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**Analysis of the Siddha drug *Gowthamar chooranam*  
using FTIR and SEM Techniques.**

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**Abstract**

Siddha system is a wonderful medical system since ancient times. The medical system fully depends upon concept of the nature. Herbals are always having highly potent medicinal value without causing any adverse effects. *Gowthamar chooranam* is one of the best Siddha formulation indicated in Siddha literatures for the management of hepatic diseases. Though this formulation is being used in clinical practice, Scientific documentation to standardize this drug is essential nowadays. So, the Siddha formulation *Gowthamar chooranam* is subjected into characterization using FTIR and SEM. The results confirmed that the presence of functional groups Amide, Phenols and alcohols, Alkanes, Aldehyde, Amine, Alkenes, Alkanes, Ester, ether, Alkyne. The results of SEM analysis shows the morphological nature of the drug *Gowthamar chooranam*. These findings will help for further research in *Gowthamar chooranam*.

**Keywords:** Siddha drug, herbal drug, *chooranam*, *Gowthamar Chooranam*.

**Introduction**

Herbals are widely used in traditional medicines. For getting more scientific knowledge the traditional medicines need much more investigation<sup>[1]</sup>. Various medicinal compounds were identified in herbals. Those are always considered as safe with great medicinal value. The pharmaceutical principles of Siddha medicines is a specialized one. Many modern drugs are causing hepatotoxicity nowadays. Various herbals such as *Phyllanthus emblicus*, *Terminalia chebula*, *Piper longum* etc., having the property of hepatoprotective<sup>[2,3]</sup>.

*Gowthamar chooranam* is a sastric poly herbal Siddha formulation which was indicated as a good drug to treat jaundice<sup>[4]</sup>. There is no scientific foot prints are available regarding this formulation. Characterization studies such

as FTIR, SEM were carried out to standardize this formulation. This study will be helpful for structural and functional determination of this drug in various ways.

**Materials and Methods**

FT-IR is an important and more advanced technique to identify the functional group. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular fingerprint of the sample. Like the finger print there is no two unique molecular structures producing the same infrared spectrum. It is recorded as the wavelength and the peaks seen in the spectrum indicates the amount of material present.

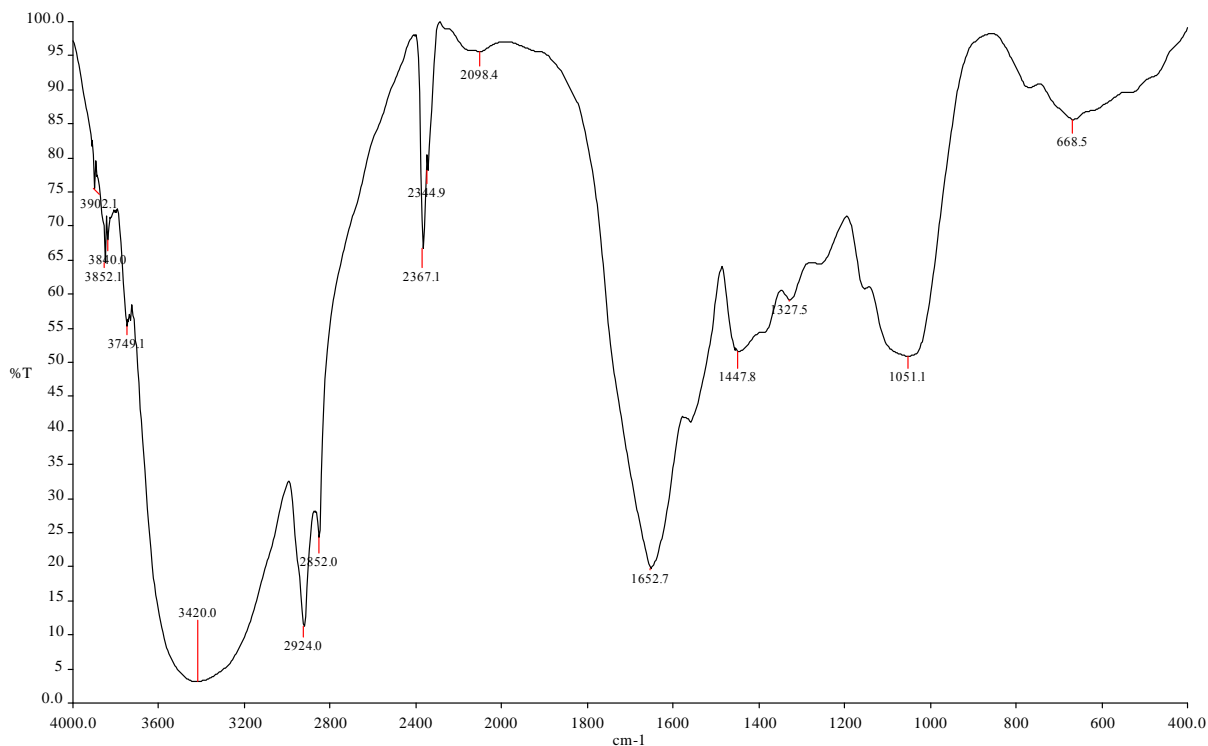
**Details regarding the FT-IR analysis.**

