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AN EXTENSIVE PHARMACOLOGICAL REVIEW ON *SIDDHA* POLY HERBAL FORMULATION "*THATHU BHUSTIKKU CHOORANAM*" FOR MALE INFERTILITY - A DRUG REVIEW

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ABSTRACT

The Siddha system is one of the most conservative medical systems in the world. Herbals play a vital role in Siddha medicinal preparations. In the Siddha system of medicine, the diagnostic methodology is based on assessingthe character of the three humors, namely "Vatham", "Pitham" and "Kapham". The formulation of Siddha medicines depends upon the factors of "Panchaboothams" and "Arusuvai." According to Siddhar‟s concept, the human body is made up of "Saptha Udal Thaathukkal" ie „Saaram‟, „Saenneer‟, „Oon‟, „Kolupu‟, „Ennbu‟, „Moolai‟, and „Sukilam‟. The role of „sukkilam‟ in reproduction is well explained in Siddha literature in an exclusive manner. The aim of this drug review is to validate the *Siddha* herbal formulation *Thathu bhustikku chooranam*with scientific documentation. The medicinal uses and therapeutic actions of each ingredient used in this formulation are matched with current research findings from various research publications. The ingredients present in this formulation are effective in the treatment of male infertility. Based on this evidence of *Siddha* literature and also the modern scientific research studies the keyhole, which reveals spermatogenic, aphrodisiac, antioxidant activities of the ingredients of *Thathu bhustikku chooranam*is apparent from this review.

KEYWORDS: *Thathu bhustikku chooranam*, Male infertility, *Siddha* system, Pharmacological activity.

INTRODUCTION

The inferior quality of semen and reduced sperm countare the major reasons for infertility in males. In Siddha, there are a countless herbal and mineral formulations labelled as aphrodisiacs, Nowadays, the prevalence of male infertility is so high. The Siddha medical term "Thathu Nattam" is nealy correlated with the modern term oligozoospermia (diminished volume of semen). According to the World Health Organization, infertility is defined as the inability of a sexually active noncontraceptive couple to achieve spontaneous conception in one year. Nearly 30 million men worldwide are Infertile. 40% to 50% of infertile males‟ the etiology is unknown. Male infertility, the pathophysiology having a number of cellular abnormalities manifesting at both the molecular and biochemical levels which result in decreased quality and quantity of sperm in the semen. Male infertility's major prevalence was observed to be oligozoospermia. There are so many medicines indicated in our Siddha system for the treatment of male infertility, There is a need for much more effective drug with easy affordability and availability. The World Health Organization (WHO) estimates that 80 percent of the population of some Asian and African countries presently uses herbal medicine for health care.[1] Herbal drugs as the major remedy in traditional system of medicine have been used in medical practices since agedness.[2] The *Siddha* system is contains roughly 300, 000 verses covering diverse aspects of medicine. This work includes herbal, mineral and metallic compositions used as medicine. The *Siddha* system of medicine described about 32 forms of internal medicines in *Siddha* textbook. Among these forms, *Chooranam* is the one form of internal drug in which medicines were purified and made into powder form by pounding of dried drugs. *Thathu bhustikkuChooranam* is a herbal formulation contains three ingredients which is mentioned in *Siddha* Literature of *Anuboga vaidhiya birahmma ragasiyam* Page number: 77. This drug is used for male infertility (aanmaladu). The drug review of '*Thathu bhustikku Chooranam*' is a herbal formulation gives evidence for its therapeutic action mentioned in literatures. The ingredients of this drug are *Neermulli vithai (Hygrophilla auriculata), Saalaam pisin (orchis latifolia), Karuvapattai (Cinnamomum verum)* This review describes the Description of the plant, chemical properties and pharmacological activities of each ingredient used in this formulation.

MATERIALS AND METHODS

Research Design : Drug Review on Literature.

Research Type : Literature Review.

Research Period : 03 Months.

