the inside and is approximately half a line thick. When young, the seed/kernel is oval, pale brown, and soft, but it quickly shrivels and has irregular, vertical lines or furrows on its surface and rich in oil" [14].

Parts Used: Fruit

Chemical constituents

"seeds from Pakistan contained EO consisting of sabinene, followed by α -pinene, cymene, terpinen-4-ol, elemicin, and safrole nutmeg seed essential oil are terpinen-4-ol (2.4%), copaene (2.4%), γ -asarone (2.3%), β -phellandrene (2.2%), myristicin (1.9%), α -thujene (1.3%), 3-carene (1.2%), β -terpineol (1.1%), γ -terpinene (1.0%), isoterpinolene (0.9%), p-menth-8-en-1-ol (0.9%), γ -elemene (0.8%), safrole (0.7%), methyleugenol (0.7%), 4-carene (0.7%), p-cymene (0.7%), α -bergamotene (0.6%), α -phellandrene (0.5%), camphene (0.4%), and α -terpinyl acetate (0.4%)" [14].

Organoleptic Characters [15]

S.No	Name of the drug	Parts used	Taste	Division	Potency	Actions
1	<i>Terminaliachebula</i> (<i>Kadukkai</i>)	Unripe fruit	Sweet, sour, pungent, bitter, astringent	Sweet	<i>Veppam</i>	Astringent
2	<i>Piper longum</i> (<i>Arisithipilli</i>)	Fruit	Pungent	Pungent	<i>Veppam</i>	Stimulant, Carminative
3	<i>Alpiniaofficinarum</i> (<i>Chitrathai</i>)	Rhizome	Pungent	Pungent	<i>Veppam</i>	Expectorant, Febrifuge Stomachic
4	<i>Piper cubeba</i> (<i>Valmilagu</i>)	Fruit	Pungent	Pungent	<i>Veppam</i>	Stimulant, Carminative, Expectorant
5	<i>Myristicafragrans</i> (<i>Sathikkai</i>)	Unripe fruit	Pungent, astringent	Pungent	<i>Veppam</i>	Stimulant, Carminative, Tonic, Narcotic,

Pharmacological Properties

Pharmacological evaluation of ingredients present in the siddha polyherbal formulation *Gowthamar chooranam* was,

Terminaliachebula (*Kadukkai*)

Immunomodulatory activity [16]

"The active phytoconstituents of *Terminaliachebula* extract, gallic acid and chebulagic acid, were studied for their immunomodulatory effects on cytotoxic T lymphocyte (CTL)-mediated cytotoxicity. Gallic and chebulagic acids have been found to inhibit CTL-mediated cytotoxicity. Additionally, it has been demonstrated that gallic acid and chebulagic acid, with IC₅₀ values of 30 and 50 M, respectively, block the killing activity of CD8⁺ CTL clone. Gallic acid and chebulagic also prevented the granular exocytosis that occurs in response to anti-CD3 stimulation, which further demonstrated the immunosuppressive effects of these substances".

Anti-inflammatory [17]

“Gallic acid (3, 4, 5-trihydroxybenzoic acid) is one of the main endogenous phenolic acids found in *Terminaliachebula* plant, which possess the anti-inflammatory activity.”

Anti-allergic activity [18]

“Aller-7, a polyherbal formulation of seven medicinal plants including *Terminaliachebula* exhibited potent in vitro anti-allergic activity in isolated guinea pig ileum substrate.”

Piper longum (Thipilli)

Antiasthmatic activity: [19]

“Studies have been carried out to validate the traditional claims of Ayurveda for antiasthmatic activity of *Piper longum*. An extract of the fruits in milk reduced passive cutaneous anaphylaxis in rats and protected guinea pigs against antigen-induced bronchospasm.”

Anti-inflammatory activity [20]

“A marked anti-inflammatory activity of a decoction of *Piper longum* fruits has been reported using carrageenan induced rat oedema.”

Alpiniaofficinarum (Chithrathai)

Anti-allergic activity [21]

“*Alpiniagalanga* was found to be effective in treatment of allergy. Isolated compounds, 1 S-1-acetoxychavicol acetate and 1 S-1-acetoxyeugenol acetate from aqueous extract of rhizome have shown to inhibit release of beta-hexosaminidase and the antigen-IgE-mediated TNF-alpha and IL-4 production in passive cutaneous anaphylaxis reactions in mice.”

Piper cubeba (Valmilagu)

“Upon tracheospasmolytic guided isolation method, dihydrocubebin was isolation from n-hexane extract of *Piper cubeba*fruits traditionally used to treat respiratory disorders. It was suggested that contributed anti-asthmatic activity present in the *Piper cubeba* fruits. The effect of dihydrocubebin on the histamine release from rat mast cell that is rat basophilic leukemia (RBL- 2H3) cells and rat peritoneal mast cells.”[22]

Anti-inflammatory [23]

“Some reports revealed that *Piper cubeba* L. extracts have anti-inflammatory activity by attenuating IL-6, which is stimulated by lipopolysaccharide (LPS), in THP-1 cells resulting in inhibition of cyclooxygenases (COX-1 and COX-2) and 5-lipoxygenase (5-LOX).”

“The fruit extract of *piper cubeba* inhibited the activities of cyclooxygenases and 5-lipo-oxygenase, also it attenuated the induction of interleukin 6 in differentiated THP-1 cells stimulated by lipopolysaccharide” [24].

Myristicafragans (Jathikkai)

Anti-inflammatory [25]

“The methanol extract showed a lasting anti-inflammatory activity. Results suggest that the anti-inflammatory action is due to the myristicin present in nutmeg. Myristicin is a phenylpropene, a natural organic compound present in small amounts in essential oil of nutmeg”.

“OVA challenge effectively produced allergic asthma symptoms in both groups. Jatiphala internal administration reduced the allergic inflammatory markers such as circulating serum IgE, AEC, and infiltration of eosinophils at peribronchial and perivascular region in bronchial tissue (and BAL Fluid) as

evidenced by histopathological results, compared to asthma control group which was induced by OVA” [26].

Conclusion

All the ingredients present in siddha polyherbal formulation gowthamar chooranam is simple, easily available, inexpensive, easy to prepare. The pharmacological properties of ingredients have pungent taste, hot potency and are mostly found as anti-inflammatory, immunomodulatory, anti-allergic, anti-asthmatic. Hence it evident that the formulation was very effective in the treatment of *Swasakasam* (Bronchial asthma). Further preclinical, clinical studies and statistical data analysis helps in exploring this polyherbal siddha formulation.

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Conflict of Interest

No conflict of interest.

Author Contribution

Both authors are contributed equally.

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