WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.074
Volume 8, Issue 6, 651-677. Research Article ISSN 2277– 7105

SCREENING OF POTENTIAL FUNCTIONAL GROUPS PRESENT IN A NOVEL SIDDHA METALLO-MINERAL FORMULATION *KAALAMEGA NARAYANA CHENDHOORAM* AS MENTIONED IN *ATHMARAKSHA MIRTHAM ENNUM VAITHIYA SAARA SANGERAHAM* THROUGH A SCIENTIFIC TECHNIQUE FOURIER TRANSFORM INFRARED SPECTROSCOPY ANALYSIS (FT-IR).

Dr. R. Abinaya*[1], Dr. R. Vijaya Nirmala[1], Dr. R. Karolin Daisy Rani[2] and Dr. M. D. Saravana Devi[3]

[1]Post Graduate, Department of Gunapadam (Pharmacology), Government Siddha Medical College, Arumbakkam, Chennai, Tamil Nadu, India.

[2]Lecturer, Department of Gunapadam (Pharmacology), Government Siddha Medical College, Arumbakkam, Chennai, Tamil Nadu, India.

[3]Head of the Department, Department of Gunapadam (Pharmacology), Government Siddha Medical College, Arumbakkam, Chennai, Tamil Nadu, India.

Article Received on
25 Feb. 2019,
Revised on 14 March 2019,
Accepted on 04 April 2019
DOI: 10.20959/wjpr20196-14762

***Corresponding Author**
Dr. R. Abinaya
Post Graduate, Department of Gunapadam (Pharmacology), Government Siddha Medical College, Arumbakkam, Chennai, Tamil Nadu, India.

ABSTRACT

Aim and Objective: The aim of the present study is to validate the functional group analysis of a novel siddha metallo-mineral formulation *Kaalamega Narayana Chendhooram* as mentioned in *Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham* through a Scientific Technique Fourier Transform Infrared Spectroscopy Analysis (FT-IR). **Methods:** Siddha system of medicine was considered as the motherhood medicine of ancient tamil dravidans in India particularly in South India. This system of medicine had a treasure of house embodying the results of ordent persuits by the ancient supernatural scientists called Siddhars. This system of medicine was an unique due to reverse pharmacology. This research paper explored the presence of functional group analysis of of a novel siddha metallo-mineral formulation *Kaalamega Narayana Chendhooram* as mentioned in *Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham* hrough a Scientific Technique

Fourier Transform Infrared Spectroscopy Analysis (FT-IR). FT-IR infrared was passed through a sample. The sample absorbed the infrared rays according to the chemical properties and few of them were transmitted. The spectrum showed the molecular absorption and transmission and forms molecular fingerprint of the sample. It produces finger print there was no two unique molecular structures of producing the same infrared spectrum. Then it was recorded as wavelength and peaks of the spectrum indicates the amount of the substances present in the prepared medicine. The screening of functional groups were done in Tamilnadu test laboratory, Vaanagaram, Chennai. It shows the presence of various functional groups in *KMNC* which is responsible for treating various life threatening diseases. **Results:** The results of FT-IR shows the presence of functional groups like Alcohols, phenols, 1º,2ºamines, amides, Aldehydes, α –β unsaturated aldehydes, Ketones, Alkenes, Carbonyl (General), 1ºamine, Nitro-compounds in *Kaalamega Narayana Chendhooram*. **Conclusion:** FT-IR technique is an important and also it is more advanced technique in the analysis of functional groups. It is used to determine the functional group, quality and consistency of the test drug. The presence of functional groups are responsible for various diseases such as cancer, tuberculosis etc.

KEYWORDS: *Kaalamega Narayana Chendhooram, KMNC, Chendhooram, Siddha,* metallo-mineral formulation, Functional group, Fourier Transform Infrared Spectroscopy Analysis (FT-IR).

INTRODUCTION

"The healing comes from the nature and not from the physician, therefore the physician must start from the nature with an open mind".

- Paracelsus

The practises of traditional medicinal systems was well established in India. The traditional systems were Ayurveda, Siddha, Naturopathy and Unani. The documentation of medical practises were with held in the ancient Vedas and other scriptures like palm leaves etc. The earliest concept for the development of traditional systems was appeared and made its development during the period of 2500 and 500 BC in India.[1]

A Siddha medical system is the oldest in holistic management and it was being practiced by a large population in South India. Traditonal system of medicines were used by 60% of the world's population for their health care in developing and developed countries even though where modern medicines dominate.[2]

Thus this of medicine was a boon offered by the spiritual scientist called Siddhars. There are so many Siddhars, out of them eighteen Siddhars are the most important and they all have more knowledge about the universe and its contents. Siddhars believes that, there is a connection between the celestial bodies of our universe to the living beings of earth. Any changes in the external world, brings changes to human beings. So they believe a healthy body is essential to attain eternal life.[3]

The fundamental principles of Siddha science is 96 principles, Three humors (‘Vadha’, ‘Pittha’, ‘Kapha’), ‘Panchaboothas’ which advocates curative and preventive measures and educates systemized life style through natural way and gives total perfection for life. According to the Siddha science of medicine, diet and lifestyle plays a major role in maintain health and curing diseases.[4]

“The natural healing force within each of us is the greatest force in getting well”.

