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Physio-Phytochemical Analysis of Siddha Herbo mineral formulation –*Perumpaduku chooranam*

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Abstract –
In the traditional healing system of *Siddha* medicine there are 32 types of Internal medicines and 32 types of External medicines that play an integral part in treating the diseases. One form of the Internal medicine is the *Perumpaduku chooranam* indicated for Perumpadu (menorrhagia) in the *Siddha* literature "*Sarabendirar Vaithya Muraigal (Pitha Roga Sikitchai)"* The aim of the study is to evaluate the physiochemical and phytochemical analysis of the *Siddha* Herbo mineral formulation *Perumpaduku chooranam*. The drug is prepared as per the given *Siddha* literature. The specifications such as Organoleptic characters, pH, Ash value, Loss on drying, phytochemicals testing for Alkaloids, Phenols, Tannins, Saponins, Glycosides, Carbohydrates are performed and the results are discussed.

Keywords – *Perumpaduku chooranam, Physio-Phyto chemical, Menorrhagia, Siddha medicine*

INTRODUCTION

In the recent years of managing lifestyle disorders, people in the various parts of the world are approaching towards the traditional medicine practice with the lifestyle changes for a healthy and wealthy living. The *Siddha* system of medicine is one of the traditional medical systems that originated from Tamil Nadu. The *Siddha* medicine features the use of Herbs, Metals & Minerals and Animal (Jeevam) based medicine formulations for treating disease and improving the longevity. The *Siddha* medicine is classified into 32 types of Internal and 32 types of External medicines based on the mode of application [1,2]. One category of the Internal medicine is the *CHOORANAM,* in which the raw drugs are purified, dried, grinded separately into powder, sieved and

mixed with other drugs according to the literature. Menorrhagia, one of the lifestyle disorders is widespread affecting the quality of life of women in reproductive age. There are numerous *Siddha* formulations indicated for Menorrhagia and one of those listed is "*Perumpaduku chooranam"* specified for *Perumpadu* (Menorrhagia), *Rathapitam* in the *Siddha* literature "*Sarabendirar Vaithya Muraigal (Pitha Roga Sikitchai*)"[3]. Standardization is the principal part to ensure quality, safety and efficacy of these herbal medicines. In this study, the physiochemical and phytochemical analysis of *Perumpaduku chooranam* that includes the determination of physical parameters like pH, moisture content, ash value and quantification of phytochemical constituents are conducted and the results are presented as tabulation.

MATERIALS AND METHODS:

Collection of the raw drug:

The raw drugs except *Thamarai poo* (*Nelumbo nucifera*), *Alli* (*Nymphae stellata*), *Ilandhaikottai paruppu* (*Ziziphus jujuba*) were bought from the authenticated raw drug store in Chennai.

Identification and Authentication of the drug:

All the drugs were recognized and verified by the experts of Gunapadam in Government Siddha Medical College, Chennai. The samples were labelled as 273-281/PGG/GSMC-CH/2023-2026.

Preparation of *Perumpaduku chooranam*:

Table -1 Ingredients of the drug *Perumpaduku chooranam*

S. No	Name of the drug	Botanical name	Quantity
1.	*Elam*	*Elettaria cardamomum*	1 *palam* (35g)
2.	*Elavangam*	*Syzygium aromaticum*	1 *palam* (35g)
3.	*Thamarai poo*	*Nelumbo nucifera*	1 *palam* (35g)
4.	*Alli idhazh*	*Nymphae stellata*	1 *palam* (35g)
5.	*Ilandhaikottai paruppu*	*Ziziphus jujuba*	1 *palam* (35g)
6.	*Nerpori / puffed rice*	*Oryza sativa*	1 *palam* (35g)
7.	*Adhimaduram*	*Glycyrrhiza glabra*	1 *palam* (35g)
8.	*Muthakkasu*	*Cyperus rotundas*	1 *palam* (35g)
9.	*Pachai Karpooram*	*Borneo camphor*	1 *palam* (35g)

Figure.No:1 Ingredients of *Perumpaduku chooranam*

Elettaria cardamomum

Syzygium aromaticum

Nelumbo nucifera

Nymphae stellata

Ziziphus jujuba

Oryza sativa

Glycyrrhiza glabra

Cyperus rotundas

Borneo camphor

Purification of the raw drugs:

The purification of the raw drugs was done as per the classical *Siddha* literature *Sikitcha Rathna Deepam* [4].

