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STANDARDIZATION OF SIDDHA DRUG FORMULATION *MANDOORA ADAI KIYAZHAM* FOR THE MANAGEMENT OF *VATHA SOOBAI*

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ABSTRACT:

Siddha system is the primitive system of medicine being practiced in South India. A great attention towards Siddha system of medicine is being reached people due to potency of curing diseases. *Kuzhanthai Maruthuvam* has a significant role in the treatment and management of diseases in pediatric age group. This paper deals with ***Mandoora adai kiyazham*** documented in in classical text literature, the reference book of ***Kuzhanthai Maruthuvam (Balavagadam)*** indicated for ***Vatha soobai.*** Therefore is a need to analyze the drug as per the latest technique. Data were collected regarding ingredients of ***Mandoora adai kiyazham*** and it was sent to the Noble Research Solution for evaluate the biochemical, physiochemical and heavy metal analysis as per PLIM guidelines. Finally this revealed, biochemical, physiochemical and heavy metal analysis of ***Mandoora adai kiyazham*** is better to Management of ***Vatha soobai*****(Oedema)**. Further studies for ***Mandoora adai kiyazham*** should be done in future.

Keywords: ***Vatha soobai, Mandoora adai kiyazham*****, PLIM guidelines**.

INTRODUCTION:

Traditional Indian medical sciences are the fundamentals for most of medical therapies established worldwide, which is originated in south India. The wonderful art was discovered by siddhars to enrich human life. The concept of siddha system is based on *96 thathuvam*, *panchabootham, mukkutram, udal thathukal*. According to Siddha medicine diseases are classified as 4448 in numbers and in that 100 of them comes under pediatric diseases. There are 32 types of internal and 32 types of external medicines to treat these diseases. Among these *Kiyazham* is the simplest and quick action type of medicine. ***Mandoora adai kiyazham*** is a polyherbal formulation used for the management of ***Vatha Soobai***.

In modern *Vatha Soobai* correlated with **Oedema.** Oedema is swelling, that caused by fluid trapped in own body tissues, causes include diseases, medications, allergies, nutritional disorders in this study with the criteria, age: 5 to 12 years, oedema due to protein deficiency, oedema due to iron deficiency, oedema due to renal impairment.

Vatha soobai symptoms are fever, dehydration, pallor eyes and lips, fissure in lips, head

ache, fatigue, puffiness of face, loss of appetite, body heaviness, rise in temperature, baby

become emaciated and onset of dysentery finally leading to fatal consequence.

Mandoora adai kiyazham is a medicine used for treating these symptoms and this ***kiyazham*** has been prepared under the strict standards and parameters given by PLIM Guidelines.

This article can also be used as an initiative for research areas for identifying organoleptic, Physiochemical and Phytochemical properties, Heavy metal analysis by AAS respectively.

2.MATERIALS AND METHODS:

2.1 Drug Selection:

The siddha formulation drug ***Mandoora adai kiyazham*** selected from the ***Kuzhanthai Maruthuvam (Balavagadam)*** and this medication is indicated for treating ***Vatha soobai.***[1]

2.2 Ingredients of *Mandoora adai kiyazham:*

This poly herbal formulation contains raw drugs and the ingredients of the drug and its quantity are listed below Table 1[2,3]

Table 1

S.NO	DRUG	BOTANICAL NAME/SCIENTIFIC NAME	FAMILY	PARTS USED	QUANTITY
1.	*Suthitha Mandooram*	*Ferroso ferric oxide*	-	-	320g
2.	*Maavilai*	*Mangifera indica*	Anacardiaceae	Leaves	200g
3.	*Neermulli*	*Asteracantha longifilia*	Acanthaceae	Whole plant	200g
4.	*Keezhanelli*	*Phyllanthus amarus*	Phyllanthaceae	Whole plant	200g
5.	*Karisaalai*	*Eclipta prostrate*	Asteraceae	Whole plant	200g
6.	*Narseeragam*	*Cuminum cymium*	Apiaceae	Seed	40g

2.3 COLLECTION OF RAW DRUG:

The raw drugs were brought from a well reputed raw drug store in Tirunelveli town and metal drug *Mandooram* brought from Rajendra Herbal store in Thuckalay, Kanyakumari.

