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Review Article

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A REVIEW ON CLASSICAL SIDDHA DRUG "*MURUNGAI POO CHOORANAM*" FOR THE MANAGEMENT OF HYPERTENSION-A DRUG REVIEW

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ABSTRACT

Siddha system of medicine describes 32 forms of internal medicines in Siddha literatures. Chooranam is one of the form of internal medicine. The classical Siddha formulation *Murungai Poo Chooranam* (MC) with 9 herbal ingredients and one animal antler which stipulated for *'Ratha Pitham'* (Hypertension), *'Ratha Vandhi'* (Blood vomiting). The goal of the review to validate MC with its Anti-Hypertensive pharmacological evidences. The ingredients present in this formulation have efficacious in the treatment of Hypertension. Based on this evidence of Siddha literature and the modern knowledge and research based studies also provide keyhole which terminates Antihypertensive activities present in the ingredients of *Murungai Poo Chooranam*.

KEYWORDS: Siddha, *Murungai Poo Chooranam*, Hypertension, Antler, Pharmacological activity.

INTRODUCTION

Hypertension is one of the most common life style disorder. It is one of the most preventable causes of premature morbidity and mortality in worldwide.[1] Hypertension a medical condition, under the category of Non communicable disease called as silent killer and biggest menace of present generation. The normal BP was 120mmHg in systole and 80mmHg in diastole. The first stage of HBP was 130mmHg in systole and the diastolic becomes 80-89mmHg. The second stage ranges from 140 or higher in systolic and 90 of higher in diastolic.

One more condition called Hypertensive crisis or Hypertensive emergency, in this condition BP elevated higher than 180mmHg in systolic and the diastolic pressure becomes higher than 120mmHg.[2] Long standing and uncontrolled hypertension causes atherosclerosis, stroke, blindness, renal failure, occlusive and non-occlusive heart diseases. It also causes the heart to remodel and undergo a process of hypertrophy called left ventricular hypertrophy.[3-4] Hypertension is a common disorder rising incidence and once it established, treatment is obligatory.

The main goal of Siddha system of medicine is to satisfy the people with healthy and hygienic life. "*Pancha bootham*" (Five primordial elements) and *"Tridhosam"* (Three humors) forms the basis of Siddha. All the physiological function in the body is arbitrated by *"Tridhosam" ('Vatham', 'Pitham' and 'Kabam').*[5]

The Hypertension is called as 'Ratha Pitham' or Kuruthi azhal' in Tamil literatures. To overcome these serious consequences there are many antihypertensive drugs available in the market. In the Siddha system of medicine, many promising medicines are available to treat hypertension very effectively. Hence, from the treasure of this system, the author had decided to choose this medicine *'Murungai poo chooranam'* is a classical Siddha compound drug quoted in *Agathiyar 2000 part III*. This medicine is used to treat *'Ratha pitham'* (Hypertension), *'Ratha Vandhi'* (Blood vomiting). This review focuses on the pharmacological activities of each ingredient that supports the traditional claim and the literature search is confined to that area.

MATERIAL AND METHODS

INGREDIENTS

Each equal ratio

1. Murungai poo
2. Thamarai virai
3. Senkazhuneer virai
4. Naaval kottai
5. Atthi thulir
6. Thoothuvalam poo
7. Nilapanai vithai
8. Aalam virai
9. Maanthulir
10. Maan kombu

Table 1: Ingredients of *Murungaipoo Chooranam*.

S.No	Tamil Name	Botanical Name	English name	Family	Parts used
1	Murungai Poo	*Moringa oleifera*	Drumstick tree	Moringaceae	Flower
2	Thamarai virai	*Nelumbo nucifera*	Lotus	Nelumbonaceae	Seed
3	Senkazhuneer virai	*Nymphaea alba*	Water lilly	Nymphaeceae	Seed
4	Naaval kottai	*Syzygium cumini*	Jambul	Myrtaceae	Nut
5	Atthi thulir	*Ficus racemose*	Cluster fig	Moraceae	Leaf Bud
6	Thoothuvalam Poo	*Solanum trilobatum*	Climbing brinjal	Solanaceae	Flower
7	Nilapanai vithai	*Curculigo orchioides*	Black musale	Hypoxidaceae	Seed
8	Aalam virai	*Ficus benhalensis*	The banyan tree	Moraceae	Seed
9	Maanthulir	*Mangifera indica*	Mango tree	Anacardiaceae	Leaf Bud
10	Maan kombu	-	Deer antler	Cervidae	Antler

