



Biochemical Analysis Of Siddha Herbomineral Preparation Kadukkai Vadagam In The Management Of Swasakasam.

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ABSTRACT

Siddha is a unique system of medicine which not only treat ailments symptomatically but also cures the underlying cause of the disease. Siddhars are the forefathers of this system of medicine. They classified diseases and defined medicines accordingly. The medicines are of 2 types, Internal (32) and External (32). One among the internal medicine is vadagam. Kadukkai vadagam is indicated for Swasakasam (Bronchial asthma). Asthma is acute reversible obstructive disease due to bronchospasam. The common symptoms include cough, wheeze, dyspnea. The occurrence of disease is increased nowadays due to change in climate, diet pattern. This study reveals the biochemical analysis of kadukkai vadagam so that the effectiveness is understood. There is presence of Sulphate, Chloride, Carbonate, Aluminium, Calcium, Ammonium, Sodium, Reducing sugar, Alkaloids, and Tannic acids in *Kadukkai vadagam*.

KEY WORDS

Siddha, Swasakasam, Bronchial asthma, Kadukkai vadagam, Biochemical analysis.

1. INTRODUCTION

Herbals, Metals and minerals are natural sources of obtaining drugs. In ancient days our ancestors healed diseases through these natural forms. Siddhars also stated many principles to attain the immortal soul and reach the eternal bliss. The interrupting driving factor in achieving this target is the altered state of body. Diseases can be cured through internal medicines, external therapies. Accordingly *Kadukkai vadagam* is one of the form of internal medicine which is indicated to treat *swasakasam* (Bronchial asthma). It is selected from siddha sastric text *Athmaratchamirtham ennum vaithiya sara sangiragam*⁽¹⁾. The aim of this article is to reveal the biochemical analysis of the drug which increase the scope of this medicine in treating bronchial asthma.

2. MATERIALS AND METHODS

2.1. The Ratio, Purification process⁽²⁾, Botanical name⁽³⁾ of individual drugs in kadukkai vadagam.

Table 1 : Drugs, ratio and purification process

SNO	DRUGS	WEIGHT	PURIFICATION
1	<i>KADUKKAI</i> (<i>Terminalia chebula</i> . Retz)	100 numbers (500grams)	Immersed in kaadi neer (3 times in a day for 9 consecutive days) and inner seed is removed.
2	<i>KORAIKILANGU</i> (<i>Cyperus rotandus</i> , Linn)	12.6 grams	Dry under sun.
3	<i>KUROSANI OMAM</i> (<i>Hyosyamus niger</i> Linn)	12.6 grams	Deweed and remove unwanted substances.
4	<i>SUKKU</i> (<i>Zingiber officinale</i> , Rosc)	12.6 grams	Outer skin will be peeled off, chunnambu is applied and dried.
5	<i>KODIVELI VEER</i> (<i>Plumbago zeylanica</i> Linn)	12.6 grams	Root bark alone is taken and made into fine powder. Then it is treated with vapours of milk for 3 hours and dried.
6	<i>THIPPILI</i> (<i>Piper longum</i>)	12.6 grams	Soak in lemon juice and dry under sun.
7	<i>THIPPILI MOOLAM</i> (Root of <i>Piper longum</i>)	12.6 grams	Root nodules is removed and dried.

8	SEVIYAM (Root of <i>Piper nigrum</i>)	12.6 grams	Outer skin is peeled off and chopped it into small pieces and dried under sun.
9	MILAGU (<i>Piper nigrum</i> .Linn)	17.5 grams	Soaked in sour buttermilk for 3 hours and dried.
10	OMAM (<i>Trachyspermum ammi</i> Linn)	17.5 grams	Soaked in chunnambu thelineer and dried.
11	INDHUPPU (Sodium chloride)	17.5 grams	Soaked in kaadi neer for 3 days and dried.
12	KALLUPPU (Black salt)	125 grams	Soaked in kaadi neer and dried.
13	GINGER JUICE (<i>Zingiber officinale</i> ,Rosc)	1.3 litres	
14	LEMON JUICE (<i>Citrus lemon</i> Linn)	1.3 litres	
15	BUTTER MILK	1.3 litres	

2.2. Methods of preparation:

STEP 1- 500 grams of kadukkai is taken and powdered after purification.

STEP 2 - Kalluppu of 125 grams is taken and powdered after purification.

STEP 3 - Korai kilangu, kurosani omam, chukku, kodiveli veer, thippili, seviyam, thippili moolam each of ratio 12.6 grams was taken and powdered after purification.

STEP 4 - Milagu, indhuppu, omam each of ratio 17.5 grams was taken and powdered after purification

STEP 5 –All the powdered ingredients are grinded with buttermilk , lemon juice, ginger juice each of 1.3 litres separately and made into chewable pills (vadagam), each of size 1 grams.

