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Research Article

PHYTOCHEMICAL ANALYSIS OF *IYPATHI CHOORANAM*

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ABSTRACT

Iypathi Chooranam is a traditional polyherbal formulation used in the Siddha system of medicine, reputed for its therapeutic efficacy in managing ailments such as fever, skin disorders, gastrointestinal disturbances, eye diseases. The present study aims to evaluate the phytochemical profile of *Iypathi Chooranam* through preliminary screening techniques to establish its pharmacological potential. The formulation was prepared as per classical Siddha texts *Agasthiyar nayana vithi* and subjected to successive extraction using solvents of increasing polarity hexane, ethyl acetate, ethanol, and water. Each extract was then analyzed for the presence of major phytoconstituents, including alkaloids, flavonoids, tannins, saponins, glycosides, terpenoids, and phenolic compounds, using standard qualitative phytochemical methods. The results revealed the compounds known for their antioxidant, antimicrobial, and anti-inflammatory properties. The presence of alkaloids and saponins further supports the traditional claims of its therapeutic efficacy. This phytochemical profiling provides a foundational understanding of *Iypathi Chooranam* bioactive potential and supports its continued use in traditional medicine. This research contributes to the growing scientific validation of Siddha formulations and supports their integration into evidence-based complementary medicine. This analysis helps to explore the properties of medicine in their usage in clinical studies. It is concluded that the presence of certain phytochemicals justifies the better use of the medicine *Iypathy chooranam* for eye diseases.

INTRODUCTION

Phytochemicals are naturally occurring bioactive compounds found in plants that contribute to their therapeutic effects. These include alkaloids, flavonoids, saponins, tannins, terpenoids, and phenolic compounds, many of which possess anti-inflammatory, antioxidant, antimicrobial, and anticancer properties. Phytochemical screening plays a crucial role in identifying the presence of such compounds, thereby helping to validate the traditional uses of herbal medicines and providing a foundation for further pharmacological studies. The present study aims to carry out a preliminary phytochemical analysis of *Iypathi Chooranam* to identify the major classes of bioactive compounds present in the formulation.

This analysis is intended to provide scientific evidence supporting its traditional therapeutic applications and to contribute to the broader field of herbal pharmacognosy.

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MATERIALS AND METHODS

Plant materials[1]

The drug, *Iypathi chooranam*, is composed of ten herbal ingredients, is referred to in the literature as Agasthiyar nayana vithi, viz., *1. Elam, Kirambu, Nelli mulli, Kostam, Vaaivilangam, Korai kizhangu, Chukku, Milagu, Thippili, Kadukkai, Sivathai ver, Sarkkarai.*

Drug selection

The drug named *Iypathi chooranam* (oral administration) for treating *Kan noigal* is referred from the literature, *Agasthiyar nayana vithi*.[1]

Ingredients of *Iypathi chooranam*[1]

S.No.	Name	Botanical name	Quantity
1	*Elam*	Elettaria cardamom	10 gm
2	*Kirambu*	Syzygium aromaticum	10 gm
3	*Nelli mulli*	Phyllanthus emblica	10 gm
4	*Kostam*	Costus specious	10 gm
5	*Vaivilangam*	Embelia ribes	10 gm
6	*Korai kizhangu*	Cyperus rotundus	10 gm
7	*Chukku*	Zingiber officinale	10 gm
8	*Milagu*	Piper nigrum	10 gm
9	*Thippili*	Piper longum	10 gm
10	*Kadukkai*	Terminalia chebula	10 gm
11	*Sivathai ver*	Operculina turpethum	100 gm
12	*Sarkkarai*	Saccharum officinarum	200 gm

Collection of raw drugs

The raw drugs of *Iypathi chooranam* are preferred and brought from well apparent shops in and around Thuckalay, Kanyakumari district.

Authentication of raw material

The raw drugs were authenticated by the medical botanist and also by the Department of *Gunapadam* of Government Siddha Medical College, Palayamkottai.

Purification[2]

The drug will be purified as per Siddha literature.

Authentication of prepared drug

The resulting product of the *Chooranam* will be authenticated by the trained experts from the *Gunapadam* department.

Preparation of the Drug

All these drugs are purified as per classical Siddha texts, and grind all the ingredients into fine powder. Keep it in a air tight storage container.

Administration of the Drug

Consistency of medicine: *Chooranam*

Route of administration: Oral

Dosage

3-4 Years - 500mg

5-7 Years- 750mg

8-14 Years - 1gm

Twice a day, after food with hot water.

