Research Article

Biochemical Analysis in Standardization of Siddha Herbal Drug *Sanni Kiyaazham*

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ABSTRACT

This article provides a comprehensive review of Biochemical analysis of sanni kiyaazham, a siddha polyherbal internal kudineer formulation used in ancient siddha medicine to treat all types of sanni including Alathidu sanni. There is no direct reference for this disorder in modern medicine and only its symptoms were correlated to ADHD [Attention deficit hypertensive disorder]. The aim of the study was to create scientifically proven data by doing the biochemical analysis of sanni kiyaazham. The study was carried out based on PLIM guidelines. The formulation was subjected to various analytical evaluations to test for acid radicals like nitrates and phosphates and basic radicals like lead and arsenic. The findings provide significant insights into the biochemical analysis of sanni kiyaazham contributing to the assessment of therapeutic efficacy in treating Alathidu sanni. The result shows presence of phosphate, carbonate, and sulphates thus confirming the presence of various bioactive components in it. This baseline study provides some insights based on which future studies will be undertaken.

Keywords: Sanni kiyaazham, siddha medicine, Alathidu sanni, ADHD, biochemical analysis.

INTRODUCTION

In recent times, all over the world there has been an increased awareness among people regarding traditional medicinal systems practised across the Globe. People try to cure their diseases with all types of medicines they had access to, for worldwide usage of medicines there has to be a proper standardization of medicines according to international standards.

Siddha medicine is one of the oldest traditional Indian systems of medicine practised mostly in southern India especially Tamil Nadu. There are 32 types of internal and 32 types of external medicines mentioned in siddha for various kinds of diseases. *Sanni kiyaazham* [1] is one type of internal medicine mentioned in siddha sastric book, *18 siddhar vaithiya chillarai kovai* for all types of sanni. AlathiduSanni, a type of sanni (Mukkutra disease) in which there is an imbalance of all the three main fundamental principles of siddha: vatham, pitham and kabam. In our Siddha paediatric literature, the symptoms of diseases are taken and correlated to disease ADHD [2]

Attention deficit hyperactivity disorder (ADHD) is a chronic condition with genetic and neurobiological basis which manifests in early childhood with symptoms of hyperactivity, impulsivity, and/or inattention affecting the emotional, academic, and social functioning of the child.[3] Prevalence of ADHD in a community-based sample in India among school children was around 11%. Decoctions are water-based extracts of herbal drugs which are easily absorbed into the body and enter into the blood stream quickly which gives faster action than other forms of medications. Sanni kiyaazham, a polyherbal Siddha medication, has shown greater potential in treating ADHD and its related symptoms. Yet scientific evidences for it have not been reported. Hence, there is a need to develop a standardization technique by using preliminary guidelines. Therefore, the current investigation was done to detect Biochemical analysis of siddha formulation Sanni kiyaazham according to PLIM guidelines.

MATERIALS AND METHODS

Selection of the drug

The trial drug *sanni kiyaazham* was taken from *18 siddhar chillarai kovai* for the treatment and management of ADHD and its related symptoms. The trial drug sanni kiyaazham comprises of the following ingredients.

Table 1: Ingredients of sanni kiyaazham

S.no	Ingredients	Botanical name	Quantity
1	Chukku	*Zingiber officinale*	5.1grams
2	Milagu	*Piper nigrum*	5.1grams
3	Vasambu	*Acorus calamus*	5.1grams
4	Thippili	*Piper longum*	5.1grams
5	Elumichai	*Citrus lemon*	5.1grams
6	Chitramutti	*Sida cordfiloia*	488mgm
7	Seenthil	*Tinospora cordifolia*	488mgm
8	Parpadaagam	*Mollugo cerviana*	488mgm
9	Paathiri	*Stereospermum tetragonum*	488mgm
10	Vetiver	*Vettiveria zizanoides*	488mgm
11	Vila	*Limonia acidissima*	488mgm

Collection, Identification and Authentication of the drug

The required drug was purchased from a well reputed country shop in tambaram and raw drugs were authenticated by the medicinal botanist of NIS. The prepared medicine were authenticated by the concerned Head of the Department for its completeness.

