



Physico-Chemical Evaluation and HPTLC Finger Printing of Siddha Polyherbal Formulation Thaalisaathi Chooranam (TSC)

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ABSTRACT

Thaalisaathi Chooranam(TSC) is a poly herbal formulation widely used in Siddha system medicine. It is mainly used for Respiratory disease like bronchitis, cough, common cold, asthma and fever etc. Though the individual herbs used in the formulation have the previous record of standardization, there is no evidence of scientific validation on the physical form of the study drug Thaalisaathi Chooranam (TSC) and hence this study was aimed. All the ingredients were procured from reputed raw drug store and botanically authenticated by the Medicinal botanist of National Institute of Siddha, Chennai. All the 28 Ingredients were purified individually as per the Siddha classical literature and the formulation was prepared as per the procedure mentioned in Sastric Siddha text Siddha vaidhya thirattu. The prepared drug was subjected to analysis. The derived physico-chemical parameters, HPTLC fingerprint profiles serve as diagnostic parameters to identify this polyherbal formulation. HPTLC - High performance thin-layer chromatography is a rapid, precise and cost-effective method and this method is widely used for the determination of biological compounds from medicinal plants¹. Thus, HPTLC method has been used for the determination of Flavonoid, Alkaloids and Essential oils present in Thaalisaathi chooranam (TSC).

KEYWORDS

Thaalisaathi chooranam, TSC, Siddha medicine, Chooranam, Respiratory diseases, HPTLC.

1. INTRODUCTION

Siddha medicine is an indigenous system of medicine practiced in South India and other Tamil speaking countries like Sri Lanka, Malaysia and Singapore. World Health Organization endorsed Siddha system of medicine as a codified medical system. About 65% of Indian population is using Indian medicine for their primary health care². Even though, the formulations of Siddha medicines are well documented and time- tested standard preparations, it is the need of the hour to document standardization procedures based on current analytic techniques to prevent adulteration and to maintain quality control on par with contemporary medical world¹

Thaalisaathi chooranam (TSC) is a polyherbal formulation prescribed in the management of respiratory disorders of adults and children. Literatures Review of the ingredients of TSC revealed that the drugs are having good anti-allergic, bronchodilator, expectorant, anti-inflammatory, anti-pyretic activities^{3, 4}. But the compound form of the medicine Thaalisaathi chooranam (TSC) has not been established through standardization procedure for its global acceptance. So the author interested to do Physicochemical analysis and HPTLC finger printing methods to get the complete scientific picture of the study drug TSC

2. MATERIAL AND METHODS

2.1 Plant materials

All the ingredients were procured from reputed raw drugs store in Chennai and authenticated by Medicinal Botanist of National Institute of Siddha for its genuinity. The list of the ingredients of Thaalisaathi chooranam (TSC) is given in Table - 1

2.2 Purification of raw drugs

All ingredient were purified as per the purification method mentioned in Sastric Siddha literature and in accordance with Siddha Formulary of India

2.3 Preparation of Thaalisaathi chooranam (TSC)

The study drug TSC was prepared after purification process,

all the materials were completely dried, then powdered separately and sieved by white cloth which is mentioned as Vasthirakayam in classical Siddha text. The sieved ingredient powders were thoroughly mixed together and stored in a clean and air tight glass container.

2.4 Physico-chemical analysis

The particle size, loss on drying, total ash, acid insoluble ash, water soluble extractives, alcohol soluble extractive and pH value were carried out as per the methods described in Indian Pharmacopoeia texts and Protocol for Testing of ASU medicines published by PLIM, Ghaziabad⁵

2.5 HPTLC finger printing of Thaalisaathi Chooranam (TSC)⁶

a) Test related to Alkalids

Sample preparation: weighed about 2 g of Thaalisaathi Chooranam (TSC) and shaken for 15ml of 0.1N sulphuric acid and then filtered. The filter was washed with 0.1 N sulphuric acid to a volume of 20 ml; 1 ml of concentrated ammonia was added. The mixture was shaken with chloroform. The chloroform was dried over anhydrous sodium sulphate and evaporated to dryness. The residue was dissolved in methanol. Silica Gel 60 F254 used as Stationary phase and Toluene : Ethyl acetate : Diethylamine (70:20:10) was used as Mobile phase.

