

FTIR Analysis of Siddha Drug Mahalavangathi Chooranam

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Abstract: Background: The Mahalavangathi Chooranam is a polyherbal drug used for the treatment of Swasa Kaasam (Bronchial asthma), Kabam, Piththam, Pandu (Anaemia), Gunmam (Gastric ulcer), Pazhaya surankal (Chronic fever), Moolaviyathi (Piles), Arosakam (Aversion for food), Asiranam (Indigestion), Perumoochu (Hard breathing), Vikkal (Hic-cough), Kusumarogam (An unknown disease), Maarbu novu (Affection of the chest), Parisa vaayu (Paralysis). Objective: To explore the morphology and elemental characterization of the Mahalavangathi Chooranam. Materials and Methods: The ingredients were collected & purified and the drug was prepared as per Siddha literature "Kosayi Anuboga Vythia Brahma Rahasiam Part III Pg No.81. Here the drug was subjected into characterization through FT-IR analysis. Result: FT-IR characterization shows that the presence of functional groups like, O-H stretching (alcohol), N-H stretching (primary amine), O-H stretching (carboxylic acid), O-H stretching (alcohol), C-H stretching (alkene), C-H bending (aromatic compound), C=O stretching (esters), C=O stretching (aldehyde), C=C stretching (alkene), O-H bending (carboxylic acid), O-H bending (alcohol), C-F stretching (fluoro compound), C-O stretching (aromatic ester), C-o stretching (alkyl aryl ether), N-H Wag (Primary & secondary amines), C=C bending (alkene), =C-H bending (alkene), C-Cl stretch (alkyl halides) which ensure the efficacy and therapeutic effect of the drug. Conclusion: The instrumental analysis FTIR study for Mahalavangathi Chooranam shows the presence of functional groups through the stretch and bends which is responsible for its functional activity. It consists of activities such as anti-inflammatory, anti-bacterial effect. Further researches want to done in Mahalavangathi Chooranam to evaluate its efficacy and drug standardization.

Keywords: FT-IR, Mahalavangathi Chooranam, Functional groups, Bronchial asthma, Swasa kaasam.

1. Introduction

The Siddha system of medicine is mainly practised in the southern part of India. It is one of the earliest traditional medicine system in the world which treats not only the body but also the mind and the soul. In Siddha system innumerable varieties of herbs, mineral and animal products find mention in Siddha literature, which are used in the preparation of medicines. Herbals play a vital role for the treatment of many disease in humans. Herbal medicines are the hope for the people all over the world now to get proper safe remedy from the disease. Though herbal and polyherbal preparations are being considered as good in nature because of its therapeutic value, characterization is also essential to known the structural and functional property of herbal formulations for wide use. Even for herbal drug scientific validation is needed for safe use before going to administer clinically.

The standardization of drug and clinical efficacy of study in Mahalavangathi Chooranam (Kosayi Anuboga Vythia Brahma Rahasiam Part III Pg No.81) here performed the spectroscopic standardization of Mahalavangathi Chooranam. The analysis of Infra-red (FTIR) studies were used and results was documented.

Characterization of herbal formulations are essential to identify the lead molecule for further research to elucidate the structure of functional compounds which is reasonable for its therapeutic value.

Mahalavangathi Chooranam is a poly herbal drug used for "Swasa Kaasam" in Siddha medicine. In Siddha system, "Swasa Kaasam" can be correlated with: Bronchial asthma". In this article the drug MLC is subjected to access the functional groups present in the drug, with the help of FT-IR instrument.

2. Materials and Methods

Ingredients of Mahalavangathi Chooranam:

- 1) Lavanga Pattai (Cinnamomum verum)-pagam 1 (5g)
- 2) Nagkesaram (Mesua ferrea)-pagam 2 (10g)
- 3) Elakkai (Elattaria cardamomum)-pagam4 (20g)
- 4) Milagu (Piper nigrum)-pagam 8 (40g)
- 5) Thippili (Piper longum).-pagam 14 (70g)
- 6) Chukku (Zingiber officinale).-pagam32 (160g)
- 7) Amukkurak Kizhangu (Withania somnifera)-pagam 64 (320g)
- 8) Sarkkarai (Sugar).-sama edai (625g)

Collection of raw drugs:

Purchase the raw drugs are from ASN herbal drug shop, Melapayam, Tirunelveli.

Authentication of raw drugs:

The identification of polyherbal drugs are authenticated by faculties of Department of Gunapadam, Government Siddha Medical College & Hospital, Palayamkottai.