3.METHODOLOGY:

Kadukkai vadagam was prepared and analysed as per standard procedure at the department of Biochemistry, National institute of siddha.

Preparation of extract:

10gm of *Kadukkai vadagam* powder was measured accurately and placed in the 250 ml of cleaned beaker and added with 250 ml of the distilled water. Then it is boiled well for 10 minutes. Then it was cooled and filtered in 100 ml volumetric flask and made up to 100 ml with distilled water.

4. RESULTS

A. BIOCHEMICAL ANALYSIS

Table 2: Biochemical analysis

S.NO	EXPERIMENT	OBSERVATION	INFERENCE
1	Appearance of the sample	Dark brown in colour.	Straw yellow colour
2	SOULBILITY: a) A little of the sample is shaken with distilled water. b) Little of the sample is shaken well with conc HCL /conc H ₂ SO ₄ .	Sparingly soluble. Not completely soluble.	Insoluble Insoluble
3	ACTION OF HEAT: A small amount of the sample is taken in a dry test tube and heated gently at first and then strong.	White fumes evolved. No brown fumes.	Presence of carbonate Absence of nitrate
4	FLAME TEST: A small amount of the sample is made into a paste with conc.HCL in a watch glass and introduced into nonluminous part of the Bunsen flame.	No Bluish green flame appeared.	Absence of Copper

5	ASH TEST: A filter paper is soaked into mixture of the sample and cobalt nitrate solution and introduced into bunsen flame and ignited.	Yellow colour flames.	Presence of Sodium
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B. TEST FOR ACID RADICALS:

Table 3: Acid radicals

SN O	PROCEDURE	OBSERVATION	INFERENCE
1	TEST FOR SULPHATE: a) 2 ml of above prepared extract is taken in the test tube to this added 2 ml of 4% ammonium oxalate solution. b) 2 ml of the above prepared extract is added with 2 ml of dilution HCL is added until the effervescence ceases off. Then 2 ml of barium chloride solution is added.	Cloudy appearance present A white precipitate insoluble in Conc.HCL is obtained.	Presence of Sulphate
2	TEST FOR CHLORIDE: 2 ml of above the prepared extract is added with dil. HNO_3 till the effervescence ceases. Then 2 ml of is treated with silver nitrate solution.	Cloudy appearance present.	Presence of Chloride
3	TEST FOR PHOSPHATE: 2 ml of extract is treated with 2 ml of ammonium molybdate solution and 2 ml of conc. HNO_3 .	No Cloudy yellow appearance present.	Absence of Phosphate
4	TEST FOR CARBONATE: 2 ml of the extract is treated with 2 ml of	Cloudy appearance	Presence of

	magnesium sulphate solution.	present.	Carbonate
5	TEST FOR NITRATE: 1 gm of the substance is heated with copper turnings and conc H ₂ SO ₄ and viewed the test tube vertically down.	No characteristics changes.	Absence of Nitrate
6	TEST FOR SULPHIDE: 1 gm of the substance is treated with 2 ml of concHCL.	No rotten egg smelling gas evolved.	Absence of Sulphide
7	TEST FOR FLUORIDE, OXALATE: 2 ml of extract is added with 2 ml of dil.acetic acid and 2 ml of calcium chloride solution and heated.	No cloudy appearance present.	Absence of Fluoride and Oxalate
8	TEST FOR NITRITE: 3 drops of the extract is placed on the filter paper on that 2 drops of acetic acid and 2 drops of benzdine solution is placed.	No characteristics changes.	Absence of Nitrite
9	TEST FOR BORATE: 2 pinches of the substances is made into paste by using sulphuric acid and alcohol (95%) and introduced into blue flame.	Bluish green colour flame not appeared.	Absence of Borate

C. TEST FOR BASIC RADICALS:

Table 4: Basic radicals

S.NO	PROCEDURE	OBSERVATION	INFERENCE
1	TEST FOR LEAD: 2 ml of the extract is added with 2 ml of potassium iodide solution.	No yellow precipitate is obtained.	Absence of Lead
2	TEST FOR COPPER: a) One pinch of substance is made into		

