

Research Article

Haridradi Ashcyotana: Quality Assessment of A Herbal Eye Drop

De Silva L D R^{1*}, Peiris A², Kamal S. V¹, Jayaratne D L S M³, Arawwawala L D A M³¹Department of Shalya Shalakya, Institute of Indigenous Medicine, University of Colombo, Rajagiriya, Sri Lanka.²Vasan Eye Care Hospital, Colombo 03, Sri Lanka.³Industrial Technology Institute, Baudhaloka Mawatha, Colombo 7, Sri Lanka.Available Online: 30th September, 2015**ABSTRACT**

Background: Haridradi Ashcyotana is one of the eye drops prescribed in Ayurveda Pharmacopoeia of Sri Lanka. However, adequate scientific research was not carried out to assess the quality of Haridradi Ashcyotana. Objective and Methods: Therefore, present study was conducted to assess the quality control parameters of Haridradi Ashcyotana by (a) development of a TLC fingerprint profile (b) screening of phytochemicals (c) detection of pH and (d) evaluation of microbial limits. Results: TLC fingerprint profile of the eye drop consists of 8 prominent spots and revealed the presence of alkaloids, saponins, steroids, tannins and flavonoids in Haridradi Ashcyotana. Microbial evaluations reveal the absence of *Staphylococcus aureus*, Coliforms, *Escherichia coli* and *Pseudomonas aeruginosa* in the eye drop. Conclusion: In conclusion, quality assessment of Haridradi Ashcyotana: a herbal eye drop, was done for the first time.

Keywords: Haridradi Ashcyotana, eye drop, Abhishyanda, Phytochemicals**INTRODUCTION**

Abhishyanda (Conjunctivitis) which has been described under the diseases involving all parts of the eye or sarvagata netra roga¹, is characterized with excessive discharges or tears from all sides of the eye. Common signs and symptoms of conjunctival disorders include redness, stickiness, foreign body sensation or grittiness, lacrimation and sometimes photophobia. Vision is generally normal but a slight blurring may occur if excess secretions form a film over the cornea². In all diseases of the eyes, Ashcyotana (Putting drops of medicinal liquids into the eyes) is beneficial, to prevent bleeding, excess of lacrimation, itching, friction, burning sensation and redness: features of inflammation³.

Though Ayurvedic texts has quoted Ashcyotana as a very effective external eye therapy, there are very few or no preliminary research done on eye drop preparations. There are eye drop preparations which are unique preparations derived from the ancient Ayurveda and Traditional Medicine re-discovered through extensive in day to day practice. Although there are wide number of herbal plants used in curative and preventive eye diseases scientific evidence in terms of modern medicine is lacking. Today most eye ailments are treated with antibiotics and steroidal drugs and prolong use of these drugs can lead to side effects such as glaucoma and cataract.

Acute Bacterial conjunctivitis is a common and usually a self limiting condition caused by direct eye contact with infected secretions. The most common isolates are *Staphylococcus pneumonia*, *Staphylococcus aureus*, *Haemophilus influenzae*, and *Moraxella catarrhalis*⁴. Though Bacterial conjunctivitis is frequently a self limiting condition, by administering Herbal eye drops it

significantly improves the rate of early clinical remission and early microbiological remission which will be beneficial for the patient to perform with day to day work. Also reduce the risk of developing of complications and by combating the infection reduce the epidemic involvement which benefits the community.

The shortcomings of the Health sector and as well as unwanted effects of present treatment modalities could be combated by Holistic approach of Ayurveda and Traditional Medicinal systems prevailing in the Country. There are valuable evidences that ancient systems of Ayurveda and Traditional Medicine in Sri Lanka have been successfully used to treat many infectious and degenerative eye pathologies. The herbal eye drop preparations minimize the recurrence rate of ocular diseases with better prognosis due to Anti inflammatory, Anti microbial, Anti oxidant and the Immuno modulatory action possessing herbal ingredients used in the preparation. Haridradi Ashcyotana is one of the eye drops prescribed in Ayurveda Pharmacopoeia – Sri Lanka⁵. However, adequate scientific research was not carried out to assess the quality of Haridradi Ashcyotana. Therefore, present study was conducted to assess the quality control parameters of Haridradi Ashcyotana.

