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Research Article

A COMPARATIVE PHARMACEUTICO-ANALYTICAL STUDY OF MUKHAPRASADANA LEPA ALONG WITH ITS MODIFIED FORM AS A CREAM

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Abstract

Acharya Sharangadhara has mentioned many varnya lepas which helps in developing better complexion and curing skin problems. Mukhaprasadana lepa is one among that mentioned in Sharangadhara samhitha. Ayurveda classical texts explains the internal characteristics, relates with the external expression of an individual, thus face reflects the personality of person. In present scenario, people are very much cautious about their health as well as complexion. Thus health and complexion can be understood as the two faces of a single coin. The present article is aimed to provide the details of pharmaco-Analytical study of mukhaprasadana lepa and its modified form as cream. While considering the present day scenario, the Mukhaprasadana cream will be the better choice because of its user friendly nature. The main aim of the study is to develop a standard method of preparation of mukhaprasadana lepa. To convert the Mukhaprasadana lepa into a cream form.To comparatively analyze both Mukhaprasadana lepa and it's pharmaceutically modified form of a cream with classical and advanced analytical techniques. Mukhaprasadana lepa and its modified form as a cream is prepared with standard house hold parameters. Comparative analysis of both Mukhaprasadana lepa and its modified form as a cream will be comparatively analyzed with suitable physicochemical parameters and advanced instrumental methods of analysis. In Phytochemical evaluation of MPL, sugars, tannins, glycosides, sterols and saponins were present. Loss on drying, Ash value, Acid insoluble ash, Extractive values, P^H value was within the normal limit in MPL. The MPC was non irritant, pinkish brown colour. It is easily spreading and more soluble in water and methanol. In the sterility test, *pseudomonas aeruginosa* and *staphylococcus aureus* were absent. The drugs used were reviewed and it was found that, most of them were kapha-pitta nashaka and helpful in the treatment of Mukhadushika**.** While considering the present day scenario, the Mukhaprasadana cream will be the better choice because of its user friendly nature.

Key words: Varnya lepa; Ayurveda face cream; Cosmeceuticals.

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INTRODUCTION

Ayurveda is considered as an ancient medical science of world which has acquired different concepts from almost all the Indian philosophies. As an aphorism says "A thing of beauty is a joy forever", here the word joy in particular is an excellent state of physique and psyche i.e an equilibrium status of dosha, dhathu, & agni results in Prasanna atma indriya mana, & thus a person is said to be 'Swastha' as per Acharya Sushrutha.[1] In present scenario, people are very much cautious about their health as well as complexion. Thus health and complexion can be understood as the two faces of a single coin.

Previously herbal drugs were not much used in modern pharmacies because of its lengthy processing, difficulty in extracting, standardizing, and identification. But now a day with the advancement in technologies 70% of modern pharmacies are focusing on herbal drugs especially in pharmaceutically modified forms such as creams,[2] ointments, gel, liniment etc. These kinds of pharmaceutically modified forms of herbal formulations have not only increased their market value but also for enhancing the therapeutic efficacy, shelf life and acceptability. Considering the significance of topical applications, the later works have developed on cream preparation which has its own benefits in therapeutics. Therefore converting the lepa form into cream is the necessity of the modern era. Regarding the Ayurvedic products the concept of standardization of final product is the major issue.

In samhitha kala kalka was using in the form of lepa, the same reference was noted in Vedic period also. In later period, madhuchishta, sarjarasa etc were used in gritha and taila kalpanas which give a semi solid consistency to the product and can be easily applied over the affected area. In adhunika kala creams and ointments play a major role in external route of administration of drugs. Mukhaprasadana lepa is one of the varnya lepa mentioned in Sharangadhara samhitha[3] at around six varnya lepa are mentioned in

Sharangadhara samhitha and one of them is selected for present pharmaceutical standardization and its converted form as a cream.

MATERIAL AND METHODS

Selection of Drug

Mukhaprasadana lepa is a poly herbal formulation in the form of churna extensively used to skin complexion. Six drugs are described in Mukhaprasadana lepa of Sharangdhar Samhita are combined with equal quantity.

