

**INTERNATIONAL JOURNAL OF CURRENT RESEARCH IN
CHEMISTRY AND PHARMACEUTICAL SCIENCES**

(p-ISSN: 2348-5213; e-ISSN: 2348-5221)

www.ijcrfps.com

DOI:10.22192/ijcrfps

Coden: IJCROO(USA)

Volume 4, Issue 6 - 2017

Research Article



DOI: <http://dx.doi.org/10.22192/ijcrfps.2017.04.06.009>

Standardization of Ayakantha chendhooram through Fourier Transform Infrared Spectroscopy

Muthumari K R^{*1}, Helen Sathiya X¹, Kanakavalli K², Anbu N²

¹PG Scholar, Govt Siddha Medical College, Chennai, Tamilnadu, India

²Professor, Post Graduate Dept of Maruthuvam, Govt Siddha Medical College, Chennai, Tamilnadu, India

***Corresponding author: Muthumari K R**

PG Scholar, Govt Siddha Medical College, Chennai, TN, India

E-mail: drmuthumarikrishnan@gmail.com

Abstract

Knowledge of traditional medicines has been grown along with the evolution of human. But its importance was faded during recent past due to introduction of modern drugs and now it is again rejuvenating due to the former's adverse effects. With this awareness, it is important to standardize the traditional drugs to evaluate the quality of drugs through which those could be safely and effectively used for treating various diseases. In this way, *Ayakantha chendhooram*, a Siddha traditional medicine is studied through Fourier Transform Infrared Spectroscopy to identify the functional groups present in it. Primary and secondary amines, alkanes, aliphatic compounds, esters, alcohols and alkyl halides are observed in the study.

Keywords: Ayakantha chendhooram, functional groups

Introduction

Siddha system of medicine is a traditional system grown by various Siddhars who belong to South India in which herbs, metals and minerals are used in traditional medicines for treating various diseases. There is a global resurgence in the use of Ayurveda, Siddha and Unani (ASU) medicines along with a growing scientific interest in them as a source of new drugs.^[1] There has been a boom in the usage of ASU drugs and export is appreciably high in the last two decades.^[2] Though herbal products have been gaining importance throughout the world, one of the obstacle is the lack of standardization of drugs. Furthermore, the constituents responsible for the claimed therapeutic effects are frequently unknown or only partly explained. This is further complicated by the use of combination of herbal ingredients as being used in traditional practice. It is common to have as many as five different herbal ingredients in one product.^[3] So, standardization is necessary for herbal drugs and products before its

clinical application. *Ayakantha Chendhooram* is a herbo-mineral preparation in which Iron and Magnetic oxide of iron are major ingredients. Modern instruments are helpful analyse herbal and herbo mineral drugs. FTIR characterization was done for *Ayakantha chendhooram* to identify the functional group present in the drug. Thus it can create fingerprints to standardize this medicinal formulation.

Materials and Methods

Details regarding sample

The ingredients of Ayakantha Chendhooram are Iron (Ayam), magnetic oxide of Iron (Kantham) juice of *Ponnanganni* (*Alternanthera sessalis*) and juice of *Naarukaranthai* (*Spheroanthus amarointhoides*) as mentioned in *Nasakanda venba*.

Drug collection

All the raw materials were obtained from Country drug shop, Ramaswamy chetti, Parrys, Chennai.

Identification and Authentication

All the raw drugs were identified and authenticated at Department of Botany and Gunapadam experts in Govt Siddha Medical College, Chennai. The drug was prepared in the laboratory of Gunapadam in Govt. Siddha medical college, Arumbakkam, Chennai.

Purification

The iron ore was made into powder and was immersed in *Syzygium cumini* fruit juice. Then it is placed in sunlight till the moisture of juice is dried out. The process is repeated for 6 times.^[4]

The magnetic oxide of iron is heated in a furnace and dipped in horse gram decoction for 10 times to get it in purified form.

