



(RESEARCH ARTICLE)



FTIR characterization of *Siddha* medicine *Komoothira silasathu parpam*

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GSC Biological and Pharmaceutical Sciences, 2024, 28(01), 146–149

Publication history: Received on 05 June 2024; revised on 15 July 2024; accepted on 18 July 2024

Article DOI: <https://doi.org/10.30574/gscbps.2024.28.1.0263>

Abstract

Objective: To characterize the siddha formulation *Komoothira silasathu parpam*.

Material and methods: The siddha formulation, *Komoothira silasathu parpam* was prepared as per Siddha literature Gunapadam thathu Jeevava guppu and the siddha formulation was analysed by using FTIR spectrum.

Result: FTIR characterization shows the presence of some functional group such as Alkyne, Alkene, Alkane, Carbon dioxide, Aldehyde, Primary Amine, Alcohols where identified in Siddha formulation komoothirasilasathuparpam. This study forms the base for pharmaceutical analysis of Komoothirasilasathuparpam which will be followed by safety and efficacy studies later.

Conclusion: The instrumental analysis FTIR study for *Komoothira silasathu parpam* shows the presence of functional groups through the stretch and bands which responsible for its functional activity. It was to subject for further many studies to validate its efficacy for its potency.

Keywords: FTIR; Siddha drug; Herbomineral compound; Functional group

1. Introduction [1, 4,6, 13]

Fourier-transform infrared (FTIR) spectroscopy has emerged as a valuable tool in the analysis of traditional medicinal formulations, particularly those from the Siddha system of medicine. Siddha medicine, rooted in ancient Indian traditions, utilizes a variety of natural ingredients, often derived from herbs and minerals, to treat various ailments. These formulations are typically complex mixtures of bioactive compounds whose efficacy is closely tied to their chemical composition.

FTIR spectroscopy offers a non-destructive method to analyze such formulations by identifying functional groups present in the molecules. This technique relies on the absorption of infrared radiation by chemical bonds within the sample, producing a unique spectrum that serves as a molecular fingerprint. By comparing these spectra with reference standards, FTIR enables the identification and quantification of key constituents in Siddha formulations.

In recent years, there has been a growing interest in applying FTIR analysis to Siddha formulations to authenticate their ingredients, assess their quality, and ensure consistency in therapeutic efficacy. This analytical approach not only aids in understanding the chemical complexity of these formulations but also supports efforts in standardizing traditional medicines for broader acceptance and integration into modern healthcare practices.

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This paper explores the application of FTIR spectroscopy in the characterization of Siddha formulations, highlighting its role in elucidating their molecular composition and providing scientific validation to traditional medicinal practices. Through such analyses, FTIR contributes to enhancing the quality control measures essential for the safety and effectiveness of Siddha medicines in contemporary healthcare systems.

2. Material and Methods

2.1. Ingredients & Collection of drugs [1]

The following Raw materials were collected from Ramasamychetty traders, Paris, Chennai.

- *Komoothirasilasathu* (Asphalt mineral pitch) -84(20 varagan)
- *Kadukkai* (*Terminalia Chebula*. Retz) -42 gm(10.varagan)
- *Thandrithol* (*Terminalia bellarica*. Rob) -42 gm (10 varagan)
- *Nellimulli* (*Emblicaofficinalis*. Linn) -42 gm (10 varagan)

2.2. Authentication

The above raw materials were authenticated by post graduate department of gunapadam and medicinal botany Government siddha medical college, palayamkottai.

2.3. Purification of the materials [1, 2]

2.3.1. *Komoothirasilasathu*

Komoothirasilasathu is finely grind with milk, and keep it until it gets dry.

2.3.2. *Kadukkai*

Remove the seed from *kadukkai*.

2.3.3. *Thadrithol*

Remove the seed from *thandrikai*.

2.3.4. *Nellimulli*

Remove the seed from *Nellikai*

2.4. Process of preparation [1, 3]

Dried pericarp of *Terminalia chebula*, *Terminalia bellarica*, *Emblicaofficinalis* each weighing about 42 gm taken in a clean pot and add 1600ml of water. It was boiled and reduced upto 200ml and filtered this decoction. And then 84 gms of purified *komoothirasilasathu* is placed in a stone mortar and triturated with above prepared decoction for about 3 hours and made into small cakes and dried.

Then dried cakes (*villai*) were placed with in a earthen plate and covered with another earthen plate subjected into incineration process by using dried cow dung cakes. After incineration process it is allowed to cool, black colored *komoothirasilasathuparpam* is obtained. It is kept in a stone mortar and grind into fine powder and stored in a container.

2.5. Human dose

488 mgs.

2.6. FTIR spectrum analysis [4-12]

Fourier transform infrared spectroscopy is an important and more advanced the 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. In FTIR, infrared is absorbed from my 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. It is recordable as wavelength and the peaks seen in the spectrum indicated the amount of material present.

3. Result

The results of the FTIR Data interpretation of Komoothirasilasathuparpam has been tabulated in table 1.

Table 1 FTIR Data interpretation of SAMPLE (KSP)

Frequency (cm-1)	Bond	Functional Groups
701.80	C = C Bending	Alkene
885.68	C = C Bending	Alkyne
1475.54	C – H bonding	Alkane
2360.87	O = C = O stretching	Carbondioxide
2879.72	C – H stretching	Aldehyde
3566.38	N – H Stretching	Primary Amine
3647.39	O – H stretching	Alchols.

4. Discussion [5,7,10]

In FTIR- Spectra analysis, this sample KSP exhibits the peak value at 701.80, 885.68, 1475.54, 2360.87, 2879.72, 3566.38, 3647.39 having C = C Bending = C Bending, C – H bonding , O = C = O Stretching, C – H Stretching ,N – H Stretching , O – H stretching. This indicates the presence of some organic functional groups such as Alkyne, Alkene, Alkane, Carbon dioxide, Aldehyde, Primary Amine, Alcohols.

5. Conclusion

Instrumental analysis FTIR study for *Komoothira silasathu parpam* shows the presence of functional groups through the structure and bends which are responsible for its functional activity. It was too subject for further many studies to validate its efficacy and safety through proper standardization procedure for its potency.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

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