Procurement of drug

Ingredients of study drug Mukhaprasadana lepa namely Vata patra (*Ficus bengalensis*), Malathi pushpa (*Jasminum grandiflora*), Raktha chandana (*Pterocarpus santalinus*), Kushta (*Saussuria lappa*), Lodhra (*Symplocos racemosa*), Kaliyaka (*Berberis aristata*) All the ingredients except vata patra were purchased from genuine source Nagarcoil, Tamilnadu and vata patra collected from nearby areas in Manipal karnataka. Before processing the all drugs was authentified in the department of Pharmacognosy Lab. Mukha prasadana cream were prepared in the department of Rasashastra and Bhaishajya Kalpana, and research and development department.

Method of preparation of lepa

The drugs are individually powdered and sieved through sieve no.120 to get a micro fine powder. All the powders are mixed well and preserved in airtight containers.[3]

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Method of preparation of cream

It consist of 3 steps.[4]

Step 1- Preparation of Decoction (preparation of aqueous phase)
Step 2-Preparation of oil phase (Melting of bee wax and Stearic acid.)
Step 3- Mixing of aqueous phase and oil phase by use of an emulsifying agent.

Step 1: Preparation of Decoction (preparation of aqueous phase)

The measured quantity of drugs are taken and coarsely powdered, add 3200 ml of water and kept for boiling. Mild fire should be maintained throughout the procedure.

After reducing to ¼, the Kashaya (Decoction) should be filtered through a clean Cora cloth.

This obtained Kashaya (Decoction) was again filtered by using Whatman filter paper (grade 1).

Then measured Kashaya (800ml) and 200 ml of rose water is then taken into a porcelain dish and kept on water bath. Then measured quantity of KOH pellets (30g) is added, melt it completely. Methyl paraben is added to this phase.

Step 2: Preparation of Oil phase

Ingredients

Stearic Acid- 300gm
Bee's wax - 20gm

Procedure

The measured quantity of Bee's wax was taken in a porcelain dish and kept on water bath.

After complete melting of Bee's wax, add measured quantity of stearic acid and allow it to melt.
Maintain the temperature to 75^0C.

Step 3: Mixing of oil phase and water phase

The preservatives (Methyl paraben), and other water soluble components (KOH and Glycerin), were dissolved in the aqueous phase and heated to 75^0 C. (A)

Heat the mixture (Bee's wax and Stearic acid) until the temperature were attained to 75^0C. (B)

Next, add the second mixture (B) to the first mixture (A) slowly with continuous stirring until the thick stable emulsion is formed.

Stir and mix thoroughly by use of a hand blender or in Khalva yantra and transfer it into a clean container.

Allow it for self cooling.

DISCUSSION

The formulations that have been explained in the ancient classics have mostly proven to be authentic and practical. In the present era various thoughts have been incorporated in the minds of pharmaceutical people and most of the pharmaceutical company tries to transform a classical formulation from its original classical forms to a desired form which is most required for the present society. E.g. application of a lepa to a face for a desired effect may cause discomfort to the patients and its modified form into a cream may be comfortable but at the time of modification of the cream the properties of the drugs and its action should not be hindered. Hence an effort was made to transform a lepa choorna into a cream form by adopting a Standard OperativeProcedure and analyze both the original form ie, lepa choorna and the obtained cream for various analytical procedures.

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RESULTS

1. Raw material standardization[5]

Table 1: Phytochemical evaluation of raw materials in methanol extract

	Alkaloids	Sugars	Glycosides	Phenolic compound	Flavanoids	Aminoacids	Proteins	Sterols	Tannins
Daruharidra	+	+	+	-	-	-	-	+	+
Raktha chandana	-	-	+	-	-	-	-	-	-
Kushta	+	++	+	-	-	-	-	+	+
Lodhra	+	+	+	-	-	-	-	+	+
Vatapatra	+	-	+	-	-	-	-	+	+
Malathi pushpa	++	+	++	++	+	-	-	+	++

Table 2: Physicochemical evaluation of raw materials[6]

Drug name	Total ash	Water soluble extractive	Alcohol soluble extractive	Acid insoluble ash
Daruharidra	3.49%	28%	4.16%	0.49%
Rakthachandana	0.45%	2.48%	10.08%	0.1%
Kushta	1.8%	8.96%	29.36%	0.75%
Lodhra	11.52%	25.92%	12.8%	1.89%
Vatapatra	10.18%	11.42%	5.2%	2.76%
Malathipushpa	5.5%	27.04%	34.4%	0.049%