Purification of Raw Drugs:

- 1) Lavangapattai (Bark of cinnamon)
Dry in the sun light

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- 2) **Nagkesaram (Ceylon iron wood)-Flowers**
The contaminated particles are removed and cleaned using water and allowed to dry.
- 3) **Elakkai (Cardamom seeds)**
Remove the dust particles and dry in the sunlight
- 4) **Milagu (Black Pepper)**
Soak in sour butter milk and fry it.
- 5) **Thippili (Long pepper)**
Soak in lemon juice and dry it.
- 6) **Chukku (Dried ginger)**
Soak dried zinger in lime stone water for 3 hours. Then remove the skin and dry it.
- 7) **Amukkurak kizhangu (Winter cherry)**
Boil with milk and dry it.
- 3) **Piththam**
- 4) **Paandu (Anemia)**
- 5) **Gunmam (Gastric ulcer)**
- 6) **Pazhaya surankal (Chronic fever)**
- 7) **Moolaviyathi (piles)**
- 8) **Arosagam (Aversion for food)**
- 9) **Asiranam (Indigestion)**
- 10) **Perumoochu (Hard breathing)**
- 11) **Vikkal (Hic-cough)**
- 12) **Kusumarogam (An unknown disease)**
- 13) **Maarbu novu (Affection of the chest)**
- 14) **Paarisa vaayu (paralysis)**

3. Method of Preparation

About purified drugs are made into fine powder separately and sieved in fine cotton cloth. Mix all the powders and take equal amount of sugar and mix it also. Finally it is stored in airtight container.

Shelf Life:

3 months.

Dosage:

3 Virarkadai alavu (800-1000mg).

Adjuvant:

Hot water

Indication:

- 1) **Swasa kaasam (Bronchial asthma)**
- 2) **Kabam**

4. Results and Discussion

The result of Scanning electron microscope in different view trace elements FT-IR data has compiled as follows.

FTIR ANALYSIS:

FT – IR Spectra were recorded at *Kalasalingam Academy of Research and Education (International Research Centre), Srivilliputhur*. IRTracer – 100 Fourier Transform Infrared (FTIR) Spectrophotometer was used to derive the FT – IR Spectra of *Mahalavangathi chooranam* in Potassium Bromide (KBr) matrix with scan rate of 20 spectra per second at the resolution 0.25 cm⁻¹ in the wave number region 400-4000 cm. The samples were ground to fine powder using agate motor and pestle and then mixed with KBr. They were pelletized by applying pressure to prepare the specimen (the size of specimen about 13 mm diameter and 0.3 mm in thickness) to recorded the FT-IR spectra under Standard conditions. The recorded spectrum is given in Figure 1.]

