

Therapeutic effectiveness of a Siddha formulation Asuwathi Chooranam– A Review

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ABSTRACT

Siddha is one among the ancient systems of Indian Medicine. Siddha medicine serves both Therapeutic and Prophylactic concepts and hence Holistic in nature. Obesity is a public health problem that has become epidemic worldwide. Substantial literature has emerged to show that overweight and obesity are major causes of co-morbidities, including type II diabetes, cardiovascular diseases, various cancers and other health problems, which can lead to further morbidity and mortality. “.Asuwathi Chooranam” is one of the Sastric Siddha herbal formulation with 12 herbal ingredients. It has indications for *Athithoolam* (obesity), anemia, bronchial asthma, Abdominal pain, leprosy, scabies, Infertility. This review is aimed to bring out scientific evidence for the therapeutic usage of *Asuwathi Chooranam*. Most of the drugs have Anti-obesity activity, anti-hyperlipidemic activity, anti-oxidant hence justifying its usage in above mentioned disease.

KEYWORDS

Siddha, *Athithoolam*, *Asuwathi Chooranam*, Obesity

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INTRODUCTION

Siddha Medicine is one among the World's oldest medical systems. It is originated in Southern Part of Tamilnadu and Kerala more than 3,000 years ago. Obesity is characterised by abnormal lipid metabolism and excess adipose tissue. Body mass index (BMI) is a crude population measure of obesity that is commonly used to classify overweight and obesity in adults. It is defined as a person weight in kilograms divided by the square of their height in meters (kg/m²). A person with a BMI of 30 or more is generally considered obese, while a person with a BMI equal to or more than 25 is considered overweight. The prevalence of obesity differs from one country to another and depends on several factors including gender, age, employment status, and social class. Numerous studies have verified the association of overweight and obesity in the development of different metabolic disorders including Hypertension, Dyslipidaemia, Hyperinsulinemia. One of the major complications associated with obesity is impaired anti-oxidant defence system.

"*Asuwathi Chooranam*" is a polyherbal formulation drug which is mentioned in Siddha text '*Agasthiyar Vaithiya Kaaviyam -1500*' which is indicated for 26 types of Diseases including *Athithoolam* (Obesity). The drug review of "*Asuwathi Chooranam*" a polyherbal drug gives for its therapeutic action mentioned in literature. The search was made from the various texts in library of National institute of Siddha, journals, internet.

Standard operating procedure for preparation of *Asuwathi Chooranam*

Purification of raw drugs:

All the raw drugs are purified as per the methods mentioned in Siddha literature.

Preparation of drug "*Asuwathi Chooranam*":

The raw drugs are dried and powdered separately then mixed well together and then added with equal amount of *Panaivellam* (Palm jaggery) and preserved in a tightly closed container. The ingredients and their details are mentioned in table 1 and 2.

Pharmacological activities of ingredients of *Asuwathi Chooranam*:

1. *Chukku (Zingiber officinale)* :

¹Zingiber officinale Roscoe inhibits the hydrolysis of triolein emulsified with phosphatidylcholine by pancreatic lipase in vitro and it reduces the elevation of rat plasma triacylglycerol levels. Zingiber officinale Roscoe inhibits the intestinal absorption of dietary fat by inhibiting its hydrolysis. Antiobesity effects of Zingiber officinale Roscoe has been investigated in high-fat diet mice. Study indicate that the anti-obesity effect of aqueous extract of Z. officinale Roscoe in mice fed a high-fat diet is due to the inhibition of intestinal absorption of dietary fat by the active compounds of Z. officinale Roscoe.

2. *Milagu (Piper nigrum)* :

Pepper has important medicinal and preservative properties, and, more recently, piperine has been shown to have fundamental effects on *p*-glycoprotein and many enzyme systems, leading to bio transformative effects including chemoprevention, detoxification, and enhancement of the absorption and bioavailability of herbal and conventional drugs. Based on modern cell, animal, and human studies, piperine has been found to have immunomodulatory, anti lipidemic, anti-oxidant properties.

3. *Thippili (Piper longum)* :

Increase in body weight and fat deposition are the chief indicators for the gradual progress of obesity. As the animals were fed with HFD, there was an increase in the adiposity, which in turn increased the fat cell mass. Thus, there was an overall increase in body weight. ⁶The increased body weight found in HFD rats might be due to the consumption of a diet rich in energy, in the form of saturated fats (lard) and its deposition in various body fat pads, and decreased energy expenditure as compared to NPD-fed animals. However, on treatment with piperine there was a significant decrease in body weight and fat mass, which proved its anti obese action.

