



## Scientific view on Kanthagam (sulphur) in Siddha Medicine

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### Abstract

“Traditional Medicine is the sum total of the knowledge, skills and practices based on the theories, beliefs and experiences indigenous to different cultures, whether explicable or not, used in the maintenance of health as well as in the prevention, diagnosis, improvement or treatment of physical and mental illness” says WHO. It has been evolved according to the special geographical feature of the region as well as the culture and language of the natives. The same way, Siddha system is also native to tamil speaking regions.

*Siddha* medicine derives its medicinal ingredients from plants, animals and minerals etc. The reason for the popularity of the system is attributed to its effective cure with minimal side effects. Siddhars, the founders of this system of medicine possessed Siddhic powers (supernatural power). In *Siddha* system *Padaanam* are group of metals and minerals which are considered as toxins if it is in un-purified state and they are around 64 drugs. “*Kanthagam*” or Sulphur is one among the *Padaanam*. Sulphur is most widely used in Siddha system for dermatological problems and venereal diseases. Several present-day research studies has been done in sulphur for its target drug therapy process for many diseases. This paper deals with the recent scientific facts and traditional usage of Kanthagam in detail.

**Key words :** Kanthagam, Sulphur, Padaanam, Siddha medicine

### Introduction

*Siddha* is a traditional healing holistic medicine of India which emphasizes the maintenance of a relaxed mind and body harmony and insists to keep pace with the laws of nature. Siddha system is the foremost of all medical systems and is practised in South India, especially in Tamil Nadu, India. It is also called as Dravidian system of medicine, since it evolved along with Dravidian’s culture. Siddha drugs are known for its safety and efficacy. In *Siddha* system, besides herbs, metal and mineral drugs were also used as medicines.

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The reason for the popularity of the system is attributed to its effective cure with minimal side effects. Siddhars, the founders of this system of medicine possessed Siddhic powers (supernatural power). They have left their imprints in many disciplines like medicine, alchemy, philosophy, yoga, varma, and other external therapies.

Sulphur has a long history of use in science and medicine due to its wide spectrum of chemical and biological properties. In the pharmaceutical industry, sulphur finds use in the manufacture of organo-sulphur compounds, sulphonamides, which have antibacterial and antifungal properties.  $\beta$ -lactam antibiotics such as penicillin, cephalosporins, monolactams are popular. Sulphur has been traditionally sourced from nature from volcanic rocks, geological fossils and salt domes, while industrially sulphur is obtained by refining of hydrocarbons.

#### Occurrence:

More than 98 per cent of the native sulphur produced in the United States at this time comes from deposits in Louisiana and Texas, Nepal, Afghanistan, Kashmir, Burma etc. In India it is found in combination with other metals, minerals, herbal and animal products.

Naturally Occurred as a sublimation product at volcanic fumaroles; a product of the activity of biological micro-organisms; as a result of low oxidation potential and highly acidic chemical reactions in mineral deposits; formed by the decomposition of sulfides, especially pyrite, during mine fires; found in sedimentary rocks.

#### Forms of Sulphur

Sulphur combines directly with almost all the elements with the exception of gold, platinum and the noble gases. In its native form, sulphur is a yellow crystalline solid. It can be found as a pure element or as sulphate or sulphide minerals. Pyrites are a common mineral comprised of iron and sulphur compounds. Pyrites include a range of sulphide materials, such as marcasite, pyrite, and pyrrhotite. Pyrites was used as a substitute for sulphur in the manufacture of sulphuric acid.

On the other hand, the sulphide ores contain sulphur and during the production of metal from sulphide ores, sulphur is released as SO<sub>2</sub> which is used to produce sulphuric acid. The sulphuric acid thus produced contains about 32.7% of sulphur and contributes in the industries which otherwise would have used elemental sulphur.

#### Crystallographic description of sulphur

Crystal Data: Orthorhombic. Point Group:  $21m\ 21m\ 21m$ . Crystals are dipyramidal on thick tabular; and also massive, reniform, and forming stalactites; as a powder.

#### Physical Properties:

*Cleavage:* Imperfect

*Fracture:* Conchoidal to uneven.

*Tenacity:* Rather brittle to somewhat sectile.

*Hardness:* 1.5-2.5 Moh scale

*Melting Point:* 119-120 °C

*Boiling point:* 444.60 °C

*Storage:* Placed in closed bottle

#### Optical Properties of Sulphur:

In solid state, it is optically Transparent to translucent in nature. The colour of the sulphur was Sulphur-yellow to honey-yellow, and sometimes visible as yellowish brown, greenish, reddish or yellowish gray; may be black from included organic matter. Streak is the colour of a crushed mineral's powder. The colour of a mineral's powder may differ from the actual colour of the mineral. This property can be useful for mineral identification. Streak of the sulphur was White in colour. Luster refers to the general appearance of a mineral surface to reflected light. Two general types of luster are designated as follows metallic or non-metallic. The luster of sulphur will be Resinous to greasy in nature.

#### Kanthagam (Sulphur) in siddha medicine

Siddhar Bhogar classified the metals and minerals into four groups in his book "*Bhogar karasara thurai*" They are,

Metals (*Ulogam*)-11

Toxins (*Pasanam*)-64

Minerals (*Karasaram*)-25

Hydrochemicals (*Uparasam*)-120

"Kanthagam" or Sulphur is one among the *Padaanam*. Sulphur is a crystalline, non-metal used in the preparations like *Rasayanam*, *mathiri*, *Mezhugu*, *Parpam* and *Chenduram* as major ingredients in *Siddha* therapeutics.

In *Siddha* medicine, it was clinically used as a therapeutic ingredient in Skin care therapies. In solid state, it possesses bitter and astringent.

