WORLD JOURNAL OF PHARMACEUTICAL RESEARCH
SJIF Impact Factor 8.453
Volume 13, Issue 14, 793-808. Research Article ISSN 2277–7105

FORMULATION AND EVALUATION OF POLYHERBAL LIPSTICK

Mohini Rathod*, Jay Bariya, Hawa Bibi Mulla, Khushi Chauhan, Shaba Shaikh and Vivek Patel

Department of Pharmacognosy Technology and Pharmaceutics, Shree Dhanvantary Pharmacy College, SDPC Campus, Kim, India.

Article Received on
24 May 2024,

Revised on 14 June 2024,
Accepted on 04 July 2024

DOI: 10.20959/wjpr202414-33117

***Corresponding Author**
Mohini Rathod
Department of Pharmacognosy Technology and Pharmaceutics, Shree Dhanvantary Pharmacy College, SDPC Campus, Kim, India.

ABSTRACT

In modern times, men and women both rely heavily on cosmetics to change how they seem. By using makeup, they could become more self-assured and attractive.[1] The study aimed to create herbal lipstick with natural components to cure, smooth, and provide cosmetic and medical benefits for chapped, dark, and other lip conditions caused by environmental elements like heat, humidity, and radiation. To create and assess herbal lipstick with significant smoothing action without impairing the natural structure of lips, the current study was devised. Natural elements will improve the appearance and lessen any negative effects on the lips. We attempted to create an herbal lipstick recipe utilizing natural herbs like dragon fruit, castor oil, and olive oil because our lips' surface needs constant smoothing and mending to remove dead cells, dryness, and chapped lips to keep them healthy. The flavonoids, vitamin E, and ricinoleic acid—all well-reported chemical constituents are present in formulation. Which will provided smoothing and exfoliation, respectively.[2] A variety of organoleptic measures, including color, odor, pH, and thickness, melting point, breaking point, spreadibility, stability, anti-microbial tests were used to assess prepared lipstick. The outcome demonstrates both a cosmetic and medical benefits on lips that are black, dry and affected by atmosphere. Three batches (F1, F2, F3) were formulated and evaluated using different combination of ingredients. The results indicate that formulation F1 has better satisfactory results than F2 and F3 making it an ideal candidate for an optimized batch. The selected final formulation F1 was also compared with the marketed product and observed a comparatively better effect along with an additional antimicrobial effect.

KEYWORD: Natural cosmetics, Polyherbal lipstick, Dragon fruit extract, Anti-microbial.

INTRODUCTION

Cosmetics contain various formulations such as skin care lotions, creams, powders, hair colors, colored contact lenses, hair sprays, deodorants, shower gels, bath oils, and many various types of cosmetics in the present world.

In the modern era herbal is the signature face of safety in contrast to the synthetic chemical formulations that have much numbers of adverse effects on skin and human health. Nowadays, herbal products via herbal tablets, herbal paste, herbal tonics, herbal shampoo, herbal hair oil, herbal face wash, herbal creams, and herbal lipsticks are very famous due to herbal awareness and its benefits of. Herbal products represent the fastest-growing industry and segment that desires to control the health of consumers.[3,4]

Beauty products are very famous in the market and lipsticks are one of them. Herbal lipsticks have minimal side effects along with medicinal benefits and beautifying the consumers. Lipsticks are available in so many shades which will be extensively used by women of our community with good satisfaction.[3-6] keeping natural shade of color in form of dragon fruits extract present study was conducted.

Benefits of herbal lipstick over synthetic lipstick[13,14,15]

- It affords nutrients to boost the body's health.
- Free from harmful synthetic chemicals those having side effects.
- They have the advantage of safe use, compatibility with the body and easy choice over synthetic products
- Herbal lipstick is natural, affordable, and non-expensive.
- Variety of products along with no side effects.
- There is no need to test on animals because of herbal properties.
- It helps to heal damages caused by lips disorders such as sun damage, and discoloration.

Ideal characteristic[19]

- Non-irritation and non-toxic.
- Required plasticity
- Physical and chemical stability.
- Prevents drying on board.

