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Review Article

THE PHARMACOLOGICAL USAGE OF *PANCHADEEPAKINI CHOORANAM* FOR RESPIRATORY AILMENTS

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ABSTRACT

An old Indian traditional medical practice called Siddha developed in South India. The Lord typically serves as the source of the system. It is believed that Goddess Parvathi, represented by Lord Shiva, received the Siddha system's knowledge from the Almighty, who then passed it on to Nandikeswara. Nandikeswara was appointed to set up for the framework to be spread in the midst of humankind thus, he obediently granted the information to Sage Agastya. Agastya gave all of the relevant information to his various disciples, who helped spread the system around the world. Diet and lifestyle play a significant role in both health and disease treatment, according to the Siddha medicine system. *Pathiyam* and *Apathiyam* refer to this Siddha medicine concept, which is essentially a rule-based system with a list of "dos and don'ts." The aim of this review article is to explore the scientific literary evidence for the therapeutic usage of *Panchadeepakini chooranam* for (*Silethuma Noi/Kaba Noi*) as mentioned in *Citta Vaittiya Tirattu* and to assign effort to entity the pharmacological activity for the curative nature of the drug. Most of the raw drugs used for the preparation of *Panchadeepakini chooranam* have bronchodilatory activity, anti-tussive activity, anti-allergic activity, immunomodulatory activity, anti-histamine activity hence justifying its usage in respiratory illness.

INTRODUCTION

The Siddha system essentially depends on 96 fundamentally important basic elements. Man is seen as a microcosm and the cosmos as a macrocosm in the Siddha system of medicine. Man is, in other words, a little cosmos all by himself. According to this theory, man is made up of the same five fundamental elements that make up the universe: Earth, Water, Fire, Air, and Space. The genesis and development of these fundamental components, as well as their involvement in the production of every material in the world and in people, are all explained by the *Pancheekaranam* theory (Five-Fold Combination) of Siddha science [1]. According to Siddha science of medicine, diseases, derangements, or disorders manifest when one or more of the three biohumors- *Vali, Azhal, and Aiyam* become vitiated.

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Iya Noi*: Synonyms - *Silethuma Noi*/*Kaba Noi

***Iya Noi* Types**: 21

Irumal, Kasam, Swasam, Deepanam, Mantham, Vali, Azhal, Mukootu, Sugasanni, Suram, Adhisaram, Neerkovai, Akkini, Bootham, Muyalagan, Veri, Vigaaram, Suronidham, Viranam, Dhurgandham, Nithiyam these are the various types of *Iya Noi* [2].

***Kabam* (Bio-Energy Water):** One of the three humours/principles of functional constitution of the body represent the elements water and earth. *Kabam* is the principle of stabilizing energy and governs growth in the body and mind and is concerned with structure, stability, lubrication and fluid balance. It dominates the head and neck region and exhibits itself into five forms. They are *Avalambagam, Kilaetham, Pothagam, Tharpagam and Santhigam*. It is eliminated from the body through the urine [3].

***Kabam* Diseases**: Anasarca, Obesity, Degenerative disorders, Diseases of lungs upper respiratory organs[4].

In Siddha system of medicine for the treatment of increased *Kabha* condition, commonly a drug with the taste of *Kaippu* (bitter) or *Thuvarppu* (acrid) can be selected if *Vaatha* is decreased. The taste of

Kaarpu/pungent (hot) can be selected if *Pitha* is decreased. The characteristics of *Varatchi* (dryness), *Vemmai*(hot), *Koormai* (sharpness) can be selected and *Veppa veeriyam* (heating effect) also can be selected [5].

This review article describes the pharmacological activity of each ingredients of *Panchadeepakini chooranam* and to explore their therapeutic effect in treating respiratory diseases.

MATERIALS AND METHOD

It is prepared based on the formula mentioned in the textbook of *Citta Vaittiya Tirattu*.

The raw drugs of *Panchadeepakini Chooranam* (*Milagu, Chukku, Thippili, Elam, Chirakam*) each 1 *Palam* (35gm) separately were mildly roasted, powdered, filtered then mixed with equal quantity of white sugar and preserved in a tightly closed container.

Dose: 3 *Viral Alavu*

***Anupanam*:** Honey/Ghee

Therapeutic Usage: *Seriyamai* (indigestion*), Porumal* (flatulence), *Ushna noi* (heat illness), *Soolai* (painful diseases), *Mayakkam* (giddiness), *Moolavayu* (flatus), *Asthi suram* (fever with bony pain*), Vettai* (venereal diseases*), Piththavayu*, *Silethuma Noi/ Kaba Noi*.