Purification of the drugs

Purification process was made according to the procedures mentioned in the classical Siddha literature[4]

Chukku (*Zingiber officinale*)- after removing the outer skin, dry under the moonlight

Milagu (*Piper nigrum*)- soaked in sour buttermilk for 3 hours and dry under the moonlight

Vasambu (*Acorus calamus*)- put into the flame directly until it burns completely

Thippili (*Piper longum*)-remove the nodes and dried

Seenthil (*Tinospora cordifolia*)-The outer epidermal layer is to be peeled off

Lemon (*Citrus lemon*), Chitramuti (*sida cordifolia*), Parpadaagam (*Mollugo cerviana*),Paathiri (*stereospermum tetragonum*),Vetiver (*vettiveria zizanoides),*Vila (*Limonia acidissima*), the above mentioned drugs are to be washed and dry under the moonlight.

Method of preparation

Ingredients mentioned above are made as a coarse powder and then soaked it in a vessel containing of water 1litre and heat till it comes to 1/8th of its volume and then the decoction is filtered.

Biochemical analysis of acidic and basic radicals

Table 2: Analytical Investigation on Test for Basic Radicals

Test for Specific Acid Radical	Indication / Observation	Inference	Results
Test for Carbonates To 1 ml of the test solution about 1 ml of concentration (conc.) HCL was added.	Formation of brisk effervescence indicates the presence of carbonates	Presence of brisk effervescence Absence of brisk effervescence	Positive Negative
Test for chlorides To 2 ml of test solution, about 1 ml of silver nitrate solution was added.	Appearance of White precipitate indicates the presence of chlorides.	Presence of White precipitate Absence of White precipitate	Positive Negative
Test for sulfates To 1 ml of the test sample add diluted H_2SO_4 till effervescence ceases followed by this about 1 ml of barium chloride solution was added.	Appearance of white precipitate indicates the presence of sulfates.	Presence e of white precipitate Presence e of white precipitate	Positive Negative
Test for sulfides To 1 ml of the test sample about 2 ml of HCL was added with slight warming the mixture.	Formation of colorless gas with the smell of rotten egg indicates the presence of sulfides.	Presence of rotten egg smell Absence of rotten egg smell	Positive Negative
Test for phosphates To 2 ml of test solution treated with 2 ml of ammonium molybdate solution followed by addition of 2ml of concentrated nitric acid	Formation of yellow precipitate Indicates the presence of phosphates	Presence of yellow precipitate Absence of yellow precipitate	Positive Negative
Test for Fluoride and Oxalate To 2 ml of the test solution about 2 ml of dil acetic acid and 2ml of calcium chloride solution was added	Formation of white precipitate Indicates the presence of Fluoride/ Oxalate	Presence of white precipitate Absence of white precipitate	Positive Negative
Test for Borates 2ml of the test solution was added with sulphuric acid and 95% alcohol followed by exposure to flame	Appearance of green flame Indicates the presence of Borates	Presence of green flame Absence of green flame	Positive Negative
Test for Nitrates 0.5 ml of test solution heated with copper turning followed by addition of sulphuric acid	Appearance of reddish brown gas Indicates the presence of Nitrates	Presence of reddish brown color Absence of reddish brown color	Positive Negative

Table 3: Analytical Investigation on Test for Basic Radicals

S.No	Test for Specific Basic Radical	Indication / Observation	Inference	Results
1.	**Test for Lead** 1 ml of the test solution added with 2 ml of potassium chromate solution.	Formation of yellow precipitate indicates the presence of lead.	Presence of yellow precipitate Absence of yellow precipitate	Positive Negative
2.	**Test for Arsenic** 1 ml of the test solution added with 2 ml of 10% (2N) sodium hydroxide (NaOH) solution.	Formation of brownish red precipitate indicates the presence of Arsenic	Presence of brownish red precipitate Absence of brownish red precipitate	Positive Negative
3.	**Test for Mercury** 1 ml of the test solution added with 2 ml of 10% (2N) sodium hydroxide (NaOH) solution.	Formation of yellow precipitate indicates the presence of mercury.	Presence of yellow precipitate Absence of yellow precipitate	Positive Negative
4.	**Test for Copper** 1 ml of the test solution added with 1 ml of Ammonium hydroxide (NH4OH) solution	Formation of blue precipitate indicates the presence of copper.	Presence of blue precipitate Absence of blue precipitate	Positive Negative
5.	**Test for Ferric** To 1 ml of test solution, about 2 ml of potassium ferrocyanide was added.	Formation of blue precipitate indicates the presence of ferric.	Presence of blue precipitate Absence of blue precipitate	Positive Negative
6.	**Test for Ferrous** To 1 ml of test solution, about 1 ml of potassium ferric cyanide solution was added.	Formation of blue precipitate indicates the presence of ferrous.	Presence of blue precipitate Absence of blue precipitate	Positive Negative
7.	**Test for Zinc** 1 ml of the test solution added with 2 ml of sodium hydroxide (NaOH) drop wise until indication appears.	Formation of white precipitate indicates the presence of Zinc.	Presence of white precipitate Absence of white precipitate	Positive Negative
8.	**Test for Silver** 1 ml of the test solution was added with 1 ml of conc. HCL followed by appearance of curdy white precipitate. Boil the precipitate with water. It does not dissolve. Add NH_4OH solution in it and add 1 ml dilute HNO_3.	Formation of curdy white precipitate indicates the presence of silver.	Presence of curdy white precipitate Absence of curdy white precipitate	Positive Negative
9.	**Test for Magnesium** 1 ml of the test solution added with 2 ml of sodium hydroxide (NaOH) drop wise until indication appears.	Formation of white precipitate indicates the presence of Magnesium.	Presence of white precipitate Absence of white precipitate	Positive Negative

