WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 7, Issue 11, 985-989. Research Article ISSN 2277–7105

STANDARDIZATION OF SIDDHA HERBAL FORMULATION JEEVASHAKTHI DHRAVAGAM THROUGH FTIR AND ICP-OES TECHNIQUES

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Article Received on
13 April 2018,
Revised on 03 May 2018,
Accepted on 24 May 2018
DOI: 10.20959/wjpr201811-12476

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ABSTRACT

Siddha medicine is an ancient traditional system of medicine in south india. Herbals are mostly used in the siddha system for its high therapeutic and potential values. Dhravagam is a ancient method to prepare the distillation from the drug. In siddhar's dhravagam is used for all the diseases especially in emergency and prophylactic measures. One of the herbal siddha formulation is Jeevashakthi Dhravagam which was indicated for the vatha diseases. The aim of the present study was to standardize the siddha herbal formulation JSD through FTIR and ICPOES analysis. FTIR analysis revealed the presence of Alcohols, Amines, Alkanes, Alkyl Halide, Nitro compounds and Aliphatic amines in the drug. ICPOES analysis showed that the drug has presence of Calcium, Iron, Potassium, Magnesium, Sodium and Phosphorus. Further, heavy metals such as Cadmium, Copper, Mercury, Nickel and Lead within the permissible limits.

KEYWORDS: Jeevashakthi dhravagam, FTIR, ICPOES.

INTRODUCTION

Siddha medicine, which is mostly prevalent in tamilnadu (south eastern india) is popular among tamil speaking people even outside of this region. Medicine in siddha system are mainly plants, minerals and metals. In recent days traditional medicines are attaining greater

importance due to its safety and efficacy. Medicinal plants are rich in phytochemicals which have potential to cure various diseases. Though herbal products have become increasingly popular throughout the world, one of the impediments in its acceptance is the lack of standard quality control profile. The quality of herbal medicine that is, the profile of the constituents in the final product has implications in efficacy and safety.[1] So there is standardization is necessary for a herbal drug to ensure its safety and efficacy. The standardization of Jeevashakthi dhravagam through FTIR and ICPOES analysis revels the presence of functional groups and minerals respectively.

MATERIALS AND METHODS

Details regarding the sample

The drug ***Jeeva shakthi dhravagam*** was prescribed in Siddha literature "Pathartha guna vilakkam" (moola vargam).[2] which is indicated for all vatha diseases and mental disorders. The ingredients of the drug are,

1. *Piper betle*
2. *Syzigium aromaticum*
3. *Citrus medica*
4. *Rosa chinensis*

Details regarding the experiment

1. FTIR Analysis

FT-IR spectra were recorded at SAIF, IIT Madras, India. The Perkine Elmer Spectrum One Fourier Transform Infrared (FTIR) Spectrometer was used to derive the FT IR Spectra of ***Jeeva shakthi dhravagam*** in Potassium Bromide (KBr) matrix with scan rate of 5 scan per minute at the resolution 4cm^{-1} in the wave number region 450-4000cm-1. 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 FTIR Spectra under Standard conditions (4). FT- IR Spectra were used to determine the presence of the functional groups and bands in the ***Jeeva shakthi dhravagam***.