Table1: Ingredients of *Panchadeepakini Chooranam* [6]

S.No	Tamil name	Botanical name	Quantity
1	*Milagu*	*Piper nigrum* Linn	*1 Palam*
2	*Chukku*	*Zingiber officinale,* Rose	*1 Palam*
3	*Thippili*	*Piper longum*	*1 Palam*
4	*Elam*	*Elettaria cardamomum* Maton	*1 Palam*
5	*Chirakam*	*Cuminum cyminum* Linn	*1 Palam*
6	Sugar	*Saccharum officinarum*	Equal quantity

Table 2: Siddha Pharmacological properties of the ingredients of *Panchadeepakini Chooranam* [7]

S.No	Name of the Drug	Taste	*Panchaboodham*	*Thanmai*	*Pirivu*	Action
1	*Milagu*	Bitter Pungent	Air+Space Air+Fire	*Veppam*	Pungent	Acrid, carminative, anti-periodic, rubefacient, stimulant, resolvent anti-*Vatha*, antidote
2	*Chukku*	Pungent	Air+Fire	*Veppam*	Pungent	Stimulant, Carminative stomachic
3	*Thippili*	Sweet Dried	Earth+Water	*Thatpam* *Veppam*	Sweet	Stimulant, Carminative
4	*Elam*	Pungent	Air+Fire	*Veppam*	Pungent	Stimulant, Carminative Stomachic
5	*Chirakam*	Pungent Sweet	Air+Fire Earth+Water	*Thatpam*	Sweet	Stimulant, Carminative Stomachic, Astringent

Chemical composition of *Piper nigrum*

Black pepper contains moisture- 13.2%, protein- 11.5%, carbohydrate- 49.2%, mineral matter- 4.4%, fat- 6.8%, fibre- 14.9%, phosphorus- 198mg/ 100g; calcium- 460mg/100g; phytin phosphorus- 5mg/100g; vitamin A value- 1800IU/ 100g, iron- 16.8mg/100g. The presence of oxalic acid (0.4-3.4%) has been reported. starch is the predominant constituents of black pepper it accounts 34.1% in it. The alkaloid piperine ($C_{17}H_{19}O_3N_1$) is considered to be the major constituents responsible for the bitter taste of black pepper. Other pungent alkaloids, occurring in pepper in smaller quantity is chavicine, piper dines and Piperettine. Oil of the pepper is an important colourless to slightly greenish liquid with a characteristic's odour of pepper and also of phellandrene [8].

Chemical composition of *Elettaria cardamomum*

Cardamom has attracted the interest of several research groups over the last two decades, volatile as well as non-volatile compounds being identified. The chemical composition of cardamom varies with variety, region and age of the product, but may be as high as 8%. The volatile oil contains about 1.5% α-pinene, 0.3% α-terpinyl acetate, 0.5% terpinolene, 3% linalool, 2.9% terpinen 4-01, 2.2% α-phellandrene, 11.6% limonene, 36.8% sabinene, 1.3% citronellol, 0.4% geraniol, 0.2% methyl eugenol and 2.7% trans-nerolidol [9].

Chemical composition of *Zingiber officinale*

Biologically active substances found in ginger rhizome include terpenoids, tannin, alkaloids, glycosides, steroids, phenolic compounds, flavonoids, carbohydrates, and proteins. The aroma and a large portion of the flavour of ginger are controlled by the

ingredients of its steam-volatile oil, whilst the pungency is formed by non-steam volatile components. These two classes of elements are responsible for ginger's distinctive organoleptic qualities. Ginger's steam volatile oil, which mostly consists of sesquiterpene hydrocarbons, monoterpene hydrocarbons, and oxygenated monoterpenes, is what gives it its distinct scent and flavour. The natural oil of the fresh ('green') rhizome has a tendency to be substantially more plentiful in monoterpene components than does the essential oil produced from dried ginger, which is thought to be the most significant contributor to the perfume of ginger. Although they make up a small portion of the volatile oil, oxygenated sesquiterpenes appear to be a significant contributor to the flavouring properties. Mono- and sesquiterpenes, such as camphene, β -phellandrene, curcumene, cineole, geranyl acetate, terpineol, linalool, α-zingiberene, sesquiphellandrene, β -bisabolene, zingiberenol, and farmesene, make up the majority of the volatile oil. [10].

Chemical composition of *Cuminum cyminum*

The cumin seeds are rich in aldehyde (60%) as well as lipids, amino acids, flavonoids, glycosides, volatile oil, and volatile oil (2–5%). Cumin aldehyde is the main constituent of the fresh oil, which is yellow in colour.