2.4 IDENTIFICATION AND AUTHENTICATION OF THE DRUG:

The raw drugs were identified and authenticated by the Head of the Department of Post graduate department of Gunapadam, Government Siddha Medical College, Palayamkottai. The sample of each raw drug is stored in the PG Department of Gunapadam for the future reference.

2.5 PURIFICATION OF THE METAL AND RAW DRUG:

Purification of metal[(2)] and raw drugs[(4)] were done as per classical siddha literature.

Taken *Mandooram* is purified method is mix the pulverized kittam (1 part), Tamarind Leaf (4 parts) and water (8 parts) together and boil this for 3 hours.On colling, Rince it off well,dry it and winnow away the tamarind leaf from it. Triturate the *kittam* powder and burn it with 8 volumes of cow's urine. Finally rince it off well once all urine gets evaporated.then dried and powdered[(2)].

Raw drugs Maavilai, Neermulli, Keezhanelli, Karisaalai should be remove stalks and mud, midvein of leaves and wipe it with clean cloth. Don't use brown,rotten insect eaten leaves, stem and root[4] .

2.6 PREPARATION OF THE TRIAL COMPOUND DRUG *MANDOORA ADAI KIYAZHAM*:

Taken 320gms *Suthitha mandooram* and 200gms equal quantities of other drugs like maavilai, neermulli, keezhanelli, karisaalai all the drugs and narseragam about 40gms. The above mentioned drugs are grinded into coarse powder. Then the powder are mixed well and kept separately in a neet dry air container[2] .

Sample Description

2.7 ADMINISTRATION OF THE DRUG:

Form of the Medicine: ***Kiyazham***

Route of Administration: **Oral**

Dose: **15 - 30 ml** (based on the age and weight of the child) Twice a day after food

Indication: ***Vatha soobai***

2.8 ORGANOLEPTIC CHARACTERS:

State, nature, odor, consistency, flow property, appearance of the drug and solubility of the drug were noted. The organoleptic character analysis was done by Noble Research Solutions Pvt. Ltd., Chennai, India[4,5]

2.9 PHYSIOCHEMICAL ANALYSIS OF *MANDOORA ADI KIYAZHAM*:

Percentage Loss on Drying

Test drug was accurately weighed in evaporating dish. The sample was dried at 105ºC for 5 hours and then weighed.

Determination of Total Ash

Test drug was accurately weighed in silica dish and incinerated at the furnace a temperature 400 ºC until it turns white in color which indicates absence of carbon. Percentage of total ash will be calculated with reference to the weight of air-dried drug.

Determination of Acid Insoluble Ash

The ash obtained by total ash test will be boiled with 25 ml of dilute hydrochloric acid for 6mins. Then the insoluble matter is collected in crucible and will be washed with hot water and ignited to constant weight. Percentage of acid insoluble ash will be calculated with reference to the weight of air-dried ash.

Determination of Alcohol Soluble Extractive

Test sample was macerated with 100 ml of Alcohol in a closed flask for twenty-four hours, shaking frequently during six hours and allowing it to stand for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a tared flat bottomed shallow dish, and dry at 105ºC, to constant weight and weigh. Calculate the percentage of alcohol-soluble extractive with reference to the air-dried drug.

Determination of Water Soluble Extractive

Test sample was macerated with 100 ml of chloroform water in a closed flask for twenty-four hours, shaking frequently during six hours and allowing it to stand and for eighteen hours. Filter rapidly, taking precautions against loss of solvent, evaporate 25 ml of the filtrate to dryness in a tared flat bottomed shallow dish, and dry at 105ºC, to constant weight and weigh. Calculate the percentage of water-soluble extractive with reference to the air-dried drug.

3. PHYTOCHEMICAL SCREENING ANALYSIS OF *MANDOORA ADAI KIYAZHAM*

The Phytochemical screening analysis was carried out for the extract of ***Mandoora adai kiyazham*** as per the standard procedure by the experts of Biochemistry Department of Government Siddha Medical College, Palayamkottai.

