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Physico Chemical Analysis of Amrabeejadi Antidandruff Cream

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Abstract

Dandruff is very common in population. It causes hair fall or hair loss, itching in scalp, acne, pimples and recurrent infection of facial skin, more over it also causes social embracement.

Ayurveda has recommended many herbal formulations and remedies are mentioned for dandruff like *Nilikadham taila, Khas-khasbeejadi lepa, Amrabeejadi lepa* etc., in which *Amrabeejadi lepa* formulation is one of them which is indicated even in severe dandruff. This lepa contains *Amra beeja majja, Haritaki* and *Dugdha*. This dosage form has very short shelf life and low patient compliance. So to increase its shelf-life and also for better patient compliance *amrabeejadi lepa* modified into cream in house.

The study is intended to evaluation of *Amrabeejadi antidandruff cream*. The *Amrabeejadi* antidandruff cream tested with standards parameters pH (3-4), viscosity (32640 cpc) spreadability (8-80 gmcm/sec) and extrudability (good). The lotion shows good consistency and good appearance. So we can develop the classical formulation in convenient dosage form, consumer friendly, highly potent and longer shelf life without disturbing basic concepts of Ayurveda.

Keywords: *Lepa;* Modified cream; Evaluation.

Introduction

In the Ayurveda the greatest emphasis is given to the complete knowledge of drugs including identification, procurement, processing, preparation and application under a separate branch called *Bhaishajya Kalpana*. The term *Bhaishajya Kalpana* consists of two words – *Bheshaja* and *Kalpana*. The substance which helps to bring back the vitiated *doshas* to their normal level or that which counter acts the diseased condition and brings back the body to a healthy state is known as *Bheshaja*. *Kalpana* is a process or a kind of modification, transformation (*samskarana*) or plan of preparation of medicines using either a single drug or several drugs.

The preparations of *Bhaishajya Kalpana* are *panchavidha kashaya kalpana, taila, ghrita, avaleha, asava arista, lepa and malahar*. These are therapeutically potent formulations used for different ailments. But it found difficult to adopt few preparation in these for longer duration like *panchavidha kashaya and lepa*. These are effective when prepared freshly. May be to overcome these disadvantages some other dosages which are equally potent are prepared and used.

In this study one of the modified cream i.e., *Amrabeejadi antidandruff cream* was taking for evaluation for various parameters like colour, appearance, consistency, homogenicity, skin irritation, washability, pH, spreadability, extrudability, viscosity along with antimicrobial study.

In present work main objective was to evaluate Amrabeejadi antidandruff cream.

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Materials and Methods

Amrabeejadi antidandruff cream (in house preparation) was procure from dept of Bhaishajya kalpana of shri B. M. K. Ayurveda mahavidhyalaya, which was prepared by adopting mixing method (standard preparation method) Amrabeejadi antidandruff cream was prepared by mixing with Amrabeejadi lepa (mixture of amrabeeja majja churna and haritaki phala majja churna), milk powder, glycerylmono stearate (as a cream base), glycerine, vitamin C and preservatives.

Evaluation of Cream

Physical Evaluation[1]

Physical parameters such as colour, appearance and consistency were checked visually.

Homogeneity

The cream was tested for homogeneity by visual inspection, after the cream have been set in the container, spread on the glass slide for the appearance, tested for the presence of any lumps, aggregation.[1]

Skin Irritation Test

The skin irritation was carried out on human volunteers. Five volunteers were selected and 1.0 g of formulated cream was applied on an area of two squareinch to the back of the hand. The volunteers were observed for lesions or irritation.[1]

Washability

Formulations were applied on the skin and then ease and extent of washing with water were checked manually.[1]

PH

The test solution was prepared by adding 100 of distilled water to 1gm and 5gm of prepared cream; it was stirred by using a thin glass stirring rod. Next the pH meter is standardized by means of the standard solution provided at room temperature. The electrode of pH meter is immersed into the test solution and beaker was turned slightly too obtained good contact between the test solution and electrode. The meter had auto read system and it automatically signal when stabilized. The pH was recorded three times and average reading was taken.[2]

Spreadability[3]

Spreadability is a term expressed to denote the extent of area to which the cream readily spreads on application to the scalp. The therapeutic efficacy of a formulation also depends on its spreading value. Spreadability is expressed in terms of time in seconds taken by two slides to slip off from the formulation, placed between, under the application of a certain load. Lesser the time taken for the separation of the two, better the spreadability. Two glass slides of standard dimensions were selected. The formulation whose spreadability had to be determined was placed over one of the slides. The other slide was placed on top of the formulations was sandwiched between the two slides across the length of 7.2 cm along the slide. 40 gms weight was placed up on the upper slide so that the formulation between the two slides was pressed uniformly to form a thin layer. One of the slides was fixed on which the formulation was placed. The second movable slide was placed over it, the time taken for the upper slide to travel the distance of '1 ' cm and separate away from the lower slide under the direction of the weight was noted.

The spreadability was then calculated from the following formula:

$$\text{Spreadability} = \frac{m \times l}{t}$$

m = weight tied to the upper slide (100g)

l = length of glass slide (7.5 cm)

t = time taken in seconds.