Cumin aldehyde, limonene, o & p -cymene, b-pinene, 1, 8-cineole, α & γ-terpinene, safranal, and linalool are chemicals that are found in cumin. The cumin product contains resin, oily matter, gum, lignin, protein bodies, salts, and extractive and volatile oil, which make up the adulthood of its salt content. According to the seeds' approximate composition, they have a fixed oil content of 10% or less, along with protein, cellulose, sugar, mineral components, and volatile oil. Cumin seeds have 1–5% volatile oil, which gives them their distinctive scent. After separation, a large number of phenolic compounds, including phenolic acids, flavonoids, and phenolic diterpenes, are found in cumin fruits. These compounds are closely associated with their antioxidant activity and are crucial in preventing lipid peroxidation and various types of oxidising enzymes. Octanol, limonene, thymol, anisyl alcohol, cumin aldehyde, anethole, vanillin, and benzoic acid are among the essential oils that have been found in cumin. Aspartic, citric, malic, tartaric, propionic, ascorbic, oxalic, maleic, and fumaric acids are the main organic acids in cumin, and salicylic acid, gallic acid, cinnamic acid, hydroquinone, resorcinol, p-hydroxybenzoic acid, rutin, coumarin, and quercetin are the phenols. Cumin oil is used as a scent ingredient in cosmetics (the maximum allowable use level in perfumes is 0.4%) [11].

Chemical Composition of *Piper longum*

Two alkaloids piperlongumine and piperlonguminine, nhexadecane, n- heptadecane, n octadecane, n- nonadecane neicosane, n-heneicosane,-thujene, terpinolene, zingiberene, p-cymene, p-methoxy acetophenone, traces of dihydrocarveol, phenyl ethyl intoxicating and two sesquiterpenes; piperine, piplartin, triacontane, dihydrostigmasterol, an secret steroid, lowering carbohydrate, glycosides, sesamin and methyl- 3.4.5- trimethoxycinnamate (root); major alkaloid piperine and sesamin (stem and crop); sesquiterpene hydrocarbon, caryophyllene, a sesquiterpene intoxicating, carbonyl compound (essential lubricate), N-isobutyldeca- trans- 2-trans- 4-dienamide, piperine, piplartine and a lignan d-sesamin, two piperidine alkaloids pipernonaline and piperundecalidine (crop), sylvatin sesamin and diaeudesmin (source). [12]

Elettaria cardamomum

Bronchodilator activity

Khan, et al describes its breath-relaxing potential explaining the possible underlying mechanism. Raw cardamom extract was positive for alkaloids, flavonoids, saponins, sterols and tannins, in the carbachol-mediated broncho-constriction test in rats under anaesthesia, depending on the dose (10-100mg/kg), inhibited carbolic acid (1μmol/kg) caused by an increase in inspiratory pressure. Isolated in the rabbit in tracheal tissues, crude cardamom extracts induced relaxation of both carbochol (1μM) and extreme K (80mM)-induced shortenings as induced verapamil, suggesting its Ca channel-obstructing effect. Results show that cardamom has a bronchodilator effect mediated by Ca mechanism of the antagonist, which gives it a good mechanical background medicinal use in asthma [13].

Immunomodulatory activity

The research work of Amin F. Majdalawieh & Ronald I. Carr, et al established that Black pepper and cardamom extracts have been found to significantly enhance splenocyte proliferation, suppress T helper (Th) 1 cytokine release, and enhance Th2 cytokine release by splenocytes, respectively. Findings suggest that they exert immunomodulatory roles and antitumor activities, and can be used as potential therapeutic tools to regulate inflammatory responses and prevent carcinogenization [14].

Antiseptic and a Cough Suppressant - Cardamom oil

Cardamom belongs to the Zingiberaceae classification. It is settled of culinary advantage and is used in miscellaneous sweetmeats and cakes. Cardamom is an important element in "garam masala", an association spice for many veg and non-veg trays. Cardamom is a rich beginning of 1,8-cineole found in

most oils aroma therapists use to treat miscellaneous ailments and free tightness. The oil extracted from cardamom sources is a singular aptitude of character that holds combinations of terpenes, esters, flavonoids and more compounds. Cardamom sources are used in usual cure, for example, for the treatment of differing ailments, containing severe respiratory diseases, stomach upset, offensive breath, angry neck, cold, delirium, bronchitis, gallbladder questions, flatulence and pain. Cineole, the best alive component of cardamom oil is an effective antiseptic that kills bacteria treat offensive breath and additional contaminations and is further famous cough medicine to clear the respiratory tract [9].

Antibacterial and Anti-inflammatory activity

Souissi, M., et al have demonstrated that two cardamom extracts (fruits and seeds), which are rich in volatile compounds, against important periodontal pathogens. In addition, tested the ability of the extracts to have an anti-inflammatory effect. Cardamom fruits and seeds extracts were antibacterial against *Aggregatibacter actinomycetemcomitans, Fusobacterium nucleatum, Porphyromonas gingivalis and Prevotella intermedia* (lowest inhibitory concentrations: 0.5% [v/v], 0.25%, 0.062%, 0.125% and minimum bactericidal concentrations: 1%, 0.25%, 0.062%, 0.25%. Cell membrane *P gingivalis* inhibited cardamom treatment extracts suggesting a bactericidal mechanism of action. The extracts likewise inhibited biofilm formation even though it is correlated accompanying deformation. In addition, cardamom extracts were considerably declined secretion of IL-1b, TNF-α and IL-8 by lipopolysaccharide-aroused macrophages. The evidence suggested that the anti-inflammatory effect may be due to inhibition of the NF-κB signalling pathway. It is the first to demonstrate that cardamom fruit and seed extracts may be interesting therapeutic agents against periodontal disease due to their antibacterial and anti-inflammatory properties [15].