Standard Operating Procedure

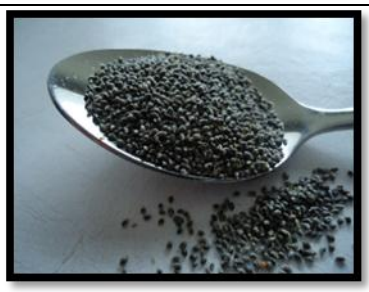
Murungai poo, Thamarai virai, Senkazhuneer virai, Naaval kottai, Athi thulir, Thoothhuvalam poo, Nilapanai vithai, Aalam virai, Maanthulir, Maan kombu were taken and made into coarse powder and stored in a container.

Dosage: 3 viral alavu (800-1000mg)[6]

Adjuvant: Honey or Ghee

Indication: Ratha Vanthi, Ratha Pitham.

Table 2: Actions and Chemical constituents of Murungaipoo Chooranam.

Name	Actions[7]	Images	Chemical constituents
Murungai poo	Tonic Emmenagogue Antispasmodic Stimulant Expectorant Diuretic		D-mannose, D-glucose, protein, ascorbic acid, polysaccharide.[8] Wax, Quercetin and Kaempferat; the ash is rich in potassium and calcium. They have also been reported to contain some flavonoid pigments such as alkaloids, Kaempherol, Rhamnetin, Isoquercitrin and Kaempferitrin.[9]
Thamarai virai	Tonic Nutrient Cooling Astringent Expectorant Sedative		Seed polysaccharides are mainly composed of four types of monosaccharide: D-galactose, L-arabinose, D-mannose and D-glucose. Seed coat of Nelumbo produced some pyrolysis polysaccharide products, including2-furaldehyde, 2-hydroxymethylfuran, (SH)-furan-2-one, 2,3-dihydro-5-methylfuran-2-one, 2-hydroxy-3- methyl-2-cyclopenten-l-one, 5-hydroxymethyl-2-furaldehyde, Levogalactosan, Levomannosan,[10]
Senkazuneer virai			Nupharine, Nymphaein and the Cardiac glycoside, Nymphalin. The presence of β-sitosterol, Gallic acid and Myricitrin. Hyperoside, Iso-quercitrin,'-Beta-xyloside of quercetin, 3;-Beta-xyloside of 3-methylquercetin.[11]
Naaval kottai	Astringent Stomachic Diuretic Tonic		Alkaloids, Glycosides, Triterpinoids, Sterols, Saponins, Flavanoids, Tannins, Carbohydrates.[12] 4-(2,2-Dimethyl-6- methylenecyl) butanol, Decahydro-8a-ethyl-1,4a,6-te tramethylnaphalene, Eicosane, Heptacosane, 1-chlorooctadecane, Octacosane, Tetratetracontane, Octadecane.[13]