#### Types of Kanthagam:

There are four types of kanthagam, which has been discussed in *Siddha* literatures. They are as follows,

*Pirappu kandagam*,

*Kozhi thalai kandagam*,

*Vana Kendhi vaipu*,

*Vaipu kandagam*,

#### Pirappu kandagam

It occurs naturally in mines and rocks and specially this type of kanthagam can be used directly for the medicinal preparation after the definite purification process as mentioned in literatures. Exclusively which is originated in mountain rocks.

#### Kozhi thalai kandagam

The term suggests that it resembles like a red coloured cock crown. The vaippu kanthagam, Kozhi thalai kandagam & Vana kendhi kandagam are the by-products of Pirappu kandagam.

#### Classification based on Characteristic features

The Kandhagam are again classified based on its special characteristic features like colour, odour, shape etc. Here the classical literatures were separated based on its colour.

It is of four types namely

1. White coloured Kandhagam, which is ideal for the treating diseases
2. Golden coloured (nellikai Kandhagam).
3. Colour of crow i.e shiny black.
4. Red as that of beak of parrot.

Nellikai gandhagam has widely used in the *siddha* medicinal formulations. Pagai sarakku for Kandhagam is Sembu (Copper). Natpu sarakku for Kandhagam is Rasam (mercury). The Suvai (taste) of Kandhagam is bitter and astringent. It acts as a Cholagogue, laxative, tonic.

### Traditional literary names for Kanthagam

Traditionally *Sulphur/Kanthagam* is known with other names like *Ghandagam*, *Kaarizhai Natham*, *Parai natham*, *Parai Veerayam*, *Atheetha prakasam*, *Beejam*, *Selvi vindhu*, *Sakthi*, *Sakthi peesam*, *Chenduraa thrathi*, *Theviuram*, *Natham*, *Narram*, *Parai natham*, *Ponnvarni*, *Rasa sronitham*.

*Kozhi thalai kanthagam* also named as *Kozhiyin Kudakar*, *Suga thundam*, *Sigappu Kenthi*, *Shanathil Sithi*, *Yoha sithi*, *Tharuvon*, *Sathakkaranthi*, *Aanathavalli*, *Karpagam*, *Porkami* etc.

### Kanthagam- Comparison with Mother Nature

“மாதர் மகவை வளர்ப்பது போல உடம்பை

யாதரவா கத் தேற்றி யக்கையினால்” -

Verse of Theran Porut panbu nool

The drug Kanthagam has compared with the Mother Nature. It is like the diseases could be cleared by the medicines as like how a mother nurtures their child during their childhood caring period.

### Traditional Purification methods for Kanthagam

The extract obtained from outer shell of tamarind is to be collected and place in a mud pot by adding old rice water, sour butter milk & juice of mushroom for fermenting process. The lower pot has covered with a cotton cloth and has to place sulphur above to that and this has closed with a lid. After the closing procedure, which is subjected to Pudam for 6hours and the granule sulphur will settled down in the lower border of the pot.

The other Purification process was, the Grinded paste of lawansonia innermis is mixed with cows curd and placed in mud pot. The mouth of the mud pot is covered with a cotton cloth. Sulphur is placed over the cloth and covered with another pot and placed under the ground approximately between half to 1feet and subjected to pudam process with cow dunk cake The sulphur which melts and settled down were collected and the procedure was repeated for 7 times.

The another method was the sulphur is placed in an iron spoon and a small quantity of cows butter milk is added and the spoon is heated until the butter melts. This mixture is immersed in a inclined position in cow's milk. The procedure is repeated for 30 times to get purified sulphur.

### Sulphur contained products

*Annabedhi*, *Venthutham*, *Mayil thutham* having sulphur forms. And also the herbal ingredients like *Vengayam*, *Kadugu*, *Mullanki*, *Ennaigal*, *Muttai* also has sulphur forms in its nature(TV Sambasivam pillai).

### Sulphur in current therapeutics

Sulphur has a long history of use for a variety of dermatological disorders, as an ingredient in acne ointments in antidandruff shampoos, and as an antidote for acute exposure to radioactive material. Sulphur aids in wound healing via keratin and has a history of folk usage as a remedy for skin rashes. Purified sulphur has been used as a therapeutic agent to reduce clinical manifestations of a reaction to combined radiotherapy called auto sensitization, a type of autoimmunity associated with radiation therapy. The majority of research works published in modern side were on the activity of SO<sub>2</sub>, a by-product of Sulphur. It was studied for numerous respiratory disorders, cardiovascular distress, and inflammatory conditions. Inhalation exposures to SO<sub>2</sub> were used to investigate the creation of an animal model for COPD using Sprague Dawley rats (Wagner et al., 2006).

Following continuous treatment for 3 days or 20- 25 days at SO<sub>2</sub> exposure concentrations of 5, 10, 20, 40, or 80 ppm (13.3, 26.6, 53.2, 106.4, or 212.8 mg/m<sup>3</sup>), pulmonary histology revealed a dose-related increase in edema formation and inflammatory cell infiltration in the animals exposed for 3 hours. In those exposed for nearly a month, the edematous tissue was replaced by fibrous tissue. Decreases eosinophilic multi-lamellar infiltrates, a decrease in microvilli content, mitochondrial pyknosis, and nuclear and chromatin alterations.

### Conclusion

The drug Kanthagam has many clinical role and the further the combinational drug research has to be putforth to reveal the scientific facts mentioned by Siddhars. In drug preparation process, several forms of medicines like *parpam*, *mezhu*, *mathirai* are prepared from this drug. The same, the kanthagam indredient drug also included in the Essential drug list for siddha medicine, which is published by Ministry of AYUSH Government of India. We concluding that, further more clinical evaluation may taken for the globalization of glory of siddha medicine and its drug formulation.

### Conflict of Interest

None declared

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