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Research Article

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Standardization of Siddha poly herbal formulation *"Siringipaerathi Chooranam"* through a scientific method – FTIR (Fourier Transform Infrared Spectroscopy)

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Abstract

Aim and objective: The aim of the study is to standardize the Siddha poly herbal drug "*Siringipaerathi Chooranam"* through the scientific method FTIR.
Materials and methods: Siddha system of medicines plays an important role in treating acute and chronic diseases through the herbal preparation. *Siringipaerathi Chooranam* is the herbal formulation which has been indicated for Jaundice in Siddha classical literature. Thus this trail drug was standardize through FTIR and the results were noted.
Results: The instrumental analysis of *Siringipaerathi Chooranam* through FTIR shows the presence of Alcohol, Amine, Alkane, Acid, Alkene, Aromatic, Alkyl Halide, Nitro groups, Ether, Esters.
Conclusion: The functional group analysis of Siddha drug *Siringipaerathi Chooranam* will provide the good information for the biological activity.

Keywords: Standardization, Herbs, *Siringipaerathi Chooranam,* FTIR.

Introduction

Among the traditional system of medicine Siddha system was explored by the Siddhars in South India that is based on Herbs, metals, and minerals for treating various diseases[1].

Siringipaerathi Chooranam is one of the Siddha poly herbal drug which have the potency of treating Jaundice as mentioned in classical Siddha literature. Characterization of the drug plays a major role in determining the durg for its various aspects.

Now a days scientific validation of traditional medicines were important for its safety and efficacy before going to administer in human population. Standardization of poly herbal formulation for characterization is important for the quality of drugs[2].There has been noted that there was a increasing use of traditional medicines in recent decades[3].

Materials and Methods

Drug selection:

In this research paper purified and prepared *"Siringipaerathi Chooranam"* was taken as a trial drug for Hepatoprotective activity from the Siddha literature "*Sarabendra Vaidhiya Muraigal". Soolai, Moola, Kusta, Pitharoga Muraigal*, page no: 194-195.

Table: 1. Ingredients:

Name of drugs	Botanical name	Quantity
Inji	*Zingiber officinalis*	560 gm (16 palam)
Milagu	*Piper nigrum*	50.4gm (12 varahan)
Thippili	*Piper longum*	33.6gm(8 varahan)
Thipili moolam	*Piper longum*	16.8gm(4 varahan)
Lavanga pathiri	*Cinnamomum tamala*	35gm(1 palam)
Elam	*Elettaria cardamomum*	42gm (10 varahan)
Kodiveli ver	*Plumbago zeylanica*	42gm (10 varahan)
Lavanga pattai	*Cinnamomum zeylanicum*	35gm (1 palam)
Moongil uppu	*Bambusa arundinaceae*	35gm (1 palam)
Sandhana thool	*Santalum album*	35gm (1 palam)
Vilamichu-ver	*Plectranthus vettiveroides*	35gm (1 palam)
Sathikkai	*Myristica fragrans*	35gm (1 palam)
Seeragam	*Cuminum cyminum*	35gm (1 palam)
Kirambu	*Syzygium aromaticum*	35gm (1 palam)
Sugar	*Saccharum officinarum*	Equal quantity
Nei	English Name : Ghee	30ml

Collection of the Plant materials:

All the raw materials were bought from the Ramasamy Mudhaliyar Store, Parry's corner, Chennai.

Identification and Authentication of the drug:

All the plant materials were identified and authenticated by the Botanists and Gunapadam experts in Government Siddha Medical College, Arumbakkam, and Chennai-106.

Purification of the drugs

All the drugs mentioned here were purified as per the Siddha literature [4].

Inji	Outer skin of ginger was peeled off.
Milagu	It was soaked in sour buttermilk for 3 hours and allowed to dry
Thippili	Soaked in lemon juice and allowed to dry.
Thippilimoolam	Remove the nodules and dried.
Lavangapathiri	Dried in sun light.
Elam	Roasted in the pan and outer skin was removed.
Kodiveli-ver	The root was cleaned with a white cloth.
Lavangapattai	Dried in sun light.
Sandhana kattai	The skin was peeled off to get purified and powdered
Vilamichu-ver	The root was cleaned with a white cloth.
Sathikkai	Cleaned and cut into small pieces and dried.
Seeragam	Clean the dust particles and allowed it to dry.
Kirambu	Flower buds were removed.

Preparation of the Drug:

Procedure:

In order to obtain the purified form of ginger, the upper skin of ginger was peeled off and then sliced into small pieces. The sliced pieces were dried in sunshade for two days. After complete drying 560 grams of dried ginger was taken and fried well in ghee and then powered.

