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Establishment quality and purity of "Chandraprabha vati" using sensory characteristics, physiochemical parameters, qualitative screening and TLC fingerprinting

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Abstract
Chandraprabha vati is one of the effective and very popular Ayurvedic Formula consisting of 37 ingredients, for prescribes many diseases. Chandra means moon and Prabha means Glow. That means the use of this classical formulation brings glow to your body because the property of Chandraprabha vati is similar to moon which removes darkness of night in gentle way. This vati is made by many companies and still not stable of standard parameters to identify the consistency of Chandraprabha vati. Therefore this present study was conducted to recognize of consistency of Chandraprabha vati using sensory characteristics, physiochemical parameters, qualitative screening and TLC fingerprinting and the results revealed that the prepared Chandraprabha vati has no impurities, low pH value in nature, little high of acid insoluble ash, presence of chemical compounds and the TLC studies on water soluble extractive fraction was studied and given 11 spots.

Keywords: Chandraprabha vati, Sensory characteristics, Physiochemical parameters, Qualitative screening, TLC fingerprinting.

1. Introduction
In the present era, market of all possessions has become global. Health has been of utmost importance since ancient times for the mankind. During the past two decades, herbal medicines attracted attention to a greater extent in western countries because of their high pharmacological activities with low toxicity and rare complications. Herbal drugs are obtained from the natural resources such as plants, animals and minerals. These are used for making medicines where the standardization and quality control with proper integration of scientific techniques and traditional knowledge is important. The standardization of herbal drugs including authentication of genuine drug, harvesting the best quality raw material, assessment of intermediate and finish product and detection of harmful and toxic ingredient. Based on the above rationale the present study was undertaken with an aim to study the consistency of Chandraprabha vati described in ancient texts of Ayurveda namely Sharangadhara Samhita in the chapter of Prameha Cikitsa (Treatment of urine abnormalities) [1].

2. Materials and Methods
This study was done to find out sensory characteristics, physiochemical parameters, qualitative screening and TLC fingerprinting.

2.1 Method of preparation of Chandraprabha vati
Chandraprabha vati was made according to Sharanghadhara Samhita, and the Vati Kalpana mentioned in the Ayurvedic pharmacopeia [2]. The plant material except the Vacha, Ativisha, Daru and Gajapippali were authenticated from the Botanical section of the National Botanical garden, Peradeniya, Sri Lanka (6/01/H/3) and the authentication of all raw materials of the plants and minerals (Table 1) were done by Head, Department of Dravya Guna Vingnana, Institute of Indigenous Medicine, University of Colombo, Rajagiriya and also the vati were prepared under the supervision of Head of the department, Dravya Guna Vingnana at the pharmacy of Institute of Indigenous Medicine. Prepared vati were kept in air tight glass containers.

Table 1: Formulation composition of Chandraprabha vati

	Drug	Latin name	Part used	Ratio
1.	Candraprabha	*Cinnamomum camphora* L.	Deposits in the oil cells (camphor)	1
2.	Vacha	*Acoruscalamus* L.	Rhizome	1
3.	Mustaka	*Cyperusrotandus* L.	Tubers	1
4.	Bhunimbha	*Andrographis paniculata*B.	Whole plant	1
5.	Amurta	*Tinospora cordifolia* L.	Whole plant	1
6.	Daru	*Cedrusdeodara*R.	Heartwood	1
7.	Haridra	*Curcuma longa* L.	Dried rhizomes	1
8.	Ativisha	*Aconitumheterophyllium*W.	Roots	1
9.	Darvi	*Berberisaristata* L.	Whole plant	1
10.	Pippalimula	*Piper longum* L.	Roots	1
11.	Citraka	*Plumbago zeylanica* L.	Purified Roots	1
12.	Danyaka	*Coriandrum sativum* L.	Fruits	1
13.	Haritaki	*Terminaliabelarica*R.	Fruits	1
14.	Vibhitaki	*Terminaliachebula*R.	Fruits	1
15.	Amalaki	*Emblicaofficinale*W.	Fruits	1
16.	Cavya	*Piper cheba*B.	Roots	1
17.	Vidanga	*Emblicaribes*B.	Fruits	1
18.	Gajapippali	*Scindapsusofficinalis*S.	Fruits	1
19.	Shunti	*Zingiberofficinale*R.	Rhizome	1
20.	Marica	*Piper nigrum* L.	Fruits	1
21.	Pippali	*Piper longum* L.	Dried spikes	1
22.	Swarnamakshikabhashma	Copper pyritis	Bhasma	1
23.	Yavakshara	Potassium carbonate	-	1
24.	Swargiksha	Sodium bicarbonate	-	1
25.	Saindavalavana	Rock salt	-	1
26.	Savvarcalalavana	Black salt	-	1
27.	Vid lavana	Ammonium chloride	-	1
28.	Trivurt	*Ipomeaturpethum*R.	Roots	4
29.	Danti	*Baliosperummontanum* L.	Roots	4
30.	Twak	*Cinnamomumzeylanicum*B.	Bark	4
31.	Ela	*Elettariacardomomum*M.	Seeds	4
32.	Vankshalochana	*Bambusaarundinaceae*R.	The manne of bamboo	4
33.	Tejapatra	*Cinnamomumtamala*N.	Leaves	4
34.	LauhaBhashma	Ferrum	Bhasma	8
35.	Sita	Sugar	Sugar	16
36.	Shilajatu	Aspelt mineral pitch	PurifiedShilajatu	32
37.	Guggulu	*Balsamodendronmukul*H.	Resinous gum-(purified)	32