Effect of *Elettaria cardamomum* (L.) *Maton* in preventing Pan masala-induced lung damage in male Swiss mice

Kumar S, et al explores the potential curative properties of *Elettaria cardamomum (L) Maton* against pan Masala-induced lesions in the lungs of male Swiss mice. The experimental mammals were divided into 3 groups (control, acted with pan masala group and pan masala cardamom considered group) to assess pan masala toxicity. The verdicts confirmed profound changes in bronchi tissue, as told in the paper histological and transmission energized matter microscopic studies. Pan Masala Lung the medicated group had adenocarcinoma, oedema and inflammation accompanying increased acid activity phosphatase, soluble phosphatase and lactate dehydrogenase. The reactions were visible in the cardamom-considered group, and the enzyme venture was also significantly discounted (P<0.05) in the healing group. So, the exhilarating results of experiment observed when pan masala is increased cardamom or administered unique[16].

Cuminum cyminum

Bronchodilator Activity

Boskabady M H, et al demonstrate that almost strong sedative (bronchodilator) effect of *Cuminum cyminum* on tracheal loops of guinea pigs. An exciting effect of the plant on β-adrenoceptors and/or an inhibitory effect on histamine H1 receptors are considered as likely mechanisms, apart from opening potassium channels and blocking calcium channels [17].

Anti-allergic Activity

Many nations utilise *Cuminum cyminum L.* seed as a spice. Although various functions of the components in cumin seed have been documented, the water-soluble component's anti-allergic properties have not. In order to demonstrate the anti-allergic properties of cumin, Hada M, *et al* concentrated on the suppressive effect of cumin seed aqueous extract on degranulation in this investigation. The rat basophilic leukaemia cell line RBL-2H3 cells' antigen-induced degranulation was considerably and dose-dependently inhibited by cumin seed aqueous extract, without cytotoxicity. The extract also prevented the antigen-induced increase in intracellular calcium ion concentration. According to an immunoblot investigation, the extract inhibits the phosphorylation of Akt, Bruton's tyrosine kinase, phosphatidylinositol 3-kinase, and phospholipase C-1/2 in the signalling pathways [18].

Anti-bacterial Activity

Derakhshan S, et al determined the effect of cumin beginning essential oil on the biofilm-making capability of *Klebsiella pneumoniae* strains and on the integrity of a native fighting plasmid DNA from *K. pneumoniae* isolates. Antibacterial cooperation between the essential oil and picked antibiotic disks was persistent, and the essential lubricate cut down biofilm composition and enhanced the venture of the ciprofloxacin plate. Results desire the potential use of essential oil artificial can enhance the in vivo productiveness concerning this essential oil [19].

Anti-tussive Activity

Boskabady M H, et al evaluated the antitussive effects of *Cuminum cyminum L*. on guinea pigs. Results presented meaningful reduction of cough number in the presence of both concentrations of liquid & macerated extracts and Codeine (P<0.01 to P<0.001). The cough number observed in the vicinity of higher concentrations of liquid and macerated extracts were not significantly various than those of lower

concentrations. Additionally, skilled was no significant dissimilarity between cough numbers noticed in the presence of two together concentrations of extracts with that of Codeine. Results marked an antitussive effect of cumin which was corresponding to that of Codeine [20].

Piper longum

Piperine inhibits eosinophil infiltration and airway hyper-responsiveness by suppressing T cell activity

Kim, et al imply that the therapeutic mechanism by which Piperine effectively treats asthma is based on a decrease in Th2 cytokines (interleukin-4, interleukin-5), eosinophil infiltration, and by a marked decrease in thymus and activation regulated chemokine, eotaxin-2, and interleukin-13 mRNA expression (especially transcription of nuclear factor-dependent genes) in lung tissue [21].

Immunomodulatory Activity

Alcoholic extract of the fruits of the plant *Piper longum* and its component piperine was intentional for their immunomodulatory and antitumor action. Alcoholic extract of the products was 100% poisonous at an aggregation of 500µg/ml to Dalton's lymphoma ascites (DLA) containers and 250µg/ml to Ehrlich ascites abnormal growth in animate being (EAC) containers. Piperine was erect expected cytotoxic towards DLA and EAC containers at an aggregation of 250µg/ml. Alcoholic extract and piperine was more erect to produce cytotoxicity towards L929 containers in sophistication at an aggregation of 100 and 50µg/ml, individually. Administration of alcoholic extract of *Piper longum* (10mg/dosage/animal) in addition to piperine (1.14mg/dosage/animal) commit prevent the dependable tumour growth in rodent persuaded accompanying DLA containers and increase the extent of a being's life of mice significance Ehrlich ascites abnormal growth in animate being tumour to 37.3 and 58.8%, individually. Administration of *Piper longum* extract and piperine raised the total WBC count to 142.8 and 138.9%, individually, in Balb/c rodent. The number of plaques making containers likewise reinforced considerably apiece presidency of the extract (100.3%) and piperine (71.4%) on 5th epoch afterwards additional dose of vaccine. Bone essence cellularity and α-esterase beneficial containers were more raised for one presidency of *Piper longum* extract and piperine [22].