-Hippocrates

Standardisation is essential for globalization traditional medical systems. Mortality rate was increased day by day due to severity of diseases but also with the adverse effect of the synthetic drugs. Because of this people from different parts of the World preferred to choose natural products as medicines for their health care remedies. Thus it is the best time to explore siddha medicines to the World with minimum adverse effects, less expensive and easy affordable. Thus attempt was made to standardize the siddha drug through a scientific technique FT-IR. This article highlights the protocol of medicine and steps to develop a SOP for siddha metallo-mineral formulation *Kaalamega Narayana Chendhooram.* The authors were initiated the SOP of the preparation, FT-IR techniques. It is the advanced technique used to identify the functional groups, quality, and consistency of the prepared medicine. It also involved in the determination of amount of the substances present in the sample. It is a good excellent tool for quantitative analysis. It can be useful for further studies and research on siddha medicines in future.

"The best doctor must give the least medicines".

- Benjamin Franklin

THE DIFFERENT TYPES OF *KMNC* PREPARATIONS WERE AVAILABLE IN DIFFEREN CLASSICAL SIDDHA LITERATURES.THEY ARE LISTED AS BELOW

- Vaiththiya Viththuvan Mani S.Kannuchamipillai, Chikichcha Raththina Theepamennum Vaithya Nool, Page No: 247, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.
- Kandhasamy Mudhaliyaar, Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham, First edition 1931, Page No : 496, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.
- Vaiththiya Viththuvan Mani S.Kannuchamipillai, Kannusamy Paramparai Vaithiyam, Page No : 327, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.
- Vaiththiya Viththuvan Mani S.Kannuchamipillai, Kannusamiyam, Page No: 120, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.
- Vaiththiya Viththuvan Mani S.Kannuchamipillai, Kannusamy Paramparai Vaithiyam, Page No : 327, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.

All the above mentioned the classical siddha text books shows the same ingredients and the same indications of *KMNC* but all the above preparations follows different medicinal preparation methods.

The current research derived the medicinal preparation the siddha text, Kandhasamy Mudhaliyaar, Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham, First edition 1931, Page No : 496, B.Rathna Nayaagar & Sons, Thirumakal Vilasa Achchakam, Chennai 79.

SELECTION OF THE DRUG

For this present study, the metello-mineral formulation **"*KAALAMEGA NARAYANA CHENDHOORAM*"** was taken as the compound drug preparation for oral cancer mentioned in the classical Siddha literature "*Athmarakshamirtham Ennum Vaithiya Saara Sangeraham"* written by *Kandhasamy Mudhaliyaar,* pg no:493, First Edition 1931.[5]

Ingredients of the drug

1. Purified *Vediuppu [Potassium nitrate]* – 840 gm
2. Purified *Thurusu [Copper sulphate]* – 210 gm
3. Purified *Padikaaram [Aluminium potassium sulphate (Alum)]* – 840 gm

4. Purified *Vengaram [Sodium bicarbonate* (Borax)*]* – 210 gm
5. Purified *Navacharam [Ammonium Chloride]*-210gm
6. Purified *Pooneeru [Impure Sodium Carbonate* ***(****Fullers Earth)]* – 105 gm
7. Purified *Jaathilingam* [Red sulphate of mercury]-525gm
8. Purified *Gandhagam [Sulphur]* – 420 gm
9. Purified *Kalluppu [Sodium chloride]*- 210 gm
10. Purified *Rasam [Hydragyrum]* – 1050 gm
11. Purified *Aritharam [Tri sulphate of Arsenic* (Yellow Orpiment)*]*- 350 gm
12. Purified *Manosilai [Di suphate of Mercury* (Red Orpiment)*]*- 140gm

Collection of the raw materials

All the raw materials were purchased from R.N. Rajan country drug store, Parrys corner, Chennai.

Identification and Authentication of the drug

The raw materials were identified and authenticated by the experts of *Gunapadam*, Government Siddha Medical College, Arumbakkam, Chennai- 106.

The specimen sample of each raw material has been kept in the PG *Gunapadam* department individually for future reference.

Fig no. 1: A Bird View of Preparation of *Kmnc.*

Purification of the drugs

Purification process was done as per the classical Siddha literature.

1. Purification of Pottasium Nitrate (*Vediuppu)*

Materials Required

Salt	100 gm
Water	400 gm
Fermented butter milk	100 gm
Lime juice	100 gm

Procedure

Water was added to the pottasium nitrate and boiled on a hearth with mild flames. The white yolk of eggs (4 nos) were added to every 1400gm of salt and the bubbles thus appeared with impure substances were removed with wooden spoon.

The ingredients were then transferred to another pot, sealed with mud pasted cloth, filtered and transferred to another pot, sealed with mud pasted cloth, filtered and kept in places without aeration. Next day the water was filtered and salt was sun shade. This process was repeated for seven times to get it purified.

2. Purification of *Padikaaram* (Aluminium potassium sulphate (Alum)

The alum was dissolved in water and it was filtered, boiled. Then it was cooled to get purified form.

3. Purification of *Thurusu* (Copper sulphate)

The copper sulphate was fried, till it turns to whitish.

4. Purification of *Vengaram (*Sodium biborate*)*

Borax was bundled and hanged in the buffalo's dung solution and boiled. The bundle was cleaned with fresh water and insolated to get it in purified form.

5. Purification of *Navacharam* (Ammonium chloride)

Navacharam (Ammonium chloride) was dissolved in hot water and filtered. After it was cooled, it was poured in a broad mouthed vessel and insolated; the salt was formed in a purified form. It was preserved with small quantity of the root of jequirity in a bottle.

