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Research article

PRELIMINARY QUALITATIVE BIO-CHEMICAL EVALUATION OF ACID, BASIC RADICALS OF A CLASSICAL SIDDHA HERBO-MINERAL FORMULATION *"KALLADAIPPU CHOORANAM"*.

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ABSTRACT

BACKGROUND:

The trial drug *"Kalladaippu Chooranam (KC)"* is a herbo-mineral formulation is used for treating Urolithiasis.

OBJECTIVE:

The aim of this present study is to validate the qualitative bio-chemical analysis of a classical Siddha Herbo-Mineral Formulation *"Kalladaippu Chooranam (KC)"* as Mentioned in *Agathiyar Ayulvetham 1200*.

METHODS AND MATERIALS:

Siddha system of medicine is one of the oldest system of medicine which have been practiced by the Dravidian people particularly in Southern part of India. It was a fruitful gift of God sponsored through the great spiritual scientist in the name of Siddhar's. The trial drug was prepared by, as per the Standard Operative Procedure (SOP) as mentioned in classical literature. Then trial drug *(KC)* was subjected to qualitative bio-chemical analysis. This current study explore that the qualitative analysis of a trial drug through bio-chemical analysis.

RESULTS:

The present investigation of qualitative bio-chemical analysis shows that the presence of various chemical compounds in the trial drug "*(KC)* Acid radical such as Chloride, Phosphate, Sulphide and Basic radical such as Iron.

CONCLUSION:

Thus the authors conclude from the results, the presence of these various chemical compounds in the trial drug *(KC)* will be responsible for its therapeutic effect. This preliminary bio- chemical analysis will pav a flatform to do further pharmacological studies.

Keywords:

Siddha, Kalladaippu Chooranam, KC, Bio-chemical analysis, Herbo-Mineral formulation.

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INTRODUCTION

Siddha system of medicine is one of the oldest holistic management system among the Indian system of medicine with meticulously documented medicines, it have been being practiced by Dravidian people in South India from ancient time. However this system of medicine attain its fame due to its safety, efficacy, low cost effectiveness, with tremendous medicinal use[1,2].

Even though there is as much incredible advances present in modern science, technology and allopathic medicine. We couldn't provide the quality of treatment to the people. Globally, the Traditional system of medicine particularly herbal – mineral medicines were considered as a major healthcare provider. Indian traditional medicinal systems such a Ayurveda, Siddha and Unani had a very rich history for their effectiveness without any adverse effect [3].

Pharmacop oeial committees for ASU systems, provide certain standards for quality, purity and strength of drugs and then they approved the drug formularies. Central Council for Research in Ayurveda and Siddha (CCRAS) laboratories, laboratories of Central Council for Research in Unani Medicine (CCRUM), Pharmaco-poeial Laboratories, Council for Scientific & Industrial Research (CSIR) laboratories and certain several sector are involved in the mammoth job of controlling and maintaining of quality, formulation of standard for ensuring safety and quality of polyherbal/ herbomineral preparations[4].

Herbal- Mineral formulations are widely used in traditional medicines from ancient time. Various medicinal chemical compounds were identified in herbal-mineral formulation. Thus in this paper the authors explore the qualitative bio-chemical analysis of a classical Siddha Herbo-Mineral Formulation *"Kalladaippu Chooranam (KC)"* as mentioned in *Agathiyar Ayulvetham 1200*. Herbo-Mineral formulations are always considered to be safe lots of medicinal value. This trial drug was validated for its bio-chemical study to know the chemical compound present in this drug. The fresh formulation prepared in the laboratory was tested for the presence of above mentioned parameters.

Nature itself is the best physician - Hippocrates

AIM AND OBJECTIVE:

The aim of the present study is to validate the qualitative bio-chemical analysis for the trial drug *"Kalladaippu Chooranam (KC)"*.

MATERIALS AND METHODS

Collection and identification of drug:

The herbo-minerals preparation of *Kalladaippu Chooranam* were identified and authenticated (certificate no: 17051801 - 03) by Research officer, Siddha Central Research of India, Central Council for Research in Siddha, Chennai.

Purification of the Drug:

The ingredients of this Herbo-Mineral formulation were purified according to the proper produce methods described in Siddha Classical Literature.

Ingredients of *Kalladaippu Chooranam(KC):*

Purified *Padigaram (Alum)*

Purified *Venkaram (Borax - Sodium Biborate)*

Purified *Induppu (Rock Salt - Sodium Chloride)*

Purified *Savukkaram (Sodium Carbonate)*

Ashes of Nayuruvi (Achyranthes aspera)

Ashes of *Panangathir (Borassus flabellifermis)*

Ashes of *Vazhai Mattai (Musa paradisiaca)*

Preparation of drug:

Equal amount of purified *Padigaram, Venkaram, Induppu* and *Savukkaram* were made into fine powder. Equal amount of ashes of *Nayuruvi, Panangathir* and *Vaazhai Mattai* made it also into fine powder. Then mixed both the powder contents and sieved by pure cloth *(vasthirakayam)*, and stored it into an air tight container.

