WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 7.523
Volume 6, Issue 16, 530-539. Research Article ISSN 2277– 7105

STANDARDIZATION OF *MUGDHA LEPA*: AN AYURVEDIC PROPRIETARY HERBO-MINERAL FACE PACK FOR *ACNE VULGARIS*

Vandana Meena*[1], Shakti Bhushan[2] and Anand K. Chaudhary[3]

Junior Resident[1], Junior Resident[2] and Professor[3]

Department of Rasa Shastra & Bhaishajya Kalpana, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi (U.P.).

Article Received on
04 October 2017,

Revised on 24 October 2017,
Accepted on 14 Nov. 2017

DOI: 10.20959/wjpr201716-10083

***Corresponding Author**
Vandana Meena
Junior Resident, Department of Rasa Shastra & Bhaishajya Kalpana, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi (U.P.).

ABSTRACT

Acne vulgaris is not a life threatening disease but it is a distressing skin condition which can carry significant psychological disability. Ayurvedic Classics under the name of *Varnya* herbs, describes numerous formulations to treat countless skin diseases. After an investigative search in the Ayurvedic classical text book and contemporary sciences research paper the formulation was named *Mugdha Lepa* keeping in view of the gorgeousness and the splendour exquisiteness of the facial beauty. The objective of this work is to formulate and evaluate a polyherbo-mineral face pack for cosmetic purpose from herbal ingredients. *Shankha bhasma*, *Haridra* (*Curcuma longa*), *Rakta chandan* (*Pterocarpous santilanus), Manjistha (Rubia cordifolia), Nimba (Azadiricta indica)* and *Shalmali kantak (Salamalia malabarica*) were used as principle ingredient and were taken in the ratio 1:2:3:3:3:4 dried, powdered and *Bhavana* of *Kumari* (*Aloe vera*) and *Tulsi* (*Ocimum santum*) *Swarasa* was given thereafter. Final formulation was analyzed on the parameters of organoleptic characterization and physico-chemical analysis. It was further evaluated for Microbial Limit Tests which includes tests for Total Viable Count (bacteria and fungi). *Mugdha Lepa* possessed the reddish brown in colour, smooth and soft on touch with *Tikta, Kashaya Rasa* and with some non-specific smell. In the terms of physico-chemical analysis, it was marked that the parameters were in the permissible boundary. pH of *Mugdha Lepa* was 8.88 incorporating some alkalinity and making it suitable for human skin. The results of Total Microbial Count reported that it is safe for use.

KEYWORDS: Acne, *Lepa*, *Varnya*, *Mugdha*, Herbo-mineral *lepa*.

1. INTRODUCTION

It is the usual craving of mankind to have a fit and glamorous skin with striking personality but very few are blessed with naturally ideal skin. Beauty is not just a optical occurrence; it is a characteristic that provides a perceptual familiarity to the eye, the ear, the intellect, the artistic faculty, or the ethical sense.[1] Unfortunately, Acne is the disease which agitate the face during primary phase of life i.e. Pubescent to Adulthood and if deserted or mistreated may give scar for lifetime. It is not a life threatening disease but it is a distressing skin condition which can carry with it significant psychological disability and has significant impact on quality of life.

In order to treat acne there are many cosmaceuticals flourished in the market which rather than treatment worsen the problem. But Ayurveda promises numerous examples to treat the various skin problems among them chiefly used dosage form is *Lepa*. The herbal paste which is applied on face to treat acne, pimple, scars, marks and pigments are known as "*Mukha Lepa*". The process of smearing this herbal mix on face is known as "*Mukha Lepana".* This beauty therapy is popular as facial and the smooth powder which is used for facial application is "Face Pack". Diverse types of skin need different types of herbal face packs.[2]

A great demand from Ayurveda in the field of cosmetology has been established due to its unique concept about beauty and effective, cheaper and long lasting beauty therapy without any side effect.[3] Face packs are helpful for preventive, promotive and curative of any skin problems. Keeping all the above points in mind a formulation named *Mugdha Lepa* was designed after proper search of ancient Ayurvedic classical text books along with contemporary sciences research paper and the word *Mugdha* in the formulation signifies the attractiveness and charismatic appearance of the facial texture.

2. MATERIAL AND METHOD

2.1 Procurement and Authentication of Raw material

The best variety of *Shankha*, *Manjistha* Root, *Nimba* Bark and *Haridra* Kand were procured from Gola Deenanath, Local Ayurvedic market of Varanasi, Uttar Pradesh. Whereas *Rakta Chandan* was purchased from M/S. P. KRISHNAN, 10/930, 931, Street market, Palayam Road, Calicut, Kerala. *Shalmali kantak* was collected from campus of Banaras Hindu University, Varanasi, Uttar Pradesh.