6. Purification of *Kalluppu* (*Sodium chloride)*

Kalluppu was dissolved in vinegar and clean with a cloth, dried in a sunshade.

7. Purification of *Pooneeru* (*Impure Sodium Carbonate)*

Fuller's earth 1.3 litre was soaked in dew's water 5.2 litres and allowed to settle. Next morning it was churned well and the outer cream layer was removed. The remaining mixture was in procelin plates and insolated to obtain purified form. This process was repeated for ten times and stored in a bottle.

8. Purification of *Rasam* (Mercury) Materials Required

Mercury	35 gm
Brick powder	100 gm
Turmeric powder	100 gm
Acalypha juice (*Acalypha indica*)	1.3 litre

Procedure

Mercury was triturated with brick powder and turmeric powder for one hour respectively and washed with water. Then the Mercury was boiled with the juice of Indian *Acalypha* till the juice completely evaporates. And thus mercury was purified.

9. Purification of *Lingam* (Cinnabar)

Lime juice, cow's milk and the *Acalypha indica* juice were mixed together in equal proportion and allowed to fuse Cinnabar so as to get it in a purified potent form.

10. Purification of *Thaalagam* (Yelow Orpiment): Materials required

Arsenic trisulphide	35 gm
Cow's urine	1 litre
Indian *acalypha* juice	300 ml
Lime stone	300 gm

Procedure

Arsenic trisulphide was bundled and kept immersed in the mixture of limestone, *Acalypha indica* juice and cow's urine and heated to get purified.

11. Purification of *Gandhagam* (sulfur)

Materials Required

Sulphur	35 gm
Butter	35 gm
Cow's milk	150ml

Procedure

Sulphur was placed in an iron spoon. Butter was added and the spoon was heated till the butter melts, this mixture was immersed in inclined position in cow's milk. The procedurewas repeated for about 7 times and thus sulphur was purified. Fresh milk was used each time.

12. Purification of *Manosilai* (Red orpiment) Materials required

Red orpiment	35 gm
Cow's butter milk	125ml

Procedure

Red orpiment was triturated with cow's butter milk for 3 hours. It was dried to get purified form.[6]

Preparation of the trial drug – "*KAALAMEGA NARAYANA CHENDHOORAM*"

1. Purified *Vediuppu [Potassium nitrate]* – 840 gm
2. Purified *Thurusu [Copper sulphate]* – 210 gm
3. Purified *Padigaram* [Aluminium potassium sulphate (Alum)] – 840 gm
4. Purified *Vengaram [Sodium bicarbonate* (Borax)*]* – 210 gm
5. Purified *Navacharam [Ammonium Chloride]*-210gm
6. Purified *Pooneeru [Impure Sodium Carbonate (Fullers Earth)]* – 105 gm
7. Purified *Jaathilingam* [Red sulphate of mercury]-525gm
8. Purified *Gandhagam [Sulphur]* – 420 gm
9. Purified *Kalluppu [Sodium chloride]*- 210 gm
10. Purified *Rasam [Hydragyrum(Mercury)]* – 1050 gm
11. Purified *Aritharam [Tri sulphate of Arsenic* (Yellow Orpiment)*]*- 350 gm
12. Purified *Manosilai [Di suphate of Mercury* (Red Orpiment)*]*- 140gm.

Procedure

- 840 gm of 8th solution of *Vediuppu [Potassium nitrate]* and *Padigaram* [Aluminium potassium sulphate *(Alum)]* were taken.
- Along with that, 210 gm of *Thurusu [Copper sulphate]*, *Vengaram [Sodium bicarbonate* (Borax)*]*, *Navacharam [Ammonium Chloride]*, *Kalluppu [Sodium chloride Impura]* were taken and then mixed with 105 gm of *Pooneeru* [*[Impure Sodium Carbonate (Fullers Earth)]*.

- Above ingredients were ground into fine powder and divided into 3 parts.
- First part of the powder was underwent distillation process, the end product was mixed with 2nd part of powder and dried.
- Second part of the powder was underwent distillation process, the end product was mixed with 3rd part of powder and dried.
- Third part of the powder was undergoes distillation process, the final end product was taken and kept in a sealed bottle.
- The *Jaathilingam* [Red sulphate of mercury]-525 gm, *Aritharam* [Tri sulphate of Arsenic (Yellow orpiment)]-350 gm, *Gandhagam [Sulphur]* 420 gm, *Manosilai [*Di sulphate of mercury (Red Orpiment)*]* 140 gm weregroundalong with the end product of distillation for 12 hours (4 *saamam*) and made into fine powder and dried.
- Dried powder was kept in a mud pot which was sealed with 7 mud pasted plaster.
- Another mud pot with small quantity of sand was taken and above preparation was kept into it and sealed the lid with mud pasted plaster.
- The mud pot was ignited by using *Aavarai* stick for 30 hours (10 *saamam*), after 30 hours "*Chendhooram*" was obtained

Drug profile

Drug name	*Kaalamega Narayana Chendhooram*
Dosage	244 mg of *Chendhooram* [1/2 *Panavedai*]
Route	Enteral (oral)
Adjuvant	*Thipili chooranam* with honey (bd for 48 days – 1 *mandalam*)
Indications	*Kannaputru* [ORAL CANCER], *Elaippu* [Tuberculosis], *Kuttam 18* [Hansen's Disease]
Reference	*"AthmarakshaMirutham Ennum Vaithiya Saara Sangeeraham"*[13].


