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Pharmacognostical and physicochemical analysis of *Elaneer kuzhambu* – An ayurvedic polyherbal formulation

Mohammed Salman

Abstract

Anjana, or the application of medications to the eye as an ointment, fine powder, or tablets rubbed in suitable solutions, is a method of administering effective formulations described in traditional Ayurvedic writings. Daarvi, Hareetaki, Vibheetaki, Amalaki, Madhuka Naalikerajala, Shashi, Saindhava, and Maakshika are all components of the test drug Elaneer Kuzhambu. Although Elaneer Kuzhambu is widely used in Kerala to prevent cataracts from forming, its effectiveness has not been shown by scientific studies. This formulation is thus selected for this analysis. Organoleptic testing, pharmacognostic testing, phytochemical analysis, and high-performance liquid chromatography were all performed for the first time on this compound formulation. The research reveals that Yashtimadhu has prismatic crystals, Daruharidra has yellowish brown content and prismatic crystals, Haritaki has sclereids, tannin, and starch grains, and Hareetaki has oleoresin, starch grains, and tannin. The total ash, specific gravity, and pH values from the phytochemical examination are respectively 4.36, 1.47, and 1.39.

Key-Words: *Elaneer Kuzhambu*, Pharmacognosy, Physicochemical, HPTLC

INTRODUCTION:

Cataracts are the leading cause of blindness worldwide, affecting 40 percent of the population (17 million people). As many as 40 million people will have cataracts by the year 2025. Cataracts cause blindness in four million Indians per year (Minassian DC and Mehra V. 1990). Cataracts form when the lens of the eye becomes opaque as a consequence of changes in its internal chemical and physical composition. Cataracts can only be treated surgically. However, researchers are looking at different modalities of therapies for cataract, such as the use of antioxidants, vitamins, etc., owing to the high cost and after surgical difficulties of cataract surgery. The Ayurvedic therapy for cataracts, known as Timira, entails a series of procedures

such as Snehapana, Raktamoksha, virechana, nasya, anjana, moordhni vasti, basti, Tarpana, etc. Since antiquity, people have turned to Anjana to rid themselves of eye issues since it lasts far longer than other topical ocular applications. Topical administration is preferable to systemic administration for a number of reasons, including the reduction of potential adverse effects and the achievement of an adequate concentration of medicine permeating the lens.¹ Humans need a longer period of anti-cataract medication application due to the gradual growth of age-related cataract. Therefore, the Anjana method of ocular administration will be examined.

Department of Botany, Gauhati University, Guwahati, (Assam) - India

<i>Darvi</i>	Berberis aristata	Stem	96 gm
<i>Haritaki</i>	Terminalia chebula	Pericarp	96 gm
<i>Amalaki</i>	Phyllanthus emblica	Pericarp	96 gm
<i>Vibhitaki</i>	Terminalia bellerica	Pericarp	96 gm
<i>Madhuka</i>	Glycyrrhiza glabra	Root & stolons	144gm
<i>Kerajala</i>	Cocos nucifera	Tender/ unripe Drupe water	8.172 litres
Reduced to 1.022 litres			
<i>Pitakarohini (Gambhari)</i>	Coptis teeta	Rhizome	12 gm
<i>Sasi</i>	Dryobalanops aromatica	Sublimed extract	12 gm
<i>Saindhava Lavana</i>	Rock salt		6 gm
<i>Makshika</i>	Honey		170.25gm

The vast majority of medications produced by Anjana are made in water. The elaneer kuzhambu is made using coconut water, which has properties somewhat dissimilar to plasma in the human body. Factors such as molecular weight, drug solubility, partition coefficient, and pKa have a role in how well a medication is absorbed into the body. In the eye, wetting, spreading, and the slowing of evaporation all have different connections with one another. Further the drug uptake by cornea also depends on viscosity of the vehicle, pH, Oil-water partitioning and osmolality.

This study evaluates the physico chemical profile and analytical study of *Elaneer kuzhambu* which is used as *Anjana/ Eye ointment*. **Material and Methods**

Collection/Procurement of the drug

The test drug *Elaneer kuzhambu* was procured from Kottakkal Arya Vaidya Shala. The identities of samples of all drugs were confirmed by correlating their morphological and microscopical characters with those given in the literature.