Plant materials were authenticated from department of Dravyaguna, Institute of Medical Sciences, Banaras Hindu University (B.H.U.), Varanasi. A sample of raw *Shankha* was authenticated from department of Rasa Shastra, Faculty of Ayurveda, Institute Medical Sciences, Banaras Hindu University, Varanasi.

2.2 Preparation of *Shankha Bhasma*

Shankha Bhasma was prepared in two steps: *Shodhana* of *Shankha* and *Marana* of *Shankha* as per the reference of *Rasa Tarngani*.[4,5] Firstly, raw *Shankha* (Conch shell) was purified by *Swedana samskara* (Bio-fomentation) in *Dolayantra* (a specific instrument designed for *Swedana samskara*) for 12 hours and then it was dried and weighed. In the process of *Marana, Shodhita Shankha* (purified conch shell) was levigated with *Kumari Swarasa* for 3-4 hour till *Subhavita Lakhsana* (desired characters after *Bhavana* as per classics) appeared. Then *Chakrikas* were prepared and after drying it was subjected to *Puta* in Horizontal Electric Muffle Furnace at a temperature of 700^0C for 2 hour duration and was then allowed to self cool. On completion of 3 *Puta* all the desired characteristics mentioned for *Bhasma Pariksha* in the classics were acquired.

2.3 Preparation of Powdering of Herbal Drugs

The powdering of herbal drugs had been done as per the Reference of AFI part II *Churna Paribhasha Prakaran.*[6] In the main pharmaceutical process of powdering firstly all plants material were cleaned physically to get rid of the unwanted particle and rinse with water and was kept in a tray and dried out in sunlight, then dried and weighed. Pulverized to make it powder form. The powder was sieved with the help of mesh no.120. The sieved homogenous powder was measured and collected in an air tight container for further procedure.

2.4 Preparation of *Mugdha Lepa*

Based on this, the ingredients were mixed in the proportion of 1:2:3:3:3:4. i.e.(Table.I).

Table: I- Compositions of *Mugdha Lepa.*

Ingredient	Proportion
Shankha Bhasma	1 Part
Haridra(Curcuma longa)	2 Parts
Rakta-Chandan (Pterocarpus santalinus)	3 Parts
Manjistha(Rubia cordifolia)	3 Parts
Nimba(Azadirachta indica)	3 Parts
Shalmali Kantak(Salmalia malabarica)	4 Parts

Initially, *Shankha Bhasma* and *Churna* of *Manjistha, Nimba, Haridra, Chandana* and *Shalmali kantak* were mixed thoroughly with the help of Roller machine and Edge Runner machine to perform *Bhavana* process. The freshly collected juice of *Kumari* was poured into the mixture till the powder got fully impregnated. The procedure was continued for 6 hrs. After each *Bhavana*, the levigated material was kept in a stainless steel tray and dried under sunlight until it became completely dry. The material of previous procedure (*Kumari Swarasa bhavita*) after proper drying was put in the Edge Runner machine, *Tulsi Swarasa* was poured into it and the same procedure was repeated as quoted above. The complete dried material was put in pulveriser and processed to convert it into powdered form. The powder was filtered with the help of Sieve no.120. The product obtained was reddish brown in color with *Tikta Kashaya rasa* and this final product was *Mugdha Lepa*. On completion of three *Bhavana*, levigated material was dried in sunlight. The obtained product was packed in non reactive moisture free suitable air tight contain and labelled properly according to the Rule 161. of Drug & Cosmetic Rule 1945.[7]

1. Analytical characterization of *Mugdha Lepa*

1.1 Orgenoleptic characterization

A sample of *Mugdha Lepa* was observed properly for their colors. Samples were chewed in between incisor teeth to hear any perceptible sound. Samples were touched for any perceptible coarse powder, smelt for any particular odor and tested by tongue for any specific taste.

3.2 Physico-chemical Characterisation

The Physico-chemical parameters of formulations includes determination of loss on drying at 105^0C, determination of total ash, acid-insoluble ash, alcohol soluble extractive value, water soluble extractive value and pH. All the above parameters were followed as per the guidelines of Pharmacopeial Laboratory of Indian Medicine (PLIM).[8]

3.3 Microbial count of *Mugdha Lepa*

The Microbial Limit Tests are designed to perform the qualitative and quantitative estimations of specific viable microorganisms present in samples. It includes tests for total viable count (bacteria and fungi).[9] When test samples are diluted with fluid medium, the tests were conducted quickly with proper attention to evaluatethe quality control and the prevention of biohazard precisely.

