



Preliminary analysis of Siddha Preparation ‘‘Kadikkara Chendooram’’ - Siddha and modern Standardization methods

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ABSTRACT

The holistic medicine aims to restore health by understanding the underlying causes of the diseases. It strives to attack the root causes and detoxifying, cleansing, strengthening body tissues (dhatus) and balancing bodily doshas, ensuring complete cure. The Siddhars wrote their knowledge in palm leaf manuscripts, fragments of which were found in different parts of South India. They listed numerous valuable medicines for each diseases. Among that, ‘‘Kadikkara Chendooram’’ is a one of effective medicine for *Pakkavatham*. The main ingredients of this preparation are *Kadikkaram* (Nitrate of Silver), *Lingam* (Red Sulphide of Mercury - Natural), *Rasa Chendhooram* (Red Sulphide of mercury). All ingredients were purified and prepared the medicine as per the instructions of authenticated Siddha text. This study focus to validate the Siddha preparation ‘‘Kadikkara Chendooram’’ scientifically through the analysis in Siddha and Modern standardization methods to improve the research on Siddha Medicines. Hence, this article gives evidences on the efficacy of this Siddha preparation.

Keywords:

Kadikkara Chendooram, Standardization, Siddha Medicine

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INTRODUCTION

Siddha system of medicine is one of the earliest traditional medicine systems in the world which treats not only the body but also the mind and the soul. The word Siddha has its origin in the Tamil word Siddhi which means "an object to be attained" or "perfection" or "heavenly bliss". It is one of the traditional systems of medicine prevalent in South India that uses a scientific and holistic approach to provide preventive, promotive, curative, rejuvenating, and rehabilitative health care. The classical Siddha system mentions 4448 diseases that are developed by the derangement of three humor (Vali, Azhal, and Aiyam).

In the Siddha system of medicine, use of metals and minerals is very much advocated. The depth of their knowledge in the field of minerals is clearly evident from the way the drug classification has been done. Raw drugs obtained from animal kingdom are also used for medicinal preparations in Siddha Medicine. Siddha Medicine has safe herbal and herbo mineral treatment for many more very common and rare diseases. Lifestyle modifications including diet are important.

According to the Siddha texts the modes of treatment include 32 types of internal medicines and 32 types of external applications. Based on that, *Kadikkara Chendooram* is a one of popular internal medicine in Siddha which is best choice for *Pakkavaham* (Hemiplegia). Hence this study going to analyse the Siddha preparation "*Kadikkara Chendooram*" in Siddha and modern standardization methods

MATERIALS AND METHODS

The selected drug *Kadikkara Chendooram* is a meto - mineral formulation contains three ingredients which mentioned in Siddha Literature of, Dr. Kuppasaamy Muthaliyar, K.N, Dr.Uththamarayan, K.S, 2016, *Siddha Vaiththiya Thiraddu*, Department of Indian Medicine and Homeopathy, Page Number 157.

Method of Preparation

Take each equal amount of Purified *Lingam*, *Rasa Chendhooram* and *Kadikkaram* and make as powder

separately. Then take a glass – corked air tight glass container (*Kal kaarkkup puddi*) and put half amount of powder of Purified *Rasa Chendhooram*, then place half amount of powder of Purified *Lingam* above it. Then put whole part of powdered *Kadikkaram*. After that again put rest half part of the *Rasa Chendhooram* powder above the powder of *Kadikkaram*. Finally lay the rest half part of the *Lingam* on top of whole layer of powders. After that close the bottle by a glass cork very tightly and cover the bottle by a piece of leather. Then after place the bottle in the middle part of the heap of boiled rice (*Nel*) and keep it until become cool. Finally take the medicine out, powdered well by using stone mortar (*Kalvam*) and store in a clean container.

Standardization of *Kadikkara Chendooram*:

As Per the Siddha Classical Literature

Standardization of drug means confirmation of its quality and purity and detection of the nature of adulterant.

