



FTIR Characterization of Siddha Medicine *Thirijathadhi Mathirai*

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ABSTRACT

Background : The Thirijathadhi Mathirai is a herbal combination of medicine used for Asthma, Hypertension, Cough, Wheezing, Dyspepsia, Vomiting, Giddiness, Hic-cup, Madness, mania, Pulmonary tuberculosis. Sore throat, Spleen disorder, Rheumatism, Heart disease. Thirst, Fever, Prickling pain in abdomen.

Objectives: To characterize the herbal drug “ Thirijathadhi Mathirai”

Materials and Methods: The ingredients such as Lavangapattai, lavanga pathiri, Elak-kai, Thippili, Karkandu, Thiratchai, Athimathuram karchoorakai, honey. The drugs were prepared as per Siddha literature “ Anubava Vaithiya Deva Ragasiyam”. The drugs were analysed by using FTIR spectrum

Result: FTIR Characterization shows the presence of some functional group such as carboxylic acid, Carbondioxide, imine / oxime. alkyl aryl ether, anhydride, alkenes, Halo compounds, alkyl halides, 1,2,3 trisubstituted. Where identified in Siddha herbal formulation. “ Thirijathadhi Mathirai”. This study forms the base for the pharmaceutical analysis of Thirijathadhi mathirai which will be followed by safety and efficacy studies later.

Conclusion: The instrumental analysis FTIR study for *Thirijathadhi Mathirai* shows the presence of functional groups through the stretch and bends which responsible for its functional activity. It was to subject for further many studies to validate its efficacy and safety through proper standardization procedure. For its potency.

Keywords:

FTIR, Siddha drug, Herbal formulation, Functional group

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INTRODUCTION

The siddha system of medicine is mainly practised in the southern part of India as it originates from Tamilnadu. It is one of the earliest traditional medicine system in the world which treat not only the body but also the mind and the soul. According to siddha the five basic elements (*panchapoatham*) are present in all living and non-living things of the universe in various proportions. In the siddha system of medicine, all vital processes (physiological, biochemical-metabolic) have been classified under three functional heads namely *vali*, *azhal*, *Iyyam* (*Vaatham*, *Pitham*, *kabam*) are called three *uyir – thaathukal*. Siddha medicine was formulated to treat various disease are some modern analytical equipments are helpful to get knowledge regarding the traditional medicinal compound formulation.

Siddha Medicine *Thirijathadhi Mathirai* is indicated as one of the best siddha medicine for its wide medicinal uses. In ancient days it is widely used as a drug of choice for treating Asthma, Hypertension, Cough, Wheezing, Dyspepsia, Vomiting, Giddiness, Hic-cup, Madness, mania, Pulmonary tuberculosis, Sore throat, Spleen disorder, Rheumatism, Heart disease, Thirst, Fever, Prickling pain in abdomen^[1].

In this study, FTIR characterization was done for the herbal Siddha formulation “*Thirijathadhi Mathirai*” to evaluate functional group. It is an excellent tool for quantitative analysis.

METHODS AND MATERIALS

Thirijathadhi Mathirai is a Siddha herbal formulation has the ingredients of

PURIFICATION OF RAW DRUGS:

1. *Lavanga Pattai* (*Bark of Cinnamon*):
Dry in the sunlight.
2. *Lavanga pathiri* (*Cassia Cinnamon*):
Remove the dust particles and dry in the sunlight.
3. *Elakkai* (*Cardamom Seeds*):
Remove the dust Particles and dry in the sunlight.

4. *Thippili* (*Long Pepper*):
Soak in lemon juice and dry it.
5. *Thiratchai* (*Dried Grapes*):
Seeds of the dry grapes are removed.
6. *Athimathuram* (*Indian or Jamaica Liquorice*):
Wash with water, scrub the skin, make into pieces and dry in sunlight.
7. *Karchoorakkai* (*Date Palm*):
Remove the seeds and dust particles.
8. *Honey*:
Boiled and filter them.

METHOD OF PREPARATION:

All purified raw drugs are made into fine powder individually. To this mixture add honey and grind in to a paste like form and made into small pills size of *Siru Nellikkai* (approximately 4 to 5 grams) and dried in sunshade and kept in airtight porcelain container.

SHELF LIFE:

1 year.

INDICATION:

Asthma, Hypertension, Cough, Wheezing, Dyspepsia, Vomiting, Giddistate, Hic-cup, Madness, mania, Pulmonary tuberculosis, Sore throat, Spleen disorder, Rheumatism, Heart disease, Thirst, Fever, Prickling pain in abdomen.

DOSAGE:

1 Pill

Details regarding the analysis

FTIR spectra were recorded at kalasalingam academy of research and education (International research center) Srivilliputhur.

FTIR Spectrum analysis

Fourier transform infrared spectroscopy it 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 compound present in the sample.