Literature collected from

***Siddha* Literature** :*Anuboga vaidhiya birahmma ragasiyam*

Page number : 77

Author :*Kosaye*

Published by : *Tamizh palkalaikazhakam- Thanjavur*

Year of Publication : 1997

Literature searching in electronic databases such as Science Direct, Pub Med, Pub Med Cochrane and Google-Scholar for publications.

Ingredients of drug

Neermulli vidhai -*Seed of Hygrophilla auriculata*

Saalaam pisin - *Gum of Orchis latifolia*

Karuvapattai -*Cinnamomum verum bark*

Drug Preparation

All the drugs were got authenticated by the Gunapadam experts and Botanist. All the drugs were dried and purified according to the classical *Siddha* literature. Then all the ingredients were finely powdered. The *CHOORANAM* will be purified by *PITTAVIAL* process (Steaming process). Then sugar will be added to it. Then it will be dried and stored in an air tight container.

Dosage :1/2palam (17.5 gm)

Adjuvant : Goat's milk

Indication : *Thaathu nattam*

Drug Review

Neermulli-Hygrophila auriculata -Seed

Figure No. 1: (a*) Neermulli vithai-Hygrophilaauriculata.*

Taxonomic classification

Kingdom : Plantae
Phylum : Tracheophyta
Class : Magnoliopsida
Order : Personales
Family : Acanthaceae
Genus : *Hygrophila*
Species : H. *auriculata*

Description

Hygrophila or Marsh Barbel (English) it is commonly used to call in Tamil as a *Neermulli.* An annual herbal plant grows up to 60cms altitude. The plant stem is tetragonal, hairy and stiffened at the nodes. The bark is dark brown, although the leaves are elliptic-lanceolate and hispid. The flowers are violet and somewhat purple-blue. The fruit looks like a four-sided figure, linear, glabrous and about contains 1cm long seeds which are orbicular hairy and brown in color.[4] Tamil: *Neermuli.*

Distribution

Around the world found in Sri Lanka, Myanmar, Indonesia, Malaysia and throughout the plains of India, in moist habitats such as marshy margins of canals, also found in tropical Himalaya.[5]

Parts used

Seeds.

Actions

Diuretic, Aphrodisiac.

Chemical constituents

Tetracontane (57.74%), Octacosane (6.58%), β-sitoterol (5.47%), Hexadecanoic acid, methyl ester (3.81%), pentacosane (3.77%) and 2-methylhexacosane (3.43%), n-Hexadecanoic acid possesses antioxidant, antimicrobial and anti-inflammatory properties.

Pharmacological Activities

Hypoglycemic activity

Ethanolic extract of aerial parts of *Hygrophila auriculata* shows signs of reduction in glucose in the blood. Also, the decrease in thiobarbituric acid reactive substances (TBARS) and hydroperoxide in both liver and kidney. This extracts also showed decreased lipid peroxidation allied with increased activity of superoxide dismutase (SOD) and catalase. Reported an effect of hot water extracts of *Hygrophila auriculata* on glucose tolerance of normal human subjects and maturity onset of diabetic patients. A direction of aqueous extract of *Hygrophila auriculata* to rats there is no any effect on the gluconeogenic capacity of the kidney or intestinal glucose absorption.[6]

Hematopoietic action

Petroleum ether extraction from *Hygrophila auriculata* increases WBC count significantly. The mixture of Petroleum: ether: chloroform extracts of leaf showed significantly increases erythrocyte count, leukocyte count, and hemoglobin count.[7]

Antioxidant activity

The methanolic extraction of leaves promising antioxidant activity due to the presence of phenolic compounds and flavonoid.[8]

Neurology[25]

a. Neuroprotective

Due to the presence of terpenoid element in *Hygrophila auriculata* shows improvements in cognitive testing and reductions in brain lipid peroxidation with potency comparable to

500mg/Kg Vitamin E by treated in orally for seven days in rats then subject to transient global cerebral ischemia.

b. Aphrodisiac

An ethanolic extract of the seeds (100-200mg/kg) administered to rats for the increase in growing frequency (380-472% of control) and similar reductions in growing, intromission, and post-ejaculatory latencies; all doses were none significantly more libido enhancing than the active control of 0.5mg/kg testosterone injections.

