ORIGINAL ARTICLE

Mugdha Rasa an ayurvedic proprietary medicine to treat acne vulgaris

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Abstract

Background: Acne is the disease which agitates the face during the primary phase of life, and if deserted or mistreated might give scar for lifetime, ayurvedic treatment for acne vulgaris has much to offer but lacks in standardization of products. After an investigative search of classics and contemporary science regarding various herbs and minerals, a formulation was selected keeping in the view of attractive hypnotizing behavior of the facial beauty and was named Mugdha Rasa. **Objectives:** In this study, an attempt was made to standardize Mugdha Rasa on the basis of its classical parameters along with contemporary parameters. **Settings and Designs:** The formulation contains following ingredients, i.e., Shankha Bhasma, Manjistha (*Rubia cordifolia*), Sariva (*Hemidesmus indicus*), Nimba (*Azadirachta indica*), and Haridra (*Curcuma longa*) in the ratio 1:4:4:2:2. Initially, Bhavana of Kumari swarasa was given followed by Tulsi swarasa and lastly with Kumari swarasa, to maintain the standard operative procedure. **Materials and Methods:** Final formulation was analyzed on the parameters of organoleptic characterization and physicochemical analysis. It was further evaluated for microbial limit tests which include tests for total viable count (bacteria and fungi). **Results:** Mugdha Rasa possessed the reddish brown in color, smooth, and soft on touch with Tikta, Kashaya Rasa and with some non-specific smell. In terms of physicochemical analysis, it was evident that the parameters were within the permissible limits. pH of Mugdha Rasa was 8.88 indicating its compatibility with human skin. The results of total microbial count reported that it is safe for use.

Key words: Acne vulgaris, antibacterial, antioxidant, varnya herbs, yuvan pidika

INTRODUCTION

Acne is the disease which agitates the face during primary phase of life, i.e., pubescent to adulthood, and if deserted or mistreated might give scar for lifetime, acne is one of the most prevalent dermatologic diseases in the world affecting approximately 85% of the population between the ages of 12 and 25 years, nearly 8% of adult aged 25–34 years, and 3% of adult aged 35–44 years.[1] Acne onset age varies but usually begins at puberty. A type of acne called adult acne may first occur between the mid-20 s, affecting mainly females. Acne vulgaris is not a life-threatening disease, but it is a distressing skin condition which can carry significant psychological disability. The patients suffering from this condition are more likely to experience anger and are under increased risk of depression, anxiety, and suicidal ideation. The primary factors involved in the formation of acne lesions are increased sebum production, sloughing of keratinocytes, bacterial growth, and inflammation. *Propionibacterium acnes*, an anaerobic pathogen, plays an important role in the pathogenesis of acne by inducing certain inflammatory mediators.[2]

Nowadays, public are more conscious regarding their facial magnificence and spend grand amount of money either through commercials or conventional treatment basically steroids to become liberated from the situation. Cosmetics are not suitable to all the condition; it may worsen the condition, as well as conventional treatment, is having its own precincts. On being acknowledged with higher incidence of the problem and the limitations of the available medications, it is the need

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of hour to uncover out an effective, safe, and reasonable therapy to manage this wearisome problem. Ayurvedic classics reveal a ray of hope as it is having exceptional approach to understand the disease in a holistic dimension. Quite a lot of effective preparations have been described in classics under the name of Varnya herbs,[3] to improve the skin complexion and to treat countless skin diseases. Observing all these points into consideration, the present formulation has been designed by scanning a large number of ayurvedic texts books, publications, and clinical reports.

In our study, selected plants were Manjistha (*Rubia cordifolia*), Sariva (*Hemidesmus indicus*), Nimba (*Azadirachta indica*), and Haridra (*Curcuma longa*) including Shankha Bhasma as ingredients. These all herbs possess the property, i.e., antibacterial, antioxidants, anti-inflammatory, and antiandrogenic and to improve texture, luster, as well as it increases complexion. Various references were found in classical books of Ayurveda regarding these herbs for therapeutic benefit and management of Yuvan pidika. The main aim of the present work was to formulate and evaluate the herbomineral powder Mugdha Rasa for internal administration in Yuvan pidika (acne vulgaris).

MATERIALS AND METHODS

Procurement and Authentication of Raw Material

The best variety of Shankha as per the Grahya-Agrahya Lakshana (acceptable, non-acceptable) mentioned in Ayurvedic classics, Manjistha root, Nimba bark, Haridra khand, and Sariva root was procured from Gola Deenanath, Local Ayurvedic market of Varanasi, Uttar Pradesh. Plant materials were authenticated from the Department of Dravyaguna, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh. A sample of Raw Shankha was authenticated from the Department of Rasa Shastra, Faculty of Ayurveda, Institute Medical Sciences, Banaras Hindu University, Varanasi, Uttar Pradesh.

