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THERAPEUTIC EFFECTIVENESS OF A SIDDHA POLYHERBAL FORMULATION ARUTHA CHOORANAM IN THE MANAGEMENT OF *THOOKAMINMAI* (INSOMNIA) - A DRUG REVIEW

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Abstract:

Siddha system of medicine is one of the ancient systems of medicine in India practised in southern parts of India, particularly in Tamil Nadu. This system of medicines is prepared from ingredients that are obtained from herbals, minerals, metals and animal products. "*Arutha chooranam"* is one of the Sastric Siddha Polyherbal formulations containing 8 herbal ingredients. It is indicated for *Thookaminmai* (Insomnia). This review is aimed to bring out scientific evidence for the therapeutic usage of "*Arutha chooranam*" in *Thookaminmai* (Insomnia) and focused on the pharmacological activity responsible for the therapeutic nature of the drug in *Thookaminmai* (Insomnia). Most of the ingredients of *Arutha chooranam* have sedative, anticonvulsant, muscle relaxant, antioxidant, analgesic, neuroactive compounds, and antinociceptive activities. Hence justifying its usage in *Thookaminmai* (Insomnia).

KEYWORDS

Siddha Medicine, *Arutha chooranam, Thookkaminmai*, Pharmacological activity.

A.INTRODUCTION

Siddha system of medicine is a traditional medicine that originated and was practised in southern India, particularly in Tamilnadu. Siddha system is known to be their efficacy and safe. Siddhars who were the founder of the Siddha system possessed Yoga siddhi powers (supernatural powers). They had given unique treatment methods like medicine, alchemy, philosophy, Yogam and Varmam. *"Arutha chooranam*" is a Siddha Poly herbal formulation that is mentioned in the Siddha text of *Chikitcha Rathanathi Deepam*(1), which is indicated for *Thookaminmai* (insomnia). The drug review of "Arutha chooranam", a herbal drug gives evidence for its therapeutic action mentioned in the literature. This review focused on each ingredient's pharmacological activities, which supports the traditional claim, and the literature search is confined to that area. The review of the literature was made from the textbooks in the National Institute of Siddha library, journals, the internet, databases, Standard operating procedure for the preparation of Arutha chooranam and the Purification of its ingredients.

B. Preparation of "Arutha chooranam"

Table 1

S.No	Tamil name / Botanical name	Part used	Quantity
1	*Aruvatha (Ruta graveolens)*	Leaf	35 Grams
2	*Venthayam (Trigonella foenum-graecum)*	Seed	35 Grams
3	*Seeragam (Cuminum cyminum)*	Seed	35 Grams
4	*Karunjeeragam (Nigella sativa)*	Seed	35 Grams
5	*Sannalavangappattai (Cinnamomum verum)*	Bark	35 Grams
6	*Athimathuram (Glycyrrhiza glabra)*	Root	35 Grams
7	*Sombu (Foeniculum vulgare)*	Seed	35 Grams
8	*Thaniyaa (Coriandrum sativum)*	Seed	210 Grams
9	*Seenikarkandu*	-	455 grams

C.METHOD OF PREPARATION OF TRIAL DRUG:

All the above-mentioned (1 to 8) drugs were purified and grounded as a fine powder and then mixed with equal amounts of *Seenikarkadu* powder and then store in an airtight glass container.

D.PHARMACOLOGICAL ACTIVITIES AND INGREDIENTS OF ARUTHA CHOORANAM

1. *Aruvatha* (*Ruta graveolens*)

i. Antioxidant activity:

R.Graveolens et al. was determined using 2, 2-Diphenyl-1-picryl hydrazyl radical (DPPH˙) as described by Blios. Briefly, 100µg Extracts of R. graveolens were mixed with 5 ml of 0.1 mM methanolic solution of DPPH and incubated at 20°C for 20 min in complete dark. The DPPH alone serves as control and methanol were used for the baseline correction [(2)]

2. *Venthayam* (*Trigonella foenum-graecum*)

i. Anti-depression activity:

It has been proven that the shortening of immobility time depends mainly on the enhancement of central 5-HT and catecholamine neurotransmission. Trigonella foenum ethanolic extract showed significant antidepressant activity as evidenced by a decrease in immobility time of force swim test and tail suspension test. The antidepressant activity of this plant extract can be attributed to the various phytochemicals present in its ethanolic extract. Abundant studies are showing that phytochemicals like phytosterols, phenolic compounds, flavonoids and glycosides show antidepressant activity [(3)].

ii. **Antioxidant activity:**

Methanolic extracts of callus derived from hypocotyls and cotyledons of *T. foenum-graecum* showed higher antioxidant activity than methanolic extracts of seeds. The number of phenolic contents in methanolic extracts of calli was more when compared with that of methanolic extracts of T. foenum-graecum seeds [(4)].