50.4 grams of Purified Pepper, 33.6 grams of *Thippili*, 16.8 grams of *Thipplimoolam*, 42 grams of *Kodiveli-ver*, 35 grams of *Moongil uppu*, *Lavangapathiri*, *Sandhana thool*, *Vilamichu-ver*, *Lavanga Pattai*, *Adhikari*, *Seeragam*, *Kirambu* were taken and powered separately then mixed together with processed ginger powder.

Finally, the mixture was ground well which favors the homogenous preparation. Then the mixture powder was sieved through the thin clean white cloth. After that twice the weight of sugar was added to the mixture and again it was ground well.

Finally, the end product was obtained, which was kept in an air tight container and labeled as "***Siringipaerathi Chooranam*" (*SPC*)**[5].

Purification of the Chooranam: steaming process (*Pittaviyal murai*)

The *"Siringipaerathi Chooranam"* was purified by *pittaviyal* method (steam cooking in milk) as per Siddha classical literature. A mud pot was taken and it was half filled by milk and mixed with equal quantity of pure water. The mouth of the pot was sealed by a cloth. This *chooranam* was placed over a clean dry cloth and tied firmly around the mouth of mud pot. The gap between mud pots was tied with a wet cloth to avoid evaporation. The mud pot was kept on fire and boiled until the cow's milk reduced in the lower pot.

The same drug was later dried and powdered then sieved again. It was used for the further study [6].

Storage of the drug:

The prepared test drug was stored in a clean, air tight glass container.

Administration of the drug:

Form of the medicine : *Chooranam*
Route of Administration : Enteral
Dose : 2 gm twice a day depending on the severity
Adjuvant : honey

Indication:

Kamaalai, *Marbuvali, Kirani, Suram, Vaanthi, Peenisam*.

Experiment regarding details:

Sophisticated instrumental analysis

FT-IR (Fourier Transform Infra-Red)

Fig: 1 FTIR-Instrument

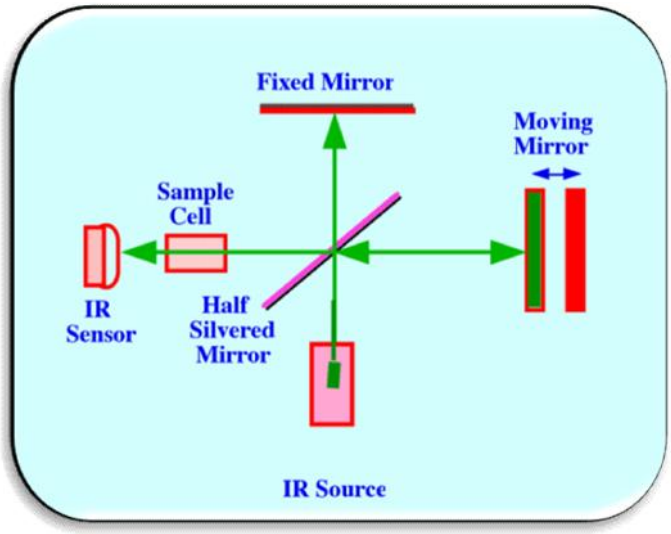

Fig: 2 FTIR-Mechanisms

Model : Spectrum one: FT-IR Spectrometer
Scan Range : MIR 450-4000 cm-1
Resolution : 1.0 cm-1
Sample required : 50 mg, solid or liquid.

FTIR analysis was done at SAIF, IIT Madras. IR data was acquired using Perkin elmer FT-IR spectrometer. For sampling techniques, KBr method (Price, 1972) was followed. It is the preferred method of infrared spectroscopy. FT-IR is an important and more advanced technique. It is used to identify the functional group, to determine the quality and consistency of the sample material and can determine the amount of compounds present in the sample. It is an excellent tool for quantitative analysis.

In FT-IR infrared is passed from a source through a sample. This infrared is absorbed by the sample according to the chemical properties and some are transmitted. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular fingerprint of the sample. Like the finger print there is no two unique molecular structures producing the same infrared spectrum. It is recorded as the wavelength and the peaks seen in the spectrum indicates the amount of material present.