Preparation of Shankha Bhasma

Shankha Bhasma was prepared in two steps: Shodhana of Shankha and Marana of Shankha as per the reference of Rasa Tarangini.[4,5] First, Raw Shankha (conch shell) was purified by Swedana samskara (Biofomentation) in Dolayantra (a specific instrument designed for Swedana samskara) for 12 h in lemon juice (6 L) as media, and then, it was dried and weighed. In the process of Marana, Shodhita Shankha (purified conch shell) was kept for the first Puta without Bhavana, and for further Putas, it was levigated with Kumari Swarasa for 3–4 h till Subhavita Lakshana (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°C for 2 h duration and was then allowed to self-cool. On completion of three *Puta,* all the desired characteristics of Bhasma completion test (rekhapurnatwa, varitara, unama) mentioned for Bhasma Pariksha in the classics were acquired.

Preparation of Powdering of Herbal Drugs

The powdering of herbal drugs had been done as per the reference of AFI Part II Churna Paribhasha Prakarana.[6] In the main pharmaceutical process of powdering, first, plants material was cleaned physically to get rid of the unwanted particle and later on rinsed with water and kept in a tray, dried out in sunlight, and weighed. Further, it was pulverized to make it into powdered form. The powder was sieved with the help of mesh no.120. The sieved homogenous powder was measured and collected in an airtight container for further procedure.

Preparation of Mugdha Rasa

Shankha Bhasma, Manjistha, Sariva, Nimba, and Haridra were used as ingredients for preparation of Mugdha Rasa in powdered form. Initially, Bhavana of Kumari swarasa was given and followed by Bhavana of Tulsi swarasa, and lastly, it was repeated with Bhavana of Kumari swarasa, it was prepared in three different batches to maintain the standard operative procedure.

Bhavana with Kumari and Tulsi swarasa

Initially, Shankha Bhasma and Churna (powdered form) of Manjistha, Sariva, Nimba, and Haridra were mixed thoroughly with the help of roller machine and edge runner machine. The freshly collected juice of Kumari was poured into the mixture till the powder got fully impregnated. The procedure was continued for 6 h. After each Bhavana, the levigated material was kept in a stainless steel tray and dried under sunlight until it became completely dry. The dried levigated mass was powdered and collected for further procedure.

The material of previous procedure (Kumari swarasa Bhavita) after proper drying was put into the edge runner machine and Tulsi swarasa was poured into the material, and same procedure was repeated as above, and lastly, it was done again with Kumari Swarasa. After each Bhavana, the levigated material was kept in a tray and dried in sunlight till complete dehydration. The complete dried material was put in pulverizer and processed to convert it into powder form. The powder was filtered with the help of sieve no.120. The product obtained was reddish brown in color with Tikta Kashaya Rasa (bitter in taste), and this final product was Mugdha Rasa. On completion of three Bhavana, levigated material was dried in sunlight. The obtained product was

packed in non-reactive moisture free suitable airtight container and labelled properly according to the Rule 161 of Drug and Cosmetic Rule 1945.[7]

Analytical Characterization of Mugdha Rasa

Organoleptic characterization

A sample of Mugdha Rasa 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. The findings have been presented in the tabular form below [Table 1].

Physicochemical characterization

The physicochemical parameters of formulations include determination of loss on drying at 105°C, determination of total ash, acid-insoluble ash, alcohol-soluble extractive value, water-soluble extractive value, and pH and are mentioned in Table 2.[8]

Microbial count of Mugdha Rasa

The microbial limit tests are designed to perform the qualitative and quantitative estimations of specific viable microorganisms present in samples. It includes test for total viable count (bacteria and fungi). The utmost care must be taken in performing the tests so that microbial contamination from the outside can be avoided. When test samples have antimicrobial activity or when they include antimicrobial substances, these antimicrobial properties must be eliminated by dilution, filtration, neutralization, inactivation, or other appropriate means. The tests conducted for the sample prepared by mixing multiple portions randomly chosen from individual ingredients or products. When sample was diluted with the media used for the total viable count, i.e., plate count agar (PCA) was composed of 5 g casein enzyme hydrolyses, 2.5 g yeast extract, 1 g dextrose, and 9 g agar per liter, and the pH was adjusted to 7.0 ± 0.2. 3.5 g of PCA media was dissolved in 200 ml of distilled water. The test was conducted quickly with proper attention to evaluate the quality control and the prevention of biohazard precisely.

Determination of the total bacterial count and total fungal count was done by sterilization of PCA, Petri plate, dilution solution, and beaker, and all test tubes were done in autoclave 15 psi pressure (121°C) for 20 min. 100 µl of dilution samples of Mugdha Rasa were poured into Petri plates having PCA media and left for 15 min for fixing, and this procedure was done in sterile media provided by laminar air flow chamber. Samples were placed in BOD incubator for 72 h. After 72 h, the sample was observed for bacterial growth if any counted and noted. This process was done as per the guidelines of food safety and standards authority of India, Ministry of Health and Family Welfare Government of India, New Delhi 2012, Lab Manual 14.[9] (http://www.fssai.gov.in/Portals/0/Pdf/15Manuals/MICROBIOLOGY %20MANUAL.pdf).