Administration: Dosage: 1 gm/ twice a day/ after meal

Adjuvant: honey

Indication: *Vatha Kalladaippu*[5].

Biochemical analysis:

The Bio chemical analysis of the extract gives an idea about the chemical constituents present in trial drug *"Kalladaippu Chooranam (KC)"*.

Chemicals and drugs:

The chemicals used in this study were of analytical grade obtain from Department of Biochemistry, Government Siddha Medical College, Chennai.

Methodology:

2 gm of the trial drug *"Kalladaippu Chooranam (KC)"* is mixed 5 gm of Sodium carbonate and taken in a 100 ml beaker and 20 ml of distilled water is added. The solution is boiled for 10 minutes, cooled and then filtered. The filtrate is called sodium carbonate extract.

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Table no:1 Bio-chemical analysis of *"Kalladaippu Chooranam*

S.No	EXPERIMENTS	OBSERVATIONS
1a	**Test for Sulphate** 2 ml of the above prepared extract is taken in a test tube. To this add 2ml of 4% Ammonium oxalate solution.	Absence of White Precipitate
b	2ml of extract is added with 2ml of dilute hydrochloric acid until the effervescence ceases off. Then 2ml barium chloride solution is added.	Absence of White Precipitate
2	**Test for Chloride:** 2ml of extract is added with dilute nitric acid till the effervescence ceases. Then 2ml of silver nitrate solution is added.	white precipitate obtained
3	**Test for Phosphate** 2ml of the extract is treated with 2 ml of Ammonium molybdate solution and 2ml of concentrated nitric acid.	Yellow precipitate Obtained
4	**Test for Carbonate:** 2ml of the extract is treated with 2ml of magnesium sulphate solution.	Absence of white Precipitate
5	**Test for Sulphide:** 1 gm of the extract is treated with 2ml of concentrated Hcl.	Absence of Rotten egg smelling
6	**Test for Nitrate:** 1gm of the substance is heated with copper turnings and concentrated sulphuric acid and viewed the test tube vertically down.	Absence of reddish brown gas.
7a	**Test for Fluoride and oxalate** 2ml of the extract is added with 2ml of dilute acetic acid and 2ml of calcium chloride solution and heated.	Absence of white Precipitate
b	5 drops of clear solution is added with 2ml of diluted sulphuric acid and slightly warmed to this, 1 ml of dilute potassium permanganate solution is added.	KMNO4solution Discolourisation obtained
8	**Test for Nitrite** 3 drops of the extract is placed on a filter paper. On that, 2 drops of Acetic Acid and 2 drops of Benzidine solution is placed.	Absence of yellowish red color
9	**Test for Borate** 2 pinches of the substance is made into paste by using Sulphuric acid and Alcohol (95%) and introduced into the blue flame.	Absence of Green tinged flame

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Table no: 1 (Conti.) Test for Basic radicals

10	**Test for lead** 2 ml of the extract is added with 2 ml of Potassium iodide solution.	Absence of Yellow Precipitate
11a	**Test for Copper** One pinch of substance is made into paste with concentrated Hydrochloric acid in a watch glass and introduced into the non luminous part of the flame.	Absence of Bluish green colored flame.
b	2ml of the extract is added with excess of Ammonia solution	Absence of deep Blue
12	**Test for Aluminium** To the 2 ml of extract. Sodium Hydroxide solution is added in drops to excess.	Absence of White Precipitate.
13a	**Test for Iron** To the 2 ml of extract, 2 ml of Ammonium Thiocyanate Solution is added.	Absence of Blood red color
b	To the 2 ml of extract, 2 ml of Ammonium Thiocyanate solution and 2 ml of concentrated Nitric Acid is added.	Blood red color obtained
14	**Test for Zinc** To the 2 ml of extract Sodium Hydroxide solution is added in drops to excess.	Absence of White precipitate.
15	**Test for Calcium** 2 ml of the extract is added with 2 ml of 4% Ammonium Oxalate solution.	Absence of White precipitate.
16	**Test for Magnesium** 2ml of extract, Sodium Hydroxide solution is added in drops to excess.	Absence of White precipitate.
17	**Test for Ammonium** 2 ml of extract few ml of Nessler's Reagent and excess of Sodium Hydroxide solution are added.	Absence of Reddish brown Precipitate
18	**Test for Potassium** A pinch of substance is treated with 2 ml of Sodium Nitrite solution and then treated with 2 ml of Cobal Nitrate in 30% glacial Acetic acid.	Absence of Yellow precipitate
19	**Test for Sodium** 2 pinches of the substance is made into paste by using Hydrochloric acid and introduced into the blue flame.	Absence of Yellow colour flame
20	**Test for Mercury** 2 ml of the extract is treated with 2 ml of Sodium Hydroxide solution.	Absence of yellow Precipitate
21	**Test for Arsenic:** 2 ml of extract is treated with 2 ml of silver Nitrate solution.	Absence of Yellow precipitate
22	**Test for Starch** 2ml of extract is treated with weak iodine solution	Absence of Blue colour
23	**Test of reducing Sugar** 5ml of Benedicts qualitative solution is taken in a test tube and allowed to boil for 2 minutes and added 10 drops of the extract and again boiled for 2 minutes. The colour changes are noted.	Absence of Green colour
24	**Test of the alkaloids** 2ml of the extract is treated with 2ml of potassium lodide solution.	Absence of Red color
25	**Test of the proteins** 2ml of the extract is treated with 2ml of 5% NaOH, mix well and add 2 drops of copper sulphate solution.	Absence of Violet color[6]