Preparation

Purified magnetic oxide of iron and iron were taken with equal quantity, they ground with breast milk in a stone mortar. Then it was made into a pellet and dried. The pellet was kept in an earthen crucible which was closed with another earthen crucible and was sealed by mud smeared cloth and was dried. Then it was incinerated by using 50 low dung lakes. Again the mixture which was kept in earthen crucible was taken by ground with equal quantities of *Alternanthera sessilis* and *Spheroanthus amaranthoides* juices for 4 samam (12 hrs). Again it was incinerated into 50 low

dung lakes. The end product was collected and kept in an air tight container.^[5]

Details regarding experiment

Fourier Transform-Infra Red Spectroscopy (FTIR)

FTIR analysis was done at SAIF, IIT Madras. IR data was acquired using Perkin elmer FT-IR spectrometer. For sampling techniques, KBr method (Price, 1972) was followed. The sample was ground using an agate motor and pestle to give a very fine powder. The finely powder sample was mixed with about 100 mg dried potassium bromide salt. The mixture was then pressed under hydraulic press using a die to yield a transparent disc (measure about 13 mm diameter and 0.3 mm in thickness) through which the beam of spectrometer passed. The analysis was carried out using BRUKER RFS 27: Standalone FT-Raman Spectrometer.

Results

In FTIR spectra analysis this Herbo-mineral drug *Ayakantha chendhooram* sample exhibits the peak value shows in table at the wave number 3395, 3011, 2925, 2853, 1645, 1461, 1408, 1167, 1075, 887, 721, 604 having N-H Stretch, C-H Stretch, C-H stretch, C-H stretch, C=O, N-H stretch, C-H stretch, C-C stretch, C-N, C-O stretch, C-N stretch, C-H stretch, C-H stretch, C-Br stretch. This indicates the presence of some organic functional groups such as primary and secondary amines, alkanes, aliphatic compounds, esters, alcohols and alkyl halides.