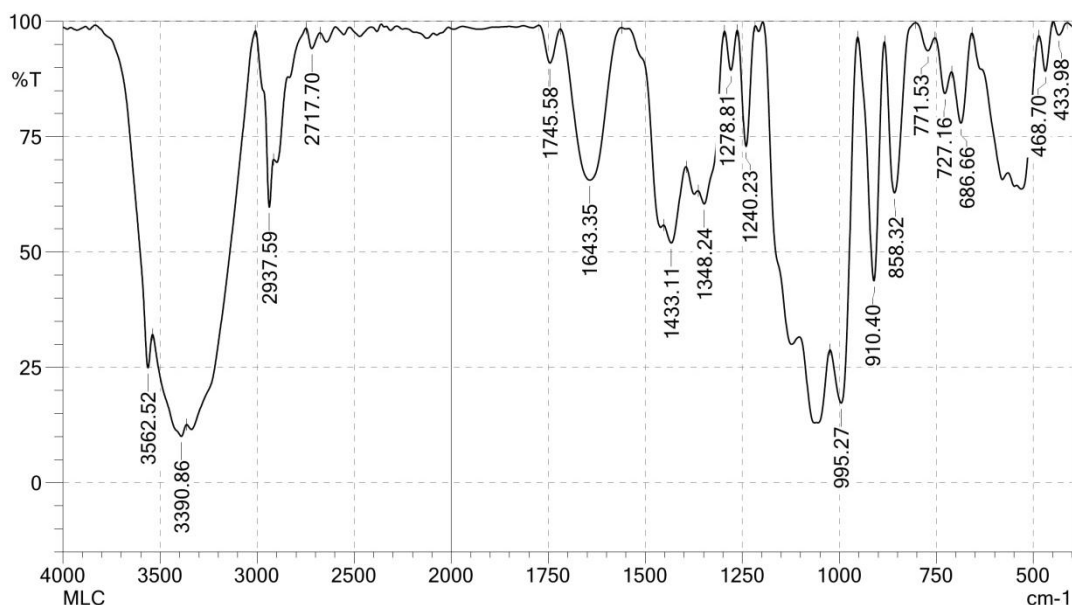


Figure 1: FTIR SPECTRA OF MLC

Table 1: FTIR Interpretation of MLC

S. No	Wave Number (cm ⁻¹)	Vibrational modes of MLC in IR region	Functional group
1	3562.52	O-H Stretching.	Alcohol
2	3390.86	O-H Stretching & N-H Stretching.	Alcohol, Primary amine
3	2937.59	O-H Stretching, O-H Stretching.	Carboxylic acid, Alcohol
4	2717.70	O-H Stretching, C-H Stretching.	Carboxylic acid, Alkene.
5	1745.58	C-H Bending, C=O Stretching & C=O Stretching.	Aromatic compound, Esters and Aldehyde.
6	1643.35	C=C Stretching.	Alkene.
7	1433.11	O-H Bending.	Carboxylic acid.
8	1348.24	O-H Bending.	Alcohol.
9	1278.81	C-F Stretching, C-O Stretching.	Fluoro compound, Aromatic ester.
10	1240.23	C-O Stretching.	Alkyl aryl ether
11	995.27	C=C Bending	Alkene.
12	910.40	N-H Wag	Primary & Secondary amines.
13	858.32	=C-H Bending	Alkene.
14	771.53	C-Cl Stretch.	Alkyl halides.
15	727.16	C-Cl Stretch.	Alkyl halides
16	686.66	C-Cl Stretch.	Alkyl halides

Interpretation

FTIR instrumental analysis was done at International Research centre, Kalasalingam Academy of Research and Education, Krishnankovil. The test drug was identified to have 18 peaks. They were the functional groups present in the *Mahalavangathi Chooranam*. the figure 1 and table1 shows the presence of alcohol, primary amines, carboxylic acid, alkene, aromatic compound, esater, aldehyde, fluoro compound, aromatic ester, alkyl aryl ether, primary & secondary amines, alkyl halides. Which represents the peak values. It is the functional group and determines the amount of compounds present in the sample. These functional groups are responsible for the therapeutic effect of the drug.

Alcohol:

Anti septic, Disinfectant action and anti microbial activity, Broncho dilator activity. Small studies, suggest that low dose of alcohol may have a bronchodilator effect by relaxing smooth muscle tone.

Alkene:

Anti oxidant activity, anti fungal activity.

Primary amines:

Anti inflammatory, Anti viral activity.

Carboxylic acid:

It is used as antimicrobials. Amino acid and fatty acids are important examples of carboxylic acids. Which are the building block of proteins and lipids respectively.

Esters:

Analgesic activity and Anti-inflammatory activity.

Alkyl halides:

Alkyl halides have little biological activity. They protect against bacteria and fungai.

Primary amine:

Anti-inflammatory and anti viral activity

5. Conclusion

These observed data from this FTIR characterization helps to standardize this *Siddha* compound drug "*Mahalavangathi Chooranam*" regarding its functional behaviour. Final conclusion is FTIR analytical studies showed no harmful chemicals and minerals etc. . *Mahalavangathi Chooranam* is safe to use. The further research works has to be carried out for the development of scientific data to hold the drug in a scientific manner.

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References

- [1] Munusamy Muthaliyar, Kosayi Anuboga Vythia Brahma Rahasiyam Part III, 1950, Pg No.81
- [2] Thiru K. S. Murugesu Mudhaliyar, Gunapadam Mooligai Vaguppu (Part 1), Department of Indian Medicine and Homeopathy, Chennai-106: 2013.
- [3] Sarakku suththis seimuraikal, Department of Indian Medicine and Homeopathy, 2008.
- [4] Somasundaram. S, Maruthuva ThavaraIyal, Vol – 1, Ilangovan publishers, Tirunelveli – 2, 1997 edition
- [5] Alcohol with Asthma. <https://asthma.net/coping/alcohol>
- [6] Mariia and Iryna Kravchenko, Synthesis and Pharmacological properties of Novel Esters Based on Monoterpenoids and Glycine, Pharmaceuticals (Basel).2017 Jun; 10 (2): 47.
- [7] Alkene with antioxitative activities from Murraya koenigii (L.) Spreng, Bioorganic & Medicinal chemistry Letters, Volume 26, Issue 3, 2016, pg 799-803.
- [8] IR Spectrum Table & Chart. <https://www.sigmaaldrich.com>
- [9] Fourier Transform Infra-red Spectroscopy available at: https://www.lpdlabsservices.co.uk/analytical_techniques
- [10] chemical_analysis/ftir. php