ISSN: 2230-9926

Available online at http://www.journalijdr.com

IJDR

International Journal of Development Research
Vol. 13, Issue, 05, pp. 62834-62836, May, 2023
https://doi.org/10.37118/ijdr.26780.05.2023

REVIEW ARTICLE OPEN ACCESS

ASSESSMENT OF FUNCTIONAL GROUP IN HERBAL FORMULATION SATHAKUPPAI CHOORANAM THROUGH FOURIER TRANSFORM INFRARED SPECTROSCOPY

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ARTICLE INFO

Article History:
Received 20th March, 2023
Received in revised form
14th April, 2023
Accepted 28th April, 2023
Published online 30th May, 2023

KeyWords:

FT-IR, Sathakuppai Chooranam, Functional groups, Herbal siddha formulation, Kumbavatham, Periarthritis.

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ABSTRACT

Background: The Sathakuppai chooranam is a single herbal medicine used in the treatment of Kumbavatham (Periarthritis). **Objective:** This study is aimed to evaluating the morphology and elemental charecterization of the Sathakuppai chooranam. **Materials and methods:** The ingredients were collected and purified and the drug was prepared as per Siddha literature Siddha Vaithiya Pathartha Guna vilakkam. It is subjected into characterisation through FT-IR analysis. **Results:** The FT-IR characterization showed the presence of functional groups like O-H stretching (carboxylic acid, alcohol molecule), N-H stretching (amine salt),C-H stretching (alkene), N-H stretching (amine salt), C-H stretching (alkene),C=C stretching (conjugate alkene, cyclic alkene,alpha beta unsaturated ketone), N=H bending (amine),O-H bending (carboxylic acid, alcohol),C-O stretching (alkyl aryl ether, primary alcohol), C-N stretching (amine), S=O stretching (sulfoxide), C=C bending (alkene), C-Br stretching (halo compund)which ensures the therapeutic effect of drug. **Conclusion:** The instrumental analysis FT-IR study for Sathakuppai chooranam shows the presence of functional groups through the stretch and bends which is responsible for its functional activity. The functional groups present in Sathakuppai Chooranam have analgesic, anti-inflammatory activities. This will ensure the efficacy and therapeutic effect of Sathakuppai Chooranam. This study forms the base for the pharmaceutical analysis of the Sathakuppai Chooranam.

Citation: ***Mathina Afrin S.A., Manoharan A and Subash Chandran G. 2023.*** "Assessment of functional group in herbal formulation sathakuppai chooranam through fourier transform infrared spectroscopy". *International Journal of Development Research*, 13, (05), 62834-62836.

INTRODUCTION

Siddha medicine is a traditional and ancient form of medicine that originated in South India. In siddha medicine, medicines are prepared from herbal, mineral and animal ingredients. Based on the principles of this medicine, our body is made up of Panchaputhams. That body is run by the vital elements, vadam, pitham, kabam. When these are out of proportion, disease may occur. The sathakuppai chooranam is taken from the siddha literature siddha vaithiya pathartha guna vilakkam used to treat kumbavatham (periarthritis). Fourier transform infrared spectroscopy FTIR is a technique used to obtain infrared spectrum based on the amount of absorption or transmittance of infrared in the sample. ftir is frequently used in a wide range of structural analysis and non destructive measurement application. It is an analytical methodology used in industry and academic laboratories to understand the structure of individual molecules and the composition of molecular mixture.The infrared light is absorbed at specific frequency directly related to the atom-to-atom vibrational bond energy in the molecule. Different bonds in a molecule vibrate at different energies and therefore absorb different wavelength of infrared radiation.The position and intensity of these individual absorption bands contribute to the overall spectrum creating a characteristic fingerprint of the molecul.

MATERIALS AND METHODS

Collection of raw materials: The raw drug is collected in and around palayamkottai Tirunelveli.

Authentication of raw materials: The raw drug is identified and authenticated by the medicinal botanist at government siddha Medical College and hospital, palayamkottai.The adulterants in the raw drug were removed and dried in the shade then the drug were course powdered and then bottle up.

Table 1. Ingridients of Sathakuppai Chooranam

S.No	Tamil Name	Scientific Name	Parts Used	Quantity
1	Sathakuppai	*Anethum graveolens*	fruits	Q.S

Dosage:1g twice a day
Indication: Kumbavatham (Periarthritis)

RESULTS AND DISCUSSION

FTIR analysis: FTIR Spectra were recorded at siddha regional Research Institute, poojapura, thiruvananthapuram, Kerala.

Instrument model =FT-WIN was used to derive the FT-IR spectra of Sathakuppai chooranam

Amine: 3-hydroxy-L-kynurenamine is a biogenic amine produced via an alternative pathway of tryptophan metabolism.It has an anti inflammatory profile by inhibiting the IFN-gamma and it consequently decrease the release of pro inflammatory chemokines, cytokines most notably TNF, IL-6 and IL12p70.

Carboxylic acid: Some of these compounds showed potent analgesic activity and interesting nonsteroidal anti-inflammatory properties in different acute and chronic inflammation models.