3. *Seeragam* (*Cuminum cyminum*)

i. Antioxidant effect

The antioxidant capacity of cumin by ABTS and DPPH assays was3.26 ± 0.29 and 2.16 ± 0.06 (mmol TE/g DW) respectively. The antioxidant activity of cumin was studied. The oil showed higher antioxidant activity compared with that of BHT and BHA. The cumin essential oil exhibited dose-dependent scavenging of DPPH radicals and 5.4 micrograms of the oil were sufficient to scavenge 50% of DPPH radicals/ml. Antioxidant activity of essential oils was evaluated by DPPH radical scavenging assay, radical inhibition of Cuminum cyminum essential oils was 83.59%, and the scavenging activities of the essential oil was increased with the increase of the essential oil concentrations [(5)].

ii. **Anti-stress activity**

The memory-enhancing and antistress activities of Cuminum cyminum were studied in rats. The antistress activity was evaluated by inducing stress via forced swimming and the urinary vanillyl mandelic acid (VMA) and ascorbic acid were estimated as biomarkers. The memory-enhancing activity was studied by conditioned avoidance response using Cook's pole climbing apparatus in normal and scopolamine-induced amnestic rats. Daily administration of cumin at doses of 100, 200, and 300 mg/kg bw, 1h prior to induction of stress, inhibited the stress-induced urinary biochemical changes in a dose-dependent manner without altering the levels in normal control groups. The cognition, as determined by the acquisition, retention, and recovery in rats, was observed to be dose-dependent [(5)].

4. *Karunjeeragam* (*Nigella sativa*)

According to different studies, it seems that NS can affect the nervous system and related diseases. In these studies, aqueous, alcoholic, and hydro-alcoholic extracts and NSO has been considered. It should be mentioned that TQ (thymoquinone) is seen to be the most useful known element of NS and can be regarded as a useful agent in the treatment of diseases of the nervous system. The results of several studies have shown that this plant can improve **memory impairment, anxiety, depression**, epilepsy, neurotoxicity, neurodegeneration, and pain. In addition, based on the current review, it is concluded that NS, through inhibition of acetylcholinesterase enzyme and particularly due to its **antioxidative effects** improves nervous system disease [(6)].

i. Antioxidant activity

Studied that methanol extracts of Nigella sativa have strong antioxidant activity using the oxygen radical absorbance capacity method and a cell-based assay. Thymoquinone has been shown to suppress the Fe-NTA-induced oxidative stress, hyperproliferative response and renal carcinogenesis in Wistar rats. It was suggested that dietary supplementation of black seeds powder inhibits the oxidative stress caused by oxidized corn oil in rats. The modulatory effect of Thymoquinone on erythrocyte lipid peroxidation and antioxidant status during 1,2-dimethylhydrazine- (DMH-) induced colon carcinogenesis after initiation in male Wistar rats was investigated[(7)]

ii. **Anti-depressant activity**

Phytochemical and biological evaluation of the antidepressant constituents in Nigella sativa using the tail suspension and forced swim methods afforded the isolation and identification of quercetin-3-O-α-L rhamnopyranoside, quercetin-7-O-β-D gluco pyranoside, tauroside E, and sapindoside B as the potential antidepressant constituents in the polar extract of N. Sativa. The isolated compounds were identified through extensive NMR analysis (1D, 2D, ESI MS) [(8)]

5. *Sannalavangappattai* (*Cinnamomum verum*)

C.verum may cause an improvement in **anxiety, locomotor activity and emotionality behaviour** in Wistar Albino rats. The improvement may be due to the metabolite of C. verum, and the improvement can also be possible by the antioxidants generated during cinnamon metabolism [(9)].

i. Antioxidant activity

The evaluation of the bioactivity and phytochemical screening of WEC and EEC had great importance. The WEC and EEC, as natural sources of phenolic compounds, were examined for their biological activities including antioxidant activities and some metabolic inhibitory properties. The WEC and EEC were found as having potent antioxidant properties in several bioanalytical assays including Fe3+ and Cu2+ reducing abilities, as well as DPPH· and ABTS•+ radical scavenging activities [(10)].

6. *Athimathuram* (*Glycyrrhiza glabra*)

i. Anti-depressant activity

The preclinical study on mice of test drug after oral administration using two paradigms possess significant effects on antidepressant activity. A combination of Glycyrrhizin glabra and Piper nigrum showed more antidepressant effects than individual drug therapy. Thus, the combination of Glycyrrhizin glabra and Piper nigrum can be explored for the management of depressive disorders [(11)].