	paste with conc HCL in a watch glass and introduced into nonluminous part of the flame. b) 2 ml of the extract is added with excess of ammonia solution.	No Blue colour flame No Blue colour precipitate formed.	Absence of Copper
3	TEST FOR ALUMINIUM: To the 2 ml of extract sodium hydroxide is added in drops to excess.	Changes in colour	Presence of Aluminium
4	TEST FOR IRON: a) To the 2 ml of extract add 2 ml of Ammonium thiocyanate solution. b) To the 2 ml of extract 2 ml of Ammonium thiocyanate solution and 2 ml of con HNO ₃ is added	No Mild red colour appear. No Blood red colour appeared.	Absence of Iron
	TEST FOR ZINC: To 2 ml of the extract sodium hydroxide solution is added in drops to excess.	No White precipitate is formed.	Absence of Zinc
6	TEST OF CALCIUM: 2 ml of the extract is added with 2 ml of 4% ammonium oxalate solution	cloudy appearance & white precipitate is obtained	Presence of Calcium
7	TEST FOR MAGNESIUM: To 2 ml of extract sodium hydroxide solution is added in drops to excess.	No White precipitate is obtained	Absence of Magnesium
8	TEST FOR AMMONIUM: To 2 ml of extract few ml of Nessler's reagent and excess of sodium hydroxide solution are added.	Brown colour appeared, green precipitate is obtained.	Presence of Ammonium
9	TEST FOR POTASSIUM: A pinch of substance is treated with 2 ml of sodium nitrate solution and then treated with 2 ml of cobalt nitrate in 30% glacial acetic acid.	No yellowish precipitate is obtained	Absence of Potassium
10	TEST FOR SODIUM: 2 pinches of the substances is made	Yellow colour flame appeared	Presence of Sodium

	into paste by using HCL and introduced into the blue flame of Bunsen burner.		
11	TEST FOR MERCURY: 2 ml of the extract is treated with 2 ml of sodium hydroxide solution	No yellow precipitate is obtained	Absence of mercury
12	TEST FOR ARSENIC: 2 ml of the extract is treated with 2 ml of sodium hydroxide solution	No brownish red precipitate is obtained	Absence of arsenic

D. MISCELLANEOUS TEST

Table 5 : Miscellaneous test

S.NO	PROCEDURE	OBSERVATION	INFERENCE
1	TEST FOR STARCH: 2 ml of extract is treated with weak iodine solution.	No blue colour develops	Absence of starch
2	TEST FOR REDUCING SUGAR: 5 ml of the benedict's qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 8 to 10 drops of the extract and again boil it for 2 minutes.	Brick red colour develops	Presence of reducing sugar
3	TEST FOR THE ALKALOIDS: 2 ml of the extract is treated with 2 ml of potassium Iodide solution. 2 ml of extract is treated with 2 ml of picnic acid. 2 ml of the extract is treated with 2 ml of phosphotungstic acid.	No red colour developed. Yellow colour developed. No white precipitate developed.	Presence of Alkaloids

4	TEST FOR TANNIC ACID: 2 ml of extract is treated with 2 ml of ferric chloride solution.	Black precipitate present	Presence of Tannic acid
5	TEST FOR AMINO ACID: 2 drops of the extract is placed on a filter paper and dried well.	No violet colour developed	Absence of amino acids
6	TEST FOR TYPE OF COMPOUND: 2 ml of the extract is treated with 2 ml of ferric chloride solution	No green colour developed. No Red colour developed. No violet colour developed. No blue colour developed.	Absence of oxyquinol epinephrine and pyro catechol Antipyrine. Aliphatic amino acids and meconic acid are absent. Apomorphine salicylate Resorcinol are absent. Morphine, Phenol cresol and hydro quinone are absent.

5. DISCUSSION:

The Biochemical analysis showed the presence of **Sulphate, Chloride, Carbonate, Aluminium, Calcium, Ammonium, Sodium, Reducing sugar, Alkaloids, and Tannic acids** in *Kadukkai vadagam* which makes it potential in treating swasakasam.

Tannic acid - In a study, the effects of Tannic Acid treatment on airway hyperresponsiveness, airway inflammation, expression of inflammatory mediators, mast cell numbers, mucus hypersecretion, and airway remodeling in ovalbumin (OVA)-induced asthmatic mouse model. The results showed that there is reduction in the expression of inflammatory mediators as well as NF- κ B activation. Thus, TA may act as an effective drug for the treatment of allergic asthma.⁽⁴⁾

Alkaloids - The presence of alkaloids particularly indole alkaloid is important in treating respiratory disease.⁽⁵⁾

Calcium - Calcium-channel blocking drugs do not induce bronchoconstriction in susceptible persons with cardiac disease and concomitant hyperreactive airways (such as asthma or chronic bronchitis). The ways in which calcium blockers might in fact play a beneficial role in preventing bronchoconstriction or inducing bronchodilation in asthma are explored. ⁽⁶⁾

Sulphate - In 1987, Okayama et al showed that $MgSO_4$ relieved bronchoconstriction in mild asthma in a dose-dependant manner. Maximal responses were similar to the effects of additional albuterol inhalation. Bronchodilation occurred soon after the beginning of $MgSO_4$ infusion and reached its maximum at the end of the 20 min of infusion. ⁽⁷⁾

6. CONCLUSION:

There are lot of siddha medicines to treat bronchial asthma yet to be scientifically validated. Hence this study explains the biochemical analysis of kadukkai vadagam. This provides the basic knowledge about the drug and further more studies of physicochemical and phytochemical activities are needed for the drug.

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