MATERIALS AND METHODS*Ingredients of Haridradi Ashcyotana*

All the ingredients used to prepare Haridradi Ashcyotana⁵ are listed in Table 1. Pharmacognostically pure and authentic ingredients were used and herbarium sheets and raw materials were authenticated (specimen no: HA 1-7) by the Senior Scientist, Botany Section, Bandaranayaka

Table 1: Ingredients of Haridradi Ashcyotana⁵

Ingredients	Family	Local name	Part/s used
<i>Terminalia chebula</i> Retz.	Combretaceae	Aralu	Fruits
<i>Terminalia belerica</i> (Gaertn.) Roxb.	Combretaceae	Bulu	Fruits
<i>Phyllanthus emblica</i> L.	Euphorbiaceae	Nelli	Fruits
<i>Curcuma longa</i> L.	Zingiberaceae	Kaha	Tender Leaves
<i>Coscinium fenestratum</i> (Gaertn.) Colebr.	Menispermaceae	Weniwel	Stem-Bark
<i>Pterocarpus santalinus</i> L. f.	Fabaceae	Rat handun	Bark
<i>Glycyrrhiza glabra</i> L.	Fabaceae	Welmi	Root
Bees Honey			

Table 2: R_f values and colours of Haridradi Ashcyotana

R _f values and colours of Haridradi Ashcyotana	
Before Spraying	After Spraying
(at 254 nm and 366 nm)	
0.03	0.25 (Orange)
0.15	0.44 (Brown)
0.27	0.51 (Purple)
0.44	
0.45	
0.63	
0.70	
0.86	

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Preparation of the Haridradi Ashcyotana⁵

Equal amounts of ingredients (25.75 g each) were taken and washed with pure water, air dried and made into coarse powder. The ingredients were put into a clean sterile clay pot and added water (4.5 L) and the decoction was prepared by simmering to 1/6. The final decoction was filtered twenty one (21) times with a sterile fine cloth. Pure Bees honey was added to the filtrate, when the decoction was cooled in room temperature. The final preparation was re-filtered with a sterile fine cloth. Every 10ml of the filtrate was introduced to sterile dropper bottles and labelled accordingly with the prepared date and stored in a cool dry place without exposure to direct sunlight. Preservatives or buffering agents were not added to the final preparation.

Development of Thin Layer Chromatography (TLC) fingerprint

Haridradi Ashcyotana was extracted into dichloromethane for 8 h at room temperature. After that, extractable matter were filtered, concentrated and spotted (10 µL from each) on a pre-coated TLC plate using, methanol, ethyl acetate, dichloromethane and cyclo-hexane in a ratio of 0.5:0.5:4:1. R_f values were recorded for the TLC fingerprint profile of the at 254nm and 366 nm.

Phytochemical screening

Presence or absences of phytochemicals such as alkaloids, saponins, steroids, tannins and flavonoids were determined according to the standard protocols⁶.

Determination of the presence/absence of alkaloids

Alkaloids form a white precipitate or turbidity with Mayer's reagent. Extract (1 mL) was acidified with 2-3 drops of 1M HCl and treated with 4-5 drops of Mayer's reagent. Formation of a white color precipitate was taken as an indication for alkaloids.

Determination of the presence/absence of saponins

Sample was mixed with 5 mL of distilled water in a test tube and it was shaken vigorously. Formation of stable foam was taken as an indication for the presence of saponins.

Determination of the presence/absence of steroid glycosides

Sample was dissolved in equal volumes of acetic anhydride and CHCl₃. The mixture was transferred to a dry test tube and con. H₂SO₄ acid was introduced to the bottom of the tube. Formation of a reddish brown or violet brown ring at the interface of the two liquids was taken as an indication for steroids.

Determination of the presence/absence of tannins

Sample was diluted with water and added to diluted ferric chloride solution. Blackish blue or green blackish color in the presence of ferric chloride was taken as an indication for tannins.