Table 3: Oraganoleptic evaluation of mukhaprasadana lepa

Parameters	Observations
Colour	Reddish brown
Odour	Smell of Rakthchandana
Texture	Smooth
Consistency	Powder(fine)

Finished product standardization

(A) Mukhaprasadana lepa

Table 4: Organoleptic evaluation

Sample		Colour	Odour	texture	Consistency
MPL	1st month	Reddish brown	Smell of Rakthachandana	smooth	Powder(fine)
	3rd month	Reddish brown	Smell of Rakthachandana	smooth	Powder(fine)
	5th month	Reddish brown	Smell of Rakthachandana	smooth	Powder(fine)

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Table 5: Physico-chemical Evaluation

Parameters	MPL		
	1st Month	3rd Month	5th Month
Loss on drying	7.91	7.63	7.66
Total ash	5.75	6.28	6.05
Acid insoluble ash	0.94	1.47	1.53
Alcohol-soluble extractive	16.5	15.99	13.057
Water soluble extractive	27.12	16.96	16.67
P^H (10% aqueous extract)	4.86	4.56	4.32
Particle size	Micro fine	Micro fine	Micro fine

Table 6: Phyto chemical evaluation of Mukhaprasadana lepa in water soluble extractive

Tests	MPL		
	1st month	3rd Month	5th month
Alkaloids (Mayer's test)	-ve	-ve	-ve
Sugars (Fehling's solution test)	++	++	+
Glycosides (Keller kiliyani test)	+	+	+
Phenolic compound	-ve	-ve	-ve
Flavanoids (Shinoda test)	-ve	-ve	-ve
Nin-Hydrin test(Amino acids)	-ve	-ve	-ve
proteins (Biuret test)	-ve	-ve	-ve
Sterols (Salkowaski reaction)	++	+	+
Tannins (Ferric chloride test)	+	+	+
Saponins	+	+	+

Table 7: Phyto chemical evaluation of Mukhaprasadana lepa in Methanol Soluble extractive

Tests	MPL		
	1st month	3rd month	5th month
Alkaloids (Mayer's test)	-ve	-ve	-ve
Sugars (Fehling's solution test)	++	+++	+
Glycosides (Keller kiliyani test)	+++	+++	+++
Phenolic compound	-ve	-ve	-ve
Flavanoids (Shinoda test)	-ve	-ve	-ve
Nin-Hydrin test(Amino acids)	-ve	-ve	-ve
proteins (Biuret test)	-ve	-ve	-ve
Sterols (Salkowaski reaction)	++	+++	++
Tannins (Ferric chloride test)	+	+	+
Saponins	-ve	+	-ve

Table 8: HPTLC Determination [7]

Sample	Peak	Start Rf	Start height	Max Rf	Max height	End Rf	End height	Area	Area %	Assigned substance
MPL	1	0.14	0.3	0.16	14.9	0.18	0.2	238.8	15.64	Unknown
	2	0.18	0.1	0.22	14.0	0.24	0.5	283.2	18.55	
	3	0.24	0.8	0.27	25.2	0.29	0.2	468.4	30.68	
	4	0.30	0.1	0.34	25.8	0.37	0.2	536.4	35.13	

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(B) Mukhaprasadana cream

Table 9: Organoleptic evaluation

Sample	Month	Colour	Odour	Texture	consistency	Spreadability
MPC	1st month	Pinkish brown	Odour of drugs	Smooth	Smooth and fine	Easily spreading
	3rd month	Pinkish brown	Odour of drugs	smooth	Smooth and fine	Easily spreading
	5th month	Pinkish brown	Odour of drugs	Slightly dry	Smooth and fine	Easily spreading

Table 10: Physico-chemical Evaluation

Parameters	MPC		
	1st Month	3rd month	5th Month
Irritancy test	Non irritant	Non irritant	Non irritant
Colour test	Pinkish brown	Pinkish brown	Pinkish brown
Melting temperature	73	72	75
Spread ability test	Easily spreading	Easily spreading	Easily spreading
P^H (10% aqueous extract	5.8	5.9	5.9
Consistency test(60sec)	5mm	5mm	5mm
Homogeneity test	Homogeneous	homogeneous	Homogeneous

Table 11: Stability test (real time stability)

