ISSN: 2322 - 0902 (P)
ISSN: 2322 - 0910 (O)

International Journal of Ayurveda and Pharma Research

Review Article

A REVIEW ON ANTI-DIABETIC HERBS OF SIDDHA SYSTEM BASED ON THEIR ORGANOLEPTIC CHARACTERISTIC

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Article info

Article History:
Received: 29-12-2022
Revised: 19-01-2023
Accepted: 28-01-2023

KEYWORDS:
Siddha, Herbs, Organoleptic character, Anti-diabetic, *Madhumegam*.

ABSTRACT

The Siddha system is a primordial system of medicine followed over a long period in the Southern part of India. Siddha system has peculiar methods in treating a disease and also possesses various diagnostic methods and treatment protocols. In the Siddha system, diagnostic methods are purely differing from other systems. The diagnostic tools are *Envagaithervu* (Eight Fold Assessment Test), *Neer Kuri & Nei Kuri* (Siddha Urine Test), *Nadi* (Pulse Test) etc. In the Siddha system treatments are based on *Nadi, Suvai*. Diabetics are the major non-communicable disease in the world. According to the statistics India is second among the top ten nations in the world, with 69.2 million people suffering from diabetes and another 36.5 million struggling with pre-diabetes. This rising prevalence is mostly due to changes in lifestyle, such as consuming unhealthy foods and being physically sedentary. In the Siddha system, it is compared with *Neerizhuvu Noi*. In Siddha, diabetes is not an illness. It is possible to keep it under control with the right diet and treatment. The article focus on scientific justification of the relationship of herbs cured *Neerizhuvu Noi* mentioned in classical text by their organoleptic characters and anti diabetic activity of the herbs. Taste plays a significant part in the selection of medicinal plants for each person in this kind of personalized treatment that is based on their constitution. This article discusses the Siddha approach to the control of diabetes, with a particular focus on the flavour of herbs.

INTRODUCTION

Diabetes mellitus is a multifactorial metabolic disorder described by chronic hyperglycemia due to insulin resistance or insulin insufficiency[1]. Diabetes mellitus is one of the most common disorders affecting almost 6% of the world population and the dynamics of diabetes are changing rapidly in low to middle income countries. According to International Diabetes Federation's (IDF) estimates, 80% of the world's diabetic population will be from low and middle income countries in 2030[2].

Access this article online	
Quick Response Code	
	https://doi.org/10.47070/ijapr.v11i1.2618

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The development of an adverse event is one of the complications in the treatment of any systemic disorder; hence, many research institutes and pharmaceutical companies are involved in drug development to find molecules with good therapeutic potential and fewer adverse events. Hence, these companies have turned their focus on herbs which beliefs to have fewer adverse events and are more potent in treating diabetes.

Each herb has the following characteristics *Suvai* (taste), *Gunam* (property or character), *Pirivu* (biotransformation), *Veeriyam* (potency) and *Seiga*i (activity). Their action and chemical constituents are depends on their organoleptic characteristics. According to Siddha literature, diabetes is known as *Innippu Neer, Madhumegam* and *Neerizhivu*. The various reasons for the cause of this disease are attributed to food, habits, and lifestyle changes and also due to hereditary causes. *Vatham, Pitham* and *Kapham* are the basic principles of Siddha medicine which play a vital role in the pathology of

Madhumegam. Diagnosis of diabetes in Siddha's perspective deals with *Envagaithervu*. Siddha system is a unique one in which varieties of drugs is prescribed for a single disease based on each patient's body constituents.

Table 1: Taste and its primordial elements[3]

Taste	Tamil name	Combination of 5 Primordial element	*Vadham*	*Pitham*	*Kabham*
Sweet	*Inippu*	Earth + water	↓	↓	↑
Sour	*Pullippu*	Earth + Fire	↓	↑	↑
Salt	*Uppu*	Water + Fire	↓	↑	↑
Bitter	*Kaippu*	Water + Fire	↑	↓	↓
Pungent	*Kaarppu*	Air + Fire	↑	↑	↓
Astringent	*Thuvarppu*	Earth + Air	↑	↓	↓

Note: In order to balance both the elevated *Pitham* and *Kapham*, the taste *Kaippu* (bitter) and *Thuvarpu* (astringent) are found to be suitable for the selection of anti-diabetic herbs.

Table 2: Role of Humors in Human Body and its elements[4]

Vatham	*Aakayam* (space)+*Vayu* (air)	Controls movements, action of nerves and sensations.
Pitham	*Thee* (fire)	Predominant constituent of blood, metabolic activity, Production of warmth
Kapham	*Mann* (earth) + *Neer* (water)	Controls stability, predominant constituent of fluid, fat.

OBJECTIVE

To validate the anti-diabetic drugs in the Siddha textbook based on their organoleptic characteristic.

METHODOLOGY

The Suvai based treatment plan is one of the highlights of the Siddha system. *Thuvarppu* (astringent) and *Kasappu* (bitter) tasted herbs are mostly used in the treatment of diabetes. The study setting used for the collection of data from library of Government Siddha Medical College attached Aringner Anna hospital. The book used for the reference is *Gunapadam – Mooligai Vaipu* and the keywords used for searching data are *Thuvarppu, Kaippu, Neerizhivu* and *Madhumegam*. The selected plants are further collected and compiled and their recent research is collected from the article that is available on websites like PubMed, and AYUSH portal.