4. *Sathikkai (Myristica fragrans)* :

MFE administration has effectively lowered the CD-induced elevated levels of lipid profiles suggesting the therapeutic potential of polyphenols and triterpenoids present in *Myristica fragrans* extract. The presence of phytoconstituents such as flavonoids, Tetrahydrofurans, (which acts on C2, C12 cells), Lignans, and related compounds may play a prominent role in therapeutic activity of MFE. Together, based on morphological, biochemical, and histological analysis It is concluded that ethanolic extract of *Myristica fragrans* has potent anti adipogenic and anti obesity activities. These findings suggest that MFE can be used as a potential therapeutic alternative for the treatment of obesity with no side effects.

5. *Athimathuram (Glycyrrhiza glabra)*:

Obesity is a chronic metabolic disorder which defines as excessive or abnormal fat accumulation. Obesity is one of the greatest health threats and it can result in a number of chronic diseases including cardiovascular diseases, diabetes, dyslipidaemia and some cancers. Due to a dramatic increase in obesity prevalence, researchers attempt to find effective medications or supplements for obesity management. Previous studies have demonstrated several side effects for anti-obesity biochemical medications. Therefore, tendency to using complementary therapies such as medicinal herbs is increasing. It has been suggested that Licorice can affect obesity and its complications including insulin resistance and lipid profile through various mechanisms. However, there are limited clinical trials with contrary results for anti-obesity properties of Licorice.

Table 1: Quantity ratio of the ingredients of *Asuwathi Chooranam*

S.No	Tamil name	Botanical name/ Family	Parts used	Quantity
1	Chukku	<i>Zingiber officinale</i> / Zingiberaceae	Dried rhizome	15.3 gms
2	Milagu	<i>Piper nigrum</i> /Piperaceae	Seed	15.3 gms
3	Thippili	<i>Piper longum</i> / Piperaceae	Spikes	15.3 gms
4	Sathikkai	<i>Myristica fragrans</i> / Myristicaceae	Fruit	15.3 gms
5	Athimathuram	<i>Glycyrrhiza glabra</i> /Fabaceae	Fruit	15.3 gms
6	Kirambu	<i>Syzygium aromaticum</i> / Myrtaceae	Flower buds	15.3 gms
7	Kadugurogini	<i>Picrorhiza kurroa</i> / Planraginaceae	Root	15.3 gms
8	Omam	<i>Trachyspermum ammi</i> / Apiaceae	Seeds	15.3 gms
9	Kurosani omam	<i>Hyoscyamus niger</i> /Solanaceae	Seeds	15.3 gms
10	Sathipathri	<i>Myristica fragrans</i> / Myristicaceae	Leaf	15.3 gms
11	Amukkara ver	<i>Withania somnifera</i> / Solanaceae	Root	30.6 gms
12	Panaivellam	<i>Borassus flabellifer</i> / Are- caceae	Powder	30.6 gms

Table 2: Information on herbal ingredients as per Siddha text *Gunapadam Mooligai Vaguppu*

Botanical name	Vernacular name				
	Tamil	English	Hindi	Sanskrit	Part used
<i>Zingiber officinale</i>	Chukku	Ginger	Adrak	adraka	Dried rhizome
<i>Piper nigrum</i>	Milagu	Black pepper	Kali mirch	Marich	Seed
<i>Piper longum</i>	Thippili	Long pepper	Pipli	Pippali,magadhi	Fruit
<i>Myristica fragrans</i>	Sathikkai	Nutmeg	Jati phal	Jatiphala	Fruit
<i>Glycyrrhiza glabra</i>	Athimathuram	Liquorice	Mulathi	Jalayashti	Fruit
<i>Syzygium aromaticum</i>	Kirambu	Cloves	Laung	Lavangaha,laung	Flower
<i>Picrorhiza kurroa</i>	Kadugurogini	Kutki	Kutaki	Katukarohini	Root
<i>Trachyspermum ammi</i>	Omam	Ajwain	Ajwain	Ajamoda	Seeds
<i>Hyoscyamus niger</i>	Kurosani omam	Henbanes	Khurasani ajwain	Parseek yawani	Seeds
<i>Myristica fragrans</i>	Sathipathri	Nutmeg	Jati phal	atiphala	Seeds
<i>Withania somnifera</i>	Amukkaraver	Winter Gerry	Asgandh	Ashva	Root
<i>Borassus flabellifer</i>	Panavellam	Palm jaggery	jaggery	Sarkara,jaggery palm	Powder