Determination of the presence/absence of flavonoids

Sample was dissolved in methanol (50 %, 1 - 2 mL) by heating. Then metal magnesium and 5 - 6 drops of con. HCl were added. Appearance of a red color was taken as confirmation of flavonoids.

Microbiological limits

Limits *Staphylococcus aureus*, Coliforms, *Escherichia coli* and *Pseudomonas aeruginosa* were determined according to the methods described in SLS standards [7-10].

RESULTS AND DISCUSSION

The past decade has seen a significant increase in the use of herbal medicines. The quality assessments of herbal formulations are of paramount importance in order to justify their acceptability in modern systems of medicine. One of the major problems faced by the herbal drug industry is the unavailability of rigid quality control profiles for herbal materials and their formulations¹¹. However, in Sri Lanka attempts were made to assess the quality of herbal medicine such as Vipadikahara Grita Taila¹², Mustadi Taila¹³ and Dasamoolaristam¹¹.

TLC fingerprint of Haridradi Ashcyotana ensure consistent quality of the product. TLC fingerprint profile of the eye drop consists of 8 prominent spots. R_f values of the prominent spots under UV light (at 254 nm and 366 nm) and after spraying vanillin sulphate are given in Table 2. Therefore, recorded R_f values of Haridradi Ashcyotana can be used to check the batch wise consistency of the product. Chemical constituents such as alkaloids, saponins, steroids, tannins and flavonoids were present in Haridradi Ashcyotana.

Now a day's most of the Ayurvedic and traditional formulations are lacking in defined quality control parameters. Therefore, the present study can be used as one of the parameters for standardization during the routine quality control of Haridradi Ashcyotana.

REFERENCES

1. Singhal GD. Susruta samhita. 2nd edition, Chaukhamba Sanskrit Pratishsthan, Delhi, 2007, p.27.
2. Srikantha Murthi KR. Astānga Hr̥dyam. 6th edition, Part 1, Chawkhambā Krishnadās Academy, Varanasi, 2012, p.266.
3. Sihota R, Tandon R. Parsons diseases of the eye. 21st edition. Elsevier, India, 2011, p. 162
4. Kanski JJ, Bowling B. Clinical ophthalmology. 7th edition, Elsevier Limited, India, 2011, p.135
5. Anonymous. Ayurveda Pharmacopoeia. Vol 1, Part 1, Department of Ayurveda, Colombo, 1994, p.278
6. Arawwawala LDAM, Hewageegana HGSP, Arambewela LSR, Ariyawansa HS. Standardization of spray dried powder of *Piper betle* hot water extract. Pharmacognosy Magazine. 2011; 7: 157–160.
7. Sri Lanka Standards. Publication of Sri Lanka Standards Institution, Sri Lanka. 2008:1351
8. Sri Lanka Standards. Publication of Sri Lanka Standards Institution, Sri Lanka. 2013; 516/2, Section 1
9. Sri Lanka Standards. Publication of Sri Lanka Standards Institution, Sri Lanka. 2013;516/3, Section 1
10. Sri Lanka Standards. Publication of Sri Lanka Standards Institution, Sri Lanka. 2008:1350
11. Kalaiselvan V, Shah AK, Patel FB, Shah CV, Kalaivani M, Rajasekaran A. Quality assessment of different marketed brands of Dasamoolaristam, an Ayurvedic Formulation. International Journal of Ayurveda Research. 2010 ;1(1): 10-13.
12. Hewageegana HGSP, Arawwawala LDAM, Fernando PIPK, Dhammarathana I, Ariyawansa HAS, Tissera MHA. Standardization of Vipadikahara gr̥ita taila: An Ayurvedia medicated oil for common skin diseases. Unique Journal of Ayurvedic and Herbal Medicines. 2013; 1: 48-51.
13. Kumaradharmadasa LPS, Arawwawala LDAM, Fernando PIPK, Peiris KPP, Kamal SV. Quality assessment of Mustadi Taila: An Ayurvedic oil as a remedy for Dental Caries (*Krimi Danta*). Journal of Pharmacognosy and Phytochemistry. 2015; 4: 21-24.