2.2. Determination of Physico-chemical parameters

Physico-chemical parameters are very important in determining quality and purity of a formulation [3].

2.2.1. Determination of foreign matter

100 g of drug sample was weighed and spread in a thin layer. The foreign matter was detected by visual inspection with the unaided eye and by the use of a lens (6x). The foreign matter was separated, weighed and percentage present was calculated.

2.2.2. Determination of loss on drying

Loss on drying was determined by taking 2 g, accurately weighed Chandraprabha vati sample, in a dried petridish (Tarred evaporating dish) and drying in an oven at 105 ˚C till constant weight. The percentage was calculated on the basis of air dried sample.

2.2.3. Determination of total ash

2 g of accurately weighed Chandraprabha vati was incinerated in a crucible at a temperature 500-600 ˚C in a muffle furnace till carbon free ash was obtained. It was then cooled, weighed and percentage of ash was calculated with reference to the air-dried drug.

2.2.4. Determination of acid insoluble ash

The ash obtained above was boiled for 5 min with 25 ml of 70 g/l hydrochloric acid and filtered using an ashless filter paper to collect insoluble matter. The ash obtained was washed with hot water and filter paper was burnt to a constant weight in a muffle furnace. The percentage of acid-insoluble ash was calculated with reference to the air-dried powered drug (40#).

2.2.5. Determination of water soluble ash

ith 25 ml of water and insoluble matter collected on an ash-less filter paper washed with hot water and ignited for 15 min at a temperature not exceeding 450 ˚C in a muffle furnace. Difference in weight of ash and weight of water insoluble matter gave the weight of water-soluble ash. The percentage of water-soluble ash was calculated with reference to the air-dried powered drug (40#).

2.2.6. Determination of extractive values

Extractive values of Chandraprabha vati were determined by the following method.

2.2.6.1. Determination of alcohol soluble extractive

4 g of the air-dried formulation (40#) was macerated with 100 ml of alcohol in a closed flask for 24 h, shaking frequently at an interval of 6 h. It was then allowed to stand for 18 h and filtered rapidly to prevent any loss during evaporation. 25 ml

of the filtrate was evaporated to dryness in a porcelain dish and dried at 105 ˚C to a constant weight. The percentage of alcohol soluble extractive was calculated with reference to the air-dried drug.

2.2.6.2. Determination of water soluble extractive

4 g of the air-dried formulation was soaked in 100 ml of water in a closed flask for 1 h with frequent shakings. It was then boiled gently for 1 h on water bath; cooled and weighed and readjusted the weight. 25 ml of the filtrate was evaporated to dryness in a porcelain dish and dried at 105 ˚C to a constant weight. The percentage of water-soluble extractive was calculated with reference to the air-dried powered drug (40#).

2.2.7. pH value

The pH is a value taken to represent the acidity or alkalinity of an aqueous solution. It is defined as logarithm of the reciprocal of hydrogen ion concentration of the solution. The pH of the filtrate of a particular concentration of an aqueous solution of the sample is often used as one of the parameters. 2.5 g sample was taken and mixed with 50 ml of distilled water by keeping it aside for a period of 2 hours and by shaking it intermittently. Then it was filtered and the pH of filtrate was noted with the help of a digital pH meter.

2.2.8. Qualitative screening [4]

The methods employed to isolate the active substance are termed as extraction method. Crude extracts obtained from such extraction can be qualitatively tested to ascertain the presence of different types of components. Qualitative tests are used to detect the presence of functional groups, which play very important role in the expression of biological activity. Qualitative tests were carried out by using the methanol or water – soluble extracts of the samples. These tests indicate the type of phyto constituents present in the sample.

Chandraprabha vati subjected to the following tests for the presence of various phytoconstituents like, alkaloids, flavonoids, saponins, carbohydrates, sterols and terpenoids, anthraquinone glycosides, coumarins, carotenoids, tannins and phenolic compounds.