***Piper longum* Antiasthma- In Vivo & In Vitro studies**

Asthma and allergic skin conditions are treated with the fruits of the *Piper longum* plant. Using guinea pig ileum preparation (in vitro), histamine-induced bronchospasm in guinea pigs, and haloperidol-induced catalepsy in mice (in vivo), the effect of petroleum ether, alcohol, and the decoction of the fruits of *P. longum* was examined for anti-histaminic activity. Using milk-induced leucocytosis in mice and passive paw anaphylaxis in rats (in vivo), its anti-allergic efficacy was assessed. Significantly ($p<0.01$) inhibiting the histamine-induced contraction of the isolated guinea pig's ileum preparation were the extracts (100g Ml-1). The extracts (50, 100, 200mg kg-1) shown significant ($p<0.01$) action, and an increase in extract dose enhanced the percentage of protection against histamine-induced bronchospasm as well as from halo period-induced catalepsy [23].

Piper nigrum

***Piper nigrum* reduces airway inflammation in asthmatic mice**

Piper nigrum is generally used as a flavor and traditional cure in many nations. It stated to have anti-oxidant, antagonistic-bacterial, antagonistic-swelling, antagonistic-mutagenic, antagonistic-diabetic, and anti-angering characteristics. However, the effect of P. nigrum on susceptible asthma has not existed popular. Study investigated the effect of P. nigrum intoxicating extracts (PNE) on ventilating pipe redness in unable to respire normally mice model. In the ovalbumin (OVA)-persuaded hypersensitive asthma model, analysed the number of angering containers and cytokines result in bronchoalveolar lavage fluid (BALF) and alveolus fabric; histological construction; in addition to the total immunoglobulin (Ig)E, antagonistic-OVA IgE, anti-OVA IgG1 and histamine levels in antitoxin. The oral presidency (200mg/kg) of PNE diminished the accumulation of angering containers (eosinophils, neutrophils in BALF and spar containers in body part tissue); controlled the balance of the cytokines result of Th1, Th2, Th17 and Treg containers, particularly, inhibited the expressions of GATA3, IL-4, IL-6, IL-1β, RORγt, IL-17A, TNF-α and raised the secretions of IL-10, INF-γ in BALF and alveolus homogenate. Moreover, PNE restrained the levels of total IgE, antagonistic-OVA IgE, anti-OVA IgG1 and histamine release in antitoxin. The histological study demonstrated that the fibrosis & combination of instigative cells were further ameliorated in PNE considered mice. On the other hand, PNE inhibited the hypersensitive responses by way of inactivation of informer peritoneal spar containers degranulation. Results imply that PNE has therapeutic potential for medicating susceptible asthma through preventing Th2/Th17 reactions and mast containers incitement [24].

Anti-tussive Activity

Piper nigrum L. fruits are a highly valued therapeutic agent that heals many ailments. Three fractions isolated from *Piper nigrum* fruits showed anti-tussive activity comparable to codeine phosphate. Pectic polysaccharide- piperine combination in parental extract synergistically enhances anti-tussive effect in guinea pigs [25].

Enhancement of IgM production in murine splenic cells by Piper nigrum

The immunostimulant exercise of 70% ethanolic extract of *P. nigrum L*. was examined by weighing the result of immunoglobulin M (IgM) and the conception of murine splenic containers artificial. The result of IgM in civilized supernatants was contingent upon a catalyst connected immunosorbent assay (ELISA) and conception of cells was calculated by 3-(4,5 dimethylthiazol-2-y)-2,5 diphenylterazolium platitude (MTT) assay. The extract at the doses of 0.01 and 0.1mg/ml considerably improved the result of polyclonal IgM result (0.3206 and 0.5014µg/ml, individually) distinguished to control (0.1465µg/ml). No dose of the extract manages unusually increase the conception of splenocytes. Study plainly displays the immunostimulant action of ethanol Olic extract of *Piper nigrum*; shown mainly for one distinction of B containers to red body fluid containers alternatively conception of splenocytes [26].

Anti-allergic Activity

In addition to immunomodulation, piperine significantly reduces allergic rhinitis in mice produced by ovalbumin. Piperine considerably reduced sneezing, rubbing, and redness brought on by nerve ending sensitization brought on by histamine generated in response to antigen-antibody interaction, but it also decreased nitric oxide (NO) levels because eosinophil migration into nasal epithelial tissue was less pronounced. It was discovered that piperine therapy lessened inflammation, redness, and disruption of alveoli and bronchioles, much like in the histological section of the nasal mucosa [27].