2. RESULT AND DISCUSSION

In the preparation of *Mugdha Lepa,* while designing the drug the rationality of proportion of drug mixing, was taken care along with specificity of *bhavana dravya* and number of *bhavana dravya***.** The minimum dose was considered for all the five ingredients viz. *Shankha Bhasma, Haridra, Rakta-chandan Manjistha, Nimba* and *Shalmali kantak* and the ingredients were mixed in the proportion of 1:2:3:3:3:4. Owing to binding capacity, hygroscopicity of liquid media especially its quantity, may alter parameters of standardization i.e. hardness, dissolution, disintegration and friability, ultimately interfering with kinetics of final product mainly absorption and thus therapeutics. While investigating the literature numerous *Saundrya Prasadak Yogas* were described for skin disorder with the *Bhavana* of many drugs. So after probing the data carefully *Kumari* & *Tulsi* were selected for *Bhavana.* The logic behind procurement of above drug was that these drugs were easily available, cheap in cost, best medicinal value regarding skin disorders. *Tulsi* retains *tiksna, ruksha guna* and *ushna virya*[10] with antioxidant, antibacterial property against *Propionibacterium acne*.

In the preparation of *Mugdha Lepa* the main pharmaceutical process is *Bhavana Samskara* (Bio-impregnation). *Bhavana* with liquids helps to bring minute particles of material in contact with each other and helps in easy and smooth grinding; it nullifies the problem of dust too. Wet trituration facilitates particle size reduction and homogenization leading to modification of properties (*Gunantatradhana*) of the end product. Liquid media may act as preservative for the material and adds bulk to final product thus altering percentage of constituents and also plays a role of buffering agent by maintaining specific pH.[11]

Kumari was poured into the mixture of *Mugdha lepa* and *Kumari swarasa* was added little by little until the mixture got fully impregnated. The total quantity of *Kumari Swarasa* added in each *Bhavna* was approximately 4-5 ltr. The speed of the machine was maintained at moderate rate to avoid any loss. If at the same time due to high speed there would have been high temperature due to frictional force which might lead to loss of some volatile matter if any. The trituration was continued until the homogenous mixture was achieved (6-7 hours). The color of the levigated mass became reddish brown and it was kept in sunlight to make it completely dry. After the *Bhavana* of *Kumari,* color became darker.

The same procedure was repeated with *Tulsi Swarasa*. The color of the levigated mass became reddish brown and it was kept in sunlight to make it completely dry. Dark reddish brown colour of compound changed into comparatively more dark reddish slight brown

compound after the *Bhavna* with *Tulsi Swarasa*. On examining *Subhavita Lakshana* it was observed that final product was smooth in touch with reduced particles size. The details of preparation is depicted in the Table (II) below.

Table II: Summary of *Mugdha Lepa* preparation.

Bhavna	***Bhavna Dravya***	**Quantity of *Bhavana dravya(ml)***	**Weight before *Bhavana* (g)**	**Weight after *Bhavana* (g)**	**Weight Gain(g)**
1st	*Kumari Swarasa*	4000 ml	3900 g	4100 g	225 g
2nd	*Tulsi Swarasa*	4000 ml	4100 g	4225 g	125 g
3rd	*Kumari Swarasa*	4000 ml	4200 g	4425 g	200 g

Mugdha Lepa possessed the reddish brown in colour with *Tikta, Kashaya Rasa* and with some non-specific smell. Sound and touch allocated the physical properties like smoothness, softness and fineness of the material. Specific colour of the product indicates formation of particular phyto-constituent, because each chemical compound posses particular color. The predominance of *Tikta & Kashaya Rasa* of the herbal ingredients attributed for the specific *Rasas* in *Mugdha Lepa*. The details of the test are depicted in the Table (III) below.