Procedure: Applied 20µl, 30µl test solutions on a precoated silica gel 60 F254 HPTLC plate (E.Merck) of uniform thickness 0.2 mm using Linomat 5 sample applicator. Developed the plate in the solvent system to a distance of 8 cm. Observed the plate under UV light at 254 nm and 366 nm using CAMAG REPROSTAR3 to identify the appearance of colour bands.

a) Test related to Flavanoids

Sample preparation: weighed about 1 g of Thaalisaathi Chooranam (TSC) and added 25 ml of methanol and macerated for 24 hours and filtered. The filtrate was evaporated to dryness. Dissolve the residue in 2 ml of methanol. Silica Gel 60 F254 used as Stationary phase and Toluene : Ethyl acetate :

Formic acid (5:4:1) was used as Mobile phase.

Procedure: Applied 5µl, 10µl test solutions on a precoated silica gel 60 F254 HPTLC plate (E.Merck) of uniform thickness 0.2 mm using Linomat 5 sample applicator. Developed the plate in the solvent system to a distance of 8 cm. Observed the plate under UV light at 254 nm and 366 nm using CAMAG REPROSTAR3 to identify the appearance of colour bands.

a) Test related to Essential oils

Sample preparation: weighed about 1 g of Thaalisaathi Chooranam (TSC) and added 25 ml of petroleum ether and macerated for 24 hours and filtered. The filtrate was evaporated to dryness and dissolved the residue in 2 ml of Petroleum ether. Silica Gel 60 F254 used as Stationary phase and Toluene : Ethyl acetate (93:7) was used as Mobile phase.

Procedure: Applied 5µl, 10µl test solutions on a precoated silica gel 60 F254 HPTLC plate (E.Merck) of uniform thickness 0.2 mm using Linomat 5 sample applicator. Developed the plate in the solvent system to a distance of 8 cm. Observed the plate under UV light at 254 nm and 366 nm using CAMAG REPROSTAR3 to identify the appearance of colour bands.

3. RESULTS AND DISCUSSION

Raw materials for this polyherbal formulation Thaalisaathi chooranam (TSC) were procured from reputed raw drug store from Chennai and the same was authenticated by Medicinal botanist of National Institute of Siddha. Physical form of medicine i.e Chooranam was prepared after purification of each and every ingredients as per Sastric Siddha literature.

The physicochemical values are shown in Table 2. The TLC photo documentations colour bands visible under UV 254 nm, 366 nm after developed with solvent system are presented are shown in Figure 1A-C. The loss on drying of the drug was found to be 5.112% which may attribute to essential oil rich ingredients. The volatile compounds may be protecting the drug from microbial growth. The total ash was found to be 4.456% which is due to the presence of the inorganic ingredient present in the drug. The acid insoluble ash shows that the drug contains only negligible amount of acid insoluble ash content. The extractive values, viz., water and alcohol were found to be 53.32% and 10.85% which shows that most secondary metabolites are extractable with the above solvents and also it shows the high polar secondary metabolites such as glycosides, tannins, proteins, etc. in the drug. The pH value of 4.62 shows that the drug is acidic in nature. The particle size analysis shows that the drug is fine in nature. The TLC photo documentation of the drug under UV 254 nm shows four major bands and four major bands under UV 366 nm related to Alkaloids, seven major bands and eight major bands under UV 366 nm related to Flavanoids and nine major bands and eight major bands under UV 366 nm related to Essential oil.

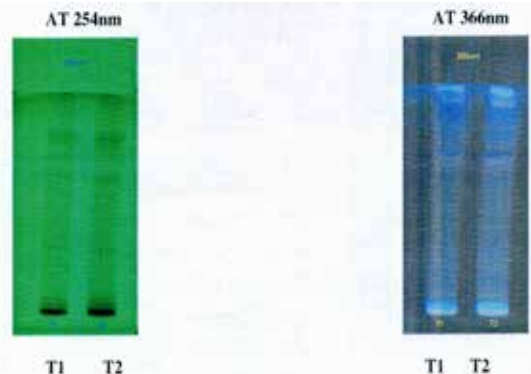
Table. 1: Ingredients Thaalisaathi chooranam (TSC)^{7,8,9}

Sl.no	Tamil name	Botanical name	Part used	Quantity
1.	Thalesapathiri	Taxus baccata L	Leaf	10 gm
2.	Lavangapattai	Cinnamomum zeylanicum BL.	Bark	10 gm
3	Elam	Elettaria cardamomum MATON	Seed	10 gm
4	Chukku	Zingiber officinale ROSC	Rhizome	10 gm
5	Athimathuram	Glycyrrhiza glabra L.	Root	10 gm
6	Perungayam	Ferula foetida L.	Resin	10 gm

