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Scientific evaluation of presence of functional groups in Siddha medicine 'Gandhaka Parpam' using FTIR spectrometer

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Abstract

Siddha is one of the oldest indigenous systems of medicine which is founded by Siddhars. 'Gandhaka Parpam' is a reputed drug mentioned in classical Siddha literature for the treatment of various diseases like leprosy, itches, scabies and other skin diseases. The aim of this present study was carried out to standardize the drug 'Gandhaka Parpam' by evaluating functional groups. The Siddha medicine 'Gandhaka Parpam' was subjected into characterization through FTIR. FTIR spectrum analysis is very helpful nowadays to identify the presence of functional groups. The FTIR peaks of 'Gandhaka Parpam' constitute some functional group such as alkane, alcohols, esters, carboxylic acid, anhydrides, aromatic, chloride, bromide. These analyses may form the platform for further research work on this Siddha medicine 'Gandhaka Parpam'.

Keywords: Siddha, Gandhaka parpam, FTIR, Functional groups.

Introduction

Siddha system is one of the ancient traditional systems of medicine of our country compiled by the Siddhars. This indigenous system of medicine utilizes raw materials from plant, animal kingdom, and metallo minerals. According to Siddha system, Medicine is a substance that helps to alleviate or eradicate the disease, gives strength to the body and normalizes the functions of the body.

The present study deals with standardization of Siddha herbo mineral formulation 'Gandhaka Parpam' is mentioned in the classical literature for the treatment of diseases like leprosy, itches, scabies and other skin diseases.

The herbo-mineral preparation like parpam is acclaimed medicinal form obtained by repeated incineration of purified metal along with juices of medicinal plants. Parpam type of medicines having

advantages like better stability, lower dosage, ease of storability and sustained availability.

The standardization of the drug is a key factor in assessing the quality control of the drugs to establish the medicine in a valuable mode. FTIR spectrum analysis is very helpful nowadays to identify the presence of functional groups. Here the Siddha medicine 'Gandhaka Parpam' was subjected into FTIR analysis for the standardization. This can create fingerprints to standardize this medicinal formulation.

Materials and Methods

Details regarding the sample:

The drug 'Gandhaka Parpam' was prepared as per the Siddha literature 'Siddha vaithiya thirattu' for the treatment of leprosy, itches, scabies and other skin diseases. The ingredients of the drug are Gandhakam

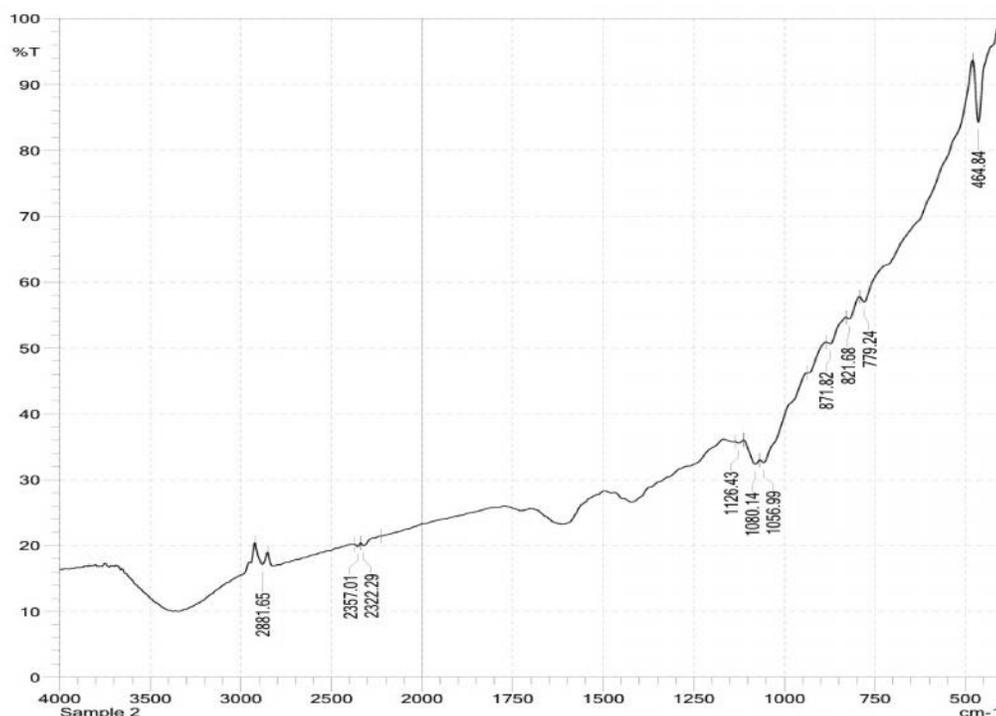
(Sulphur), Vellai vengaya saaru (*Allium cepa*), Inji saaru (*Zingiber officinale*), Maruthampattai sambal (*Terminalia arjuna*), Puliampurani sambal (*Tamarindus indicus*).

Details regarding the analysis:

FTIR spectra were recorded at IRC at Kalasalingam University, Tamilnadu. The Perkin Elmer spectrum one FTIR spectrometer was used to derive the FTIR spectra of ‘Gandhaka Parpam’ in Potassium Bromide

(KBr) matrix with scan rate of 5 scan per minute at the resolution 4cm-1 in the wave number region 450-4000 cm-1. The samples were grounded to fine powder using agate mortar and pestle and then mixed with KBr. They were then pelletized by applying pressure to prepare the spectrum (the size of specimen about 13mm diameter and 0.3mm in thickness) to record the FTIR spectra under standard conditions. The FTIR spectra were used to determine the presence of functional groups and bands in the ‘Gandhaka Parpam’.

Results



Wave number	Vibrational modes in IR regions	Functional group
2881	C-H	Alkane
2357	-	-
2322	-	-
1126	C-O	Alcohols, esters, ethers, carboxylic acid, anhydride
1080	C-O	Alcohols, esters, ethers, carboxylic acid, anhydride
1056	C-O	Alcohols, esters, ethers, carboxylic acid, anhydride
871	C-H	Aromatic
821	C-H	Aromatic
779	C-Cl	Chloride
464	C-Br	Bromide

Discussion

In the FTIR spectrometer analysis, the sample of 'Gandhaka Parpam' exhibits the peak value shows in Table 1 at the wave number of 2881, 2357, 2322, 1126, 1080, 1056, 871, 821, 779, 464 having C-H, C-O, C-Br, C-Cl. This indicates the presence of some organic functional groups such as Alkane, alcohols, esters, ethers, carboxylic acid, anhydride, aromatic, chloride, bromide.

Conclusion

Traditional medicines are always provides higher therapeutic use without causing any harmful effects. The FTIR analysis of herbo mineral drug 'Gandhaka Parpam' shows the presence of functional groups such as alkane, alcohol, ester, ether, carboxylic acid, anhydride, aromatic, chloride, bromide. Scientific validation of traditional medicines through standardization will provide the knowledge regarding the mechanism of drug action. These functional groups have more significance for its medicinal property. This results may form the base for further studies on this Siddha medicine 'Gandhaka Parpam'.

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