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Research Article

A COMPARATIVE ANALYSIS OF TWO DIFFERENT SAMPLES OF SIDDHA CLASSICAL FORMULATION-*PADIGALINGA CHENDURAM*

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ABSTRACT

Siddha is the traditional system of medicine in India which is practiced in southern part. This traditional system has many polyherbal and herbo-mineral formulation which is more effective but they lack standardization procedures. Standardization of a herbo- mineral formulation is essential to assess the quality, efficacy, purity and safety of the drug. The present paper deals with standardization of *Padigalinga Chenduram*, the *Siddha* formulation which is used for treating menorrhagia, diarrhoea, dysentry etc. In-house preparation and one marketed sample were subjected to standardization techniques like organoleptic study, physicochemical screening and heavy metal analysis. It was observed that both the samples differ in their organoleptic character, physicochemical analysis and heavy metal analysis like colour variance, percent weight loss on drying or moisture content was found to be less in market sample and total ash value was high as well. And the market sample was found to be better than the in-house sample in water-soluble and alcohol-soluble extractive values. The toxic heavy metals as per AAS is found in both formulations and the values are not matching with each other, and it may be due to the raw material collection time and geographical variation, etc. which can be further investigated for its pharmacological activity. More number of samples from different pharmas has to be studied to arrive at definite standard for manufacturing *Padigalinga Chenduram*. When a definite standard is arrived from future studies, *Padigalinga Chenduram* will be a cost effective *Siddha* formulation for the treatment of various ailments.

KEYWORDS: *Siddha*, *Padigalinga Chenduram*, Standardization, Physicochemical, Heavy metal analysis, AAS.

INTRODUCTION

Siddha system is the ancient system of medicine which is practiced mostly in South India. Both herbal and mineral drugs are used in *Siddha* system. The increased use of herbomineral drugs, their safety and efficacy are in need of standardization of these drugs. WHO has setup guidelines for the standardization of these drugs, which are used as a standard by the majority of countries. Standardization confirms the safety of the medicinal plant but efficacy has to be judged clinically or in the laboratory.

Menorrhagia is one of the common gynaecological problems faced by most of the women in the world. PLT is one of the important *Siddha* formulations which is indicated for diarrhoea, dysentery, fever, cholera and menorrhagia. The main ingredients of PLT are *Padigaram* (Alum), *Lingam* (Red Sulphide of mercury), *Kadukkai poo* (*Terminalia chebula*) and *Kattathi poo* (*Woodfordia fruiticosa*).[1]

Availability of good quality raw material, authentication of raw material, availability of standards, proper standardization methodology of single drugs and formulations, quality control parameters are the challenges faced by the pharmaceutical units manufacturing the herbal medicine in large scale. The increasing demand for the raw material and unavailability of the resources compel many manufacturers to go for substitutes and adulterants which result in the substandard products. The quality of finished products vary from one pharmacy to another also there is no consistency in batch to batch production of herbal drugs. It is important to ensure the standard and quality right from the raw drugs to the finished product.[2] The present study is targeted to the same objective.

Here an attempt has been made to study and compare the market sample of *Padigalinga Chenduram* with the in-house preparation by means

of preliminary organoleptic character, physico-chemical parameters and heavy metal analysis.

MATERIALS AND METHODS

Drug source

The in-house sample is coded as sample1. The in-house sample1 preparation was done as per the standard procedure. The main four ingredients of *Padigalinga Chenduram*[1] [Table 1] are Alum, red sulphide of mercury, gall of *Terminalia chebula* and flower of *Woodfordia fruiticosa* are collected from the pharmacy of institute.

Table 1: Ingredients of *Padigalinga Chenduram*

Name of the drug	Chemical name/ Botanical name	Parts used	Amount
Lingam	Red sulphide of mercury		1 *Palam* (35g)
Padigaram	Alum		8 *Palam* (280g)
Kadukkai	*Terminalia chebula*	Gall	1 *Palam* (35g)
Kattathi poo	*Woodfordia fruiticosa*	flower	3 *Palam* (105g)

Process of preparation[1]

Alum and red sulphide of mercury are purified powdered and mixed well. Herbal drugs *Kadukkai* and *Kattathi poo* are made into decoction by adding 650ml of water to it. The decoction is added to the above mixture and ground well until it obtains fine consistency. The market sample was purchased from the local market and coded as sample 2. Now both the samples are subjected to physicochemical and heavy metal analysis.