Cardiovascular Health a blood

The chloroform, ethanolic extract of the leaf able to restore a level of blood cells and bone marrow cells in rats which induced by cyclophosphamide- anemia. However, ethanolic extract not in rats are not feeble and assumed to stimulate erythropoiesis and is encountered with a small (possibly clinically irrelevant) decline relative to untreated control.[9]

Medicinal Uses

- Its leaf is useful in a cough.
- It is useful in an anal fistula.
- Its seed is useful in blood disorders.
- Intake of root decoction is useful in jaundice.

- Topical application of its leaf paste is useful in Prameha.
- Its root is useful in calculus.
- Its root and a whole part decoction are useful in rheumatoid arthritis[10]
- Topical application of leaf paste is useful in lumbago and arthralgia.
- Intake of Talmakhana(seed of Hygrophilla auriculata)ash along with cow urine or water is useful in inflammation[11]
- Intake of the decoction prepared from Talmakhana and other medicinal herbs alleviates insomnia[12]
- Intake of root decoction is useful in anasarca.
- Its whole part is useful in dropsy[13]

▪ **Intake powder prepared from Talmakhana fruit powder and sugar along with milk acts as an aphrodisiac**[14]

Karuvapattai- Cinnamomum verum

Figure No 1: (b) Karuvappatai - Cinnamomum verum.

Kingdom : Plantae
Division : Magnoliophyta
Class : Magnoliopsida
Order : Daphnales
Family : Lauraceae
Genus : *Cinnamomum*
Species : C. *Verum*

Description

Cinnamomum verum trees are 10–15 metres (30–50 feet) tall. The leaves are ovate-oblong in shape and 7–18 cm (3–7 inches) long. The flowers, which are arranged in panicles, have a greenish color and a distinct odor. The fruit is a purple 1 cm (½") drupe containing a single seed.

Distribution

Cinnamon is a hardy plant and is cultivated in Sri Lanka under varying conditions ranging from semi dried to wet zone conditions. The ideal temperature for growing cinnamon is between 20-30 degree C and rainfall between 1250 to 2500 mm.

Parts used

Bark.

Action

Stimulant, Carminative, Aphrodisiac.

Chemical constituents

60-70 % cinnamaldehyde, 5-10 % eugenol, benzaldehyde, cuminaldehyde and other terpenes like phellandrene, pinene, cymene, caryophyllane.

Pharmacological activities

Different plant parts of cinnamon and its EO are predominantly used as a spice and condiment to flavor seasonings, sauces, bakery, confectionery and drinks. They also added as a food additive in different food items due to their food preserving potential (Pittman, 2011). In addition to being used as a food additive, *C. verum* is one of the potent medicinal plants used for healthcare purposes. It possesses various pharmacological activities *viz.* antioxidant, antibacterial, antifungal, antiviral, antioxidant, anti- inflammatory, antidiabetic, antimicrobial, anticancer, lipid-lowering, and cardiovascular- disease-lowering compound.

Medicinal uses

- Cinnamon could lowertriglycerides andtotal cholesterol levels, which help to prevent heart disease. If you take supplements with at least 1.5 grams of cinnamon a day, it may lower your total cholesterol, LDL (or bad) cholesterol, triglycerides, and blood sugar if you have metabolic disease.

- It is also used for stimulating appetite. Cinnamomum bark is used for infections caused by bacteria and parasitic worms; and for menstrual cramps, the common cold, and the flu (influenza).

Salapisin- orchis latifolia

Figure No. 1: (c) Salaam Pisin- orchis latifolia.

Taxonomic classification

Phylum : Angiospermae

Subphylum : Monocotyledons

Order : Asparagales

Family : Orchidaceae

Genus : Orchis

Species : latifolia

Description

A medicinal plant Salabmisri (Orchis latifolia Linn). is a terrestrial herb commonly known as "Salep" in English language. It is an important medicinal plant used in clinical practice in siddha system of medicine. It is one of the herbs that is very good and is very effective in promoting sexual health.[15]

Distribution

The family is widely distributed in the tropical and temperate regions of the world. In India, it is mainly present in the regions of the eastern Himalayas. Europe (s England). Europe (n France). Europe (Luxembourg). Europe (Netherlands).[16]

Parts used

Pisin.