RESULT

Table 3: List of herbs described in Siddha literature with their unique taste pacifying the vitiated *Dosham* and their systemic validation as anti-diabetics

	Plant Name	Tamil name	Part used	Taste	Validated effects
1.	*Saracaasoca*	Asogu	Bark, seed, flowers	Astringent	Ethanolic extract reduced oxidative stress, found to possess hypo lipidemic, hypoglycemic, activity [5]
2.	*Fiscusracemosa*	Athi	Latex	Astringent	Ethanolic extract reduced blood glucose level in dose dependent manner [6]
3.	*Nympheanouchali*	Vellalli/ chevalli	Seeds	Astringent	Hydro alcoholic extract of seeds restored blood glucose and lipid profile and hepatic and renal markers [7]
4.	*Fiscusbengalences*	Aalamaram	Bark	Astringent	Aqueous extract possessed anti-diabetic Activity[8]
5.	*Cassia auriculata*	Aavarai	flowers	Astringent	Its extract possessed insulinogenic action, improved carbohydrate metabolic pathway[9]
6.	*Phoenix dactylifera*	Pereechangaai	Fruit	sweet	Date fruit aqueous extract has potential to prevent diabetic hazard

					and causes improvement in diabetic neuropathy[10]
7.	*Salaciareticulata*	Kadazhinchil	leaves	Astringent	Water extract of the leaves could be a beneficial food material for the prevention of diabetes and obesity [11]
8.	*Acacia catechu*	Karungali	Root infusion	Astringent	Ethanolic and aqueous extracts of the hard wood showed improvement on oral glucose tolerance post-sucrose load in normal and diabetic rats [12]
9.	*Tragiainvolucrata*	Kaanchori	leaves	Bitter	Extracts possessed *in vitro* alpha amylase inhibitory activity [13]
10.	*Holarrhena pubescens*	Kudasappaalai	bark	Astringent, mild bitter	Methanolic extract possessed hypoglycaemic activity of glucose tolerance test [14]
11.	*Tinosporacardifolia*	Seendil	stem	bitter	Stem extracts treatment resulted in improvement in C-peptide levels and regenerating capacity of pancreatic Bcells [15]
12.	*Asperagusracemosus*	Thanneervittan	root	sweet	Roots have been shown to enhance insulin secretion in perfused pancreas and isolated islets[16]
13.	*Strychnospotatorum*	Thettran	seed	bitter	Extracts reduced fasting blood sugar as that of glipizide[17]
14.	*Hemidesmusindicus*	Nanaari	roots	Sweet, mild bitter	Aqueous extract of the roots exhibited anti-diabetic activity [18]
15.	*Syzygiumcumini*	Naval	seeds	Astringent	Oral administration of ethyl acetate and methanol extracts of seeds showed significant decrease in blood sugar level [19]
16.	*Curculigoorchioides*	Nilapanai	Root tuber	sweet	Both alcohol and aqueous extracts produced significant hypoglycemic activity in diabetic control [20]
17.	*Sterospermumcolais*	Paathiri	leaves	Astringent	Ethanolic extract was effective in retarding glucose diffusion [21]
18.	*Terminaliaarjuna*	Marudhu	bark	Astringent	Bark extract possesses potent anti diabetic activity [22]
19.	*Mangiferaindica*	Maa	leaves	Astringent	Aqueous extract of the leaves possess hypoglycaemic activity [23]

DISCUSSION

All the selected drug were evaluated with previous studies and most of the above drugs and herbs which has anti-diabetic activities possess bitter and sour taste. According to Siddha literature *Pitham* (Fire- which is responsible for digestion and various metabolic functions) is the prime humour that is aggravated to initiate the disease due to change in food and lifestyle (*Unavaathi Seyal*) this results in the derangement of *Kapham* [7] (water) humour, which on further progression results in diabetes and its complications. Diabetic complications depend on the accumulated *Kapham* in various parts of the human body such as eyes (retinopathy), kidneys (nephropathy) and nerves (neuropathy). When there is a predominant increase in *Pitham* humour (fire) there is an increased metabolic fire as *Pitham* is an important component of digestion and metabolism. This attributes to increased hunger (polyphagia) and increased thirst (polydipsia) [8]. The increased *Kapham* (water) attributes to polyuria and the further progression of *Kapham* results in a catabolic phase of morbidity.[9] As it is mentioned in Siddha literature "*Sethumaseethamaaithudaithu*"[10] at the end of life all the edge *Kapham* is a degenerative component that is

responsible for vascular complications (micro-angiopathy) and constitutes degenerative diabetic retinopathy, degenerative diabetic nephropathy and degenerative diabetic neuropathy. In all these conditions there is an increased accumulation of fluid (*Kapham)*. Hence by using herbs with astringent and bitter taste the symptoms and complications of diabetes can be alleviated. From this, we can conclude that Siddhars *Suvai* (taste) based treatment can cure a disease which now a day's proved by the scientific World.

CONCLUSION

The above evidence proves that Siddhars line of treatment based on organoleptic characteristic shows a promising result in treating diabetes mellitus and its complication.

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Cite this article as:
M.Sri Sakthi Logisha, G.Nivetha, K.Karpagavalli, N J Muthukumar, M V Mahalakshmi, M.Meenakumari. A Review on Anti-Diabetic Herbs of Siddha System Based on Their Organoleptic Characteristic. International Journal of Ayurveda and Pharma Research. 2023;11(1):87-91.
https://doi.org/10.47070/ijapr.v11i1.2618
Source of support: Nil, Conflict of interest: None Declared

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