Procedure:

The above given ingredients of stated quantity were taken and pounded one by one into fine powder. The fine powder was sieved through a cloth and mixed together. Then it was stored in an airtight container.

DRUG PROFILE:

Route of administration	: Oral
Dose	:1¼ varagan (5.25gm)
Adjuvant	: Honey
Indication	: *Perumpadu* , *Rathapitham*

ANALYTICAL METHODS:

The following analytical specifications were carried out in Noble research solutions laboratory.

Organoleptic characters:

The state, nature, consistency, odor, appearance, flow property was spotted for the drug *Perumpaduku chooranam.*

Physiochemical analysis[6]:

The succeeding physiochemical analysis was done and the results were noted.

1.Percentage Loss on Drying:

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

2.Determination of Total Ash:

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

3.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.

4.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.

5.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.

6.pH determination:

Required quantity of test sample was admixed with distilled water and the subjected to screening using pH meter.

Phytochemical analysis [7]:

1.Test for Alkaloids(Mayer's Test):

To the test sample, 2ml of Mayer's reagent was added, a dull white precipitate revealed the presence of alkaloids.

2.Test for Coumarins:

To the test sample, 1 ml of 10% sodium hydroxide was added. The presence of coumarins is indicated by the formation of yellow color.

3.Test for Saponins:

To the test sample, 5 ml of water was added and the tube was shaken vigorously. Copious lather formation indicates the presence of Saponins.

4.Test for Tannins:

To the test sample, ferric chloride was added, formation of a dark blue or greenish black color showed the presence of tannins.

5.Test for Glycosides (Borntrager's Test):

Test drug is hydrolyzed with concentrated hydrochloric acid for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 ml of filtered hydrolysate, 3 ml of chloroform is added and shaken, chloroform layer is separated and 10% ammonia solution is added to it. Pink color indicates presence of glycosides.

6.Test for Flavonoids:

Alkaline reagent test. Two to three drops of sodium hydroxide were added to 2 mL of extract. Initially, a deep yellow color appeared but it gradually became colourless by adding few drops of dilute HCL, indicating that flavonoids were present.

7.Test for Phenols:

Lead acetate test: To the test sample; 3 ml of 10% lead acetate solution was added. A bulky white precipitate indicated the presence of phenolic compounds.

8.Test for Steroids:

To the test sample, 2ml of chloroform was added with few drops of conc. Sulphuric acid (3ml), and shaken well. The upper layer in the test tube was turns into red and Sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.

9.Test for Triterpenoids(Liebermann–Burchard test):

To the chloroform solution, few drops of acetic anhydride was added then mixed well. 1 ml concentrated Sulphuric acid was added from the sides of the test tube; appearance of red ring indicates the presence of triterpenoids.

10.Test for Cyanins (Anthocyanin):

To the test sample, 1 ml of 2N sodium hydroxide was added and heated for 5 min at 100°C. Formation of bluish green colour indicates the presence of anthocyanin.

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

11.Test for Carbohydrates (Benedict's test):

To the test sample about 0.5 ml of Benedict's reagent is added. The mixture is heated on a boiling water bath for 2 minutes. A characteristic-coloured precipitate indicates the presence of sugar.

12.Test for Proteins (Biuret Test):

To extracts 1% solution of copper sulphate was added followed by 5% solution of sodium hydroxide, formation of violet purple colour indicates the presence of proteins.

RESULTS:

1.Organoleptic characters:

Figure.no.2 Prepared drug *Perumpaduku chooranam*-PC

Table.no.2.Organoleptic characters

2.Solubility of drug:

Table.no.3 Results of solubility of drug

S.No	PARAMETER	RESULT
1.	State	Solid
2.	Nature	Moderately fine
3.	Odor	Characteristic
4.	Touch / Consistency	Soft
5.	Flow Property	Non-Free flowing
6.	Appearance	Brownish

