



Research Article

PHYTOCHEMICAL SCREENING OF *PATTAI RASAYANAM* IN THE MANAGEMENT OF *SATTAI KARAPPAN* (ATOPIC DERMATITIS) IN CHILDREN

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ABSTRACT

Siddha, recognized as one of the most ancient and traditional medical systems, provides a comprehensive approach to health and well-being. *Pattai Rasayanam*, a traditional polyherbal remedy mentioned in the *Agathiyar Vaithiya Kaaviyam 1500*, is customarily employed to address *Sattai Karappan*, which is associated with Atopic Dermatitis (AD). This formulation harnesses the combined potential of phytochemicals to enhance therapeutic effectiveness. In this research, *Pattai Rasayanam* was assessed for its phytochemical composition using established techniques. The phytochemical analysis offers valuable insights into the possible mechanisms behind the formulation's therapeutic benefits. The results of this study aid in the standardization and quality assurance of *Pattai Rasayanam*, reinforcing its traditional application in treating atopic dermatitis. By establishing a comprehensive phytochemical profile, this research sets the stage for further investigations into the formulation's effectiveness and safety. This study emphasizes the significance of traditional medicine in modern healthcare, showcasing *Pattai Rasayanam* as a promising therapeutic option for AD.

INTRODUCTION

The word "Siddha" comes from the Tamil term Siddhi, which signifies accomplishment, perfection, or achievement, and it refers to the enlightened sages known as Siddhars- saints and scholars who have attained *Ashtamasiddhi* (eight great powers) through intensive spiritual practice and profound understanding of nature. The eighteen primary Siddhars, with Sage Agathiyar recognized as the originator of Siddha medicine, are credited with developing and sharing this medical tradition through classical Tamil works written in poetic form. According to Siddha system of medicine, atopic dermatitis is termed as *Sattai karappan*. It occurs in children during *Thaalaparuvam* to *Varugai paruvam* and it was caused by eating foods such as fish, brinjal, bitter guard, corn, millet etc.^[1] According to the textbook of Balavagadam, it is characterized by itching, erythema, exudation, intense pruritis, crusting and scaling^[1].

It can be correlated with Atopic dermatitis^[2]. The Siddha classical text *Agathiyar Vaithiya Kaaviyam 1500* describes a medicine called *Pattai Rasayanam* that is used to treat *Sattai karappan* (atopic dermatitis)^[3]. This study explores the clinical use of *Pattai Rasayanam* for atopic dermatitis by identifying the key phytochemicals that contribute to its therapeutic properties.

MATERIALS AND METHODS

Raw drug^[3]

The ingredients of the formulation *Pattai Rasayanam*, includes *Lavangapattai* (*Cinnamomum verum*), *Omam* (*Trachyspermum ammi*), *Athividayam* (*Aconitum heterophyllum*), *Kurosaani Omam* (*Hyoscyamus niger*), *Jathikai* (*Myristica fragrans*), *Jathipathri* (*Myristica fragrans*), *Kirambu* (*Syzygium aromaticum*), *Sukku* (*Zingiber officinale*), *Milagu* (*Piper nigrum*), *Kadukai* (*Terminalia chebula*), *Nellikai* (*Phyllanthus emblica*), *Thandrikai* (*Terminalia bellirica*), *Sarkarai* were employed for the preparation of the formulation.

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METHOD**Collection of raw drugs**

The raw drugs mentioned above were purchased from a traditional raw drug shop in Palayamkottai, Tirunelveli.

Authentication of raw materials

The ingredients of *Pattai Rasayanam* were authenticated by the Department of Gunapadam, Government Siddha Medical College, Palayamkottai. The voucher specimen of all these ingredients were preserved in the herbarium of the Department of Gunapadam, Government Siddha Medical College, Palayamkottai, Tirunelveli.