Analytical Study

Physicochemical analysis was carried out at the Chemistry department of Siddha Regional Research Institute, Poojapura, Thiruvananthapuram and heavy metal analysis was carried out at Asthagiri Herbal Research Foundation, Perungudi, Chennai. Physicochemical analysis[3] like loss on drying, ash value, water soluble extract and alcohol soluble extract were carried out as per the PLIM guidelines/SPI(R) standard procedure. Heavy metal analysis was carried out by AAS (Atomic Absorption Spectroscopy).

RESULTS:

Organoleptic Characteristics:

Both the samples were assessed for organoleptic characteristics such as taste, smell, colour and touch. The observations are listed in Table 2.

Table 2: Organoleptic Characteristics

Characters	Sample 1	Sample 2
Touch	Fine , coarse	Fine , soft
Smell	Odourless	Odourless
Taste	No specific taste, astringent	No specific taste
Colour	Grey colour	Red colour

Physiochemical parameters of PLT

The physiochemical parameters have been done on two samples and observations are listed in Table 3.

Table 3: Physiochemical Parameters of Two Samples.

Name of test	Sample 1	Sample 2
Loss on drying at 105 c	32.29%	9.82%
Ash value	16.56%	37.37%
Water soluble extract	9.87%	20.14%
Alcohol soluble extract	46.79%	79.95%

Analysis of heavy metals

Heavy metal analysis was done by using Atomic Absorption Spectroscopy (AAS; AA240 series). Analysis of heavy metals of both the samples were estimated with the standard Hg, As, Pb, Cd, Zn, Sn and Fe for 100 ppm sample in 1 mol/L HNO_3 and listed in Table 4.

Table 4: Heavy Metal Analysis of Two Samples

Heavy Metals	Sample 1	Sample 2
Mercury	1.836g/kg	914mg/kg
Arsenic	14.869mg/kg	60.91 mg/kg
Lead	BDL	BDL
Cadmium	BDL	BDL
Zinc	751.04 mg/kg	BDL
Tin	BDL	BDL
Iron	7.020g/kg	5.1248g/kg

BDL – Below Detectable Limit

DISCUSSION

The Siddha formulation PLT has been analyzed in present study. The organoleptic characteristics mainly the colour varies significant between sample 1 and sample 2. This may be due to quality of raw material used.

The physicochemical analysis of both samples was obtained. The loss on drying of any sample is directly related to its moisture content. The less value of moisture content could prevent bacterial, fungal or yeast growth. Percent weight loss on drying or moisture content was found to be less in sample 2 compared to sample 1. The total ash value was relatively high in sample 2 which may be due to high content of inorganic materials in the sample. Ash value is useful in determining authenticity and purity of drug and also these values are important quantitative standards.

The extractive values, such as water- soluble and alcohol-soluble, indicate the amount of active constituent and the bioavailability of the plant. A lower value indicates the presence of the exhausted material. In the present study, the sample 2 had maximum water-soluble and alcohol-soluble extractive values. On analyzing both water-soluble and alcohol-soluble extractive values, the sample 2 was better compared to the sample 1 preparation.

The analysis of toxic heavy metals and AAS result reveals that the amount of Pb, Cd and Sn were below detectable limit in both the samples. The concentration of Hg was more in sample 1. Zn was present in optimum concentration in sample 1 and it was below detectable limit in sample 2. The toxic heavy metal As was present in both the samples which was more in sample 2 compared to sample 1.

The heavy metal analysis by AAS reveals that lead and cadmium are present below detectable limit. Mercury level in sample 1 is slightly higher than that of sample 2. Arsenic level in sample is comparatively lesser than that of sample 2. In both the samples mercury and arsenic level are above the permissible limits. The presence of zinc in sample 1 indicates that it can be used in the treatment of diarrhea, common cold, LRTI, wound healing, etc., presence of iron is slightly higher in sample 1 than that of sample 2. So both the samples are good supplement for iron deficiency caused by menorrhagia. According to *Siddha* perspective since both the samples have astringent taste they can be used in the treatment of menorrhagia, diarrhoea, dysentry and fever.

CONCLUSION

A definite conclusion cannot be obtained from the result of preliminary physiochemical, heavy metal and trace element analysis of two different samples of *Padigalinga Chenduram*. More number of samples from different pharmas has to be studied to arrive at definite standard for manufacturing *Padigalinga Chenduram*. When a definite standard is arrived from future studies, *Padigalinga Chenduram* will be a cost effective *Siddha* herbomineral formulation for the treatment of various ailments.

Sample 1 **Sample 2**

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