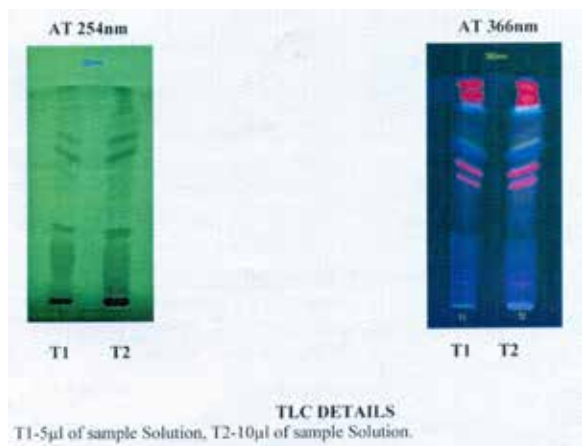
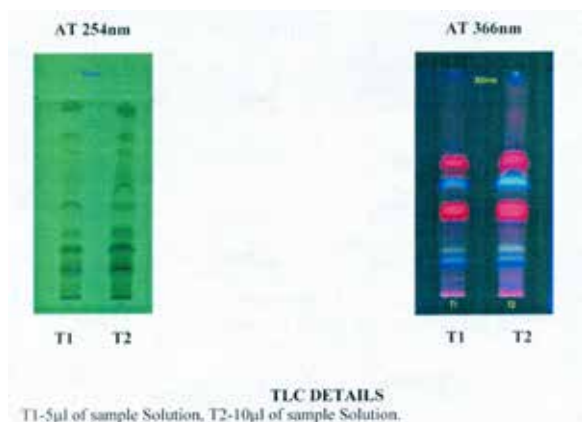
7	Nellimulli	Phyllanthus emblica L Syn : Emblica officinalis GAERTN	Dried fruit	10 gm
8	Koshtam	Saussurea lappa C.B.CL.	Root	10 gm
9	Thippili	Piper longum L.	Fruit	10
10	Seeragam	Cuminum cyminum L	Seed	10 gm
11	Sathakuppai	Anethum sowa KURZ. Syn: Peucedanum graveolens BENTH	Seed	10 gm
12	Karunseeragam	Nigella sativa L.	Seed	10 gm
13	Thippilikattai	Piper longum L.	Stem	10 gm
14	Kirambu	Syzygium aromaticum L	Buds	10 gm
15	Saathipathiri	Myristica fragrans HOUT	Aril	10 gm
16	Karkadaka-sirungi	Rhus succedanea L.	Leaf galls	10 gm
17	Saathikkai	Myristica fragrans HOUT	Fruit	10 gm
18	Thantrikkai	Terminalia bellerica ROXB	Fruit	10 gm
19	Kadukkai	Terminalia chebula RETZ & WILLD	Fruit	10 gm
20	Sadamanjil	Nardostachys jatamansi DC.	Root, ubers	10 gm
21	Milagu	Piper nigrum L	Fruit	10 gm
22	Sirunaagapoo	Mesua ferrea L	Flower	10 gm
23	Shanpagamokku	Michelia champaca L	Flower bud	10 gm
24	Vaividangam	Embelia ribes BURM.	Seed	10 gm
25	Lavangapathiri	Cinnamomum tamala NEES & EBERM	Aril	10 gm
26	Omam	Trachyspermum ammi L	Seed	10 gm
27	Thaniya	Coriandrum sativum L.	Seed	60 gm
28	Cane sugar	Saccharum officinarum L.	Granules	120 gm

Table. 2: Physico chemical values of Thaalisaathi Chooranam (TSC)

S.No	Parameters	Results
1	Appearance	Light brown coloured fine powder
2.	pH at 25°C	4.62
3.	Total ash (%)	4.456
4.	Acid Insoluble ash (%)	0.2887
5.	Loss on drying at 105°C (%)	5.112
6.	Water soluble Extractive (%)	53.32
7.	Alcohol soluble Extractive (%)	10.85
8.	Bulk Density	0.3142 g/ml
9.	Tap Density	0.5404g/ml



TLC DETAILS
T1-20µl of sample Solution, T2-30µl of sample Solution.

Figure 1 A: HPTLC photo documentation of TSC related to Alkaloids^{10, 11}**Figure 1 B: HPTLC photo documentation of TSC related to Flavanoids**^{10, 11}**Figure 1 B: HPTLC photo documentation of TSC related to Essential oil**^{10, 11}

4. CONCLUSION

The achieved results of physico-chemical analysis and HPTLC finger print profiling will be useful as tool for authentication, standardization and quality control assessment of the poly herbal formulation *Thaalisathi chooranam* (TSC),

5. ACKNOWLEDGEMENTS

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6. CONFLICTS OF INTEREST

There are no conflicts of interest from the author

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