Table 1: Ingredients of *Pattai Rasayanam* ^[1,3]

S.No	Name	Botanical name	Quantity
1.	<i>Lavangapattai</i>	<i>Cinnamomum verum</i>	5 Palam (175g)
2.	<i>Omam</i>	<i>Trachyspermum ammi</i>	¼ Palam (8.75g)
3.	<i>Athividayam</i>	<i>Aconitum heterophyllum</i>	¼ Palam (8.75g)
4.	<i>Kurosani omam</i>	<i>Hyoscyamus niger</i>	¼ Palam (8.75g)
5.	<i>Jathikai</i>	<i>Myristica fragrans</i>	¼ Palam (8.75g)
6.	<i>Jathipathri</i>	<i>Myristica fragrans</i>	¼ Palam (8.75g)
7.	<i>Kirambu</i>	<i>Syzygium aromaticum</i>	¼ Palam (8.75g)
8.	<i>Sukku</i>	<i>Zingiber officinale</i>	¼ Palam (8.75g)
9.	<i>Milagu</i>	<i>Piper nigrum</i>	¼ Palam (8.75g)
10.	<i>Kadukai</i>	<i>Terminalia chebula</i>	¼ Palam (8.75g)
11.	<i>Nellikai</i>	<i>Phyllanthus emblica</i>	¼ Palam (8.75g)
12.	<i>Thandrikai</i>	<i>Terminalia bellirica</i>	¼ Palam (8.75g)
13.	Cow milk	-	required quantity
14.	Cow ghee	-	1 Padi (1.3 lit)
15.	Sugar	-	6 Palam (210g)

Purification^[4]

Siddha drug purification methods often used are described in classical texts such as *Sigicha Rathina Deepam* and *Sarakku- Suthi Seimuraigal* Specifically,

- *Lavangapattai* (*Cinnamomum verum*) is typically dried overnight.
- *Omam* (*Trachyspermum ammi*)– Soak it in lime water and then dry it.
- *Athividayam* (*Aconitum heterophyllum*)– Peel off the skin of these, cut them into small pieces, and dry them overnight.
- *Kurosaani Omam* (*Hyoscyamus niger*)– Rub this thoroughly, break it up, remove any dirt, and then let it dry.
- *Jathikai* (*Myristica fragrans*)– Purified by removing the outer skin and cut into small pieces and dried under sunlight.
- *Jathipathri* (*Myristica fragrans*)– It will be cleaned and dried under sunlight.
- *Kirambu* (*Syzygium aromaticum*)– Remove dust particles and dry it overnight.
- *Sukku* (*Zingiber officinale*)– It will be added by double the amount of *Sunnakal* with one part of *Sukku* for three hours after that wash it and dried. And then peel off the external skin.

- *Milagu* (*Piper nigrum*)– It will be soaked in butter milk for three hours and then dried.
- *Kadukai* (*Terminalia chebula*)– Soak this in lime water, remove the turmeric water, take out the seeds and then dry it.
- *Nellikai* (*Phyllanthus emblica*)– Boil it with milk, remove the seeds and the dry it.
- *Thandrikai* (*Terminalia bellirica*)– Soak it in screw pine extract for three hours and remove the seeds and then dry it overnight.
- *Sarkarai*– It will be grinded by pestle and mortar and take that by a pad then smashing it.

Preparation^[3,4]

After purification process, grind and mix all the components, excluding cow milk, cow ghee, and sugar. Incorporate an adequate amount of cow milk and then add the cow ghee. Combine and simmer for 24 minutes. Finally, incorporate the sugar and blend thoroughly. Transfer it to a storage container.

Authentication of prepared drug

The prepared drug was authenticated by the renowned experts in the Department of Gunapadam, ensuring its quality and adherence to traditional standards.

Administration of drug^[3]

The medicine is in *Rasayanam* form.

Route of administration: Oral

Dosage^[3]

Pattai Rasayanam: 3-12 years – 1 to 3 grams (twice a day after food).