RESULTS OF BIOCHEMICAL ANALYSIS OF *SANNI KIYAAZHAM*

Test for Acid Radicals and Basic Radicals was done and the results for Biochemical analysis of the sample were given below

Table 4: Test for Acid Radicals

S.no	Specific Radical	Test Report
1	Test for carbonates	Positive- Indicates Presence
2	Test for chlorides	Negative - Indicates Absence
3	Test for sulphates	Positive- Indicates Presence
4	Test for sulphides	Negative - Indicates Absence
5	Test for phosphates	Positive- Indicates Presence
6	Test for Fluoride and Oxalate	Negative - Indicates Absence
7	Test for Borates	Negative - Indicates Absence
8	Test for Nitrates	Negative - Indicates Absence

Table 5: Test For Basic Radicals

S.no	Specific Radical	Test Report
1	Test for Lead	Negative - Indicates Absence
2	Test for Arsenic	Negative - Indicates Absence
3	Test for Mercury	Negative - Indicates Absence
4	Test for Copper	Negative - Indicates Absence
5	Test for Ferric	Negative - Indicates Absence
6	Test for Ferrous	Negative - Indicates Absence
7	Test for Zinc	Negative - Indicates Absence
8	Test for Silver	Negative - Indicates Absence
9	Test for Magnesium	Negative - Indicates Absence

DISCUSSION

The Biochemical analysis for Acid and basic radicals of sanni kiyaazham reveals the presence of Carbonates, sulphate and phosphates. various phosphate[5] compounds and sulphate[6] compounds are used in treating attention deficit hypertensive disorder. Hence the presence of these constituents proved that the trial drug will be effective in

treating attention deficit hypertensive disorder and associated symptoms

CONCLUSION

Results obtained from the above discussion finally concluded that the Siddha formulation sanni kiyaazham possess potent biologically active components which may help in treating Attention deficit hypertensive disorder. Investigation of those specifications with the help of modern analytical tools helps in standardization of Sanni kiyaazham. Hence this present investigation had generated an evidence-based data with respect to biochemical nature of the formulation of sanni kiyaazham.

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REFERENCES

1. Mohan R.C.,18 siddhargal paadiya vaithiya sillaraikovai,II Edition p427, 428.

2. Murugesa Muthaliyar K.S. Kuzhandhaimaruthuvam (balavagadam), IV edition. p504.

3. Jeeson C Unni, Co-Authors Leena Deshpande, Ajay Srivastava, Indian Academy of Pediatrics (IAP) STANDARD TREATMENT GUIDELINES 2022 Attention Deficit Hyperactivity Disorder.

4. KannusamiPillai C. Sigicharathnadeepam, I edition 2007.p27-34.

5. Merzon E, Magen E, Ashkenazi S, Weizman A, Manor I, Krone B, Green I, Golan-Cohen A, Vinker S, Faraone SV, Israel A. The Association between Glucose 6-Phosphate Dehydrogenase Deficiency and Attention Deficit/Hyperactivity Disorder. Nutrients. 2023 Nov 29;15(23):4948. doi: 10.3390/nu15234948. PMID: 38068806; PMCID: PMC10708268.

6. Uebel-von Sandersleben H, Dangel O, Fischer R, Ruhmann M, Huss M. Effectiveness and safety of dexamphetamine sulfate (Attentin®) in the routine treatment of children and adolescents with ADHD: results from a 12-month non-interventional study. Scand J Child Adolesc Psychiatr Psychol. 2021 Apr 23;9:73-86. doi: 10.21307/sjcapp-2021-009. PMID: 33928056; PMCID: PMC8077785.