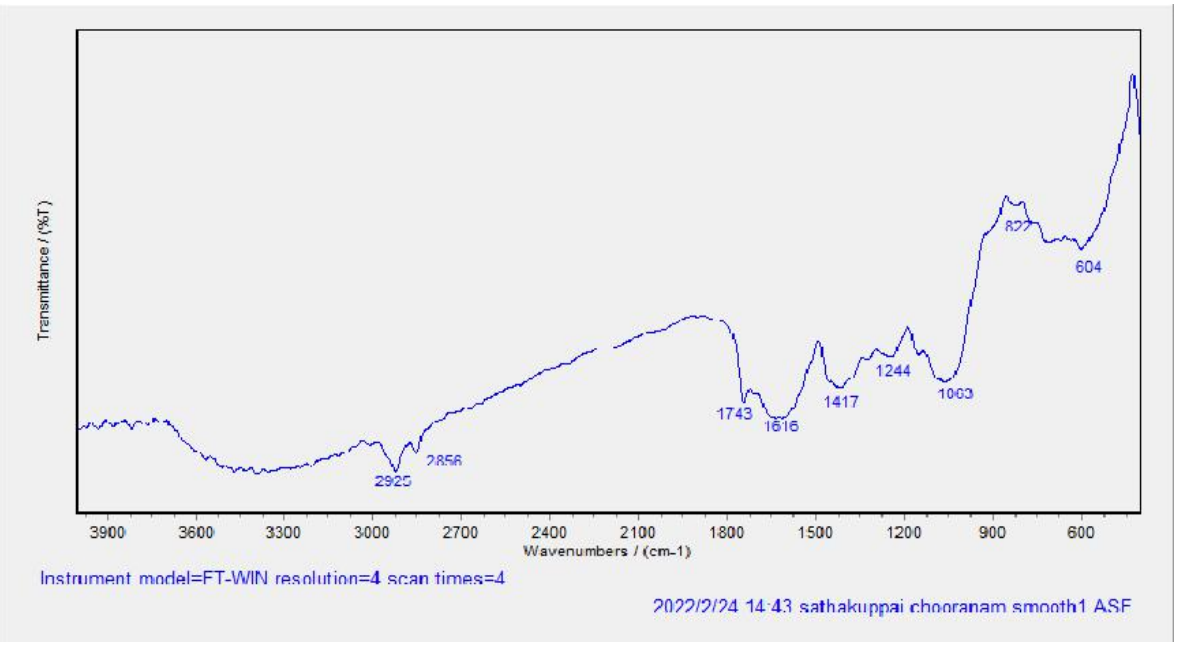

Figure 1. FT-IR Spectra of Sathakuppai Chooranam

Table 2. List of functional groups

S.No	Wave Number (cm^{-1})	Vibrational modes of sathakuppai chooranam in IR region	Functional group
1	2925	O-H Stretching N-H Stretching C-H Stretching	Carboxylic Acid,Alcohol, amine Sal. Alkene.
2	2856	N-H Stretching C-H Stretching	Amine Salt. Alkene
3	1616	C=C Stretching N=H Bending	Conjugate Alkene, Cyclic Alkene,α,β-unsaturated ketone Amine
4	1417	O-H Bending	Carboxylic acid,Alcohol
5	1244	C-O Stretching C-N Stretching	Alkyl aryl ether Amine
6	1063	C-O Stretching S=O Stretching	Primary salcohol Sulfoxide
7	822	C=C Bending	Alkene
8	604	C-Br Sretching	Halo Compound

Amine salts: Amine cyanoboranes and amine carboxy boranes were shown to inhibit inflammation.the analogs effectively blocked general inflammation, induced arthritis,the writhing reflex associated with inflammation pain.

Alcohol: Moderate alcohol consumption reduce biomarkers of inflammation including CRP, IL-6,TNF alpha2.Alcohol's anti inflammatory effects are also thought to be one of the reasons it appears to be lower the cardiovascular disease.

Sulfoxide: Dimethyl sulfoxide is an agent with a wide spectrum of pharmacological activity including membrane penetration, anti inflammatory effects, local analgesia,weak bacteriostasis.It has been given orally, intravenously, or topically for a various indication.

CONCLUSION

From the above study, Sathakuppai chooranam shows the presence of functional groups like O-H stretching (carboxylic acid, alcohol molecule),N-H stretching (amine salt),C-H stretching (alkene), N-H stretching (amine salt), C-H stretching (alkene),C=C stretching (conjugate alkene, cyclic alkene,alpha beta unsaturated ketone),N=H bending (amine),O-H bending (carboxylic acid, alcohol),C-O stretching (alkyl aryl ether, primary alcohol),C-N stretching (amine),S=O stretching (sulfoxide), C=C bending (alkene), C-Br stretching (halo compund)which ensures the therapeutic effect of drug.the functional groups present in the Sathakuppai Chooranam have analgesic,anti-inflammatory activities.This will be ensure the

efficacy and therapeutic effect of the drug Sathakuppai Chooranam.This study forms the base for the pharmaceutical analysis of the Sathakuppai Chooranam.

Acknowledgement: I wish to express my sincere thanks to Dr. A.Manoharan, M.D(S),Ph.D., Professor and HOD, and Dr. G.Subash chandran M.D (s), Ph D, Reader, Department of Pothu maruthuvam, GSMC&H, Palayamkottai for the valuable guidance. I wish to express my sincere thanks to Siddha Regional Research Institute, Poojappura, Thiruvananthapuram, Kerala for their study support.

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