7. *Sombu* (*Foeniculum vulgare*)

i. Anti-depressant activity

The methanolic extract of Foeniculum vulgare possesses significant antidepressant activity due to its reduction in the immobility period in FST and reduction in the duration of catalepsy in haloperidol induces catalepsy [(12)]

ii. Anti-anxiety activity

The lower doses of the essential oil of the aerial parts of F. Vulgare possess anxiolytic activity, while at a higher dose the oil appears to be potentially sedative. Thus, the results of the present study indicate that the essential oil of F. vulgare may have potential clinical applications in the management of anxiety [(13)]

8. *Thaniyaa* (*Coriandrum sativum*)

i. Antioxidant activity:

Plasma total antioxidant capacity, plasma catalase and cellular glutathione peroxidase were determined by using assay kits. The amount of total phenolic contents (TPC) in the aqueous extract was 1654 ± 3.4 mg GAE/L. The results of the in vitro antioxidant activity by -carotene/linoleic acid assay showed that *Coriandrum sativum* aqueous extract had strong antioxidant activity (84.6% at 400ug/ml) when compared with the standard reference Tert-butyl hydroquinone (TBHQ) (99.5% at the same concentration). The aqueous extract showed strong DPPH free-radical scavenging activity (88.5% at 400ug/ml), compared with the standard reference (TBHQ) (99.73% at the same concentration) [(14)].

ii. Anti-anxiety activity

The effects of 100 and 200 mg/kg of hydroalcoholic extract of C. sativum on the EPM, light-dark test, OF test (200 mg/kg only) and social interaction test were almost equivalent to that of 0.5 mg/kg of diazepam. Emamghoreishi et al. in 2005 showed that C. sativum has an active anxiolytic activity at a 100 mg/kg dose. In the present study, the anxiolytic activity of the C. sativum fruit extract was observed at doses of 100 and 200 mg/kg in mice. These observations indicate that C. sativum exerts an anxiolytic activity [(15)]

iii. Sedative effect

Intra cerebro ventricular injection of essential oil from Coriandrum sativum seeds induced a sedative effect at 8.6 and 86 µg doses. This effect may be due to monoterpene linalool, which also induced a similar sedative effect, and, therefore, could be considered as a potential therapeutic agent similar to diazepam [(16)]

E. CHEMICAL CONSTITUENTS AND USES:

Table 2

Tamil name	English name[(17)]	Chemical constituents	Action[(17)]	Uses in Siddha[(17)]
Aruvatha	**Garden Rue**	2-deconone, 2-dodecanone, 2-tridecanone	Carminative, Tonic, Stimulant	Pre-eclampsia Seizure Indigestion Worm infestation
Venthayam	**Fenugreek**	Amino acids(4-hydroxyisoleucine), saponins, flavonoids, polyphenols	Refrigerant, Tonic, Demulcent	Pitha disease, Hypertension
Seeragam	**Cumin seeds**	Alpha-pinenes, limonene, linolool, terpinen-4-OL, terpernoid aldehydes	Carminative, Stimulant	Pitha disease, hypertension, vatha disease
Karunjeeragam	**Black Cumin**	Thymoquinine, dithymoquinine, carvacrol	Carminative, Stomachic	Body heat, Headache, Eye disease
Sannalavangappattai	**Bark of Cinnamon**	Eugenol, hexenol, linalool, cinnamic acid	Carminative, Stimulant	Body heat
Athimathuram	**Indian Liquorice**	Triterpenoid aglycone, glycyrrhetic acid, coumarin, 6 - acetyl-5.	Emollient, Laxative, Tonic	*Pitha* disease, Eye disease
Sombu	**Anise seeds**	Methylchavicol, anisaldehyde, estragole, trans-anethole	Carminative, Expectorant, Stimulant	Fever, Liver disease
Thaniyaa	**Coriander seeds**	Borneol, p-cymene, camphor, geraniol, limonene, and alpha-pinenes	Stomachic, Stimulant	Psychiatric illness, indigestion,

F.DISCUSSION AND CONCLUSION:

Based on various Siddha classical texts review, the polyherbal formulatory drug of *Arutha chooranam* is one of the common drug used in treating *Thookaminmai* and *Pitha* diseases. Because of the above-mentioned pharmacological activities, most of the ingredients are found to possess sedative, anticonvulsant, and muscle relaxant, activities. Thus, the potency and efficiency of a drug are further enhanced. With this proven efficacy, the drug is cost-efficacy and safer treatment. *Arutha chooranam* serves as a promising drug for future research in the treatment of Thookaminmai. Further clinical studies and statistical data analysis help in exploring this polyherbal Siddha formulation.

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