Posology

One Vidanga matra (which was standardized after weighing 10 vidngas/ Seed of *Embelia ribes* which came to about 60-70 mg), as mentioned in the Ayurvedic classical text *Ashtanga Hridaya* was

used as *Anjana* twice daily in the morning and evening followed by *Triphala* eye wash.²

Method of preparation

Powders of drugs of item Nos.1to 5 are added to Nalikera Jala before boiling. The Kwatha is then filtered and boiled again over a low fire to Rasakriya (Semisolid). This is then kept in khalva when drugs of item Nos. 7,8and 9 are added and ground with honey and packed in 10 ml plastic bottles.

Elaneer kuzhambu was analyzed by using qualitative and quantitative parameters at Pharmaceutical Chemistry Laboratory, Institute of Post Graduate Teaching & Research in Ayurveda, Gujarat Ayurved University, Jamnagar.

Method of Preparation the test drug

Elaneer Kuzhambu

Organoleptic Evaluation

Various parameters such as colour, odour, taste, touch and texture of the finished product (*Rasakriya*) were observed and recorded³

Microscopic Evaluation

Sample drug was dissolved in small amount of distilled water for a while and then mounted in glycerin. Microscopical examination was carried out with and without staining.⁴ By powder microscopy, to observe the characters, determine the chemical nature of the cell wall along with the determination of the form and chemical nature of the cell contents. Microphotographs were taken by using Carl Zeiss binocular microscope attached with camera.

Physico-chemical Constants

In physical evaluation foreign matter, moisture content, ash values viz., total ash, acid insoluble ash and extractive values viz., alcohol soluble extractive value, water soluble extractive value as well as pH value etc. were determined.⁵

Phyto-chemical Analysis:

Preliminary tests were carried out on methanolic extract for the presence or absence of phytoconstituents like alkaloids, tannins &

phenolic compounds, flavonoids, saponins and anthraquinon glycosides.^{6,7} High Performance Thin Layer Chromatography (HPTLC)

HPTLC was performed as per the guidelines



provided by API⁸. Methanolic extract of drug sample was used for spotting. HPTLC was performed using Toluene + Ethyl acetate (7:3) solvent system and observed under visible light after derivation with vanillic sulphuric acid followed by heating the plate at 110°C. The colour and R_f values of the resolved spots were noted.

(Table: 5) Results and Discussion

Organoleptic Characters

Elaneer kuzhambu was characterized as fine homogenous thick liquid which was sticky and slow falling as drop, brownish black in colour, sweet smelling aromatic in odour, bitter and astringent in taste. (Table: 1). Fine liquid slowly miscible in water changing to golden yellow, after sometime thread formation is observed leaving clear fluid around.

Microscopical Characters

The diagnostic characters of microscopic analysis of *Elaneer kuzhambu* showed the presence of mesocarp cells, sclereids and tannin contents of *Haritaki*; pitted vessels, lignified fibres, and larger starch grains of *Yashtimadhu*; Starch grains of *Naalikera*, Mesocarp, Starch grains & tannin of *Vibheetaki*, Oleoresin of *Karpoora*, Fibres of *Darvi*. (Photo Plate: 1)

Physico-chemical Parameters

Physio-chemical parameters of *Elaneer kuzhambu* are tabulated in Table: 2. The extractive values of preparation were observed equal in both water as well as alcohol.

Phyto-chemical analysis

Preliminary qualitative analysis showed the presence of alkaloids, tannin & phenolic compounds, flavonoid, saponin glycosides, anthraquinone glycosides, indicating the active compounds were present in the preparation. (Table: 3)

High Performance Thin Layer Chromatography The HPTLC profiles of

methanolic extract of the formulation are super - imposable indicating the presence of all the constituents as per the ingredients. Two spots at R_f 0.35, 0.73 were observed in 254nm UV light spectrum. Four spots at 0.32, 0.5, 0.6 and 0.73 were observed in 366 nm UV light spectrum and (Photo plate: 3) (Table: 4)

Conclusion

In this formulation, diagnostic identifying features of the components are present, as shown by microscopic character analysis. It follows, *Elaneer kuzhambu* may be judged using these criteria. The QC/QA lab of a pharmaceutical company might test the purity and efficacy of the ingredients and formulations according to the instructions provided. This research may be used as a foundation for further exploration of *Elaneer kuzhambu*, a Rasakriya Anjana.