Purified *Vediuppu [Potassium nitrate]*


Purified *Thurusu [Copper sulphate]*


Purified *Padigaram* [Aluminium potassium sulphate (Alum)]


Purified *Vengaram [Sodium bicarbonate(Borax)]*


Purified *Navacharam [Ammonium Chloride]*


Purified *Kalluppu [Sodium chloride Impura]*


Purified *Pooneeru [Impure Sodium Carbonate (Fullers Earth)]*


Purified *Rasam [Hydragyrum]*


Purified *Jaathilingam* [Red sulphate of mercury]


Purified *Aritharam* [Tri sulphate of Arsenic (Yellow orpiment)]


Purified *Gandhagam [Sulphur]*


Purified *Manosilai [Red Orphiment]*

Fig no. 2: Ingredients of *Kaalamega Narayana Chendhooram*.

Process 1

Preparing for *Thravagam*

Process 2.

Divided into 3 parts

Process 3.

1st part undergoes distillation process

Collection of *Thravag*

Process 4.

The obtained *Thravagam* was used the second part

Again the second grind partunderwent distillation to process

Process 5.

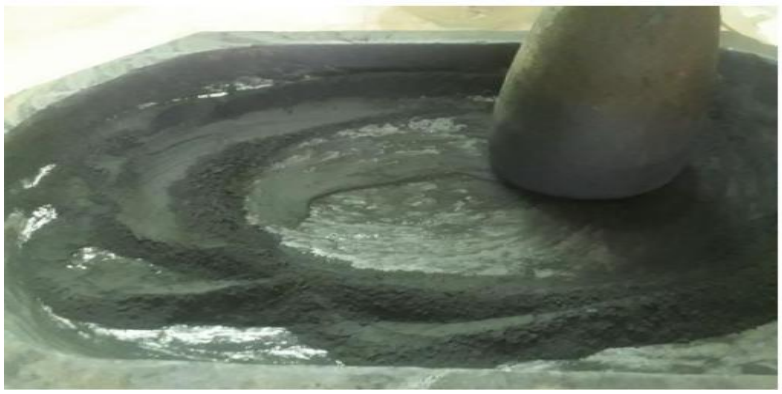
The obtained *Thravagam* is used distillation to grind the third part.

Again the third part underwent process.

Process 6.

The end product of distillation was sealed in a bottle.

Process 7.



Grinding of prepared medicine

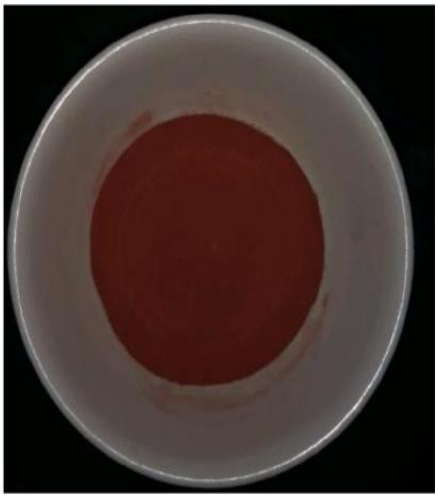
Process 8.

Final product was sealed with mud pasted cloth

Process 9.

Ignition of final *Chendhooram*

Final end product of *Chendhooram*



***Chendhooram*.[5]**

Fig no. 3: Preparation of *Kaalamega Narayana Chendhooram*.

Chendooram

Definition

Chendooram is a category of medicines made from metals or minerals (arsenicals or mercurial's or salts) by grinding them with specified juices or distillates or extractives and

subjecting them to a process of sublimation or calcinations or burning or frying or exposing to insolation till the characteristic reddening of the product takes place. The *Chendooram* are said to retain their potency for 75 years.

Method of preparation

Usually two method of preparation are adopted in their processing, with some exceptions and variants. Such as:

1. Sublimation by the sand – bath process
2. Calcination.

Other method of preparations

1. Prepared without heating (*Araippu Chendooram)*
2. Prepared by open heating (*Erippu or Varuppu Chendooram)*
3. Prepared by applying heat in the range close to 100◦c (*LaguPuda Chendooram).*

Specifications for *Chendooram*

1. *Chendooram* is red in nature, well fine in particle size and tasteless.
2. With suitable adjuvant they possess therapeutic values.
3. They are said to retain their potency for 75years.[7]

Thus the prepared medicine KMNC was subjected to Sublimation by the sand – bath process.

IMPORTANCE OF HIGHER ORDER MEDICINES

- Higher order medicines were very effective even in the very minimum dose of the drug.
- They also involved in treating many challenging incurable diseases.
- They also increased the bioavailability of the drug.
- Shelf life is higher in higher order medicines in which metals and minerals were used when compared to the plant products.
- Therapeutic efficacy is also very high with the higher order formulations.
- They provide quick remedy even in small doses.
- The great specialty of higher order formulation is adoptogenicity. (ie) the same drug with different adjuvants or without adjuvants, it can be successfully used for various diseases.[8]

SOPHISTICATED INSTRUMENTAL ANALYSIS

FTIR analysis was done at Tamilnadu test laboratory, Vaanagaram, Chennai, Tamil Nadu, India. It is the advanced technique used to identify the functional groups, quality, and consistency of the prepared medicine. It also involved in the determination of amount of the substances present in the sample. It is a good excellent tool for quantitative analysis.). FT-IR infrared was passed through a sample. The sample absorbed the infrared rays according to the chemical properties and few of them were transmitted. The spectrum showed the molecular absorption and transmission and forms molecular fingerprint of the sample. It produces finger print there was no two unique molecular structures of producing the same infrared spectrum. Then it was recorded as wavelength and peaks of the spectrum indicates the amount of the substances present in the prepared medicine.