6. Kirambu (*Syzygium aromaticum*) :

Numerous herbs and spices have been found to reduce blood glucose levels and body weight. Among these herbs, *S. aromaticum* (family Myrtaceae) is used not only as a culinary supplement in several global cuisines but also as a traditional medicinal aid in the treatment of dental pain, headache and respiratory disorders in several Asian countries. Several studies have reported that *S. aromaticum* exerts a variety of pharmacological actions, including antioxidant, hypoglycemic and anti-inflammatory activities. However, to the best of our knowledge, no study has examined its action on preventing obesity. Thus, this study and its primary finding that the addition of SAE to the diet reduces body weight in HFD-fed mice, thereby indicating its potential as a natural anti-obesity supplement.

7. Kadugurohini (*Picrorhiza kurroa*):

Diabetes is frequently associated with obesity. Recently, It has been reported the anti-hyperglycaemic activity of *Picrorhiza kurroa* (PkE) and *Quassia amara* (QaE) in streptozotocin induced diabetic rats. A study was conducted to evaluate the effect of PkE and QaE on high fat diet (HFD) induced obesity in rats, a model which mimic several features of human obesity. Methodology: Rats were provided with HFD ad libitum for 15 days. After 15 days, rats with significant weight gain compared to normal pellet diet (NPD) group, were selected for further study. PkE and QaE (100 and 200 mg/kg) treatment was started on 16th day onwards till 30th day. Control group rats were provided with NPD for 30 days. Body weight was recorded on day 1 followed by weekly basis. Fasting blood samples were collected on 15th and 30th day and total cholesterol, LDL-C, HDL-C and triglycerides level were estimated. Results: Rats fed with HFD gain significant weight compared to NPD fed rats after 15 days ($P < 0.05$). This increase in body weight was continued up to 30th day in rats maintained on HFD. Unlike QaE, PkE treatment significantly inhibited weight gain compared to vehicle treated HFD rats. PkE and QaE significantly reduced ($P < 0.05$) total cholesterol, LDL-C, triglycerides while HDL-C was significantly increased compared to vehicle treated HFD rats. Conclusions ; It was conclude that PkE has significant anti-obesity activity while QaE lacks it..

8. Omam (*Trachyspermum ammi*):

Anti-hyperlipidaemic Activity

The cardiovascular diseases have increased several folds in most developed and underdeveloped countries of the world. These cardiac ailments are directly related to hyperlipidaemia. During the last two decades, both retrospective and prospective studies have shown correlation between levels of circulating lipids and mortality rates from coronary atherosclerotic heart disease several synthetic drugs have been reported having

serious side effects. *Trachyspermum ammi* is reported to have platelet aggregation inhibitory action, antifungal potency and blood pressure lowering action. Anti-hyperlipidaemic effect of *T. ammi* seed has been obtained in albino rabbits. It was assessed that *T. ammi* powder at dose rate of 2g/kg body weight and its equivalent methanol extract were extensively effective lipid lowering action. *T. ammi* seed powder more effectively decreased total cholesterol by 71% and then, in the descending order, LDL-cholesterol by 63%, triglycerides by 53% and total lipids by 49% on post-treatment day 135. Researcher also suggested that the beneficial effects of *T. ammi* on fat metabolism may be due to the considerable amounts of fibre in the *T. ammi*.

9. Kurosani Omam (*Hyoscyamus niger*):

The free radicals scavenging activity of seven fractions of alkaloidal extract of *Hyoscyamus niger* were evaluated by 2, 2-diphenyl-1-picrylhydrazyl (DPPH) assay. Only one fraction of alkaloidal extract exhibited moderate free radical scavenging activity in comparison with the positive and negative controls. The methanolic extracts of *Hyoscyamus niger* showed antioxidant activity ($IC_{50} = 1.64 \mu\text{g}$) compared to α -tocopherol ($IC_{50} = 0.60 \mu\text{g}$), which was used as the positive control. The antioxidant activity of the aerial parts of *Hyoscyamus niger* extracts was investigated with 2 methods DPPH (2, 2-diphenyl-1-picrylhydrazyl) and ferric reducing antioxidant power (FRAP) assays. The antioxidant (EC_{50}) for methanol extract was $377 \pm 1.21 \mu\text{g/ml}$ and it was 21 ± 0.68 and $4.8 \pm 0.32 \mu\text{g/ml}$ for butylated hydroxytoluene (BHT) and ascorbic acid.

