

## ***FUNCTIONAL GROUP ANALYSIS OF AYAKANTHA CHENDHURAM BY FOURIER TRANSFORM INFRARED SPECTROSCOPY***

***Jency Risha.T<sup>1</sup>, Thiruthani.M<sup>2</sup> Chenthamarai Selvi.G<sup>3</sup>***

<sup>1</sup> P.G.Scholar, *Department of Nanju Noolum Maruthuva Neethi Noolum*, Government Siddha Medical College, Palayamkottai, Tamil Nadu, India. E-Mail: Jencyrisha@Gmail.Com

<sup>2</sup> Head Of The Department, *Department of Nanju Noolum Maruthuva Neethi Noolum*, Government Siddha Medical College, Palayamkottai, Tamil Nadu, India.

<sup>3</sup> Lecturer Grade-II, *Department of Nanju Noolum Maruthuva Neethi Noolum*, Government Siddha Medical College, Palayamkottai, Tamil Nadu, India.

### **ABSTRACT**

Siddha system is one of the ancient traditional systems of medicine for treating various disease conditions by the herbals and herbo – mineral drugs. Today, there is a need to evaluate our ancient knowledge on modern parameters to establish Siddha medicine as a main stream medical science. Standardization are essential analytical tools to upgrade the medicine. FTIR showed the peak values which are the functional groups present. *Ayakantha Chendhuram* is used in the treatment of various disorders especially Anaemia (*Paandu noi*) and its related pathological conditions. The aim of the present study was to standardize the Siddha herbo – mineral formulation (*Ayakantha Chendhuram*) by doing the Fourier Transform Infrared Spectroscopy (FTIR) and the results were noted. This study will highlight the functional groups by using the standardizing technique for the herbo – mineral formulation and brings it to the next level of research.

**KEY WORDS:** *Ayakantha Chendhuram*, FTIR, Siddha drugs, *ayam*, *kantham*, *ayakantham*, *ayakantham* standardization.

## INTRODUCTION

Siddha system of medicine is based on various amazing principles such as the theory of *Arusuvai*, Theory of *Panchabootham*, Concept of 96 *thathuvam*, the concept of *Naadi* and other principles. Based on these type of specialized concepts such as principles *Arusuvai*, *Panchabootham* Siddha medicine was formulated to treat various diseases. The herbo-mineral drug are used in traditional medicinal practice. In this isolated active principles and the chemical constituents are used in treatment of various diseases. Standardization and quality control are essential analytical tools to guarantee the correct identifications of drugs. Adulteration and misidentification of herbal drug can cause dreadful health problems to the public. Impurities also cause the health problems. So the purification of herbo-mineral drugs is very important process. Throughout the world, Anaemia (*Paandu noi*) is a grave health problem due to poor nutrition & food habits. So the necessity for an effective and safe drug in practice arises. One of the potent herbo-mineral formulations *Ayakantha Chendhuram* in IMPCOPS Siddha Formulation taken for this study. FTIR method is used to identify the functional groups which present in the *Ayakantha Chendhuram* is helpful to standardize the drug.

## MATERIALS AND METHODS

### INGREDIENTS

INGREDIENTS	CHEMICAL/BOTANICAL NAME
<i>Ayam</i>	Ferrum
<i>Ganthagam</i>	Sulphur
<i>Lingum</i>	Red sulphide of mercury
<i>Vediyuppu thiravagam</i>	Potassium nitrate
<i>Manjal karisalai juice</i>	<i>Sphagneticola calendulacea</i>

### COLLECTION OF DRUG

Drug is purchased from IMPCOPS, Palayamkottai branch from Thirunelveli on December 2017, Batch no:SII – 137.

## DETAILS ABOUT 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. Infrared spectroscopy is one of the most powerful analytical techniques which offer the possibility of chemical compound identification. It provides useful information about the structure of the molecules. The technique is based upon the simple fact that a chemical substance shows marked selective absorption in the infrared region. After absorption of IR radiations, the molecule of a chemical substance vibrate at many rate of vibration, giving rise to close-packed absorption bands, called an IR absorption spectrum which may extend over a wide wavelength range. Various bands will be present in IR spectrum which will correspond to the characteristic functional groups and bonds present in a chemical substance. Thus, IR spectrum of a chemical substance is a fingerprint for its identification.

Band position in an infrared spectrum may be expressed conveniently by the wave number ' $\nu$ ' whose units is  $\text{cm}^{-1}$ . A Nicolet 5700 FTIR USA, instrument was used for recording the IR spectra with 2-3mg of the sample as KBr pellet. IR spectra of the drug was recorded. A small quantity of dry KBr was mixed with a little amount the sample and ground for homogenization. An IR lamp was used for drying during mixing. The mixture was then pressed into a transparent thin pellet at  $5 \text{ ton/cm}^2$ . These pellets were used for IR spectral recording. The standard absorption regions of various chemical species are given in table-I.

## RESULTS AND DISCUSSION

Fig:1

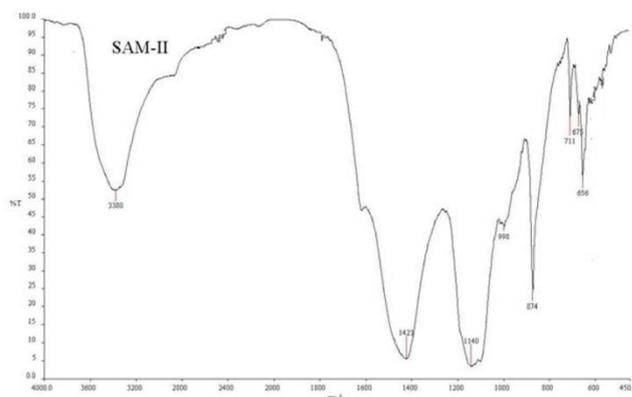


Table:1

<b>BOND</b>	<b>TYPE OF BOND</b>	<b>ABSORPTION PEAK</b>	<b>INTENSITY</b>
OH	Alcohol, Water	3380	Strong
C=C	Aromatic	1423	Weak
C-OH	Any	1140	Strong
C-H	Aromatic	998	Strong
N-H	Amines	874	Strong
C-Cl	Any	711	Strong
C-Br	Any	675	Strong
C-Cl	Any	656	Strong

In FTIR spectra analysis this herbomineral drug Ayakantha Chendhuram sample exhibits the peak value shows in table:1 at the wave number 3380, 1423, 1140, 998, 874, 711, 675, 656 having OH stretch, C=C stretch, C-OH stretch, C-H stretch, N-H stretch, C-Cl stretch, C-Br stretch, C-Cl stretch. This indicates the presence of some organic functional groups such as **Alcohol, water, Aromatic, Amines, and unknown functional groups** are also present. In the presence of Iron and Sulphur of this drug their maybe some inorganic compounds such as Chloride and Bromide which were indicated through the frequencies observed at the above mentioned wave number. The Chloride and Bromide which present in this drug will regulate the acid-base balance. So, this drug will used for further studies.

### **CONCLUSION**

These observed data from this FTIR characterization helps to standardize this herbomineral compound drug Ayakantha Chendhuram regarding its functional behavior. Some organic and inorganic functional groups are identified in this drug. This drug is useful in various types of Anaemia and its related pathological conditions, the presence of Chloride is regulate the acid-base balance. So, the author hopes that this study could help future studies regarding Ayakantha Chendhuram.

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