FT-IR is the most advanced and the major advantage is its

- Speed
- Sensitivity
- Mechanical Simplicity
- Internally Calibrated[7]

Results and Discussion

Instrumental analysis

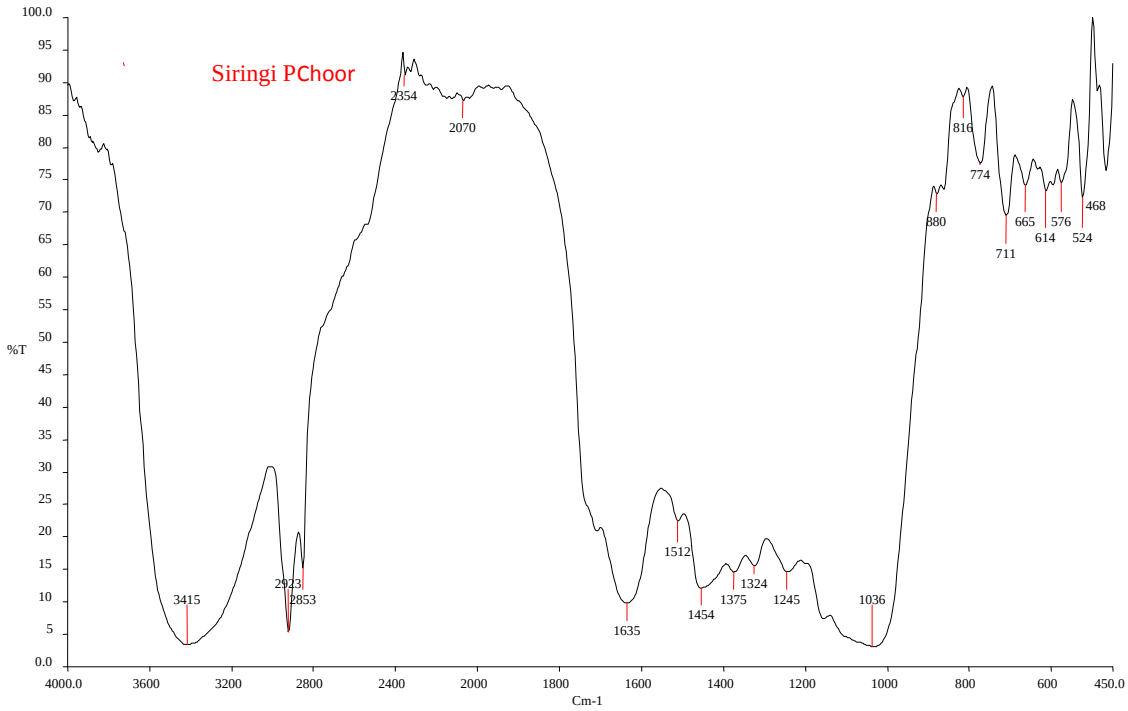

Fig: 3 FT-IR (Fourier Transform Infra Red spectroscopy)

FTIR

Siringipaerathi Chooranam.

Table: 2. FT-IR

Absorption peak cm^{-1}	Stretch	Functional group
3415	O-H Stretch, bonded N-H Stretch	Alcohol Amine
2923	C-H Stretch O-H Stretch	Alkane Acid
2853	C-H Stretch O-H Stretch	Alkane Acid
1635	N-H Bending C=C Stretch	Amide Alkane
1512	C=C Stretch C-Br Stretch	Aromatic Alkyl Halide
1454	C=C Stretch -C-H Bending	Aromatic Alkane
1375	-C-H Bending C-F Stretch N-O Stretch	Alkane Alkyl Halide Nitro
1324	C-F Stretch	Nitro
1245	C=O Stretch C-N Stretch C-O Stretch	Acid Amine Ether
1036	C-O Stretch C=O Stretch	Ether Ester
880	==C-H Bending	Alkene
816	==C-H Bending	Alkene
774	C-Cl Stretch	Alkyl Halide
711	C-Cl Stretch ==C-H Bending	Alkyl Halide Alkene
665	C-Cl Stretch	Alkyl Halide
614	C-Cl Stretch	Alkyl Halide
576	C-Br Stretch	Alkyl Halide
524	C-Br Stretch	Alkyl Halide
468	C-Br Stretch	Alkyl Halide

Interpretation

FTIR instrumental analysis was done. The test drug was identified to have 15 peaks. They are the functional groups present in the trial drug *Siringipaerathi Chooranam*. The above table shows the presence of amide, phenols, alkanes, alkyl halide, acid, aromatic, ester, ether and alcohol groups which represents the peak value.

- OH group has higher potential towards inhibitory activity against microorganisms.

- Phenols possess highly Anti-Oxidant property which enhances the drug effect against the disease.

- Amines enhance the drug effect against the disease [8].

Conclusion

The data observed from the FTIR characterization helps to standardize the Siddha poly herbal formulation *Siringipaerathi Chooranam* with its functional group. The functional groups identified from FTIR will give a better solution for clinical trails.

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