Tests	Initial month	After one month
Colour	Pinkish brown	Pinkish brown
Appearance	Semi solid	Semi solid
Odour	Characteristic	Characteristic
P^H	5.9	6.12
Thermal stability	Ok	Ok
Homogeneity	Uniform	Uniform
Spreadability	Easy	Easy
After feel	Emollient	Emollient
Type of smear	Non greasy	Non greasy
Removal	Easy	Easy
Degradation of product	Nil	Nil
Microbial limit test	<100 colonies	<100 colonies

Table 12: Viscosity Determination[8]

Parameters	MPC
Viscosity	816000cps

Table 13: Sterility Determination[9]

Parameters	MPC
Pseudomonas aeruginosa	Absent /g
Staphylococcus aureus	Absent /g
Total yeast and mold count	<10 cfu/g
Total plate count for bacteria	30 cfu/g

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Table 14: Solubility Determination

Solubilizing agent	MPL
Methanol	Highly soluble
Water	Highly soluble
Hexane	Less Soluble
Chloroform	Poorly soluble

Table 15: HPTLC determination

Sample	Peak	Start Rf	Start height	Max Rf	Max height	End Rf	End height	Area	Area %	Assigned substance
MPC 1	1	0.15	1.3	0.17	11.3	0.18	2.1	126.3	51.18	Unknown
	2	0.24	0.9	0.25	14.0	0.26	3.2	120.4	48.82	Unknown


Figure 1: Mukhaprasanada choorna


Figure 2: Aqueous phase in Mukhaprasanada choorna


Figure 3: Oil phase in Mukhaprasanada choorna


Figure 4: Oil phase in Mukhaprasanada choorna

Figure 5: Mukhaprasanada cream

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Safety and therapeutic efficacy of any Ayurvedic formulation greatly depends on the quality of the finished product. Quality of the finished product is assessed by following relevant scientific parameters. Even though all the necessary precautions are taken while preparing the product by following standard operative procedure guidelines as per GMP there are always possibilities of certain deviation in the quality of final product due to known or unknown reasons. Hence it is essential to asses and conform the quality parameters of finished product by following standard analytical methods. Hence analysis of the finished product Mukhaprasadana lepa and Mukhaprasadana cream is an important objective of the current study. Here an attempt is made to analyze the finished product with the help of Organoleptic, physicochemical and relevant instrumental methods. There are no known standards for the test products; based on general principle of category of formulation i.e. lepa and cream and also the input ingredient parameters are selected. An attempt was made to incorporate best possible parameters for analysis considering the limitation of time and available facilities.

In current study analysis was done for raw materials also because of quality of finished product greatly depend on quality of raw materials used. Here all the 6 raw materials that are common in lepa and cream are tested for their physicochemical values and preliminary Phytochemistry.API guidelines and published scientific articles are taken as standard references.

CONCLUSION

In the present study, the varnya lepa which is selected from Sharangadhara Samhitha Uthara Khanda and it was renamed as Mukhaprasadana lepa. The basic aim of the study was to comparatively analyze the formulation of Mukhaprasadana lepa in its classical form and a transformed form of Mukhaprasadana lepa into a cream.

In the context of analytical study, all the parameters required for quality testing of herbal raw materials was done by following API guidelines and published scientific articles as standard.

In the context of phytochemical evaluation, Daruharidra shows the presence of alkaloids, sugars, glycosides, sterols, tannins. Rakthchandana showed only glycosides in methanol extract.

Kushta shows the presence of alkaloids, glycosides, sterols and tannins and higher amount of sugars when compared to other raw materials. Lodhra also showed the presence of alkaloids, sugars, glycosides, sterols and tannins. Vatapatra showed the presence of alkaloids, glycosides, sterols and tannins. Alkaloids, glycosides, phenolic compound and tannins were highly positive in Malathi pushpa. Sugars, flavanoids were weakly positive in Malathi pushpa.

Loss on drying, Ash value, Acid insoluble ash, Extractive values, pH, were conducted on the prepared samples in the context of physicochemical evaluation.

In the context of cream, Irritancy test, Color test, Melting temperature, Spreadability, pH, Viscosity, Solubility, were tested.

In the Phytochemical evaluation of aqueous extract and methanol extract of Mukhaprasadana lepa were also tested for the presence of alkaloids, sugars, glycosides, phenolic compound, flavanoids, tannins, aminoacids, proteins, saponins. All the samples of lepa and cream were subjected for HPTLC determination.

In the context of sterility determination of Mukhaprasadana cream, pseudomonas aeruginosa and staphylococcus aureus were absent in all the samples.

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