- 1. Colour :** The finished form of *Chendooram* is in Brownish red colour.
- 2. Odour :** Final product of *Chendooram* is odourless. It does not possess any odour related to its ingredients.
- 3. Taste:** Properly prepared *Chendooram* should be completely tasteless. If any taste present in *Chendooram*, it indicates the *Chendooram* was not well prepared
- 4. Floating On Water :** A pinch of well-prepared *Chendooram* was sprinkled over the water in a glass container. The *Chendooram* particles did not sink but floated on the water surface. It indicates the lightness of *Chendooram*.
- 5. Finger Print Test :** Well prepared *Chendooram* should be very fine. A pinch of *Chendooram* was taken and rubbed in between the thumb and index finger. It entered into the lines (furrows) of the fingers. It confirms the fineness of *Chendooram*.

6. Lustre : If any glowing particles seen in the *Chendooram*, it shows that the drug is not prepared properly and possess unchanged substances like metals and other toxic substances. So, there should be no glowing particles present in the properly prepared *Chendooram*. The *Chendooram* was taken in a petri dish and observed for lustre in daylight via magnifying glass.

7. Organoleptic character: The organoleptic characters of the trial drug includes, *suva* (taste), *thanmai* (character), *veeriyam* (potency), *vipakam* (post absorptive changes) and *prapabam* (specific action)

Standardization As Per Modern Aspect

01.Physico Chemical Analysis

Physico-chemical analysis relies on a wide variety of analysis techniques to know the intrinsic properties of molecules or atoms. The following Physicochemical studies of the trial drug have been done according to the WHO guidelines.

1.1. Determination of loss on drying (Indian Pharmacopiea 1996): Loss on drying is a test method to determine the moisture content of the sample.

1.2. Determination of ash values: Ash values are helpful in determining the quality and purity of crude drugs.

a) Total ash

b) Water soluble ash

c) Acid-insoluble ash

1.3. Determination of extractive value: Extraction values by different solvents are used to assess quality, purity and to detect adulteration due to exhausted and incorrectly processed drugs.

a) Water soluble extractive value

1.4. Determination of pH value

02.Bio Chemical Analysis Of *Kadikkara Chendooram*

Preliminary Basic And Acidic Radical Studies:

Preparation of the extract:

100mgs of the *Kadikkara Chendooram* is weighed accurately and placed into a clean beaker and added a few drops of concentrated HCl and evaporated it well. After evaporation cooled the content and added to a few drops of concentrated nitric acid and evaporated it well. After cooling the content add 20ml of distilled water and dissolved it well. Then it is transferred to 100ml volumetric flask and made-up to 100ml with distilled water mix well. Filter it. Then it is taken for analysis.

2.1. Qualitative analysis for basic radicals:

The following tests were done for the qualitative analysis for basic radicals

Test for Calcium, Test for Iron (Ferric), Test for Iron (Ferrous) and Test for Zinc

2.2. Qualitative analysis for acidic radicals:

The following tests were done for the qualitative analysis for acidic radicals

Test for Sulphate, Test for Chloride, Test for Phosphate, Test for Carbonate, Test for starch, Test for albumin, Test for tannic acid, Test for unsaturation, Test for the reducing sugar and Test for amino acid

03.Phytochemical Analysis

Phytochemicals, chemical compounds that occur naturally in plants are responsible for colour and biological properties. The following tests are used for the analysis of phytochemicals were carried on alcoholic extract of plant.