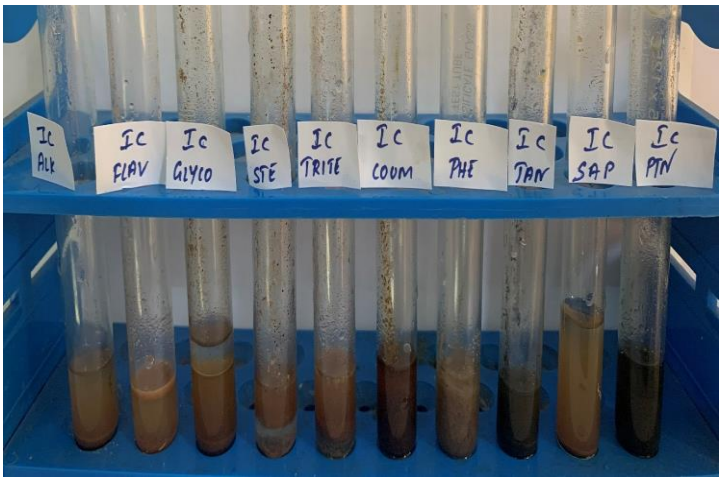
Phytochemical Analysis of *Iypathi Chooranam*

The phytochemical analysis of the drug *Iypathi Chooranam* is performed using the standard operative procedures by Noble Research Solution, Chennai.

Phytochemical Analytical Report

S.No	Experiment	Observation	Inference
1.	**Alkaloids** 2ml of Mayer's reagent was added	A dull white precipitate revealed the presence of alkaloids.	Positive
2.	**Flavanoids** Two to three drops of sodium hydroxide were added to 2 mL of extract.	Initially, a deep yellow colour appeared, but it gradually became colourless by adding a few drops of dilute HCL, indicating that flavonoids were present.	Positive

3.	**Glycosides** The drug is hydrolysed with concentrated hydrochloric acid for 2 hours on a water bath, filtered, and the hydrolysate is subjected to the following tests. To 2ml of filtered hydrolysate, 3ml of chloroform is added and shaken, the chloroform layer is separated, and 10% ammonia solution is added to it.	Pink colour indicates the presence of glycosides.	Negative
4.	**Steroids** Two 2ml of chloroform was added with a few drops of conc sulphuric acid (3ml), and shake well.	The upper layer in the test tube turned red, and the sulphuric acid layer showed yellow with green fluorescence. It showed the presence of steroids.	Positive
5.	**Triterpenoids** To the chloroform solution, a few drops of acetic anhydride were added, then mixed well.	1 ml concentrated sulphuric acid was added from the sides of the test tube, appearance of a red ring indicates the presence of triterpenoids.	Positive
6.	**Coumarin** To the test sample, 1 ml of 10% sodium hydroxide was added.	The presence of coumarins is indicated by the formation of a yellow color.	Negative
7.	**Phenol** 3 ml of 10% lead acetate solution was added.	A bulky white precipitate indicated the presence of phenolic compounds.	Positive
8.	**Tanin** To the test sample, ferric chloride was added.	Formation of a dark blue or greenish black color showed the presence of tannins.	Positive
9.	**Protein** To extract, 1% solution of copper sulphate was added, followed by 5% solution of sodium hydroxide.	Formation of violet-purple colour indicates the presence of proteins.	Negative
10.	**Saponins** 5ml of water was added, and the tube was shaken vigorously.	Copious lather formation indicates the presence of saponins.	Positive
11.	**Sugar** To the test sample, about 0.5 ml of Benedict's reagent is added. The mixture is heated on a boiling water bath for 2 minutes.	A characteristic coloured precipitate indicates the presence of sugar.	Positive
12.	**Anthocyanin** To the test sample, 1ml of 2N sodium hydroxide was added and heated for 5 min at 100°C.	Formation of a bluish green colour indicates the presence of anthocyanin.	Negative
13.	**Betacyanin**	Positive	Positive



RESULTS AND DISCUSSION

The trial drug *Iypathi Chooranam* contains

- Alkaloids
- Flavanoids
- Steroids
- Triterpenoids
- Phenol
- Tanins
- Saponins
- Sugar
- Betacyanin

Alkaloids are used as a treatment for eye diseases, such as keratoconjunctivitis. Alkaloids protect the neuroretina from damage caused by oxidative stress[4].

- Piperine is known to be able to inhibit free radicals and ROS, thereby protecting against apoptotic cell death from oxidative damage, and piperine exerted an effect as an antioxidant substance and prevented the development of cataracts by reducing the increase in the level of ROS[4].
- Phytochemical screening of Zingiber officinale revealed the presence of various chemical constituents, such as saponins, flavonoids, glycosides, alkaloids, steroids, terpenoids. The active compounds in dried ginger such as gingerol, shogaol, and paradol, are responsible for antibacterial effects[4].