Anti-histamine Activity

Bhattacharjee A, et al found that *P. nigrum* extracts showed potent antihistaminic activity, which can be used in the management of asthma or other conditions where histamine through H1 receptors is implicated. Study showed that ethanolic extract significantly inhibited histamine induced smooth muscle contraction, decrease in eosinophil and other cell count, and histamine release from the lung tissue of guinea pig. Additionally, it caused significant inhibition of antigen induced bronchial hyperactivity by decreasing the differential leukocyte count. Further analysis is needed to establish its potency as asthma medicine [28].

Zingiber officinale

Bronchodilator Activity

Six sets of 36 guinea pigs, weighing 400 to 700gm each, were created at random. Group 2 got formoterol (1.55g/kg) and budesonide (0.02mg/kg), whereas Group 1 received distilled water.

Ginger was administered to the guinea pigs in groups 3 and 4 at doses of 350 and 700mg/kg, respectively. Formoterol (1.55g/kg), budesonide (0.02mg/kg), and ginger (350 and 700mg/kg, respectively) were given to groups 5 and 6. Each group's pre-convulsion period and % protection determined. Pre-convulsion times improved statistically significantly in groups 2, 5, and 6, with values of 156.64 ±32.93, 299.33± 44.20, and 235.99 ±34.55, respectively ($p<0.01$). Additionally, relative protection values of 73 and 68%, respectively, were found for groups 5 and 6 that were statistically significant [29].

Effects of Ginger and Its Constituents on Airway Smooth Muscle Relaxation

Ginger and its live components encourage bronchodilation by modulating intracellular calcium $[Ca^{2+}]_i$ in ventilating pipe smooth muscle (ASM). In private human ASM, spirit caused meaningful and expeditious relaxation. Four freed elements of ginger were afterward proven for ASM relaxant characteristics in two together guinea pig and human tracheas: [6]-gingerol, [8]-gingerol, and [6]-shogaol persuaded brisk relaxation of precontracted ASM (100– 300 mM), when in fact [10]-gingerol abandoned to induce entertainment. In human ASM containers, exposure to [6]-gingerol, [8]-gingerol, and [6]- shogaol, but not [10]-gingerol (100mM), dampened after (Ca^{2+}) responses to bradykinin (10mM) and S-(2)-Bay K 8644 (10mM). In A/J mice, the nebulization of [8]-gingerol (100mM), 15 record before methacholine challenge, significantly weakened ventilating pipe resistance, distinguished accompanying vehicle. Taken together, these novel data show that spirit and its unique alive components, [6]-gingerol, [8]-gingerol, and [6]-shogaol, lessen ASM, and [8]-gingerol attenuates ventilating pipe hyperresponsiveness, in part by changing $[Ca^{2+}]_i$ rule. These purified compounds concede possibility determines a therapeutic alternative unique or in combination accompanying endorsed therapeutics, containing b2-agonists, in ventilating pipe diseases to a degree asthma [30].

Anti-allergic Activity

The anti-allergic property of ginger and 6-gingerol, a major compound of spirit, utilizing a mice allergy model and basic/container line culture plan. In mice accompanying ovalbumin (OVA)-induced allergic reaction to pollen, oral presidency of 2% ginger diet weakened the asperity of sneezing and nasal massaging by nasal sensitization of OVA and restrained combination of mast containers in nasal covering layer and discharge of OVA-specific IgE in antitoxin. 6-Gingerol inhibited the expression of not only Th2 cytokines but too Th1 cytokines in OVA-stimulated hate cells. Accordingly, 6-gingerol restrained artificial distinction of both Th1 containers and Th2 containers from naïve T cells. In addition, 6-gingerol calm two together superantigen staphylococcal enterotoxin B

(SEB)- and opposing-CD3-induced T cell conception 6-Gingerol again abrogated PMA plus ionomycin- and SEB-induced IL2 result in T containers, suggesting that 6-gingerol afflicted T cell receptor-interceded signal transduction alternatively the antigen-performance process. Indeed, 6-gingerol inhibited the phosphorylation of MAP kinases, calcium release and basic localization of c-fos and NF-κB by PMA and ionomycin stimulation. Results manifest that 6-gingerol restrain cytokine result for T cell incitement and increase, thereby not precipitating B container and spar cell incitement and developing in stop or alleviation of allergic reaction to pollen manifestations [31].