Athi thulir	Astringent Cordial Laxative		Triterpenoids tannins, Kaempferol, Rutin, Arabinose, Bergapten, Psoralenes, Flavonoids, Ficusin, Coumarin, Phenolic Glycosides and Saponins.[14]
Thoothuvalam poo	Stimulant Expectorant Tonic		Saponins, Tannins, Flavonoids, Cardiac glycosides.[15]
Nilapanai vithai	Tonic Diuretic Astringent Carminative Emollient		Palmitic acid, Neral, Sitogluside, beta-sitosterol, (+)-Syringaresinol, Stigmasterol, Oleic acid, Hyacinthin, 3-Methyl palmitate, Ethylpalmitate, Myristic acid, Pentadecylic acid, Daturic acid, Zinc, Tetramethylpyrazine, 3,4,5-trimethoxytoluene, Cycloartenol, Caffeine, (E)-6-Methyl-3,5-heptadien-2-one, Toluene, Curculigosaponin G, G_qt, B, B_qt, A, B, C. D, E, F, G, I, J, K, L, M, Curculigoside, Curcumadio, Curculigenin A, B, C, Curculigol.[16]
Aalam virai			Hexadecanoic acid, 5-decenedioic acid and methyl esters of 14,17-octadecadienoic acid, undecanoic acid, 5,6-dimethyl, Dimethyl ester, hexadecanoic acid, 14-methyl, hexadecanoic Acid,14-methyl, heptadecanoic acid, 16 methyl, Oxiraneoctanoic acid, 3 octyl.[17]
Maa thulir	Astringent Laxative Diuretic Demulcent Stomachic		Quercetin-3-*O*-β-*L*-rhamnopyranoside, hyperin, quercetin-3-*O*-β-glucopyranoside, 7-*O*-methylquercetin-3-*O*-β-*L*-rhamnopyranoside, rhamnetin-3-*O*-β-*D*-glucopyranoside, amentoflavone, mangiferin, irisflophenone-3-*C*-β-glucoside, maclurin-3-*C*-β-glucoside.[18]
Maan kombu	**For external** Astringent Sedative **For Internal** Alterative Styptic Tonic for Heart and Lung		Antlers mainly contain rich amino acids, such as: L-hydroxyproline, glycine, alanine and L-proline more than 10 kinds of amino acids, of which collagen is the main component hydroxyproline. Antlers also contain beta-3 subtype hemoglobin, antimicrobial peptide 1, peptidoglycan recognition protein and other animal proteins containing Zn, Cu, Fe, Mn. Antlers also contain heavy metals, such as lead, cadmium, arsenic, mercury, etc., but the content of heavy metals in qualified antler products is in accordance with the standards of medicine.[19]

Pharmacological activities of the Ingredients of *Murungaipoo Chooranam*

Murungai poo (Moringa oleifera)

Proximate analysis found that percentage of dry weight of proteins, ash, lipids, dietary fibre and nonstructural carbohydrate suggest a comparable nutritional profile for leaves and flowers. Total antioxidant content of flower is also found higher than other plant parts. The vitamin C content in flowers was found to be in highest when compared to other parts. A number of qualitative analysis of various flower extracts confirmed the presence of Saponins, tannins, alkaloids, flavonoids, steroids, glycosides, terpenoids and phenols. *Murungai poo* is the dried flower of *Moringa oleifera* used as cure for inflammations.[20]

Moringa flowers act as hypocholesterolemic, anti-arthritic agents can cure urinary problems and cold. It contains calcium and potassium and amino acids. They also contain nectar. The presence of nectar makes them viable for use by beekeepers.[21]

Thamarai virai (Nelumbo nucifera)

The embryos possess small amount of alkaloids, which are antispasmodic for the intestines and alleviates diarrhoea. The embryos within lotus seeds possess an alkaloid isoquinoline, which is sedative, antispasmodic and beneficial to heart. It dispels pathogenic heat from the heart and spontaneous bleeding due to heat. The major phytochemicals present in lotus seeds are alkaloids (e.g dauricine, lotusine, nuciferine, pronuciferine, liensinine, isoliensinine, roemerine, nelumbine, neferine).[22]

Senkazhuneer virai (Nymphaea alba)

Angiotensin converting enzyme (ACE) inhibitors plays a critical role in treating hypertension. The > 50% ACE inhibition activity at 330 µg/ml concentration.[23]

Naaval kottai (Syzygium cumini)

The in vivo and in vitro results of the study show that *Syzygium cumini* reduces the blood pressure and heart rate of SHR. This antihypertensive effect is probably due to inhibition of arterial tone by the blockade of extracellular Ca2+ influx. These effects can be attributed to the presence of flavonoids detected by phytochemical screening. The results may partially explain the traditional use of S. cumini for the treatment of disorders such as hypertension.[24]

Atthi thulir (Ficus racemose)

The petroleum ether extract of *F. racemosa* leaves at doses of 200-400 mg/kg bw exhibited significant anti-inflammatory activity in carrageenan-, serotonin-, histamine- and dextran-induced rat hind limb paw edema. A maximum effect was observed at 400 mg/kg dose. In chronic tests, at 400 mg/kg the effect was comparable with that of phenylbutazone, a non-steroidal anti-inflammatory agent.[25]