RESULT**Phytochemical**

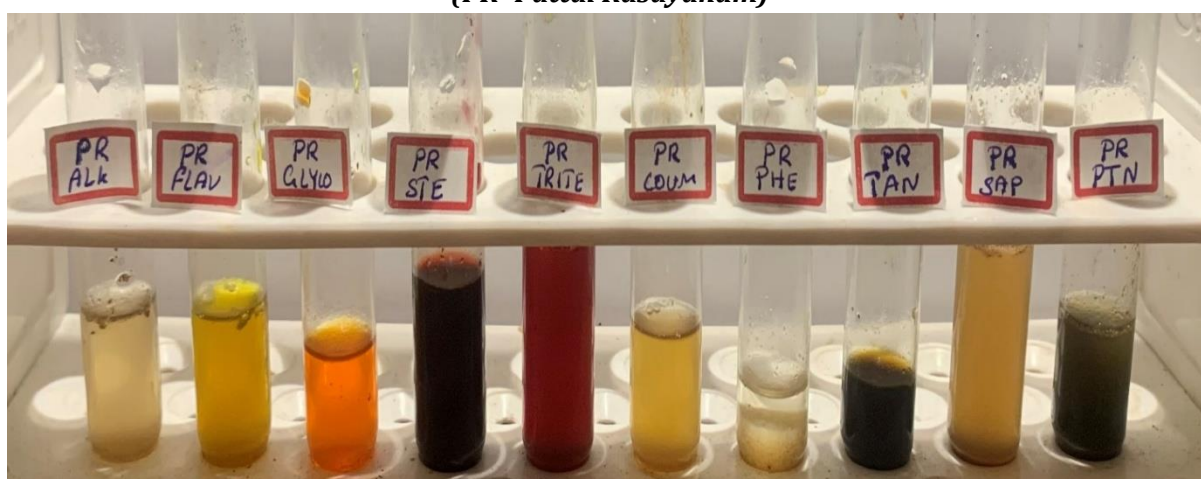
The phytochemical evaluation of *Pattai Rasayanam* was conducted by Noble Research Solutions, Chennai in accordance with the Pharmacopeial Laboratory for Indian Medicine (PLIM) guidelines for AYUSH formulations, ensuring standardization.

Phytochemical Analysis Report^[6]

S.No.	Experiment	Observation	Inference
1.	Test for Alkaloids 2ml of Mayer's reagent was added to the test sample.	Formation of dull white precipitate indicates presence of alkaloids.	Positive
2.	Test for Flavonoids To the 2ml of extract, add 2-3 drops of NaOH	A deep yellow color appeared, and it became colorless by adding few drops of Dil. HCl. This indicates the presence of flavonoids.	Positive
3.	Test for Glycosides Test drug is hydrolysed with Conc. HCl for 2 hours on a water bath, filtered and the hydrolysate is subjected to the following tests. To 2 ml of filtered hydrolysate, add 3ml of chloroform and shake it, chloroform layer is separated and 10% ammonia solution is added to it.	Pink colour indicates presence of glycosides.	Positive
4.	Test for Steroids To the test sample, add 2ml of chloroform with few drops of conc. H ₂ SO ₄ (3ml), and shake it well. The upper layer in the test tube was turn into red and sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.	The upper layer in the test tube turned into red and sulphuric acid layer showed yellow with green fluorescence. It indicates the presence of steroids.	Positive
5.	Test for Triterpenoids To the chloroform solution, few drops of acetic anhydride was added and mixed well. 1ml conc. H ₂ SO ₄ was added from the sides of the test tube.	Appearance of red ring indicates the presence of triterpenoids.	Positive
6.	Test for Coumarin To the test sample, add 1ml of 10% sodium hydroxide. The presence of coumarins is indicated by the formation of yellow color.	Appearance of yellow color indicates presence of coumarin.	Positive
7.	Test for Phenols To the test sample, add 3ml of 10% lead acetate solution. A bulky white precipitate indicated the presence of phenolic compounds.	Appearance of bulky white precipitate indicates the presence of phenolic compounds.	Positive
8.	Test for Tannins To the test sample, add ferric chloride. formation of a dark blue or greenish black color showed the presence of tannins.	Appearance of a dark blue or greenish black color indicates the presence of tannins.	Negative
9.	Test for Protein To extract, add 1% solution of copper sulphate and then add 5% solution of sodium hydroxide. formation of violet purple colour indicates the presence of proteins.	Appearance of violet purple colour indicates the presence of proteins.	Negative