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Table 1: Organoleptic characteristics of *Elaneer kuzhambu*

S/No.	Parameters	Results
1.	Colour	Brownish black
2.	Odour :	Sweet smelling, Aromatic
3.	Taste	Bitter, Astringent
4.	Touch	Sticky and slow falling drop
5.	Texture	Fine homogenous thick liquid

Fine liquid slowly miscible in water changing to golden yellow, after sometime thread formation is observed leaving clear fluid around

Table 2: Showing physicochemical constants

S/ No.	Analytical parameters	Results of <i>Elaneer Kuzhambu</i>
1.	pH	4.36
2.	Total Ash	1.47
3.	Specific gravity	1.39
4.	Total solid contents	72.99%
5.	Sugar	
	Total sugar	68.67%
	Reducing sugar	54.64%
	Non-Reducing sugar	14.03%

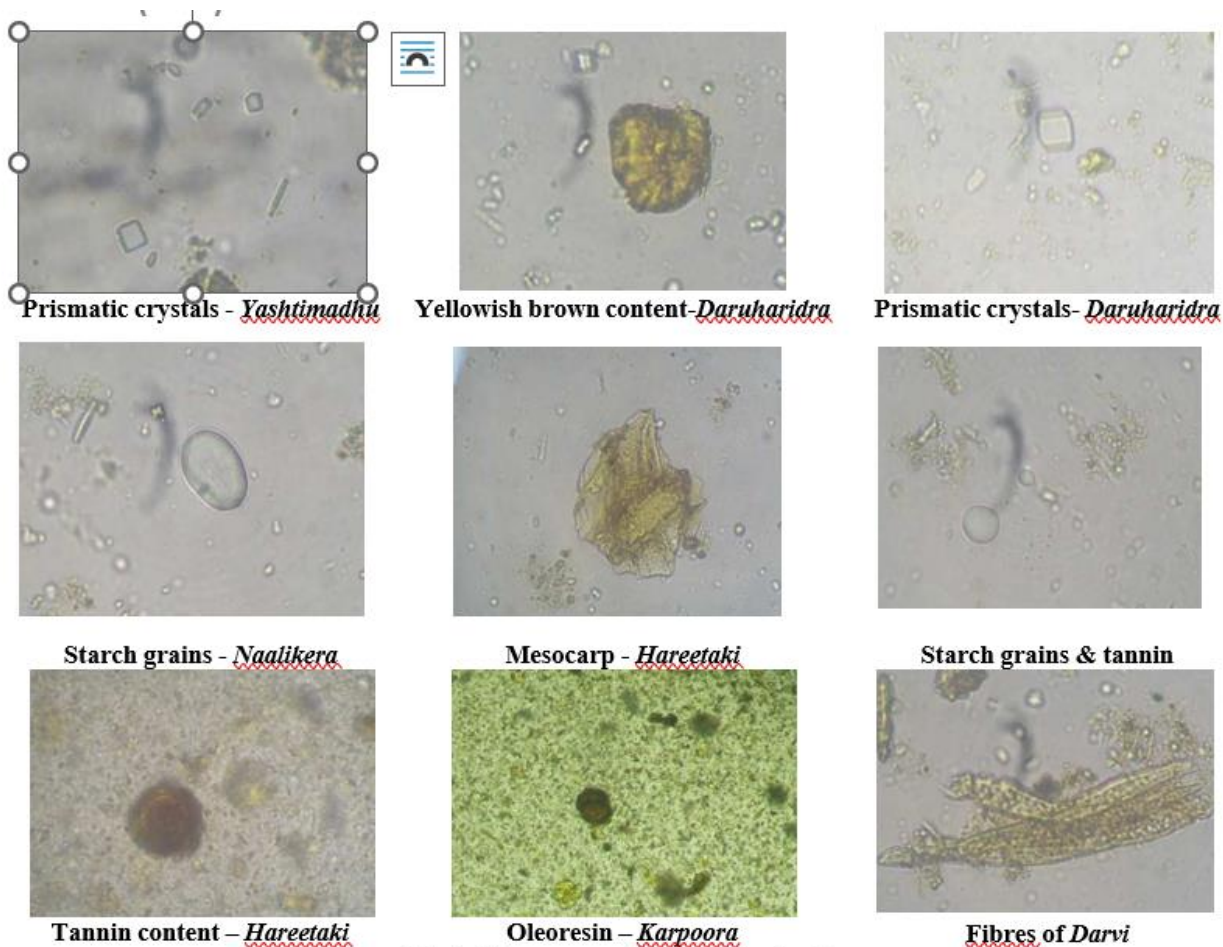


Fig. 1: Microscopy of *Elanear kuzhambu*

Table 3: Showing results of phytochemical analysis

S/ No.	Components	Results
1.	Alkaloids	+
2.	Tannin & Phenolic compounds	+
3.	Flavonoid	+
4.	Saponin Glycosides	+
5.	Anthroquinon glycosides	+
6.	Sugars	+
7.	Reducing sugars	+
8.	Protein	+

+ Present

Table 4: *Elanear Kuzhambu* Solvent system Toluene – Ethylacetate (7:3)

Under long UV(254 nm)	Under long UV(366 nm)	After spray
R _f Value	R _f Value	R _f Value
0.35	0.32	0.35
0.73	0.5	0.51
	0.6	0.73
	0.73	

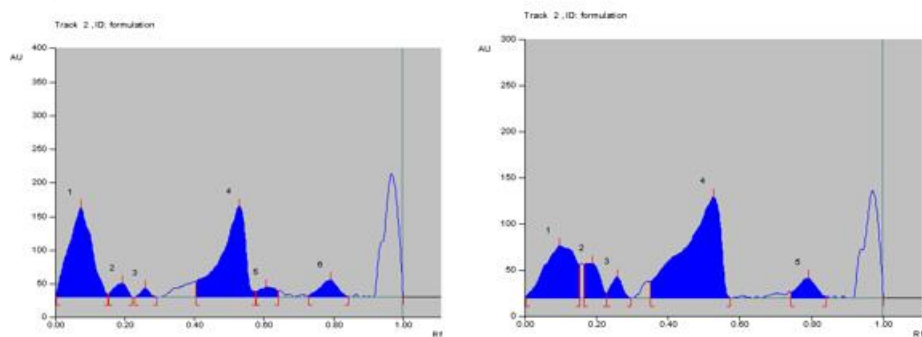


Fig. 2: Densitograms of Methanolic extract of *Elaneer kuzhambu*

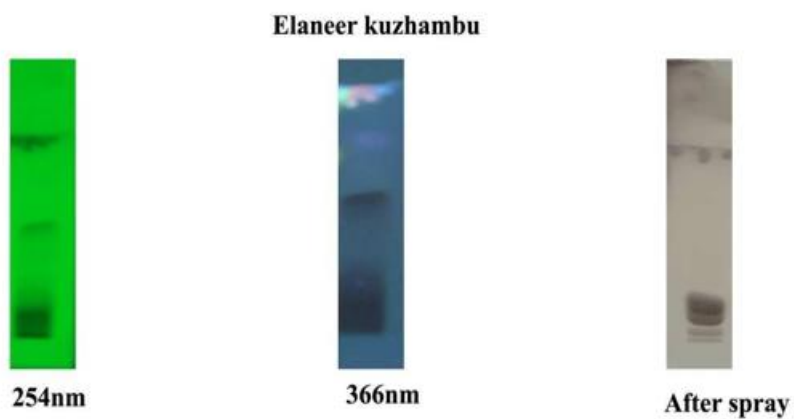


Fig. 3: HPTLC Finger prints