Bioassay-guided fract ionation of the ethanol extract of leaves isolated racemosic acid. It showed potent inhibitory activity against COX-1 and 5-LOX in vitro with IC50 values of 90 and 18 µM, respectively.[26]

Thoothuvalam poo (Solanum trilobatum)

Administration of *S. trilobatum* extract significantly decreased the level of lipid peroxidation and enhanced the activity of antioxidant enzymes. This result suggests that *S.trilobatum* might exhibit antihypertensive effect. It is one of the main ingredients in *Asai chooranam*, which is given 0.5g twice a day in Siddha system (Formulary of Siddha medicine, 1993).[27]

Nilapanai vithai (Curculigo orchioides)

Methanolic extracts of *Curculigo orchioides* root possessed profound antihypertensive activity. The antihypertensive effect has been found due to ACE inhibitor mechanism of *Curculigo orchioides* root extract because this extract lowers the blood pressure as similar to enalapril which is a ACE enzyme inhibitor in DOCA salt induced hypertensive model. Additionally, *Curculigo orchioides* root did not interfere with pulse rate (i.e. normal heart rate). The intake of *Curculigo orchioides* root extract as medicine might have potential benefits in management of hypertension.[28]

Aalam virai (Ficus benhalensis)

Injectio of F.benghalensis extracts at 10 mg/kg dosage significantly (p<0.05) reduced SBP, DBP, MABP, and heart rate by 10, 17, 13, and 29%, respectively in normotensive rats (Group 2). While, in group 3, angiotensin II (0.5 g/kg) injection increased SBP, DBP, and MABP substantially (p<0.05) and lowered heart rate by 42% compared to the control group. Angiotensin II increased SBP, DBP, and MABP to an extent of 39, 38, and 41%, respectively. In group 4, FBE was injected along with angiotensin II which efficiently reduced elevated SBP, DBP, and MABP by 27, 30, and 29%, respectively. The present showed that the extract of *F. benghalensis* stem bark offers a strong blood pressure-lowering effect in both normotensive and angiotensin II-induced hypertensive rats and its action is related to the presence of flavonoids and other phenolic compounds. Furthermore, the antihypertensive effect could be related to a strong antioxidant activity that reduces the binding of the angiotensin-converting enzyme with angiotensin receptors.[29]

Maanthulir (Mangifera indica)

In agreement, the dichloromethanic fraction of *M. indica* exhibited a high ACE *in vitro* inhibitory activity and those results may be associated, at least in part, with the highest presence of phenolic content, as the major constituents, in the studied fraction. The *in vitro* ACE inhibitory activity of ichloromethanic fraction could be evidenced *in vivo* by the reduced of the increase of MAP induced by the bolus application of Ang I. Interestingly, a significant decrease in the MAP was lower than that obtained after the standard captopril treatment for at least

two tested doses. In light of the exposed and the increasing need of new alternatives therapies, we speculated that chronic treatment with *M. indica* leaves may reduce the blood pressure of hypertensive animals via inhibition of ACE activity, resulting in the improvement of arterial baroreflex sensitivity. Here we report a comprehensive investigation undertaken with *M. indica* on the blood pressure and baroreflex of spontaneously hypertensive rats (SHRs). Our results demonstrated that *M. indica* reduced the blood pressure and these effects may be due, at least in part, to the inhibition of ACE.[30]

Maan kombu (Deer horn)

Antlers gum can significantly increase the cyclophosphamide-induced blood deficiency in whole blood red blood cells, platelets, leukocytes, T-Lymphocytes in the number of plasma prothrombin time and activated partial thromboplastin time values were significantly increased, show that it has anti-inflammatory, blood function.

CONCLUSION

From the literature review it is evident that most of the ingredients of *Murungai Poo Chooranam* has antihypertensive pharmacological activity which is responsible for its therapeutic activity claimed in Siddha text *Agathiyar 2000 part III*. Therefore, further research analysis on preclinical and clinical consideration is need for wide spread acceptance among public and scientific community.

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