Table 1. Ingredients of *Thirijathadhi Mathirai*

Tamil name	Scientific Name	Quantity
Lavangapattai	<i>Cinnamomum verum</i>	½ Thola (6gms)
Lavangapathiri	<i>Cinnamomum tamala</i>	½ Thola (6gms)
Elakkai	<i>Elettaria cardamomum</i>	½ Thola (6gms)
Thippili	<i>Piper longum</i>	2 Thola (24gms)
Karkandu	<i>Borassus flabellifer</i>	4 Thola (48gms)
Dharkshai	<i>Vitis vinifera</i>	4 Thola (48gms)
Athimathuram	<i>Glycyrrhiza glabra</i>	4 Thola (48gms)
Karchoorakai	<i>Phoenix dactylifera</i>	4 Thola (48gms)
Honey	<i>Apis mellifera</i>	Q.S

RESULTS

Fig.1. Image of the FTIR spectrum.

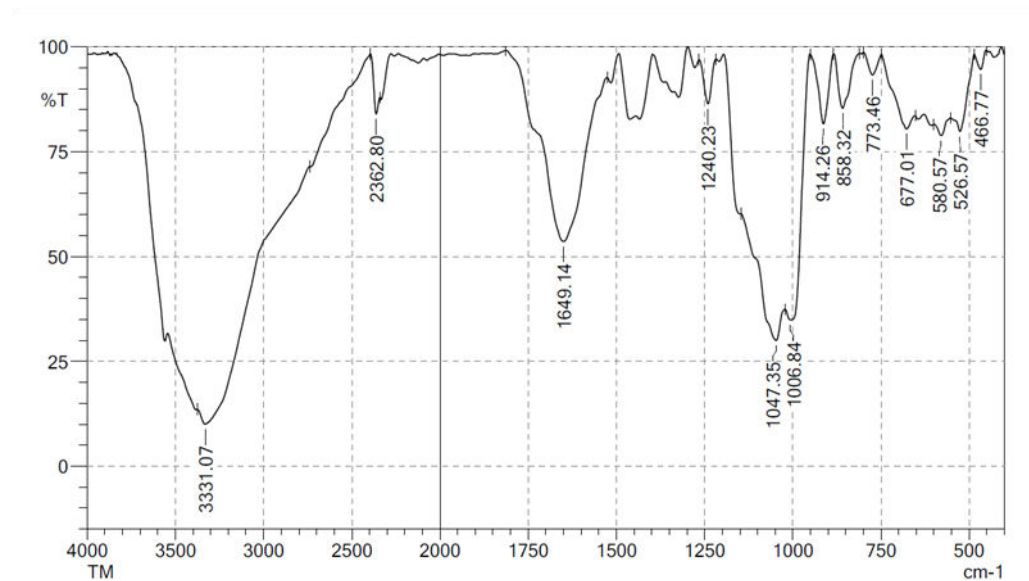


Table.1: FTIR Data interpretation of SAMPLE (TM)

Wave number	Vibrational modes of SAMPLE (TM) In IR region	Functional groups
3331.07	O-H Stretching	Carboxylic acid
2362.80	O=C=O Stretching	Carbondioxide
1649.14	C=N Stretching	Imine / oxime
1240.23	C-O Stretching	alkyl aryl ether
1047.35	CO-O-CO Stretching	anhydride
1006.84	= C-H Bend	alkenes
914.26	O-H Bend	Carboxylic acid
856.32	C-Cl Stretching	Halo compounds
773.46	C-H Bending	1,2,3 trisubstituted
677.01	C-Br Stretching	Alkyl halides
580.57	C-Br Stretching	Alkyl halides
526.57	C-Br Stretching	Alkyl halides
466.77	C-I Stretching	Halo compounds

DISCUSSION

In FTIR- Spectra analysis , this sample Thirijathadhi mathirai exhibits the peak value at 3331.07, 2362.80, 1649.14, 1240.23, 1047.35, 1006.84, 914.26, 856.32, 773.46, 677.01, 580.57, 526.57, 466.77 having O-H Stretching, O=C=O Stretching, C=N Stretching, C-O Stretching, CO-O-CO Stretching, = C-H bend, O-H Bend, C-Cl Stretching, C-H Bending, C-Br Stretching, C-Br Stretching, C-Br Stretching, C-I Stretching. This indicates the presence of some organic functional groups such as carboxylic acid, carbon di oxide, imine / oxime,

alkyl aryl ether, anhydride, alkenes, carboxylic acid, Halo compounds, 1, 2, 3 trisubstituted, alkyl halides, alkyl halides, alkyl halides, halo compounds. The presence of carboxylic acid has anti-inflammatory activity. Bronchial asthma is a chronic airway inflammatory disease. Thus it controls inflammation in bronchial asthma.

The presence of alkenes protects against bacteria and fungal infections. Alkyl halides were used as refrigerants.

CONCLUSION

The instrumental analysis FTIR study for Thirijathadhi mathirai shows the presence of functional groups through the stretch and bends which responsible for its functional activity. It was to subject for further many studies to validate its efficacy and safety through proper standardization procedure.

SOURCE OF FUNDING : Nil

CONFLICT OF INTEREST : None declared

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