Preparation of the extract:

5 grams 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 makes up to 100ml with distilled water. This fluid is taken for analysis.

Test for Calcium

2ml of the above prepared extract is taken in a clean test tube. To this add 2 ml of 4% Ammonium oxalate solution. Formation of white colored precipitate indicates the presence of Calcium.

Test for Sulphate

2 ml of the extract is added to 5% Barium chloride solution. Formation of White colored precipitate indicates the presence of Sulphate.

Test for chloride

The extract is treated with Silver nitrate solution. No White colored precipitate indicates the absence of chloride.

Test for Carbonate

The substance is treated with concentrated HCL. No brisk effervescence is formed indicates absence of Carbonate.

Test for Starch

The extract is added with weak iodine solution. formation of Blue color indicates the presence of Starch.

Test for Ferric Iron

The extract is acidified with Glacial acidic acid and potassium ferrocyanide. No Blue color is formed indicates absence of ferric iron.

Test for Ferrous Iron

The extract is treated with Concentrated Nitric acid and Ammonium thiocyanate solution. Formation of Blood red color indicates the presence of ferrous iron.

Test for Phosphate

The extract is treated with Ammonium molybdate and concentrated nitric acid. No Yellow color precipitate indicates the absence of Phosphate.

Test for Albumin

The extract is treated with Eshbach's reagent. No Yellow color precipitate is formed indicates absence of Albumin.

Test for Tannic Acid

The extract is treated with Ferric Chloride. Formation of Blue- black colored indicates the presence of Tannic acid.

Test for Unsaturation

Baeyer's test Potassium permanganate solution is added to the extract. It does not gel decolourized absence of unsaturated compounds.

Test for Reducing Sugar

5 ml of Benedicts qualitative solution is taken in a test tube and allowed to boil for 2 minutes and add 8-10 drops of the extract again boil it for 2 minutes. No colour changes occur. It indicates absence of reducing sugar.

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 filter paper and again dried. If it gets violet color, it indicates the presence of Amino acid.

Test for Zinc

The extract is treated with Potassium Ferrocyanide. No white color precipitate is formed indicates abesence of Zinc.

4. HEAVY METAL ANALYSIS BY AAS

Standard: Hg, As, Pb and Cd – Sigma

Methodology

Atomic Absorption Spectrometry (AAS) is a very common and reliable technique for detecting metals and metalloids in environmental samples. The total heavy metal content of the sample was performed by Atomic Absorption Spectrometry (AAS) Model AA 240 Series. In order to determination the heavy metals such as mercury, arsenic, lead and cadmium concentrations in the test item.

Sample Digestion

Test sample was digested with 1mol/L HCl for determination of arsenic and mercury. Similarly, for the determination of lead and cadmium the sample were digested with 1mol/L of HNO_3.

Standard Reparation

As & Hg- 100 ppm sample in 1mol/L HCl Cd & Pb- 100 ppm sample in 1mol/L HNO_3

RESULTS AND DISCUSSION:

1. ORGANOLEPTIC CHARACTERS:

Table 2

State	**Solid**	**Liquid**
Nature	Coarse woody material	Non Viscous
Odour	Characteristic	Aromatic
Touch	Hard Texture	Non greasy
Flow Property	Non free flowing	Free Flowing
Appearance	Pale greenish	Brownish

SOLUBILITY PROFILE:

Table 3

S.No	Solvent Used	Solubility / Dispersibility
1	Chloroform	Insoluble
2	Ethanol	Soluble
3	Water	Soluble
4	Ethyl acetate	Insoluble
5	DMSO*	Soluble

DMSO*-Dimethylsulfoxide

Solubility is one of the important parameters to achieve desired concentration of drug in systemic circulation for achieving required pharmacological response. But poorly water soluble drugs often required high doses in order to reach therapeutic plasma concentration of oral administration. But in researcher's medicine, 3 had soluble property. It is valuable finding to our study.(7)

2.PHYSIOCHEMICAL ANALYSIS:

Table 4

S.No	Parameter	Mean (n=3) SD
1.	***Loss on Drying at 105 °C (%).***	4.933 ± 0.3055
2.	***Total Ash (%)***	3.133± 0.5686
3.	***Acid insoluble Ash (%)***	5.733 ± 1.242
4.	***Water soluble Extractive (%)***	20.53 ± 1.1914
5.	***Alcohol Soluble Extractive (%)***	0.2233 ± 0.05132

Ash value is useful in determining authenticity and purity of sample and also these values are important qualitative standards. The total ash value, acid insoluble ash, water soluble ash was found to be mean (n=3)SD is3.133± 0.5686, 5.733 ± 1.242, 20.53 ± 1.1914 . This percentage clearly indicates that the mandoora adai kiyazham is best for drug action and effects. The Water-soluble extractive value plays an important role in evaluation of crude drugs. Less extractive value indicates addition of exhausted material, adulteration or incorrect processing during drying or storage.

The alcohol-soluble extractive value was also indicative for the same purpose as the water-soluble extractive value. The water soluble extractive value proved to be higher than alcohol soluble extractive value. It was found to be 0.2233 ± 0.05132 .

This shows that the constituents of the drug are more extracted and soluble in water as compared to alcohol. Moisture is one of the major factors responsible for the deterioration of the drugs and formulations. Low moisture content is always desirable for higher stability of drugs. In researcher's study had higher Water-soluble extractive value[7] .

3. PHYTOCHEMICAL ANALYSIS:

The phytochemical analysis of ***Mandoora adai kiyazham*** reveals the presence of **Sulphate, Starch, Ferrous iron, Tannic acid and Amino acid.**

Table 5

S.NO	PHYTOCHEMICALS	RESULT
1.	Calcium	Absent
2.	**Sulphate**	**Present**
3.	Chloride	Absent
4.	Carbonate	Absent
5.	**Starch**	**Present**
6.	Ferric iron	Absent
7.	**Ferrous Iron**	**Present**
8.	Phosphate	Absent
9.	Albumin	Absent
10.	**Tannic Acid**	**Present**
11.	Unsaturated compounds	Absent
12.	Reducing sugar	Absent

13.	**Amino acid**	**Present**
14.	Zinc	Absent

Tannin have a antioxidant activity, antimicrobial activity, anti-inflammatory activity, histamine release inhibition[9] . Starch had a main source of range of nutrients that gives good sourse of energy[10],Ferrous iron had higher absorption rate than ferric iron, also to treat and prevent iron deficiency anaemia, without enough iron, there aren't enough red blood cells transport oxygen which leads to fatigue.

4. HEAVY METAL ANALYSIS BY AAS

Test Report – Table 5

Name of the Heavy Metal	Absorption Max Λ max	Result Analysis	Maximum Limit
Lead	217.0 nm	0.88 PPM	10 ppm
Arsenic	193.7 nm	0.21 PPM	3 ppm
Cadmium	228.8 nm	BDL	0.3 ppm
Mercury	253.7 nm	BDL	1 ppm

BDL- Below Detection Limit

Report and Inference

Results of the present investigation have clearly shows that the sample has no traces of heavy metals such as Mercury and Cadmium, whereas the sample shows the presence of Lead and arsenic at 0.88 and 2.42 ppm respectively, which was less than the prescribed limit[8] .

CONCLUSION

Organoleptic characters of *Mandoora adai kiyazham* reveals that the medicine is liquid, non viscous, aromatic, non greasy, free flowing, brownish colour and characteristics and 3 had soluble proferty, It is valuble finding to our study. **Phytochemical analysis** of *Mandoora adai kiyazham* reveals the Presence of Starch, Ferrous iron, Tannic acid and Amino acid. **Heavy metal analysis by AAS** of *Mandoora adai kiyazham* sample shows that No traces of heavy metals such as mercury and Cadmium, whereas the sample shows the Presence Lead and Arsenic respectively, which was less than the prescribed limit.

Further preclinical and clinical trials should be done in future to know the value of the drug.

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