3.1. Alkaloids: Mayer's test, Dragandroff's test, Hager's test

3.2.Carbohydrates And Glycosides: Molisch test, Legal's test, Borntrager's test for anthraquinones

3.3. Phytosterols: Liebermann – Burchard test, Salkowski test

3.4. Flavanoids: Shinoda test, Fluorescence test

3.5. Tannins: Ferric chloride test, Potassium dichromate test, Lead acetate test

3.6. Proteins: Millon’s test, Biuret test, Ninhydrin test

3.7. Fixed oils and Fats: Spot test, Saponification test

3.8. Lignin: Phloroglucinol test

3.9. Saponins: Frothing test

3	Taste	Tasteless
4	Fingerprint test	Impinged in the furrow of fingers
5	Floating on water	Sprinkled over the water
6	Luster	Lusterless or no glowing particles

RESULTS AND DISCUSSION

Standardization of the Trial Drug

Physical Standardization As Per The Siddha Classical Literature:

Siddhars used these following standardization methods to ensure the safety and efficacy of the *chendooram*. It shows the effectiveness of the drug.

The following characters have been noted in *KC*

Table 1: Physical standardization of *Kadikkara Chendooram* as per *Siddha* aspect

S.No	Physical standardization Parameters of <i>KC</i>	Result
1	Colour	Brownish red
2	Odour	Odorless

Physico Chemical Standardization of *Kadikkara Chendooram*

Table 2: Physico chemical standardization of *Kadikkara Chendooram*

S.No	Physico chemical standardization of <i>KC</i>	Result
1	Loss on drying at 105°C	1.00%
2	Ash value	
	Water soluble ash	9.70%
	Acid insoluble ash	1.70%
3	Extractive values	



Fig 01: *KC* impinged in the furrow of finger (Fingerprint test)



Fig 02: Floating test of *KC* over the water

	Water soluble extractive	9.80%
4	Organoleptic characters	
	Colour in day light	Brownish red
	pH (power of hydrogen)	6.80
	Odour	Odourless
	Taste	Tasteless
	Appearance	Powder
	Touch	Nice

Bio-Chemical Analysis of *Kadikkara Chendooram*

Following bio-chemical properties identified on screening the test drug

Table 3: Biochemical analysis results of preliminary basic and acidic radicals studies

S.No	Experiment	Observation	Results
1	Test for calcium	White precipitate	Present
2	Test for sulphate	White precipitate	Present
3	Test for chloride	White precipitate	Present
4	Test for carbonate	Brisk effervescence is formed	Present
5	Test for starch	No blue colour is formed	Absent
6	Test for ferric iron	Blue colour is formed	Present
7	Test for ferrous iron	Blood red colour is formed	Present
8	Test for phosphate	No yellow Precipitate is formed	Absent
9	Test for albumin	No yellow Precipitate is formed	Absent
10	Test for tannic acid	No blue black Precipitate is formed	Absent
11	Test for unsaturation	It gets decolorized	Present
12	Test for the reducing sugar	No change in colour	Absent
13	Test for amino acid	Violet colour is formed	Present
14	Test for zinc	No white precipitate is formed	Absent

Phytochemical Analysis of *Kadikkara Chendooram*

Table 4: Phytochemical analysis results of KC

S.No	Phytochemicals	Test	Result
1	Alkaloids	Dragendroff's Test	Negative
		Mayer's Test	Negative
		Hager's Test	Positive

2	Flavanoids	Shinoda Test (Magnesium turnings & Hydrochloric acid)	Negative
		Fluorescence Test	Negative
3	Carbohydrates and Glycosides	Molisch Test	Positive
		Legal's Test	Negative
		Borntrager's Test for anthraquinones	Negative
4	Phytosterols	Liebermann – Burchard Test	Negative
		Salkowski Test	Negative
5	Tannins	Ferric chloride test	Negative
		Potassium dichromate test	Negative
		Lead acetate test	Positive
6	Proteins	Millon's test	Negative
		Biuret test	Positive
		Ninhydrin test	Negative
7	Fixed oils and fats	Spot test	Negative
		Saponification test	Positive
8	Lignin	Phloroglucinol test	Negative
9	Saponins	Frothing test	Negative

After the preparation of *KC*, it was screened for various standardization parameters such as the *Siddha* standardization methods as well as the Modern standardization methods. As per *Siddha* standardization methods, *KC* had all the characteristics of properly prepared *chendooram* such as red colour, Odorless, Tasteless, and Impinged in the furrow of fingers with floating over the water, Lusterless or no glowing particles.

