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Scientific evaluation of functional groups presence in Siddha Herbo mineral formulation “Vasantha Kusumakaram Mathirai” using FTIR spectrometer

**M. N. Parandhaman.*¹, M. Thiruthani², M.P. Abdul Kader Jeylani³,
A. Rajarajeshwari⁴, G. Chenthamarai Selvi⁵, C. Thirumavalavan⁶, S. Balamani⁷.**

¹P.G.Scholar, Department of Nanju Noolum Maruthuva Neethi Noolum,
Government Siddha Medical College, Palayamkottai, Tirunelveli.

²H.O.D, Department of Nanju Noolum Maruthuva Neethi Noolum,
Government Siddha Medical College, Palayamkottai, Tirunelveli.

^{3,4,5,6,7}Faculties, Department of Nanju Noolum Maruthuva Neethi Noolum,
Government Siddha Medical College, Palayamkottai, Tirunelveli

*Corresponding Author: **Dr. M. N. Parandhaman**

P.G. Scholar, Department of Nanju Noolum Maruthuva Neethi Noolum,

Government Siddha Medical College, Palayamkottai, Tirunelveli. E- mail: asmi.mn@gmail.com

Abstract

Siddha play a vital role for the treatment of many diseases in humans. Characterization plays a major role to identify the nature of the drug for standardization. The Siddha medicine “Vasantha Kusumakaram Mathirai” was subjected into characterization through FTIR. FTIR spectrum analysis is very helpful nowadays to identify the presence of functional groups. The FTIR peaks of “Vasantha Kusumakaram Mathirai” constitute some functional group such as Alkane, Imines & Ozimes, Phenol, Sulfone, Amine, Alkene, Bromide and Iodide. This Analysis may form the platform for further research work on this Siddha medicine “Vasantha Kusumakaram Mathirai”.

Keywords: Siddha, Standardization, Vasantha Kusumakaram Mathirai, FTIR, Functional groups.

Introduction

Siddha medicine contributes a lot to cure many diseases. Nowadays herbal medicines are hope for the people in all over the world. In some diseases the physicians may use Polyherbal and Herbomineral combined medicines. Now to get proper safe remedy for the treatment without any side effect. Even though a traditional medicine being considered as good in nature of its therapeutic value, characterization is also

essential to know the structural and functional property of Herbomineral formulation for wide use.

For the Herbomineral drugs scientific validation is needed for safe use before going administer clinically ⁽¹⁾. FTIR Spectrum analysis is very helpful to identify the presence of functional groups. Here the Siddha Herbomineral formulation “Vasantha Kusumakaram Mathirai” mathirai was subjected into FTIR characterization to create fingerprints for standardisation for the drug ⁽²⁾.

Experimental section

Details regarding the samples:

“Vasantha Kusumakaram Mathirai” is a herbomineral formulation which indicated as a drug in siddha text “Siddha Vaithiya Thirattu” for the treatment of fever (Chronic), cough, thirst, urinary disease, sneezing, etc. Vasantha Kusuma karammathirai contains Lingam (Mercuric Sulphide), Vengaram (Borax), Lavangam (*Syzygium aromaticum*), Thippili (*Piper longum*), Kostam (*Saussurea lappa*), Akkirakaram (*Anacyclus pyrethrum*), Adhimathuram (*Glycyrrhiza glabra*), Korosanai (purified Ox Bile), Kunguma Poo (*Crocus sativus*), Pachai Karpooram (*Camphora officinarum*), Ginger (*Zingiber officinale*) juice, Cow milk. The drug was prepared as per the text “Siddha Vaithiya Thirattu”³.

Details regarding the FT – IR analysis:

FT – IR spectra were regarded at SAIF, IIT madras, India. The Perkin Elmer Spectrum One Fourier Transform Infrared (FTIR) Spectrometer was used to derive the FT IR Spectra of Vasantha Kusumakaram Mathirai in Potassium Bromide (KBr) matrix with scan rate of 5 scan per minute at the resolution 4cm^{-1} in the wave number region $450 - 400\text{cm}^{-1}$. The samples were grounded to fine powdered using agate motor and pestle and the mixed with KBr. They were then pelletized by applying pressure to prepare the specimen (the size of specimen about 13mm diameter and 0.3mm in thickness) to recorded the FT – IR Spectra under standard conditions⁴. FT – IR Spectra were used to determine the presence of the functional groups and bands in the Vasantha Kusumakaram Mathirai. The recorded spectrum shows in Figure.1

Results

Figure 1. FTIR Spectra of “Vasantha Kusumakaram Mathirai”