Anti-bacterial & Anti-cough Activity

Raja, et al carried out the antibacterial and anticough forming action in familiar herbaceous curative plant *Zingiber officinale* extract. The dietary consumption of herbal cure has risen in current years. The decontaminating characteristic of different aggregation of plant extract was listened utilizing 'plate spread assay'. Antibacterial exercise was screened for three microorganisms: *Proteus mirabilis, Klebsiella pneumonia* and *Streptococcus aureus*. The data was distinguished to that of standard medicines. The antibacterial action of *Zingibe*r *officinale* data told the sensitizing kind of extract against *Proteus mirabilis, Klebsiella pneumoniae* and *Streptococcus aureus*. 250 and 500mg/kg aggregation of extract were bearing good venture, show zone of inhibition later 12-time occasion break. Another set of experiment anticough making activity of *Zingiber officinale* extract shows the expiratory exertion for an end tracheal mechanical stimulus was weakened by *Z. officinale* extract shows the dose answer in SGOT and SGPT enzyme as distinguished to SO2 acted group. The mortality rate was noticed to be non-existent in completely exploratory groups. A meaningful decline in body weight gain was noticed. Serum SGOT and SGPT aggregation displayed a meaningful increase as distinguished to control [32].

DISCUSSION

To balance the change in the humour composition in the patient's body, we must choose a medication with tastes, properties, effects, and ultimate tastes. We must also avoid choosing medications with tastes that exacerbate the imbalance. A rise in one humour is always accompanied by a fall in any of the others**.**

Drugs used in *Panchadeepakini Chooranam* majorly possess bitter taste or pungent taste and have *Veppam Thanmai*. Most of the ingredients of *Panchadeepakini Chooranam* have anti-histamine activity, anti-allergic activity, bronchodilator activity, anti-tussive activity and immunomodulatory activity and therefore legitimizing its usage in respiratory diseases.

CONCLUSION

From this literature review it is evident that the most of the ingredients of *Panchadeepakini Chooranam* have anti-histamine activity, anti-allergic activity, bronchodilator activity, anti-tussive activity and immunomodulatory activity. Reviews of the pharmacological literature will provide useful details that will help physician to learn more about the biological effects of medicinal ingredients. To develop the scientific evidence supporting the usage of *Panchadeepakini Chooranam* in treating the diseases mentioned more clinical studies should be conducted.

REFERENCES

1. https://www.tkdl.res.in/tkdl/langdefault/Siddha/Sid_Siddha_Concepts.asp
2. K.N.Kuppusamy mudhaliyar. Siddha maruthuvam (Podhu). Chennai-600 106; Dept of Indian Medicine and Homeopathy; First Edition-1936. Pg.no.672, 673
3. http://namayush.gov.in/sites/all/themes/webcms/images/org_str/SiddhaStandardTreatmentGuidelines.pdf
4. http://ccras.nic.in/sites/default/files/viewpdf/jimh/BIIHM_1995/121%20to%20128.pdf
5. Walter, Thomas M. & Haniya, T.K. & Lavanya, J. & Rasiga, R. & V S, Nandini & Justinraj, Samuel & G.Vibinshiya, & Anjum, M.R. & Merish, S. Role of tastes in treatment modalities of Siddha science. Siddha Papers 2016 (1):1-10.
6. Uthamarayan KS. Citta Vaittiya Tirattu. Chennai; Directorate of Indian Medicine and Homeopathy Publications; 1998. Pg.no.220
7. Murugesa mudaliar. Gunapadam part I Siddha Materia medica (Medicinal plants division). Chennai; Dept of Indian Medicine and Homoeopathy; 2008. Pg no. 760, 470, 514, 165, 459
8. Asim Ali khan, Jameel Ahmad, Prem Kapoor, Umar Jahangir, Shagufta parveen, qamar Alamkhan. Efficacy of Piper nigrum (black pepper): A Review. Innovare Journal of Health sciences. 2016; 4 (4): 1-3
9. Sengupta, A., & Bhattacharjee, S. Cardamom (Elettaria cardamomum) and Its Active Constituent, I, 8-cineole. Molecular Targets and Therapeutic Uses of Spices. 2009. 65–85.
10. Jyotsna Dhanik,Neelam Arya, & Vivekanannd. A review on Zingiber officinale Journal of Pharmacognosy and Phytochemistry. 2017; 6(3): 174-184.
11. Rudra Pratap singh, Gangadharappa. H.V., Mruthunjaya k. Cuminum cyminum- A Popular Spice: An updated Review. Pharmacogn. J.2017; 9(3): 292-301
12. Sadhana singh, Apurva Priyadarshi, Brijesh singh & Poonam sharma. Pharmacognostical and Phytochemical Analysis of Pippali (Piper longum). The Pharma Innovation Journal. 2018; 7(6): 286-289