Table III: Showing orgenoleptic characteristic of *Mugdha Lepa.*

Parameters	***Mugdha Lepa***
Shabda (Sound)	No perceptible sound produced during chewing
Sparsha (Touch)	Smooth, no perceptible coarse particle left
Rupa (Appearance)	Light Brownish Red
Rasa (Taste)	*Tikta & Kashaya Rasa* (Bitter)
Gandha (Odour)	Non specific odour

The physicochemical analytical test gives an idea about the physical and chemical characters of product. Interpretation of these classical tests in terms of knowledge of modern physics and chemistry has explored that these may be considered as finest standards for quality of product. This also helps us to understand the pharmacokinetics and pharmacodynamics of the preparation and to fix up standards for the quality product. In the *Mugdha lepa*, it was evident that loss on drying was under limit i.e.9.58%, reduction in moisture content reduces the chance of microbial contamination (bacterial and fungal growth) and decomposition due to undesired chemical changes. The estimation of moisture contents helps to determine the stability of the drug. Lower moisture contents indicate more stability of the drug. Total Ash value of *Mugdha Lepa* was found to be 17.8%. The total Ash value represents the inorganic salts, naturally occurring in the drug. The amount of acid insoluble ash of *Mugdha Lepa* was 3.69%. Test for acid insoluble ash was carried out to evaluate the percentage of insoluble

inorganic content (adhering dirt, silica and sand) in dilute acid. Since a drug must pass into solution before it can be absorbed, so the acid insoluble ash test is therapeutically very important. Less is the acid insoluble ash more is the physiologically availability in human body. The alcohol soluble extractive value of *Mugdha Lepa* was 3.57% which indicates the presence of polar constituents like phenols, alkaloids, steroids, glycosides, flavonoids and secondary metabolites present in the plant. Water soluble extractive value of *Mugdha Lepa* was found to be 11%. The water soluble extractive value indicated the presence of sugar, acids in the compound. Less or more extractive value indicates addition of exhausted material, adulteration or incorrect processing during drying or storage. pH of *Mugdha Lepa* was 8.88, it was slightly basic in nature it is due to presence of *Shankha bhasma* which has incorporated some alkalinity in the formulation. The details of preparation are depicted in the Table(IV) below.

Table IV: Results of physico-chemical parameters of *Mugdha lepa.*

Parameters	**Results**	
Loss on drying at 105^0C (%)	9.58	8.46
Total ash (%)	17.80	15.64
Acid - insoluble ash (%)	3.69	2.60
Alcohol soluble extractive value (%)	3.57	2.64
Water soluble extractive value (%)	11	6.72
Ph	8.88	8.84

The Microbial Limit Tests are designed to perform the qualitative and quantitative estimations of specific viable microorganisms present in samples. It includes tests for total viable count (bacteria and fungi). In the present study the results of *Mugdha Lepa* regarding Total Bacterial Count showed that no colony developed as well as in the Total Fungal Count, no Colony was present.

Probable Dermatokinetics of *Mugdha lepa* & and its influencing factor

Ayurveda classics explains that the *lepa* application helps toget infused the active ingredients into the base material and enters in the *Romakupa*, get well absorbed through *Shiramukh* and *Swedavahi srotas* and passed to the deeper layers.[12]

Metabolism of the topically applied compounds result in altered pharmacological and toxicological effects. Hence, the skin can act as a gateway for the entry of drug molecules into the body. The viable dermis comprises of different drug metabolising enzyme include epoxide hydrolase, CYPs. Further, it has been reported that the metabolism of retinoic acid

by a specific CYP isoform, CYP26A1 and the human keratinocytes contains transporter proteins which influence influx or efflux of some xenobiotics.[13,14] Absorption of drug or chemicals into the skin is influenced by several factors including molecular size, lipophilicity, pH of formulation, penetrate concentration, chemical enhancers, skin hydration, skin enzymes, temperature, formulation compositions etc.[13]

Moderate pH values [typically above the isoelectric point (pI~4) of skin] could be more appropriate for topical delivery.[15,16] Ionized drug molecules forms pair with ion present in the skin, leads to neutral compounds formation which are competent of crossing the skin barrier. The concentration of drug in the formulation is also evenly important. At higher concentration above the solubility, the excess solid drug acts as a reservoir (often causes drug crystallization in patches) and maintain constant drug level for prolonged time.[17,18] Occlusive vehicles are likely to increase the skin temperature by 2-3^{0}C resulting in increased molecular motion and permeability.[19] Further, the presence of any chemical permeation enhancers will augment the delivery of drugs and increases the level of hydration in the SC decreasing the diffusional path length and protein network density, favouring the drug transport.

CONCLUSION

Lepa kalpana may be considered as an effective dosage form described in the ancient classics of Ayurveda for skin disorders. For this preparation the standard operative procedures were followed at each and every step and to ensure its safety profile microbiological test were done. Analytical techniques were implemented to validate and authenticate the product formed and to set a comprehensive label claim.

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