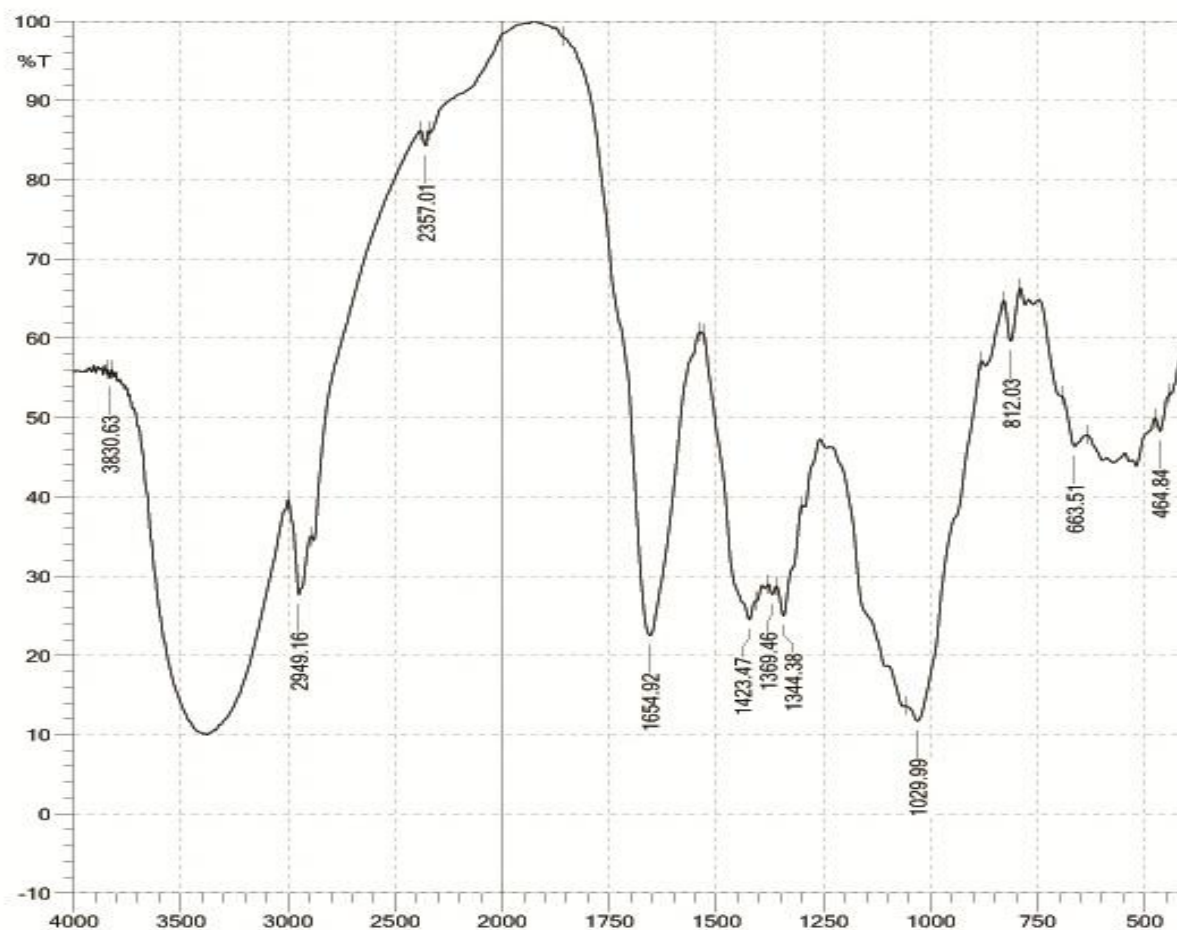


Table1. FTIR interpretation of “Vasantha Kusumakaram Mathirai”

Wave number (cm-1)	Vibrational modes of “Vasantha Kusumakaram Mathirai” in IR region	Functional Group
3830	–	–
2949	C – H (Stretch)	Alkane
2357	–	–
1654	C = N (Stretch)	Imines & Ozimes
1423	–	–
1369	O – H bending	Phenol
1344	S = O Stretch	Sulfone
1029	C – N Stretch	Amine
812	C = C bending	Alkene
663	C – Br	Bromide
464	C – I	Iodide

Discussion

In the FT-IR Spectra analysis, this herbo-mineral siddha drug “Vasantha Kusumakaram Mathirai” sample exhibits the peak value shows in Table 1 at the wave number of 3830, 2949, 2357, 1664, 1423, 1369, 1344, 1029, 812, 663, 464 having C – H (Stretch), C = N (Stretch), O – H bending, S = O (Stretch), C – N (Stretch), C = C bending, C – Br, C – I. This indicates the presence of some organic functional groups such as Alkane, Imines & Ozimes, Phenol, Sulfone, Amine, Alkene, Bromide and Iodide.

Conclusion

Traditional medicines are always provides higher therapeutic use without causing any harmful effects. The FTIR analysis of Herbo mineral drug ‘Vasantha Kusumakaram Mathirai’ shows the presence of functional groups such as Alkane, Imines & Ozimes, Phenol, Sulfone, Amine, Alkene, Bromide and Iodide. The 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 result may form the base for further studies on this Siddha medicine “Vasantha Kusumakaram Mathirai”.

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