Table 1: Showing organoleptic characteristic of Mugdha Rasa

Parameters	Mugdha Rasa
Shabda (sound)	No perceptible sound produced during chewing
Sparsha (touch)	Smooth, no perceptible coarse particle left
Rupa (appearance)	Light brownish red
Rasa (taste)	Tikta and Kashaya Rasa (bitter)
Gandha (odor)	Non-specific odor

Table 2: Results of physicochemical parameters of Mugdha Rasa

Parameters	Results
Loss on drying at 105°C (%)	9.58
Total ash (%)	17.80
Acid-insoluble ash (%)	3.69
Alcohol-soluble extractive value (%)	3.57
Water-soluble extractive value (%)	11.00
pH	8.88

RESULTS AND DISCUSSIONS

In the preparation of Mugdha Rasa, the main pharmaceutical process is Bhavana Samskara (bioimpregnation). 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 thus altering the percentage of active constituents. Added liquids act as media for extraction of components of various ingredients as well as media for their chemical interaction. It also plays a role of buffering agent by maintaining specific pH. It is evident that the liquid media as Bhavana provides better palatability.[10]

Rationality of Proportion of Mixing the Ingredients

In Ayurvedic Pharmacopoeia of India, the therapeutic dose of Manjistha, Sariva, Nimba, and Haridra Churna is mentioned as 3–6 g twice daily and in Ayurvedic Formulary of India part 1, the therapeutic dose of Shankha Bhasma is fixed 250–300 mg twice daily. Thus, if we take the minimum dose and combine all the five, based on this, the ingredients were mixed in the proportion of 1:4:4:2:2 [Table 3]. 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

the physical and chemical kinetics of final product mainly absorption and thus therapeutics. While searching the literature, numerous Saundarya Prasadak Yogas were described for skin disorder with the Bhavana of many ingredients described. The logic behind procurement of above drug was that these drugs were easily available, cheap in cost, and best medicinal value regarding skin disorders. Tulsi retains tikshna, ruksha guna, and ushna virya[11] with antioxidant, antibacterial property. However, due to the virtue of its ushna virya, it may cause aggravation of Pittaj factors and produce side effects and ill responsive reactions. Hence, if one more Bhavana of Kumari swarasa is given, the tikshnata of Tulsi will subside and will not produce any untoward reactions because Kumari possesses snigdha guna and shita virya property, hence, it will counteract the side effect of Tulsi. Kumari being one of the superlative Bhavana Dravya justifies the logic of the expertise of taking two Bhavana of it and one Bhavana of Tulsi swarasa.

After the Bhavana of Kumari and Tulsi Swarasa color became darker and the weight of the material also increased and this might be due to the dried solid content of the respective Swarasa. Dark reddish brown color of compound changed into comparatively more dark reddish slight brown compound after the Bhavana with Tulsi Swarasa. On observing the material, after Bhavana, it was seen that it was odored with mixed characteristic smell of Tulsi and Kumari. Texture appearance of final product was smooth in touch with reduced particles size. The details of preparation are depicted in Table 4 below.

Organoleptic Test

Mugdha Rasa possessed the reddish brown in color with Tikta, Kashaya Rasa and with some non-specific smell. Sound and touch allocated the physical properties such as smoothness, softness, and fineness of the material. Specific color of the product indicates the formation of particular phytoconstituent because each chemical compound possesses particular color.

Table 3: Compositions of Mugdha Rasa prepared in each batch

Ingredients	Proportion (part)
Shankha Bhasma	1
Manjistha (*Rubia cordifolia*)	4
Sariva (*Hemidesmus indicus*)	4
Nimba (*Azadirachta indica*)	2
Haridra (*Curcuma longa*)	2

The predominance of Tikta and Kashaya Rasa of the herbal ingredients attributed to the specific Rasas in Mugdha Rasa [Table 1].

The Physicochemical Analytical Test

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 Rasa, 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 content helps to determine the stability of the drug. Lower moisture contents indicate more stability of the drug. Therefore, the formulation was stable for desired period. Total ash value of Mugdha Rasa 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 Rasa 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.[12] The alcohol-soluble extractive value of Mugdha Rasa was 3.57% which indicates the presence of polar constituents such as phenols, alkaloids, steroids, glycosides, flavonoids, and secondary metabolites present in the plant. Water-soluble extractive value of Mugdha Rasa 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 the addition of exhausted material, adulteration, or incorrect processing during drying or storage.[12] pH of Mugdha Rasa was 8.88; it was slightly basic in nature it is due to the presence of Shankha Bhasma which has incorporated some alkalinity in the formulation [Table 4].

The Microbial Limit Tests

In this study, the results of Mugdha Rasa regarding total bacterial count and total fungal count showed that no colony developed and it is reported that it is safe for use.

Table 4: Summary of Mugdha Rasa preparation

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

CONCLUSION

In this study, an attempt has been made to develop a therapeutic efficient formulation in terms of the treatment of Yuvan pidika (Acne). The analytical data reported in this study can act as supportive measures to establish standard parameters.

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