13. Khan, A. ullah, Q. J. Khan, and A. H. Gilani. "Pharmacological Basis for the Medicinal Use of Cardamom in Asthma". Bangladesh Journal of Pharmacology. 2011; 6(1): 34-37
14. Majdalawieh, A. F., & Carr, R. I. In Vitro Investigation of the Potential Immunomodulatory and Anti-Cancer Activities of Black Pepper (Piper nigrum) and Cardamom (Elettaria cardamomum). Journal of Medicinal Food. 2010; 13(2): 371–381.
15. M. Souissi et al., Antibacterial and anti-inflammatory activities of cardamom (Elettaria cardamomum) extracts: Potential therapeutic benefits for periodontal infections, Anaerobe, https://doi.org/10.1016/j.anaerobe.2019.102089
16. Kumari S, Dutta A. Protective effect of Eleteria cardamomum (L.) Maton against Pan masala induced damage in lung of male Swiss mice. Asian Pac J Trop Med. 2013; 6(7): 525-531.
17. Mohammad Hossin Boskabady, Kiani S, Azizi H. Relaxant effect of Cuminum cyminum on guinea pig tracheal chains and its possible mechanism(s). Indian J Pharmacol. 2005; 37(2): 111-5.
18. Hada M, Nishi K, Ishida M, Onda H, Nishimoto S, Sugahara T. Inhibitory effect of aqueous extract of Cuminum cyminum L. seed on degranulation of RBL-2H3 cells and passive cutaneous anaphylaxis reaction in mice. Cytotechnology. 2019; 71(2): 599-609.
19. Derakhshan S, Sattari M, Bigdeli M. Effect of cumin (Cuminum cyminum) seed essential oil on biofilm formation and plasmid Integrity of Klebsiella pneumoniae. Pharmacogn Mag. 2010; 6(21): 57-61.
20. Mohammad Hossin Boskabady, Sahar Kiani, Hoda Azizi and Tahereh Khatami. Anti-tussive effect of Cuminum cyminum.Linn in guinea pigs. Natural product Radiance. 2006; 5(4): 266-269
21. Kim, S.-H. and Lee, Y.-C. Piperine inhibits eosinophil infiltration and airway hyper-responsiveness by suppressing T cell activity and Th2 cytokine production in the ovalbumin-induced asthma model. Journal of Pharmacy and Pharmacology. 2009; 61(3): 353-359
22. E. S sunila, G.kuttan. Immunomodulatory and anti-tumor activity of Piper longum. Linn and piperine Journal of ethnopharmacology. 2004; 90(2-3): 339-346
23. Dhirender Kaushik, Ruby Rani,Pawan Kausik, Disha Sacher and Jyoti Yadav. In vivo and in vitro Anti asthmatic studies of plant Piper longum. linn. International journal of pharmacology. 2012; 8(3): 192-197.
24. Bui, T. T., Piao, C. H., Song, C. H., Shin, H. S., Shon, D.-H., & Chai, O. H. Piper nigrum extract ameliorated allergic inflammation through inhibiting Th2/Th17 responses and mast cells activation. Cellular Immunology. 2017; 322,64– https://doi.org/10.1016/j.cellimm.2017.10.005
25. Khawas, S., Nosáľová, G., Majee, S. K., Ghosh, K., Raja, W., Sivová, V., & Ray, B. (2017). In vivo cough suppressive activity of pectic polysaccharide with arabinogalactan type II side chains of Piper nigrum fruits and its synergistic effect with piperine. International Journal of Biological Macromolecules. 2017; 99, 335–342. https://doi.org/10.1016/j.ijbiomac.2017.02.093
26. M.M.R. Sarker. Induction of Humoral Immunity Through the Enhancement of IgM Production in Murine Splenic Cells by Ethanolic Extract of Seed of Piper nigrum L. J. Sci. Res. 2012; 4 (3): 751-756
27. Aswar, U.; Shintre, S.; Chepurwar, S.; Aswar, M. Antiallergic effect of piperine on ovalbumin-induced allergic rhinitis in mice. Pharm. Biol. 2015; 53, 1358–1366.
28. Bhattacharjee A, Sarkar BR, Dey BK. Evaluation of in-vivo histamine release inhibitory potential of Piper nigrum seed extract. MOJ Tumor Res. 2018; 1(6): 180–185.
29. Jitendra Vaghela, Vishal kumarkvadgama,Bhargav Mpurohit. Bronchodilatory effect of Zingiber officinale roscoe (ginger) In guinea pigs Tropical journal of pharmaceutical research. 2020; 19(4); 845-849
30. Townsend, E. A., Siviski, M. E., Zhang, Y., Xu, C., Hoonjan, B., & Emala, C. W. Effects of Ginger and Its Constituents on Airway Smooth Muscle Relaxation and Calcium Regulation. American Journal of Respiratory Cell and Molecular Biology. 2013; 48(2): 157–163.
31. Kawamoto, Y., Ueno, Y., Nakahashi, E., Obayashi, M., Sugihara, K., Qiao, S., Takeda, K. Prevention of allergic rhinitis by ginger and the molecular basis of immunosuppression by 6-gingerol through T cell inactivation. The Journal of Nutritional Biochemistry. 2016;27,112–122.https://doi.org/10.1016/j.jnutbio.2015.08.025
32. Raja, Wasim & Pandey, Sonam & Hanfi, Sarfaraz & Khan, Aafrin. Evaluation of Antibacterial and Anticough Forming Effects of Zingiber officinale Extract. Journal of Chemical and Pharmaceutical Research. 2012; 1(6): 2319-1716.

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