10. Sathipathri (*Myristica fragrans*) :

Adipose tissue (Epididymal, retroperitoneal and mesenteric fat depots) were isolated, freed from surrounding tissues, weighed and its accumulation in various parts of the body, leading to excessive growth of adipose tissue. Oral administration of *Myristica fragrans* extract significantly reduced body weight, and total body composition (lean mass, total fat, fat percentage and fat free mass) in experimental rats, compared with that of CD control rats. This suggests that MFE may inhibit lipid absorption, transportation and accumulation in adipose tissue by inhibiting pancreatic lipase enzyme. Inhibiting pancreatic lipase would facilitate fat non-digestion and absorption leading to lesser lipid intake. Accumulation of excessive fat in adipocytes is the underlying phenomenon for obesity. MFE administration has effectively lowered the CD-induced elevated levels of lipid profiles suggesting the therapeutic potential of polyphenols and triterpenoids present in *Myristica fragrans* extract. The presence of phytoconstituents such as flavonoids, Tetrahydrofurans, (which acts on C2, C12 cells) Lignans, and related compounds may play a prominent role in therapeutic activity of MFE. Together, based on morphological, biochemical, and histological analysis.

It was concluded that ethanolic extract of *Myristica fragrans* has potent anti adipogenic and anti obesity activities. These findings suggest that MFE can be used as a potential therapeutic alternative for the treatment of obesity with no side effects.

11. *Amukkara Ver (Withania somnifera)* :

Withania somnifera is an important medicinal plant, which is used in traditional medicine to cure many diseases. Flavonoids were determined in the extracts of *W. somnifera* root (WSREt) and leaf (WSLEt). The amounts of total flavonoids found in WSREt and WSLEt were 530 and 520 mg/100 g dry weight (DW), respectively. Hypoglycaemic and hypolipidaemic effects of WSREt and WSLEt were also investigated in alloxan-induced diabetic rats. WSREt and WSLEt and the standard drug glibenclamide were orally administered daily to diabetic rats for eight weeks. After the treatment period, urine sugar, blood glucose, haemoglobin (Hb), glycosylated haemoglobin (HbA1C), liver glycogen, serum and tissues lipids, serum and tissues proteins, liver glucose-6-phosphatase (G6P) and serum enzymes like aspartate transaminase (AST), alanine transaminase (ALT), acid phosphatase (ACP) and alkaline phosphatase (ALP) levels were determined. The levels of urine sugar, blood glucose, HbA1C, G6P, AST, ALT, ACP, ALP, serum lipids except high density lipoprotein-bound cholesterol (HDL-c) and tissues like liver, kidney and heart lipids were significantly ($p < 0.05$) increased, however Hb, total protein, albumin, albumin:globulin (A:G) ratio, tissues protein and glycogen were significantly ($p < 0.05$) decreased in alloxan-induced diabetic rats. Treatment of the diabetic rats with WSREt, WSLEt and glibenclamide restored the changes of the above parameters to their normal level after eight weeks of treatment, indicating that WSREt and WSLEt possess hypoglycaemic and hypolipidaemic activities in alloxan-induced diabetes mellitus (DM) rats. The chemistry and nutritional properties of phenolic compounds, including flavonoids, have been extensively reviewed. Flavonoids are commonly found in all plants and also possess hypoglycaemic and antidiabetic activities. There is no report on flavonoid-containing extracts of *W. somnifera* relating to antidiabetic and antihyperlipidaemic activities

CONCLUSION

From the literature review it is evident that the most of ingredients of *Asuwathi chooranam* has pharmacological activity like Anti-obesity activity, anti-hyperlipidaemia activity, and anti-oxidant activity. Further works on isolation and identification of individuals bioactive components would be able to reveal its exact potential and efficacy in the formulation and management of obesity. Hence I conclude that ingredients and its pharmacological activity of the *Asuwathi chooranam*

are responsible for its efficacy as claimed in the literature.

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CONFLICT OF INTEREST

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