As per modern standardization methods, following parameters were followed. The Physico-chemical analysis, Bio-chemical analysis and Phyto-chemical analysis

Physicochemical analysis of *Kadikkara Chendooram* shows

The percentage of loss on drying at 105°C is 1.00%. It is within the acceptable range. The low moisture content of the trial drug reveals the stability and longer shelf life (75 years).

The Water soluble ash value of the trial drug *KC* was 9.70% and acid insoluble ash is 1.70%. The Water soluble ash value is higher than the acid insoluble ash. It represents the good quality of the drug *KC* and it is easily absorbed in the gut. Acid insoluble ash value is very small amount of the inorganic component is insoluble in acid, lower the acid insoluble value better will be the drug quality.

A water soluble extractive value of *KC* is 9.80%. Higher the Water soluble extractive value implies that the water is better solvent of the extraction.

Kadikkara Chendooram shows acidic pH 6.80. The pH level plays a role in enzyme activity by maintaining the internal environment thus regulating the homeostasis. Very high or very low pH will lead to the complete loss of the activity of most enzymes. The pH value at which the enzyme is most active is called the optimal pH value. The pH value of the trial drug *KC* falls near to the neutral pH value. Hence it has optimal enzymatic reaction.

Biochemical analysis shows,

The presence of Calcium, Sulphate, Chloride, Carbonate, Ferric iron, Ferrous iron, Unsaturated compounds and Amino acids

There are **calcium**-sensing receptors on vascular smooth muscle cells and on platelets, calcium plays a role in smooth muscle contraction and its role in the electrophysiology of the heart and myocardial function. The mechanism of action of magnesium **sulfate** is thought to trigger cerebral vasodilation, thus reducing ischemia generated by cerebral vasospasm during an eclamptic event.

Chloride is one of the most important electrolytes in the blood. It helps keep the amount of fluid inside and outside of your cells in balance.

Calcium **carbonate** is an inorganic salt used as an antacid.

Iron is an essential element for blood production. In the **ferrous** state (Fe^{2+}), iron acts as an electron donor, while in the **ferric** state (Fe^{3+}) it acts as an acceptor.

Unsaturated fats are necessary for the body, and they also protect against illness. They can improve blood cholesterol levels, ease inflammation, stabilize heart rhythms, and play a number of other beneficial roles.

Amino acids prevent muscle hypercatabolism in post stroke patients by suppressing myofibrillar protein and skeletal muscle degradation.

The phytochemical screening of the alcoholic and aqueous extract of the KC reveals,

The presence of Alkaloids, Carbohydrates, Tannins and Fixed oils and fats

Alkaloids have a wide range of pharmacological activities including antimalarial (e.g. quinine), antiasthma (e.g. ephedrine), anticancer (e.g. homoharringtonine), cholinomimetic (e.g. galantamine), **vasodilatory** (e.g. vincamine), etc

Carbohydrate-based or -modified therapeutics are used extensively in cardiovascular and hematological treatments ranging from inflammatory diseases and anti-thrombotic treatments to wound healing.

Tannins exert several pharmacological effects, including antioxidant and free radical scavenging activity as well as antimicrobial, anti-cancer, anti-nutritional and cardio-protective properties.

Fixed oils and fats possess gastroprotective, carminative, antiemetic, antibacterial, antifungal, antiviral, antiprotozoal, insect repellents, antioxidant, anticancer, antidiabetic and antimutagenic activities.

CONCLUSION

It is concluded that the trial drug *Kadikkara Chendooram* is scientifically validated by modern techniques and *Siddha* standard methods. It fulfills the standard requirements in *Siddha* aspect as well as the modern aspect. Hence the trial drug can be safely used for *Paarisavatham* (Hemiplegia).

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