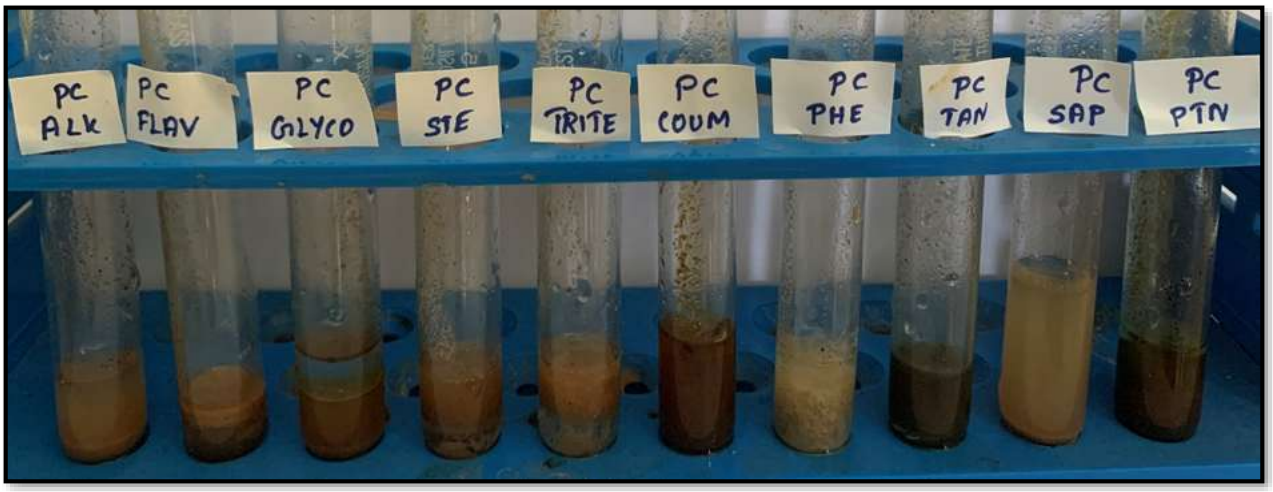
3.Physiochemical analysis of drug:

Table.no.4 Results of physiochemical parameter

S.No	Parameter	Mean (n=3) SD
1.	Loss on Drying at 105 °C (%)	8.3 ± 2.052
2.	Total Ash (%)	1.867 ± 0.5033
3.	Acid insoluble Ash (%)	0 ± 0
4.	Water soluble Extractive (%)	14.67 ± 0.7638
5.	Alcohol Soluble Extractive (%)	9.533 ± 0.4041
6.	pH	6.31

4.Phytochemical analysis:

Fig.No.3 **Qualitative**



Phytochemical Investigation

Table.no.5 Results of phytochemical analysis

S.No	TEST	OBSERVATION
1.	ALKALOIDS	+ve
2.	FLAVANOIDS	+ve
3.	GLYCOSIDES	-ve
4.	STEROIDS	+ve
5.	TRITERPENOIDS	+ve
6.	COUMARIN	+ve
7.	PHENOL	+ve
8.	TANIN	+ve
9.	PROTEIN	-ve
10.	SAPONINS	+ve
11.	SUGAR	+ve
12.	ANTHOCYANIN	-ve
13.	BETACYANIN	+ve

DISCUSSION:

From the above results of physio and phytochemical analysis, the drug *Perumpaduku chooranam* was brownish, soft , moderately fine with characteristic odor and slightly pungent taste. The tested drug has its solubility in Ethanol, water and DMSO (dimethyl sulfoxide).The results of physiochemical analysis revealed the loss on drying at 105 °C is 8.3 ± 2.052, Total ash value is 1.867 ± 0.5033, acid insoluble ash value is 0±0, pH is 6.31.The phytochemical testing with the reagents showed the presence of Alkaloids, Saponins, Tannin, Phenol, Flavonoids and Triterpenoids.

CONCLUSION:

The drug *Perumpaduku chooranam* indicated for *Perumpadu* (Menorrhagia) is valuated for its nature and solubility that, chooranam can be administered with water as an adjuvant. The pH value of 6.31denotes it slightly acidic. The total ash value 1.867 ± 0.5033, reports the low content of inorganic residue and purity of the drug. The 0% acid insoluble ash value indicates the absence of silicate impurities in the herbal formulation *Perumpaduku chooranam*. The presence of Tannin illustrates the effective nature of drug *Perumpaduku chooranam* for its Astringent property in treating *Perumpadu* (Menorrhagia).

Declaration by Authors:

Ethical approval

Ethical approved

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Conflict of interest:

The author has no conflict of interest.

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