10.	Test for Saponins To the test sample, add 5ml of water and the tube was shaken vigorously.	Copious lather formation indicates the presence of saponins.	Negative
11.	Test for Sugar To the test sample, add about 0.5ml of Benedict's reagent. Then the mixture is heated on a boiling water bath for 2 minutes. A characteristic-coloured precipitate indicates the presence of sugar.	Formation of a characteristic-coloured precipitate indicates the presence of sugar.	Positive
12.	Test for Anthocyanin To the test sample, add 1ml of 2N NaOH and heated for 5 min at 100°C. Formation of bluish green colour indicates the presence of anthocyanin.	Appearance of bluish green colour indicates the presence of anthocyanin.	Negative
13.	Test for Betacyanin	Positive	Positive

Qualitative Phytochemical Investigation (PR- Pattai Rasayanam)



DISCUSSION

The trial drug *Pattai Rasayanam* contains

- Alkaloids
- Flavonoids
- Glycosides
- Steroids
- Triterpenoids
- Coumarin
- Phenols
- Sugar
- Betacyanin

Alkaloids

The presence of alkaloids in the formulation suggests significant pharmacological potential, as alkaloids are widely known for their anti-inflammatory, antimicrobial, and analgesic properties. Ingredients such as *Aconitum heterophyllum*, *Hyoscyamus niger*, and *Piper nigrum* are known sources of alkaloids, which may contribute to the observed biological activities of the formulation. Alkaloids have been reported to modulate inflammatory pathways and inhibit microbial growth,

thereby supporting their therapeutic significance in inflammatory and infectious conditions.^[6,7]

Flavonoids

Flavonoids indicate strong antioxidant and anti-inflammatory activity, as these compounds are known to scavenge free radicals and protect tissues from oxidative damage. Several ingredients, including *Syzygium aromaticum*, *Zingiber officinale*, and *Phyllanthus emblica*, are reported to contain flavonoids that contribute to anti-inflammatory and antimicrobial effects. The presence of flavonoids supports the therapeutic potential of *Pattai Rasayanam* in managing oxidative stress.^[8,9]

Glycosides

The presence of glycosides suggests potential antimicrobial and anti-inflammatory activities, as glycosides are known to enhance cellular function and tissue repair. Plants such as *Terminalia chebula* and *Phyllanthus emblica* are rich in glycosides that contribute to their therapeutic efficacy. Glycosides are also known to improve physiological responses and enhance metabolic activities.^[10]

Steroids

Steroids are well known for their anti-inflammatory and immunomodulatory properties. These compounds help in regulating immune responses and reducing inflammatory reactions. The presence of steroidal constituents supports the potential of the formulation to modulate inflammatory processes.^[11]

Triterpenoids

Triterpenoids are reported to exhibit anti-inflammatory, antimicrobial, and wound-healing properties. These compounds are known to enhance tissue regeneration and reduce inflammatory responses. The detection of triterpenoids in *Pattai Rasayanam* supports its potential role in promoting tissue repair and controlling inflammation.^[12,13]

Coumarins

Coumarins indicate potential anticoagulant, antimicrobial, and anti-inflammatory activities. These compounds are known to enhance circulation and prevent microbial infections. The presence of coumarins contributes to the overall pharmacological profile of *Pattai Rasayanam*.^[14,15]

Phenols

Phenolic compounds are widely recognized for their potent antioxidant properties, which help in neutralizing free radicals and preventing oxidative damage. Several ingredients, including *Cinnamomum verum* and *Terminalia chebula*, are known to contain phenolic compounds that contribute to their antimicrobial and anti-inflammatory effects. The presence of phenols supports its protective activity against oxidative stress.^[16,17]

Sugars

The presence of sugars indicates the availability of carbohydrate components, which may contribute to energy supply and improve the stability and palatability of the formulation. Sugars may also support cellular metabolism and enhance the bioavailability of active constituents.^[18]

Betacyanin

Betacyanin pigments are known for their antioxidant and anti-inflammatory properties. These pigments play an important role in protecting biological systems against oxidative stress and cellular damage. Their presence further supports the antioxidant capacity of *Pattai Rasayanam*.^[19]

CONCLUSION

Pattai Rasayanam is a Siddha formulation from the classical text *Agathiyar Vaithya Kaaviyam* 1500 used in the treatment of *Sattai Karappan*. These findings provide a scientific basis for the traditional use of *Pattai Rasayanam* as a potent therapeutic agent for atopic dermatitis in children. Further studies are warranted to assess its therapeutic potency.

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