FT IR - Fourier Transform Infra-red Spectroscopy

FTIR (Fourier Transform Infra-red Spectroscopy) is a sensitive technique particularly for identifying organic chemicals in a whole range of applications although it can also characterize some inorganics. Examples include paints, adhesives, resins, polymers, coatings and **drugs**. FTIR is an effective analytical instrument for detecting functional groups.

APPLICATIONS

Quantative scans

Qualitative scan solids, liquids, gasess

Organic samples, inorganic samples

Unknown identification

Impurities screening

Formulation

Pharmaceuticals

Principle

Spectrophotometric tests are commonly used in the identification of chemical substances and quantification of polymorphic forms. The test procedures are applicable to substances that absorb IR radiation. The IR absorption spectrum of a substance compared with that obtained concomitantly for the corresponding reference standard / reference substance provide conclusive evidence of the identity of the substance being tested.

Recording Infrared spectrum of a solid as a disc (as per USP ‹197K›)

Triturate about 1 to 2 mg of the substance to be examined with 300 to 400 mg, unless otherwise specified, of finely powdered and dried potassium bromide. If the substance is a hydrochloride it is preferable to use potassium chloride. Carefully grind the mixture and spread it uniformly in a suitable die. Submit it to the pressure of about 800 mPa (8 tons/cm2). Examine the disc visually and if any lack of uniform transparency is observed, reject the disc and prepare again. Record the spectrum between 4000 to 650 cm-1 unless otherwise specified in individual standard test procedure. When sample and standard are measured for concordance, the transmittance obtained at the start of the scan range, should not deviate by more than 10% between them (For eg. If the standard shows a transmittance of 75%, the sample transmittance can be between 65% and 85%).

FT-IR was the most advanced and the major advantage was its

- Speed
- Sensitivity
- Mechanical Simplicity
- Internally Calibrated.[9]