Action

Aphrodisiac, Tonic.

Chemical constituents

Chemical analysis of Salabmisri reveals that it contains glucosides, starch, mucilage, sugar, albumin, volatile oils, bitter substances and loroglossin.[17]

Pharmacological activities

A studybyNomanAzeezetalreportedthatsalabmisriforits Antihypertensive and dyslipidemic action and reported that salabmisri significantly reducesystolic bloodpressure and improveendothelial dysfunctionbyincreasingacetylcholineinducerelaxationinrats. Salabmisri significantly reducelipid levels in tyloxapol andhigh fat diet induced dyslipidemia.[18] An open clinical study on male patients of oligozoospermia has reported spermatogenicactivityofsalabmisri. Beforeandaftertrialsemen analysis and testosterone level

was estimated and reported that sperm count was increased and improved semen morphology. The conclusion of the studyreported that semenis effective inoilgozoospermia andit may also help to treat male infertility associated with oligozoospermia.[19] A study on sexual stimulant activity of salabmistri Orchis latifolia was carried out and reported that aqueous extract this drug is rich in Fructo Oligo Saccharides (FOS's)as wellas phytosterol was administered to streptozotocin and alloxaneinduced sexual dysfunction in male rats. The studysuggested thatthe herbis a potential potentstimulant in overcoming the sexual disability related to diabetes.[20] Ameliorative Effect of Fructo-Oligosaccharide Rich Extract of Orchis latifolia Linn. on Sexual Dysfunction in Hyperglycemic Male Rats.

Diabetes mellitus (DM) is one of the most prevalentdisease that has been implicated for deleterious effects on male reproductive function possibly due to an increased oxidative stress. Fructans and fructooligosaccharides (FOS's) which are also considered as functional food components, have been reported to produce a benevolent effect against streptozotocin induced oxidative stress. The aqueous extract of Orchis latifolia rich in FOS's as well as phytosterols were evaluated for their efficacy against streptozotocin and alloxan induced sexual dysfunction.[21] The behavioral analysis of rats was undertaken to observe the effect on mount, ejaculation and intromission latencies as well as frequencies, hesitation time and copulatory rate. It was observed that hyperglycemia has an adverse effect on overall sexual behavior. The deleterious effect was significantly reduced in animals treated with polysaccharide rich fraction of O. latifolia. The study suggests that the diabetes induced sexual disability may be ameliorated by proper usage of herbal drugs.[22]

Medicinal uses

It is an important medicinal plant used in clinical practice in unani system of medicine. It is one of the herbs that is very good and is very effective sexual dysfunction. In some magical traditions, its root is called Adam and Eve Root. It is considered aphrodisiac and nervine tonic by unani physicians.[23]

Tonic and Expectorant, Aphrodisiac, Nervine Tonic, Nutritive Astringent, Refrigerant, Diuretic, Antihelminthic, Antidiarrhoeal. Salabmisri is used in Sexual weakness, Chronic Diarrhoea and Dysentery, Tuberculosis, Strangury, Syphilis, Cephalgia, Otalgia and Helminthiasis.[24,25]

CONCLUSION

A *Siddha* herbal composition known as *Thathu bhustikku chooranam* is used to treat a range of male infertility in *Siddha* medicine. The preliminary search of the literature found that each drug's pharmacological activity and indications were described in similar to *Thathu bhustikkuchooranam* indications in terms of medicinal components., studies also offer a keyhole that produces spermatogenic, aphrodisiac and antioxidant properties are most prominent in *Thathu bhustikku chooranam* ingredients, as is seen from the current review, which is based on information from *Siddha* literature and contemporary scientific research findings. To ensure for Clinical evaluation to be widely accepted by the public and scientific community, furthermore, indepth scientific research has to be conducted.

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Conflict of interest

Author concludes that there are no conflicts of interest.

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