ORIGINAL RESEARCH PAPER

Siddha

KEY WORDS: FTIR, Biochemical analysis, Siddha, *Sarvangavatha Choornam.*

BIO CHEMICAL AND FTIR ANALYSIS OF SIDDHA MEDICINE SARVANGAVATHA CHOORANAM

Nivetha.G* M.D.(Siddha) II year,Dept.of Sirappu Maruthuvam,GSMCH,Palayamkottai. *Corresponding Author

Navin Kumar. M M.D. (Siddha) II year, Dept.of Sirappu Maruthuvam,GSMCH,Palayamkottai.

Ahamed Mohideen. M Associate Professor, Dept.of Sirappu Maruthuvam,GSMCH,Palayamkottai.

ABSTRACT

BACKGROUND: The Sarvangavatha Chooranam is a Poly herbo and Mineral Siddha formulation used for treating *all types of arthritis*.

OBJECTIVES: To identify and characterize the compounds present in the poly herbal Siddha formulation "*Sarvangavatha Chooranam"*.

MATERIALS AND METHODS : *Sarvangavatha Chooranam"* has Kondraipattai, Mavilingampattai, Chithiramoolam, Kandangathiri ver, Sangamver, Vathamadaki ver, Boodhakarappan pattai, Thoothuvalai, Vellarugu, Kayam, Chukku, Indhuppu, Valayaluppu, Vediyuppu, Kalluppu as its ingredients. The formulation was prepared as per the Siddha literature " Sigicha rathna deepam Part -2 vaithiya sindhamani". The drugs was analysed Bio chemically and by using FTIR Spectrum.

RESULT: FTIR characterization shows the presence of some functional group such as Halo compound, Phenol, Nitro compound, Amine where identified in Siddha poly herbal formulation. "Sarvangavatha Chooranam". The Bio chemical analysis of Sarvangavatha Chooranam contains Calcium, Starch, Sulphate, Ferrous Iron, Unsaturated compound and Reducing sugar. This study forms the base for the pharmaceutical analysis of Sarvangavatha Chooranam which will be followed by safety and efficacy studies later.

INTRODUCTION

Siddha system of medicine is mainly practiced in the southern part of India as it orginates from Tamilnadu, It is one of the earliest traditional medicine system in the world which treats not only the body but also the mind and soul. In the Siddha system of medicine, all vital processes (physiological, biochemical-metabolic) have been classified under three functional heads (uyir – thaathukal) namely vali, azhal, Iyyam (Vaatham, Pitham, kabam). Variety of Siddha medicines has been formulated to treat various diseases. These modern analytical equipments are helpful to get knowledge regarding the organic and inorganic groups present in the formulations.

FTIR characterization was done for the poly herbo and mineral Siddha formulation "Sarvangavatha Chooranam" to identify the functional group. Each molecule or chemical structure will produce a unique spectral fingerprint, making FTIR analysis a great tool for chemical identification. Bio chemical analysis was done to evaluate the acid and basic radicals present in the formulation.

MATERIALS AND METHOD

Sarvangavatha Chooranam , siddha poly herbo mineral formulation has the following ingredients

INGREDIENTS:

DRUG	BOTANICAL NAME	PART USED	DOSE
Mavilingam	Crataeva religiosa	Bark	35g
Kondrai	Cassia fistula	Bark	35g
Chitiramoolam	Plumbago indica	Root	35g
Kandakathari	Solanaum xanthocarpum	Root	35g
Sangam	Clerodendrum inerme	Root	35g
Vathamadakki	Clerodendrum phlomidis	Root	35g
Boothakarapan	Sterculia foetida	Bark	35g
Indhuppu	Sodium chloride impure/Rock salt	-	35g
Thuthuvalai	Solanum trilobatum	Whole plant	35g
Velarugu	Enicostema axillare	Root	35g
Kayam	Ferula asafetida	Resin	35g
Chukku	Zingeber officinale	Rhizome	35g
Valayaluppu	Glassgall/selvitri	-	35g
Vediuppu	Potassium nitrate/salt petre	-	35g
Kaluppu	Himalyan crystal salt	-	35g

Purification of drugs

All the ingredients were completely purified as per the method mentioned in the siddha literatures in the presence of Guide / Faculty members. Then the trial drug *Sarvangavatha chooranam* was prepared as per the method mentioned in the " Sigicha rathna deepam Part 2 vaithiya sindhamani".

PREPARATION:

The above mentioned drugs are purified properly and they are dried in shade and made into powder it separately and mix well

REFERENCE : sigicharatna deepam part 2 vaithiya sindhamani (pg: no: 164)

DOSE : 800mg -1000mg Twice a day

ADJUVANT : Hot water

DURATION : 30-40 days.

Important Therapeutic Use:

All types of Arthritis

Details regarding the analysis

FTIR spectra analysis was carried out at kalasalingam academy of research and education (International research centre) Srivilliputhur.

FTIR Spectrum analysis

Fourier transform infrared spectroscopy is an important and more advanced technique. It is used to identify the functional group to determine the quality and consistency of the sample material and can determine the amount of compound present in the sample.

In FTIR- infrared is passed from a source through a sample. This infrared is absorbed by the sample according to the chemical properties and some are transmitted. The spectrum that appears denotes the molecular absorption and transmission. It forms the molecular finger print of the sample. It is recorded as wavelength and the peaks seen in the spectrum indicate the amount of material present.

Fig.1. Image of the FTIR spectrum.