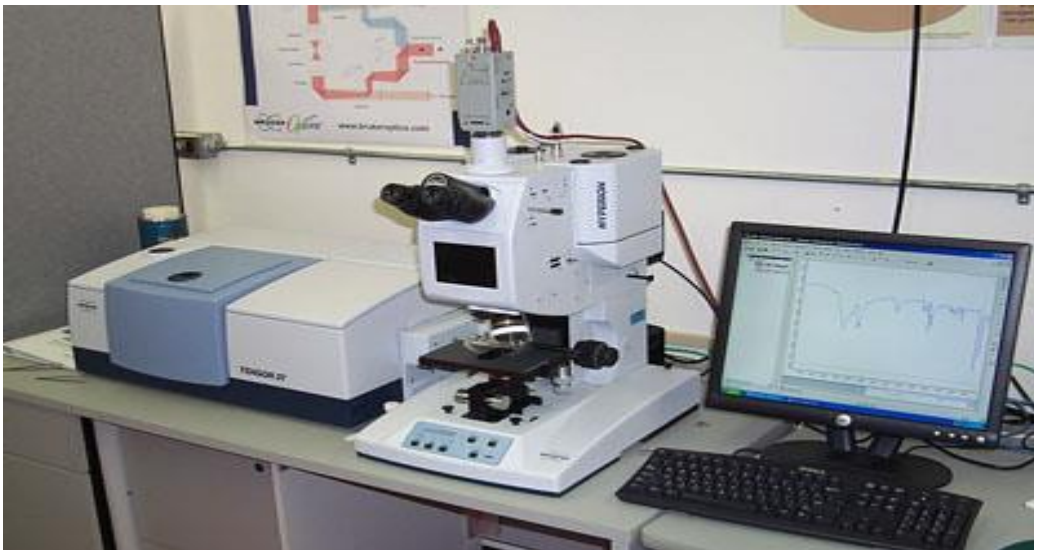


Fig no. 4: **FT-IR INSTRUMENT.**

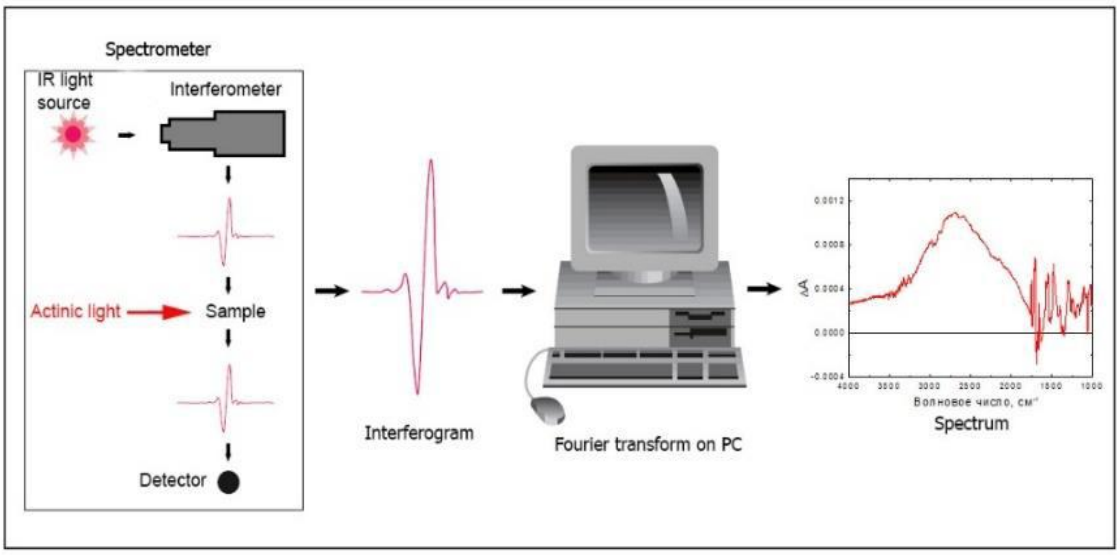


Fig no: 5: FT-IR MECHANISM.

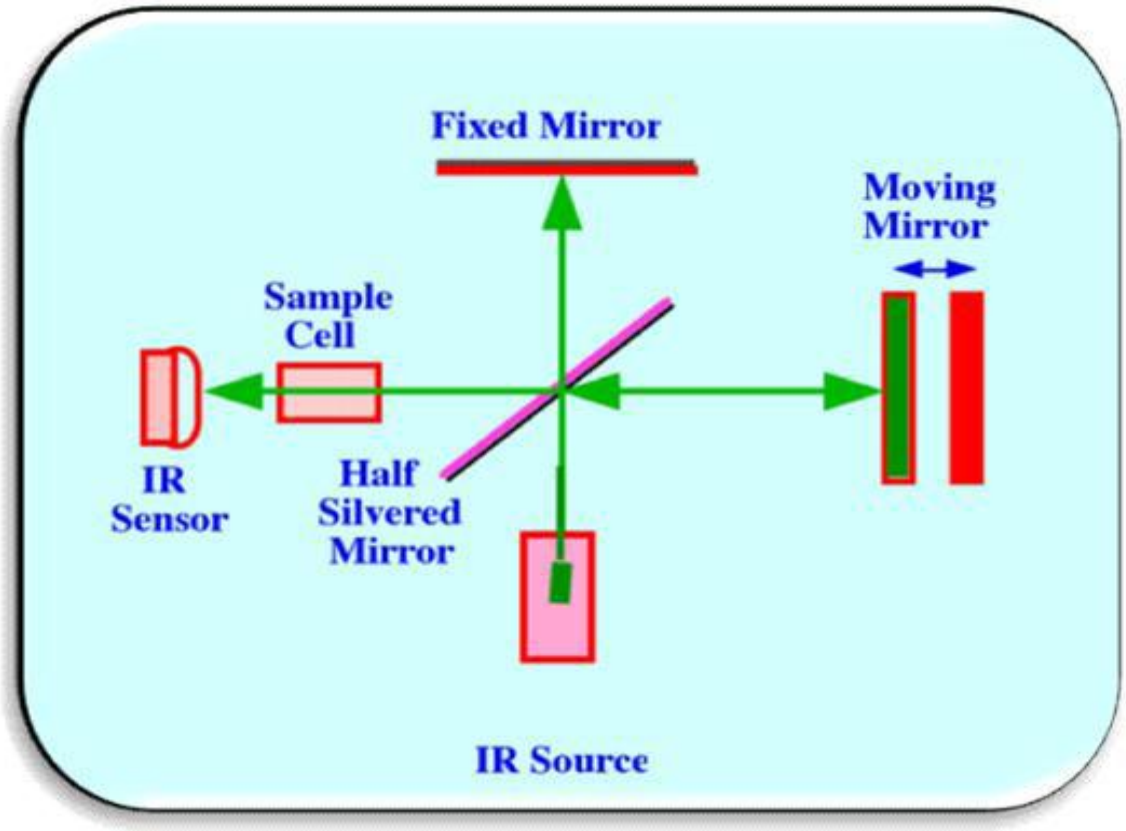


Fig no: 6: FT-IR MECHANISM.