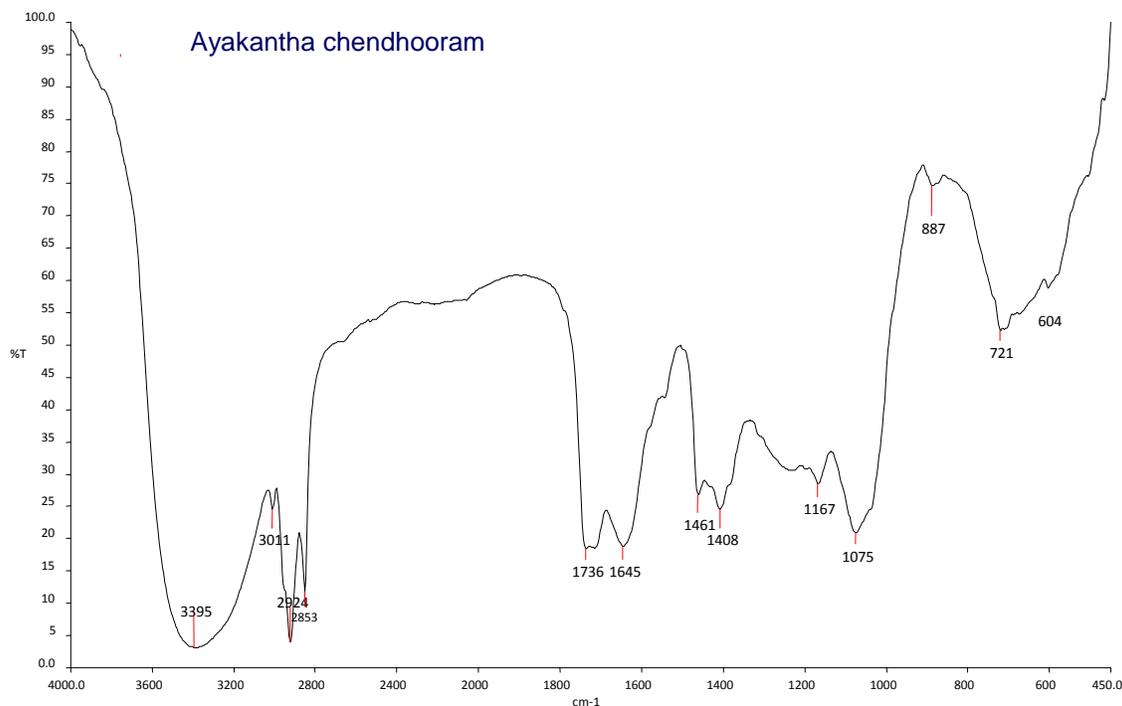


Table 1

Absorption peak cm^{-1}	Stretch	Functional group
3395	N-H stretch	1*,2* amines and amide
3011	C-H stretch	Aromatics
2924	C-H stretch	Alkanes
2853	C-H stretch	Alkanes
1736	C=O stretch	Esters
1645	N-H stretch	1* amines
1461	C-H stretch	Alkanes
1408	C-C stretch	Aromatics
1167	C-O stretch	Alcohols
1075	C-N stretch	Aliphatic amines
887	C-H stretch	Aromatics
721	C-H stretch	Alkanes
604	C-Br stretch	Alkyl halides

Discussion

FTIR analysis is utilized to find out the organic nature of sample as well as metal oxygen Stretching frequencies. The presence of some organic functional groups such as primary and secondary amines, alkanes, aliphatic compounds, esters, alcohols and alkyl halides were identified in the herbo-mineral Siddha medicine *Ayakantha chendhooram* through FTIR Analysis. Though iron and magnetic oxide of iron are the two major ingredients of the drug, there may be the presence of some inorganic compounds in this drug such as Fluoride and Chloride compounds which were indicated through the frequencies observed at the above mentioned wave number.^[6] The presence of Flourine and Chlorine additionally helps in the proper formation of bone, teeth and in the regulation of acid base balance, which may be confirmed through further studies.^[7]

Conclusion

These observed data from this FTIR characterization helps to standardize this Siddha compound drug *Ayakantha chendhooram* regarding its functional behaviour. Some organic functional groups such as primary and secondary amines, alkanes, aliphatic compounds, esters, alcohols and alkyl halides were identified in the drug. Besides iron and magnetic oxide of iron, presence of fluoride and chloride is identified

through observed frequencies, because of this reason though Siddha literature states that this drug is indicated for diseases such as Jaundice, Vatha diseases etc. the presence of Flourine and Chlorine additionally helps in the proper formation of bone, teeth and in the regulation of acid base balance, which may be confirmed through further studies. So, the author hopes that this study could help future studies regarding *Ayakantha chendhooram*.

Acknowledgments

Authors wish to express their thanks to SAIF, IIT Madras, and the faculties of Post graduate Maruthuvam department, Govt. Siddha Medical College, Chennai.

References

1. Urmila Thatte, Clinical Research Ayurvedic Medicines. Pharma Times, 2005; 37(7): 9-12.
2. Sathiyarajeswaran P et al., Powder Diffraction fingerprints on cinnabar and its preparations. Journal of Siddha, 2009; 2(1): 29- 33.
3. Kunle, Oluyemisi Folashade *, Egharevba, Henry Omoregie and Ahmadu, Peter Ochogu, Standardization of herbal medicines - A review, International Journal of Biodiversity and Conservation Vol. 4(3), pp. 101-112, March 2012

4. Thyagarajan R, Gunapadam Part II, First edition reprint, 2013, Pg. No. 91
5. M. Vadivelu mudhaliyar, Nasakanda venba, 1926, Pg.No.31, 32
6. Foil A Miller and Charles H Wilkins, Infrared spectra and Characteristic Frequencies of Inorganic Ions Their Use in Qualitative Analysis, Mellon Institute, Pittsburgh
7. Satyanarayana U, Chakrapani U, Essentials of Biochemistry, Second revised edition, reprint 2015, Pgeno. 211, 212.

Access this Article in Online	
	Website: www.ijrcrps.com
	Subject: Siddha Medicine
Quick Response Code	
DOI: 10.22192/ijrcrps.2017.04.06.009	

How to cite this article:

Muthumari K R, Helen Sathiya X, Kanakavalli K ' Anbu N. (2017). Standardization of Ayakantha chendhooram through Fourier Transform Infrared Spectroscopy. Int. J. Curr. Res. Chem. Pharm. Sci. 4(6): 48-51.
DOI: <http://dx.doi.org/10.22192/ijrcrps.2017.04.06.009>