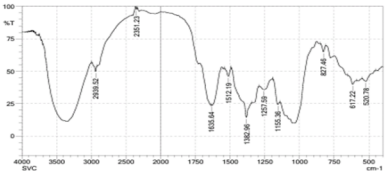

Table.2: FTIR Data interpretation of Sarvangavatha Chooranam

Wave number	Vibrational modes of Sarvangavatha Chooranam In IR region	Functional groups
520.78	C-Br Strech	Halo compound
617.22	C-I Strech	Halo compound
827.46	C-H Bending	Halo compound
1155.36	C-F Strech	Fluoro compound
1257.59	C-O Stretch	Aromatic Ester
1382.96	O-H Bending	Phenol
1512.19	N-O Strech	Nitro compound
1635.64	N-H Bending	Amine
2351.23	C-Br Stretch	Halo Compound
2939.52	C-H Stretch	Alkane

BIO-CHEMICAL ANALYSIS OF "SARVANGAVATHA CHOORANAM"

The Drug Sarvangavatha Chooranam was subjected to various test to confirm the presence of acid and basic radicals.

CHEMICALS AND DRUGS

All the chemicals used in this studies were of analytical grade obtained from Department of Biochemistry, Government Siddha Medical College & Hospital, Palayamkottai.

METHODOLOGY

5gms of the drug was weighed accurately and placed in a 250ml clean beaker then 50ml of distilled water is added and dissolved well. Then it is boiled well for about 10 minutes. It is cooled and filtered in a 100ml volumetric flask and then it is made to 100ml with distilled water. This fluid is taken for analysis

Table 3: QUALITATIVE ANALYSIS

S.No	EXPERIMENT	OBSERVATION	INFERENCE
01	**TEST FOR CALCIUM** 2ml of the above prepared extract is taken in a clean test tube. To this add 2ml of 4% Ammonium oxalate solution	A white precipitate is formed	Indicates the presence of Calcium
02	**TEST FOR SULPHATE** 2ml of the extract is added to 5% Barium chloride solution.	A white precipitate is formed	Indicates the presence of Sulphate
03	**TEST FOR CHLORIDE** The extract is treated with silver nitrate solution	A white precipitate is formed	Indicates the presence of Chloride
04	**TEST FOR CARBONATE** The substance is treated with concentrated Hcl.	No brick effervescence is formed	Absence of Carbonate
05	**TEST FOR STARCH** The extract is added with weak iodine solution	Blue colour is formed	Indicates the presence of Starch
06	**TEST FOR FERRIC IRON** The extract is acidified with Glacial acetic acid and potassium ferro cyanide.	No blue colour is formed	Absence of Ferric iron
07	**TEST FOR FERROUS IRON** The extract is treated with concentrated Nitric acid and Ammonium thiocyanate solution	Blood red colour is formed	Indicated the presence of Ferrous iron
08	**TEST FOR PHOSPHATE** The extract is treated with Ammonium Molybdate and concentrated nitric acid	No yellow precipitate is formed	Absence of phosphate
09	**TEST FOR ALBUMIN** The extract is treated with Esbach's reagent	No yellow colour precipitate is formed	Absence of Albumin
10	**TEST FOR TANNIC ACID** The extract is treated with ferric chloride.	No blue black colour precipitate is formed	Absence of tannic acid
11	**TEST FOR UNSATURATION** Potassium permanganate solution is added to the extract	It get decolourised	Indicates the presence of Unsaturated compound
12	**TEST FOR THE REDUCING SUGAR** 5ml of Benedict's qualitative solution is taken in a test tube and allowed to boil for 2 minutes and add 8-10 drops of the extract and again boil it for 2 minutes.	No Colour change occurs	Absence of Reducing sugar
13	**TEST FOR AMINO ACID** One or two drops of the extract is placed on a filter paper and dried well. After drying, 1% Ninhydrin is sprayed over the same and dried it well.	Violet colour is formed	Indicates the presence of Amino acids
14	**TEST FOR ZINC** The extract is treated with Potassium Ferro cyanide.	No white precipitate is formed	Absence of Zinc

FTIR RESULTS AND DISCUSSIONS

In FT-IR spectra analysis, this sample Sarvangavatha Chooranam exhibits the peak value at 520,78,617.22,827.46, 1155.36,1257.59,1382.96,1512.19,1635.64,2351.23,2939.52 having C-Br Strech,C-I Strech,C-H Bending, C-F Strech, O-H Bending, N-O Strech, N-H Bend.

This indicates the presence of some organic functional groups such as Halo Compound, Fluoro compound, Aromatic Ester, Phenol, Nitro compound, Amine, Alkane respectively.

The presence of Amine commonly used as analgesics in medicine that relieves pain. The presence of aromatics are good pain relievers has anti-pyretic, anti-inflammatory, auto-immune activities. The presence of Halo compounds are used for treatment of typhoid fever. The presence of phenol is an active ingredient in some oral analgesics, likewise the presence of other these identified functional groups in the medicinal compound are also responsible for the therapeutic function of drug "Sarvangavatha Chooranam"

BIO CHEMICAL RESULTS AND DISCUSSIONS

The Biochemical analysis of the trial drug Sarvangavatha Chooranam was tabulated above in Table 3.

The Bio chemical analysis of Sarvangavatha Chooranam contains

- Calcium
- Starch
- Sulphate
- Ferrous Iron
- Unsaturated compound
- Chloride
- Amino acids

CONCLUSION

The instrumental analysis FTIR study for "Sarvangavatha Chooranam" shows the presence of functional groups through the stretch and bends which is responsible for its functional activity. Sarvangavatha chooranam is a Siddha Sastric drug taken from a classical literature used in the treatment of Santhuvatham and other ailments listed. The formulation is also screened for its Bio chemical properties. It has to be subjected for further studies to validate its efficacy and safety.

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