RESULTS AND DISCUSSIONS

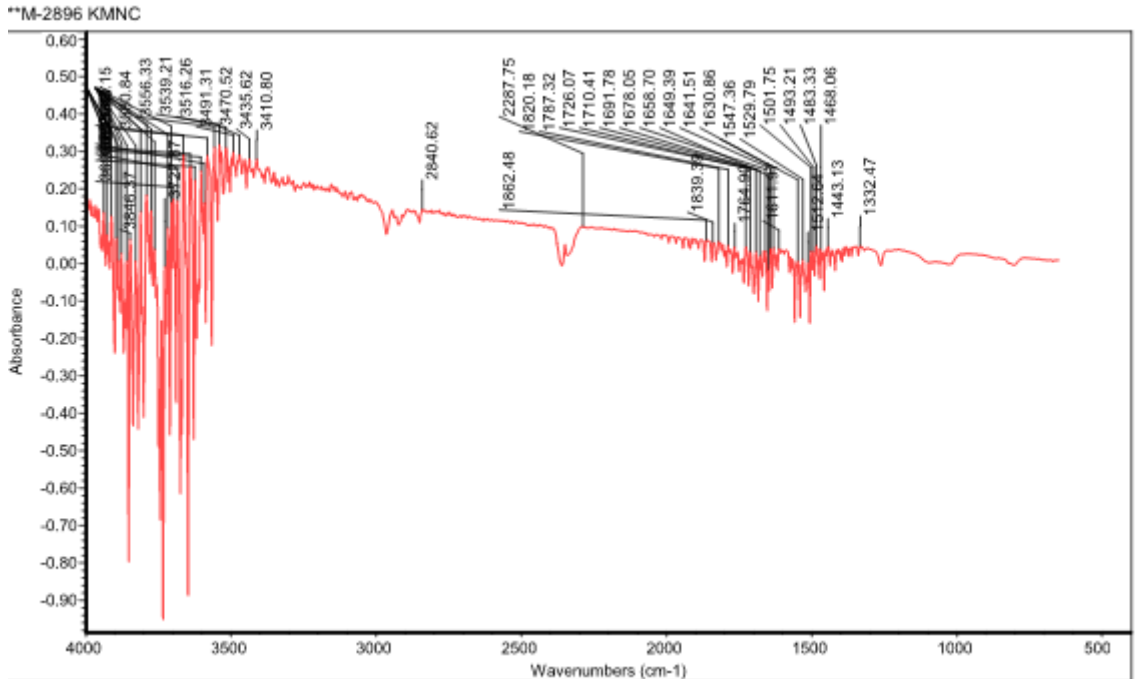


Fig no: 7: FT-IR graph.

Table No: 1: Functional Group Analysis.

Absorption peak (cm^{-1})	Stretch	Functional group
3846	O-H,H	Alcohols, phenols
3727	O-H,H	Alcohols, phenols
3690	O-H,H	Alcohols, phenols
3580	O-H,H	Alcohols, phenols
3556	O-H,H	Alcohols, phenols
3539	O-H,H	Alcohols, phenols
3516	O-H,H bonded	Alcohols, phenols
3491	O-H,H bonded	Alcohols, phenols
3470	N-H	1º,2ºamines, amides.
3435	O-H,H	Alcohols, phenols
3410	O-H,H	Alcohols, phenols
2287	H-C=O, C-H	Aldehydes
1820	C=O	α –β unsaturated aldehydes, Ketones.
Absorption peak (cm^{-1})	Stretch	Functional group
1862	-C=C	Alkenes
1820	C=O	Carbonyl (General)
1787	C=O	Carbonyl (General)
1764	C=O	Carbonyl (General)
1710	C-O	α –β unsaturated aldehydes, Ketones
1691	C-O	α –β unsaturated aldehydes, Ketones
1678	-C=C	Alkene
1658	-C=C	Alkene

1630	**N-H**	**1°amine**
1611	**N-H**	**1°amine**
1547	**N-O stretch, Asymmetric**	**Nitro-compounds**
1529	**N-O, Asymmetric**	**Nitro-compounds**

Interpretation

The wave numbers from 4000cm-1 to 1500cm-1 gives details for identification of functional group.

The wave number from 1500cm -1 to 400 cm-1 provides particulars about a molecular fingerprint.

The above result shows the presence of functional group like a Alcohols, phenols, 1°,2°amines, amides, Aldehydes, α –β unsaturated aldehydes, Ketones, Alkenes, Carbonyl (General), 1°amine, Nitro-compounds in *Kaalamega Narayana Chendhooram*.

They may be responsible for the presence of anticancer action of *Kaalamega Narayana Chendhooram* in oral cancer.

Amides

Amide derivatives of Benzene- sulfonanilide, a Pharmaceutical composition is used in cancer treatment. The lead molecule of these compound was methane sulfonamide, a cyclo oxgenase (COX) inhibitor. They act as a efficient anti tumour agents.[10]

OH

OH group of *KMNC* has higher potential towards inhibitory activity against microorganisms.[11]

Ketones

Ketones plays an important role in treating cancer cells. The eliminating carbohydrates can quickly lower calorie intake, reducing the energy available to the cells in the body. In turn, this may slow down the tumour growth and the cancer's progression.[12]

Aldehydes

Aldehydes plays an important role in maintain and differentiation of stem cells as well as normal development. Aldehydes are the potential therapeutic target for treatment of prostate

cancer and also plays a key role in resistance to radiation therapy and tumour recurrence in prostate cancer.[13]

Nitro compounds

Nitro and nitroso compounds are potent, selective and nontoxic inhibitors, suppressants of cancer growth and viral infections. These compounds are particularly useful for the treatment and suppression of tumours and viruses.

Phenols

The effect of phenols is currently of great awareness due to their anti carcinogenic activities. Phenolic acid components play an important role in the control of cancer and other human diseases. Phenols and flavanoids possess diverse biological activities, for example, antiulcer, anti-inflammatory, cytotoxic and antitumour, antispasmodic and antidepressant activities.[14]

Alkanes

Alkane derivative like bis (4-amino-5-mercapto-1, 2,4-triazol-3-yl) possess anti- cancer activity.[15]

Alkenes

Alkenes are the molecules containing a C=C double bond and is claimed to reduce the risk of heart disease and cancer.

Ether

Certain ether lipids such as 1-0-octadecyl-2-0 methyl-rec-glycero-3-phosphocholine represent a new class of anti -neoplastic agents. These ether lipids have been shown to be cytotoxic for a wide variety of tumours.

