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FTIR Analysis of Kuppaimeni Chooranam - A siddha herbal drug

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Abstract

The herbal formulations in the Siddha system have reached global attention primarily because of their long-term advantages for general wellness and fewer adverse effects. Characterization plays a major role to determine the nature of the drug for standardization. FTIR characterization will help to determine the functional compounds of the drug. Siddha medicine Kuppaimeni Chooranam is indicated for the treatment of bleeding hemorrhoids. The drug was subjected to FT-IR analysis using KBr pressed disk technique on Analytical Technologies FT-IR spectrophotometer (Model: INFRA 3000-50) and the characteristic peaks were detected to identify the presence of functional groups. Kuppaimeni Chooranam was found to contain certain functional groups, including alkyl halides, alkynes, aromatics, carbohydrate alkene, alkane, and phenol.

Keywords: Siddha system, Kuppaimeni Chooranam, FTIR characterization, functional groups

Introduction

The Siddha system of medicine is an ancient traditional medicine that is practiced in Tamilnadu, and other Tamil speaking regions of the world. The Siddha system of medicine system which treats not only the body but also the mind and the soul. The word Siddha has its origin in the Tamil word Siddhi which means “an object to be attained” or “perfection” or “heavenly bliss”. The roots of the system are intertwined with the

culture of ancient Tamil civilization. Siddhars were the premier scholars of the system in ancient times. In Siddha system of Medicine Bleeding Piles may be compared with Raththa Moolam. Raththa Moolam is one among the 21 types of Moola noi which is mentioned in Yugi Vaithiya Chinthamani 800 and is compared with 1st degree Internal Hemorrhoids in modern aspect. The drug Kuppaimeni Chooranam mentioned in Siddha literature-Pathartha Guna Vilakkam page No 263, [1] in the treatment of Raththa Moolam. There

have been many studies to find out the chemicals in this medicine and their pharmacological actions. Among them, FT-IR spectrophotometer is the analytical technique to detect the functional group of a drug. Therapeutic activity of herbal formulation depends on its phytochemical constituents. For the development of a new drug or the standardization of the traditional Siddha

formulations through characterization, usage of modern sophisticated equipment is an emergency need to strengthen the field of Pharmacology. FT-IR is one of the important analytical techniques which is used to determine the organic compounds, including chemical bond and inorganic materials.

Materials and Methods

Ingredients:

Table1.Ingredients of the Kuppaimeni Chooranam

S.No	Tamil name	Botanical name	family	Parts used
1.	KUPPAIMENI	<i>Acalypha indica</i>	<i>Euphorbiaceae</i>	Leaves

Source of raw drug:

Required Raw drug is freshly collected from in and around Palayamkottai, Tirunelveli. It is identified and authenticated by the medicinal Botanist at Government Siddha Medical College and Hospital, Palayamkottai.

Purification of raw drugs:

The leaves of Kuppaimeni are freshly collected. The ingredients of the trial drug is purified according to the proper procedure drug.

Adulterants are removed and the leaves are dried in shade.

Method of preparation:

- Purified raw drug is made into fine powder.
- Then it is filtered using pure white cloth.

FT-IR study method

The drug was subjected to FT-IR analysis using KBr pressed disk technique on Analytical FT-IR spectrophotometer (Model: INFRA 3000-50) and the characteristic peaks were detected and recorded.[4],[5]

Results

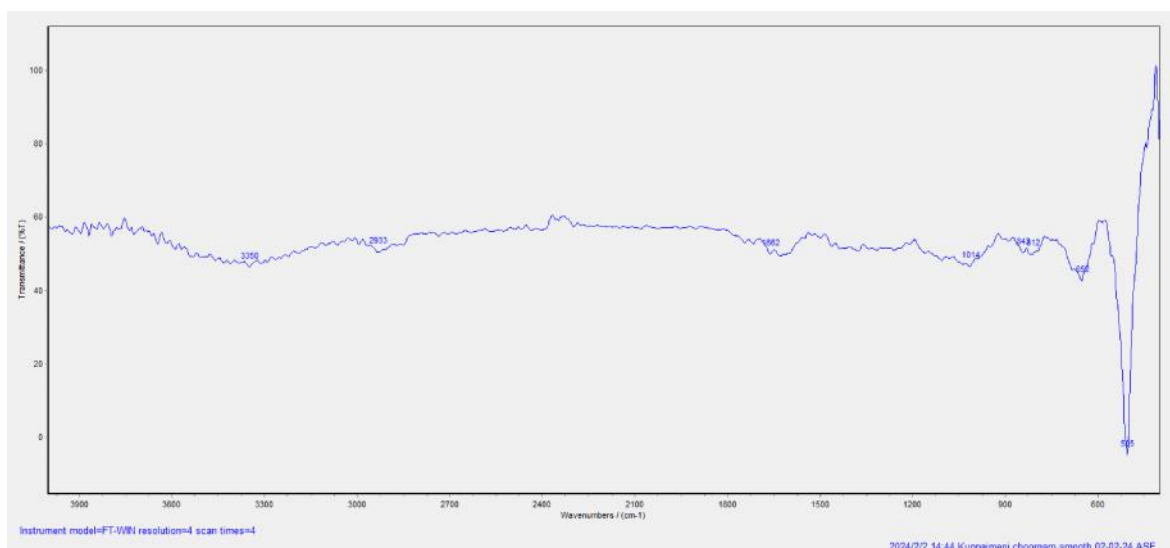


Table: 2. FTIR Interpretation of Kuppaimeni Chooranam

S. No	Peak	Characteristic Absorptions (cm ⁻¹)	Possible Functional Group	Class
1	505	300 -600	C-Br Stretch	Alkyl Halides
2	652	600 -900	C-H Bend	Alkynes
3	812	600 -900	C-H out of plane	Aromatics
4	843	600 -900	C-H out of plane	Aromatics
5	1014	900 -1200	(C-O) in C-OH group	Carbohydrate
6	1662	1500 – 1800	C=C Stretching	Alkene
7	2933	2700 -3000	C-H stretching	Alkane
8	3350	3300 -3600	ArO-H Bonded	Phenol, Alcohol

FTIR study of Kuppaimeni Chooranam exhibits the peak value at 505, 652, 812, 843, 1014, 1662, 2933, 3350 having C-Br stretch, C-H Bend, C-H out of plane, C-H out of plane, (C-O) in C-OH group, C=C Stretching, C-H stretching, ArO-H Bonded.[2],[3]

This peak values indicate the presence of some organic functional group such as Alkyl Halides, Alkynes, Aromatics, Carbohydrate, Alkenes, Alkane and Phenol. [4]

The presence of alkanes protects against bacteria and fungal infections and presence of aromatics are good pain relievers has anti inflammatory activity. Alkane is used to enhance the antioxidant activity of the drug.[6] Phenol in oil remains a reliable and time-tested treatment option for internal haemorrhoids.[5]. Phenol has been used to disinfect skin and to relieve itching.[7]

Conclusion

The instrumental analysis FTIR study for Kuppaimeni Chooranam reveals the presence of functional groups through the stretch and bend which is responsible for its functional activity. This study can be considered as the first step towards identifying the followed methods through FTIR analysis. Further research work is necessary to develop scientific evidence and establish the scientific validity of the drug.

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