Flavonoids is useful due to their antioxidant, anti-inflammatory and ocular blood flow enhancing properties in the treatment of the ocular diseases and important role in the development and progression of the ocular diseases with etiology including hypoxia, decreased blood supply to ocular tissues, free radical mediated oxidative damage and in certain conditions, increased vascular permeability, angiogenesis, and leakage of vascular contents (diabetic retinopathy, age-related macular degeneration[6][7]

Steroids help to reduce the inflammation, Redness, and swelling in the conjunctival tissue and reduce the eye pain[8].

Triterpenoids can scavenge free radicals and reduce oxidative damage, which may help protect photoreceptor cells and retinal neurons. Triterpenoids can modulate inflammatory cytokines (like TNF-α, IL-6), helping to reduce retinal inflammation.

Tannins are powerful antioxidants, which help neutralize free radicals that can damage eye tissues and contribute to retinal degeneration, It has Antioxidants, Anti-inflammatory Effects, tannins may reduce inflammation in ocular tissues due to their anti-inflammatory bioactivity, potentially offering relief or slowing progression and Antimicrobial Properties, Tannins have antimicrobial effects that might be beneficial in preventing or managing eye infections (e.g.,conjunctivitis)[5].

- Terminalia chebula(*Kadukkai*) is a well-known medicinal plant in traditional siddha medicine, including for the treatment of eye diseases. Its pharmacological effects are attributed to a variety of bioactive phytochemicals with antioxidant, anti-inflammatory, and antimicrobial properties and it contains high content of Tannins (Polyphenols) Properties: Astringent, antimicrobial, antioxidant. Traditionally used in eye washes or herbal decoctions to treat conjunctivitis and blepharitis.[6][7]
- Flavonoids also present in *kadukkai*
- Properties: Capillary-protective, antioxidant, anti-inflammatory.
- May support microvascular health in the retina and prevent oxidative damage.
- Traditional and Experimental Uses in Eye Diseases: Decoctions used as eye washes for

infections as conjuctivitis

Saponins enhance capillary integrity and circulation, which is important for maintaining a healthy retina and optic nerve, and it has Antimicrobial Activity to prevent or reduce eye infections.

- Mechanism: Saponins can disrupt bacterial membranes, offering a natural antimicrobial effect. This might have applications in natural eye drop formulations or lid hygiene products.

Betacyanins are potent antioxidants that scavenge reactive oxygen species (ROS), which are implicated in age-related macular degeneration (AMD), glaucoma, and diabetic retinopathy.

- Evidence: In vitro studies have shown that betacyanins reduce oxidative stress in various cell types, which may translate into protection for retinal cells.
- Anti-inflammatory Effects: Chronic inflammation contributes to retinal damage and vascular changes in eye diseases.
- Betacyanins may inhibit inflammatory markers like COX-2 and TNF-α, and this anti-inflammatory activity could help preserve retinal function over time.
- Vascular Health and Blood Flow
- Healthy microcirculation is essential for retinal and optic nerve health. Betacyanins may improve endothelial function and reduce blood pressure, which is particularly helpful for diseases like hypertensive or diabetic retinopathy.
- Operculina turpethum(Sivathai): Sterols & Triterpenoids (β-sitosterol, lupeol, betulin, betulinic acid) Found in stems and roots. These molecules have anti-inflammatory properties and may promote ocular surface health, reducing inflammation and supporting tear-film stability.
- Flavonoids, saponins, tannins, alkaloids
- These support antioxidant defenses, protecting eye tissues from oxidative stress, and may even help with microbial and inflammatory eye issues.
- Finally, this phytochemical analysis reveals the presence of alkaloids, flavanoids, steroids, terpenoids, phenol, tanins, saponins, sugar & beta cyanin.

CONCLUSION

Iypathi chooranam is a Siddha drug taken from *Agathiyar nayana vithi*, used in the treatment of *Kan noigal*. Further clinical studies are required to validate its efficacy and safety for therapeutic ingestion. The phytochemical analysis of this formulation reveals the presence of key bioactive constituents such as alkaloids, flavonoids, tannins, saponins, and phenolic compounds. These compounds are well-known for their pharmacological actions, including antioxidant, anti-inflammatory, antimicrobial, and wound-healing properties.

The presence of such phytochemicals supports the traditional use of *Iypathi Chooranam* but also highlights its potential for further scientific exploration and drug development. However, comprehensive pharmacological, toxicological, and clinical studies are necessary to establish its efficacy and safety profile in modern therapeutic contexts.

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