Carboxylic acid

Benzene-poly-carboxylic Acid Complex (BP-CI) is a novel anticancer complex against human cancer cells. Docosahexaenoic acid (DHA) is an omega-3 fatty acid. Its structure is a carboxylic acid (-oic acid) with a 22- carbon chain (docosa-is Greek for 22) and six (hexa-) cis double bounds. DHA was revealed to increase the efficacy of chemotherapy in prostate cancer cells and a chemo protective effect in a mouse model was reported. It may also be used as a non- toxic adjuvant to increase the efficacy of chemotherapy. In mice, DHA was found to reduce growth of human colon carcinoma cells The cytotoxic effect of DHA was caused by decrease in cell growth regulators.[16]

CONCLUSION

In the current biological era, there was a huge rate of mortality increased throughout the World due to various diseases and also from the adverse effects of the prepared synthetic drugs. In order to overcome this tredible effects there is a need to globalise the traditional system of medicine due to minimum adverse effects, easy affordable, less cost effectiveness. For globalisation the traditional system of medicine, standardization is essential. Thus an attempt was made in this research paper to standardize a novel siddha metallo-mineral formulation *Kaalamega Narayana Chendhooram* as mentioned in *Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham* hrough a Scientific Technique Fourier Transform Infrared Spectroscopy Analysis (FT-IR).**:** The results of FT-IR shows the presence of functional groups like Alcohols, phenols, 1º,2ºamines, amides, Aldehydes, α –β unsaturated aldehydes, Ketones, Alkenes, Carbonyl (General), 1ºamine, Nitro-compounds in *Kaalamega Narayana Chendhooram*. The presence of functional groups are responsible for various diseases such as cancer, tuberculosis etc.

ACKNOWLEDGEMENT

First and foremost I would like to thank the Almighty for his showers, grace, strength and caliber for doing various research. In the name of *Siddhars* who has given me power and courage to accomplish this work, I bow my head on thanks and gratitude to *Siddhars* for their blessings. Finally, I would like to acknowledge the person who mean world to me, My mother Mrs. A.Pushpavalli Rajendran for her lovable support and encouragement towards my various research work.

REFERENCES

1. Subhose V, Srinivas P, Narayana A. Basic principles of pharmaceutical science in Ayurveda. Bulletin of the Indian Institute of History of Medicine, 2005; 35(2): 83–92.
2. Ballabh B, Chaurasia OP. Traditional medicinal plants of cold desert Ladakh-Used in treatment of cold, cough and fever. Journal of Ethnopharmacology, 2007; 112(2): 341–345.
3. National Institute of Siddha-About Siddha Medicine available at http://nischennai.org/siddhamedicine.html
4. K.S.Uthamaraiyen, Siddha Maruthuvaanga Surukkam, 3rd edition, published by Indian Medicine and Homeopathy department, Chennai-106, page no: 314-338, 386-434, 184.

5. Kandhasamy Mudhalaiyaar, Kaalamega Narayana Chendhooram, Athmaraksha Mirtham Ennum Vaithiya Saara Sangeraham First Edition 1931, P.no.493,94a.
6. R.Thiagarajan Gunapadam Thathu – Jeeva Vaguppu, Department of Indian Medicine and Homeopathy, 8th edition, Page no:441-447.10 Page no: 326, 244-245.18, Page no:401-235.10, Page no:551-556.10, Page no:434 -440., Page no:407-414., Page no:380-383., Page no:423-426.Page no:225-267., Page no:269-.281., Page no:325-343., Page no:302-320.
7. K.S.Uthamarayan, H.I.B.M., the Department of Indian Medicine and Homeopathy, Chennai, 1936, Page no: 763.
8. *S, kannnan. M, sathyarajeswaran. P, anandhan. T.* Higher order medicine forms in siddha.
9. Fourier Transform Infra-red Spectroscopy available at:https://www.lpdlabservices.co.uk/analytical_techniques/chemical_analysis/ftir.php
10. CT supran, Amide derivatives of Benzene-Sulfonanilide, method of cancer treatment using the same, Expert opin Ther Pat, 2012 oct.; 22(10): 1251-55. Epub 2012 Jul 31.
11. Kuo- chery chen et al, Enzyme and microbial technology, Immobilization of microorganisms with alcohol, Jan 1994; 16: 79-83.
12. Poff et al, Ketone supplementation decreases tumour cell viability and prolongs survival of the mice with metastatic cancer. International journal for cancer, May 2014.pg no: 2-6.
13. Laurean et al. Targetting the cancer stem cell marker, aldehyde, to circumvent cisplastin resistance in NSCC. Aug 2017.
14. Wu-Yang Huang, Yi-Zhong Cai & Yanbo Zhang, Natural Phenolic Compounds From Medicinal Herbs and Dietary Plants: Potential Use for Cancer Prevention. Nutrion and cance 2009, vol 62 Pages 1-20 | Received 12 Dec 2008, Accepted 14 Apr 2009, Published online: 29 Dec 2009.
15. Snehal A.Chavan, Avinash g, et al., Synthesis and Anti-Cancer Activity of Bis-(N-Glucosylated Trriazolothiadiazolyl) Alkanes via Cyclocondensation reaction involving c-s and c-n bond formation, 190: 12, 2315-2324.
16. Fares F, Azzam N et al., Benzene-Poly-Carboxylic Acid Complex, a novel anti-cancer agent induces apoptosis in human cancer cells, Plos one: 2014, feb 11; 9(2).