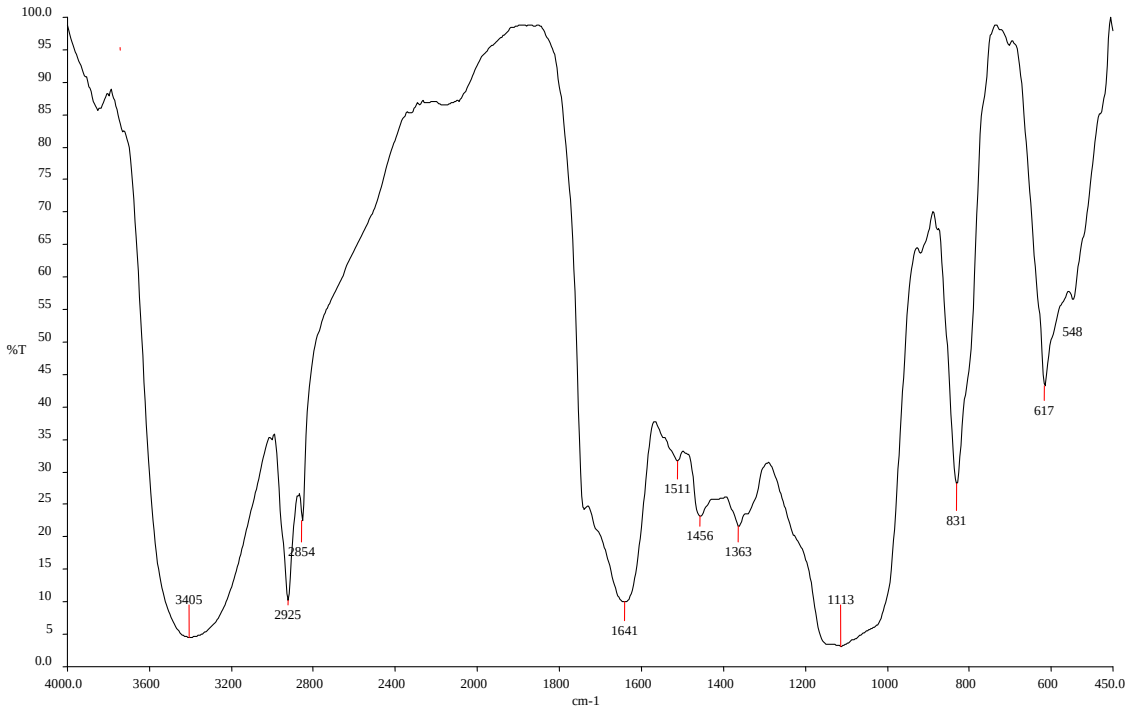
2. ICP-OES Analysis

The Inductively Coupled Plasma Optical Emission Spectrometric (ICP-OES) analysis was done at SAIF in IIT MADRAS, Chennai - 36 using Perkin Elmer Optima 5300 DV. The

digestion sample was prepared by using 100 mg of ***Jeeva shakthi dhravagam*** added with 3 ml of Nitric acid and 25 ml of Distilled water.

RESULTS

FTIR



Absorption Peak cm^{-1}	Stretch	Functional Group
3405	O-H Stretch, N-H Stretch,	Alchohols,1^o & 2^o amines
2925	C-H Stretch,	Alkanes
2854	C-H Stretch,	Alkanes
1641	N-H bend	1^o Amines
1511	N-O asymmetric Stretch	Nitro compounds
1456	C-H Bend	Alkanes
1363	C-H Rock	Alkanes
1113	C-N Stretch	Aliphatic amines
831	C-Cl Stretch	Alkyl halides
617	C-Cl Stretch	Alkyl halides
548	C-Br Stretch	Alkyl halides

ICP-OES Analysis

S.No	Elements	Detected levels
1.	Ca	12.160 mg/L
2.	Cd	BDL
3.	Cu	BDL
4.	Fe	2.346 mg/L
5.	Hg	BDL
6.	K	13.801 mg/L
7.	Mg	1.324 mg/L
8.	Na	4.390 mg/L
9.	Ni	BDL
10.	Pb	BDL
11.	P	106.341 mg/L

BDL- Below Detectable Level

DISCUSSION

In the FT-IR Spectra analysis, this sample *Jeevashakthi dhravagam* exhibits the peak value shows in Table 1 at the wave number of 3405, 2925, 2854, 1641, 1511, 1456, 1363, 1113, 831, 617, having O-H stretch, N-H stretch, C-H stretch, C-O stretch, C-H Bend, C-H rock, C-N stretch, C-Cl stretch and C-Br Stretch. This indicates the presence of some organic functional groups such as Alcohols, Amines, Alkanes, Alkyl Halide, Nitro compounds and Aliphatic amines.

ICP-OES analysis shown that the drug has Cadmium, Copper, Mercury, Nickel and Lead at Below Detectable Level which shows that the drug is safe for administration. Further JSD contains minerals Calcium, Iron, Potassium, Magnesium, Sodium and Phosphorus within the WHO permissible limits. Calcium is required for development of bone and teeth. It interacts with troponin C to trigger muscle contraction and is necessary for nerve transmission.[3] Iron is an important component of heme part of haemoglobin.[4] Potassium maintains intracellular osmotic pressure and is required for the transmission of nerve impulse.[5] Magnesium is necessary for proper neuro muscular function.[6] Sodium is necessary for normal muscle irritability and cell permeability.[7] Phosphorus is required for required for the formation of phospholipids, phosphoproteins and nucleic acids.[8] The indication for JSD is all kind of vatha diseases i.e Nerve, muscle and bone diseases. Since, the ingredients present in JSD are required for proper functioning of bone, muscle and nerves, the drug is useful for the treatment of vatha diseases.

CONCLUSION

The present FTIR analysis shows the presence of Alcohols, Amines, Alkanes, Alkyl Halide, Nitro compounds and Aliphatic amines in the drug Jeevashakthi Dhravagam. The presence of Calcium, Iron, Potassium, Magnesium, Sodium and Phosphorus are revealed from ICPOES analysis. As these minerals are required for proper functioning of nerves and joints this drug can be given to treat loss of appetite and various vatha diseases. Further, Cadmium, Copper, Mercury, Nickel and Lead is present at Below Detectable Level indicates that the drug is safe for administration.

ACKNOWLEGEMENT

Authors are thankful to Sophisticated Analytical Instrument Facility (SAIF), IIT madras and faculties of Postgraduate Dept. of Sirrappu maruthuvam, Government siddha medical college, Chennai for their valuable support.

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