Viscosity

The viscosity of formulated cream was measured using Brook field Viscometer (LVDV-III ultra-programmable Rheometer) with spindle no. 63 and rpm 30 at 25^{0}C

Extrudability

In the present study, the method adopted for evaluating cream formulation for extrudability was based upon the quantity of cream extruded from tube on application of weight on crimp. More quantity extruded better was extrudability. The formulations were filled in a clean, lacquered aluminum collapsible 5 grams tube with a nasal tip of 5mm opening and applied the pressure on the tube by the help of different weight. Tube extrude ability was then determined by measuring the amount of cream extruded through the tip when a pressure was applied on tube.[4]

Microbial Limit Test

Cream checked the sample for specific micro-organisms viz, Escheriachia coli, Salmonella abony, Staphylococcus aureus, pseudomonas aeurginosa as per standard Indian pharmacope.[5]

Results

Discussion

Table 1: Showing Analysis of Amrabeejadi Antidandruff Cream

Sl no.	Test	Result
1	colour	Light brom
	consistency	Semisolid
	Washability	Good
	Homogenity	Good
	Skin irritatation	No irritation
1.	p^H 1% solution	4.05
	p^H 5% solution	3.02
2	Spreadability-weight 40 gms	8.2gm-cm/sec
	Spreadability-weight 100 gms	80.2 gm-cm/sec
3	Extrudability	Good
4.	Viscosity	32640 cps

Table 2: Showing Extrudability of Cream

Sl. No.	Weight	Length of ribbon	Wt. of ribbon
1	350 gms	1.0 cm	1.55 gm
2	390 gms	1.2 cm	1.57 gm
3	500 gms	1.5 cm	1.59 gm
4	550 gms	1.6 cm	2.00 gm
5	600 gms	2.0 cm	2.20 gm
6	700gms	2.2 cm	2.30 gm
7	800 gms	2.4 cm	2.50 gm
8	890 gms	2.5 cm	2.60 gm
9	1 kg	2.8 cm	2.80gm

Table 3: Showing Microbial Limit Tests of Cream

	Amrabeejadi antidandruff cream
E. coli	Absent
S. aureus	Absent
P. aeruginosa	Absent
S. abony	Absent

Antimicrobial Study

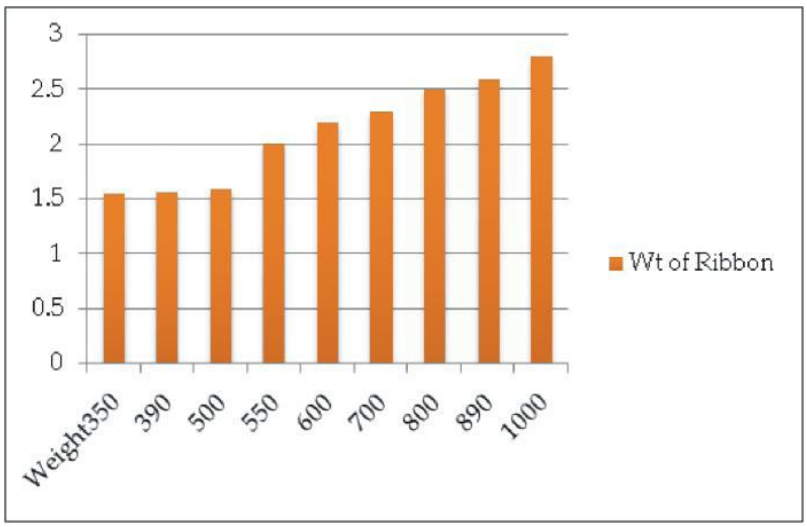
Amrabeejdi antidandruff cream was subjected to Microbial limit test for four different microorganisms' *viz.Escherichia coli, Staphylococcus aureus, Pseudomonas aeruginosa, and salmonella ebony.* It showed that there was no growth of these organisms after 24 hrs of incubation as per Indian pharmacopeia.

pH

Vitale G at el, skin, hair and scalp have a pH range of from about 3 to 9 and preferably, about 4 to 6. The pH of the Amrabeejadi antidandruff cream was in the range of 3 to 4.5, so it is compatible with the scalp without irritation and without affecting the hair texture.[6]

Viscosity

Viscosity was determined by Brookfield viscometer, its value was found to be in the range of 32,640 cps indicate the good consistency.



Extrudability

By increase in pressure at the bottom of the container tube the product is uniformly extruded proportionately. This was shown in the following bar diagram where gradual increase in weight applied at the crimp of tube caused gradual increase in length of ribbon. And as well as weight of the ribbon these indicates that the extrudability of cream is good.

Spreadability

Spreadablity is important evaluation parameter for cream it indicates how fast the cream spread over the applied surface. It was found in the range of 8.21 to 80.52 gm-cm/ sec with weight of 40 gms and 100 gms respectively. Hence cream may also uniformly spread over the scalp with gentle massage.

Bele, Archana A et al,[7] in phytochemical screening, found the presence of tannins and phenolic compound in both aqueous and alcoholic extracts of Amrabeeja majja and Haritaki. At the same time the antimicrobial, anti-oxidant activity, antifungal activity and anti-inflammatory of the alkaloids are well documented. The growth of many fungi, yeast, bacteria and virus was inhibits by tannins.

Here Amrabeeja majja has anti-microbial, anti-oxidant, anti-inflammatory, anti-bacterial and anti-fungal activity [8] and Haritaki has antibacterial, antifungal, antioxidant activity and wound healing property.[9] Based on evidences and taking all these properties in therapeutic approach dandruff may be treated well.

As considering treatment option it must consider that long term chronic therapy will be required as dandruff due to commensal microbes return upon cessation of treatment. These necessitate that patient be highly complaint to any therapy. As hair is a significant driver of cosmetic appeal for any subject. To remain complaint to long term therapy the treatment is cosmetically appealing as well as effective.[10] Here Amrabeejadi lepa is modified into Amrabejjadi antidandruff cream for better patient compliance and for long term use.

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