2.2.9. TLC fingerprinting

2.2.9.1. Extraction procedure

5 g of the Candraprabha vati was magnetically stirred for 25 min. in 25 ml of distilled water. This was again re-extracted into dichloromethane. The resultant extract was further concentrated and was loaded on a glass column (20x1 cm) using silica gel (200-400#) as stationary phase. The fractions were colleted by performing the gradient elution using toluene and ethyl acetate as mobile phases. Fractions (each of 10 ml) were collected and monitored simultaneously on a TLC plate using silica gel as a stationary phase and toluene: ethyl acetate: Chclohexane (4:1:0.5) as a mobile phase [5].

3. Results

3.1. Sensory characteristics

Appearance	–	Black coloured unpolished pills
Taste	-	Slightly bitter and acrid
Colour	–	Black
Odour	-	Fragrant
Solubility	-	Water soluble

3.2. Physio-chemical parameters

Evaluation of Physio- chemical parameters of Candraprabha vati is given in Table 2. The percentage of ash value was lowest in water insoluble (4.386%) followed by acid insoluble (11.86%) and water soluble (24.281%).

Table 2: Physio- chemical parameters of Candraprabha vati

Parameter	Value
Foreign matter	Not identify
Moisture content	1.0289%w/w
Total ash	18.063%w/w
Acid insoluble ash	11.86%w/w
Water insoluble ash	4.386% w/w
Water soluble ash	24.281%w/w
Water soluble extractable	46.879 %w/w
Ethanol soluble extractable	9.93%w/w
pH value	5.32

3.3. Qualitative screening

Evaluation of Qualitative screening of Candraprabha vati is given in Table 3. Alkoloid, Flavonoids, Carbohydrate, Sterols and triterpenoid, Tanin and Phenolic compound were present in Chandraprabha vati.

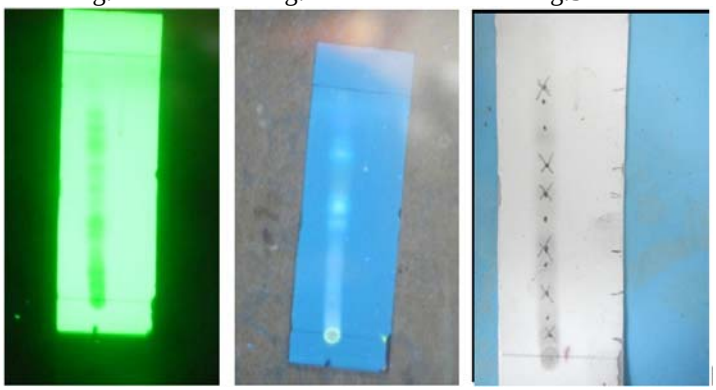
Table 3: Qualitative screening of Chandraprabha vati

Substance	Present	Absent
Alkoloid	√	
Flavonoids	√	
Saponin		√
Carbohydrate	√	
Sterols and triterpenoid	√	
Tanin	√	
Phenolic compound	√	
Anthraquinone glycoside		√

3.4. TLC fingerprinting

Isolation and Identification of chemical markers in Candraprabha vati using Thin Layer Chromatography (TLC) is given Fig. 1, 2 and 3.

Fig.1 Fig. 2 Fig.3



254 nm 366 nm After derivatization with Vanillin sulphate

Rr values and respective colours for the separated spots are given below table 4.

Table 4: Rr values

Before spraying λ 254 nm & 366 nm	After spraying
0.06	0.06 (Brown)
0.09	0.09 (Brown)
0.17	0.17 (Gray)
0.25	0.25 (Brown)
0.29	0.29 (Pink)
0.39	0.39 (Purple)
0.45	0.45 (Purple)
0.52	0.52 Pink)
0.62	0.62 (Gray/ Blue)
0.69	0.69 (Purple)
0.72	Brown)

4. Discussion

Chandraprabha vati was evaluated as per WHO guidelines on quality controls and standardization of medicinal plant materials. No foreign matter was found due to careful manual selection of ingredients.

Physio-chemical parameters indicated that it has little high acid insoluble ash that may be due to certain metal and mineral preparations added in this formulation and may be stuck with little sand particles.

pH value is slightly towards acidic probably due to the addition of bicarbonate which produce carbonic acid in aqueous medium.

Water soluble extractable are considerably high (46.9 w/w) is an indicating more water soluble constituents in Chandraprabha vati.

Preliminary phyto chemical analysis indicated the presence of Alkoloids, Flavonoids, Carbohydrates, Sterols and triterpenoids, Tanins and Phenolic compounds.

TLC studies on water soluble extractive fraction was studied and eluted 11 spots, for the solvent system Dichloromethane, ethyl acetate and Cyclohexane (4:1:0.5) can be considered as a reference for the quality of this preparation.

5. Conclusion

The present study has generated certain preliminary phyto chemical data to establish the quality and purity of Chandraprabha vati that would be helpful in identification of genuine Chandraprabha vati. Qualitative studies have indicated the presence of Alkoloids, Flavonoids, Tanins, Phenolic compounds, sterols in the drug and need further studies to identify their nature.

6. References

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