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RESULTS

The results of qualitative Bio-chemical analysis of *"Kalladaippu Chooranam (KC)"* was tabulated below.

Table No: 2 Results of Bio-chemical analysis Acid radicals of "Kalladaippu Chooranam

S.No	CHEMICAL COMPOUNDS ACID RADICAL	RESULTS
1	Chloride	Positive
2	Phosphate	Positive
3	Sulphide	Positive

Table No: 3 Results of Bio-chemical analysis Basic radical of *"Kalladaippu Chooranam (KC)"*

S.No	CHEMICAL COMPOUNDS BASIC RADICAL	RESULTS
1	Iron	Positive

DISCUSSION

- The results of the bio chemical analysis of *"Kalladaippu Chooranam (KC)"* shows the presence of Acid Radicals such as Chloride, Phosphate, Sulphide and Basic Radical like Iron. The presence of these compounds enhance the pharmacological activity of the trial drug *"Kalladaippu Chooranam (KC)"*.
- pH of the urine plays an important role in the formation of renal calculi. Acidic nature of urine involve in the formation stones such as Uric acid stones, Oxalates stones, Cystine stones. Alkaline nature of urine involve in the formation of stones such as Struvite stones, Calcium stones, Phosphate stones.
- The trial drug *"Kalladaippu Chooranam (KC)"* shows the presence of Chloride, the bio chemical compound. The combined formulation of Sodium chloride is preferred for reducing Urine pH. Thus it indirectly involved in the prevention of stones like Struvite stones, Calcium stones, Phosphate stones and also it involved in the excretion of calcium[7].
- The trial drug *"Kalladaippu Chooranam (KC)"* shows the presence of Phosphate, the bio-chemical compound. On in-vitro study of orthophosphate salts on administered orally there is a excretion of urine in urolithiasis patient was found . Due to its effect long period of observation was done in recurrent stone formation in patients the miracle was happened
- there is a no evidence of formation of new stones and it prevents the formation of stones. Orthophosphate salts are available as potassium acid phosphate, neutral mixtures consisting of potassium and sodium phosphates or potassium phosphates alone, or an alkaline mixture consisting of disodium and dipotassium phosphates[8].
- The trial drug *"Kalladaippu Chooranam (KC)"* shows the presence of Sulphide, the bio-chemical compound. The combined action of hydrogen sulphide plays an important part in normal renal physiology. The dysfunction of hydrogen sulphide contributes certain renal diseases. Thus it acts as a promising therapeutic agent in renal disease and renal injuries[9].
- The trial drug *"Kalladaippu Chooranam (KC)"* shows the presence of Iron, the bio-chemical compound. Iron is an important essential compound which is indispensable for life. Normally body iron balance is maintained by both systemic and cellular regulatory mechanisms. The iron-regulatory hormone hepcidin is responsible for the maintenance of adequate systemic iron levels. Thus kidney plays a important role in preventing iron loss from the body by the process of reabsorption. If there is any disturbances in cellular and systemic iron balance are recognized as causes and consequences of kidney injury and renal diseases. Thus iron plays a major role in kidney diseases[10]
- The presence of these acid and basic radicals of this trial drug *"Kalladaippu Chooranam (KC)"* prevents the formation of renal stones and prevents the damage of kidney from various source.

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CONCLUSION

The trial drug *"Kalladaippu Chooranam (KC)"* is a herbo-mineral formulation has been subjected to qualitative bio-Chemical analysis to explore the effective work of Siddhar's. The present study shows the presence of various chemical compounds such as Chloride, Phosphate, Sulphide, Iron. The presence of these chemical compounds unconcealed the therapeutic effect of the trial drug. Further there is a need in the validation of pharmacological activity to validates its own potency for the future reference.

CONFLICT OF INTEREST: None declared

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