The Perkin Elmer Spectrum One Fourier Transform Infrared (FTIR) Spectrometer was used to derive the FT IR Spectra of *Gowthamar chooranam* in Potassium Bromide (KBr) matrix with scan rate of 5 scan per minute at the resolution 4cm<sup>-1</sup> in the wave number region 450-4000cm<sup>-1</sup>. The samples were grounded to fine powder 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 13 mm diameter and 0.3 mm in thickness) to recorded the FT- IR Spectra under Standard condition [5]. FT- IR Spectra were used to determine the presence of the functional groups and bands in the *Gowthamar chooranam*. The recorded spectrum shows in figure 1.

**SEM (Scanning Electron Microscope)**

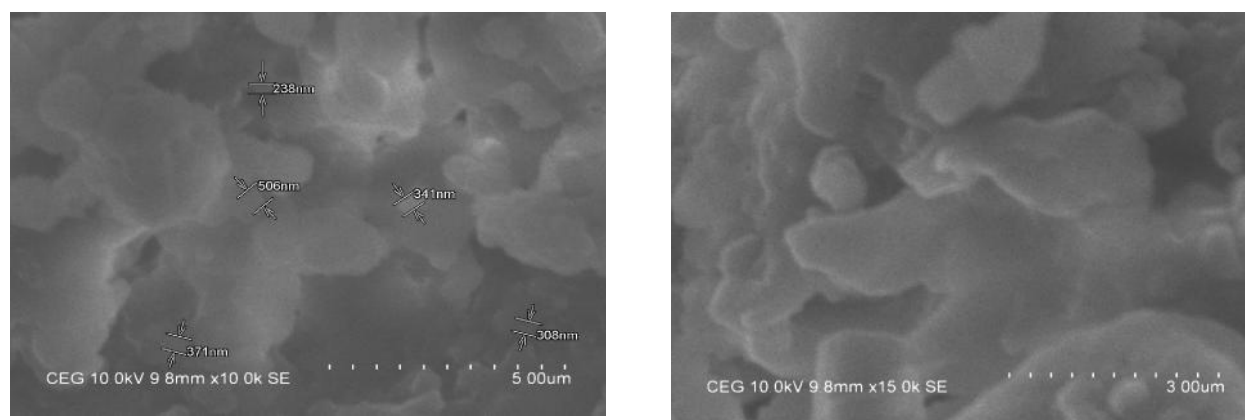
The study was carried out in Anna University, Chennai.

**Results**

**Figure 1 FT-IR Spectra (Fourier Transform Infra Red)**

**Table 1. FT-IR Interpretation**

Absorption peak cm <sup>-1</sup>	Stretch	Functional group
3852.1	N-H stretch	Amide
3420.0	O-H stretch	Phenols and alcohols
2924.0	H-C-H stretch	Alkanes
2852.0	C=O stretch	Aldehyde
2367.1	N-H stretch	Amine
2344.9	N-H Stretch	Amine
1652.7	C-C=C symmetric stretch	Alkenes
1447.8	H-C-H bend	Alkanes
1327.5	C-O stretch	Ester, ether
1051.1	C-O stretch	Ester, ether
668.5	C-H bend C-C stretch	Alkyne



**Figure 2. SEM: (Scanning Electron Microscope)**

Through SEM analysis, the particles of the siddha poly herbal formulation were found near 200nm -500 nm (Figure 2).

### Discussion

The FTIR results shows the observed N-H stretch, O-H stretch, H-C-H stretch, C=O stretch, N-H stretch, C-C=C symmetric stretch, H-C-H bend, C-O stretch, C-H bend, C-C stretch which indicates that the presence of functional groups Amide, Phenols and alcohols, Alkanes, Aldehyde, Amine, Alkenes, Alkanes, Ester, ether, Alkyne. The results of SEM analysis shows the morphological nature of the drug *Gowthamar chooranam*.

### Conclusion

Nowdays it is very essential to validate the traditional formulations to get various knowledge regarding the science behind those formulations. This FTIR and SEM characterization findings of *Gowthamar chooranam* helps to standardize this drug. Pharmacological investigation and clinical trial have to be carried out on this formulation. These results will help in structural identification of this drug and further research on this drug.

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