- Requires low particle content.
- The product should be visually appealing, odor-free, and comfortable to use.
- Long-lasting lip color after application.
- Provides a shiny and smooth appearance after sweating.
- It should not fuse or harden within permissible temperature ranges.

Objectives

The main objective of the present study was to prepare a polyherbal lipstick. In the formulation of polyherbal lipstick, Dragon fruit is used as an a natural colouring agent and Beeswax, Liq. Paraffin, Rosewater essence, Olive oil, and Vitamin E Oil are used in this polyherbal lipstick. Different evaluation tests are carried out for the prepared polyherbal lipstick formulation, such as Color, Texture, PH, melting point, Breaking point, Hardness, Spreadability, Stability, Fragrance stability, and Skin irritation test.

Pharmacognostic profile of fruit

Name: Dragon fruit[14,16,17,18]

Synonym - Selenicereus undatus

Biological source -Ripe fruit that grows on climbing cactus known as Hylocereus. (Cactaceae).

Chemical constituent reported – Beta lain.

Uses - As a coloring agent

Figure 1: Dragon Fruit.

Table 1: Ingredient sourceand uses.

Ingredients	Source and Family	Use
1. Bees wax (*Cera alba*)	➢ Obtain from the honeycomb of bees Apis melifera and other Apis specie ➢ Apidae	Thickening agent

2. Liq. paraffin (*Paraffinum liquidum*)	➢ It can be extracted from distillation of petroleum.	Emollient
3. Rosewater essence (*Rosa danascena*)	➢ It is obtained by distillation of fresh rose petals. ➢ Rosaceae	Fragrance
4. Dragon fruit (*Selenicereus undatus*)	➢ Ripe fruit that grows on climbing cactus known as Hylocereus. ➢ Cactaceae	Coloring agent
5. Olive oil (*Olea europaea L.*)	➢ The oil is extracted from the fleshy part of the ripened fruit of the olive tree. ➢ Oleaceae	Base preparation
6. Vitamin e oil (*Alpha- tocopherol*)	➢ Extracted from veg. oil deodorizer distillate. ➢ Four tocopherols	Smoothing agent

Figure 3: Bees wax.

Figure 4: Olive oil.

Table 2: Preparation of formulation.

Ingredients	Uses	F-1	F-2	F-3
Beeswax	Thickening Agent	6 gm	4 gm	4 gm
Liq. Paraffin	Base	6 gm	3.5 gm	1.60 gm
Dragon fruit Extract	Coloring Agent	4 ml	3 ml	2 ml
Olive oil	Moisturizing Agent	4.5 ml	4 ml	2 ml
Rose water essence	Flavorings Agent	Q.S.	Q.S.	Q.S.
Vitamin E	Emollient	1 ml	1 ml	1 ml

Extraction methods

1) Dragon fruit extraction[34]

➢ Dragon fruit is also a source of natural red dye. It contains a constituent called betalain that is responsible for red pigments. Dragon fruit has a wide range of color alternatives such as red, striped white and rose pink. This extraction process has been done by maceration method. In this method wash the fruit first then peeled and cut it into uniform-sized fine slices. A portion of the sliced fruits is poured in water and grind this portion.

Then extract out the remaining portion with the help of filter paper. Collect the extract into a suitable container and store it.

Figure 6 Dragon fruit extraction.

2) Rose water extraction[35]

- Rose / Rose water are efficient and cheapest source of fragrance because it is easily available in the market. This process is done by distillation technique. In this technique take rose / rose water with distilled water and place it in a ‘still’(a distillation apparatus) at 25`C for 3 days’ time period. Then separate the essence from rose water by solvent extraction and store it in a cool container.

Figure 7: Rose water extract.

Procedure[18-19]

The herbal lipstick was formulated as per general method of lipstick. In this formulation, Beeswax, Liq. Paraffin, Dragon, Olive oil was melted in porcelain dish with decreasing order of their melting point. Edible colouring matter like dragon fruits extract mixed with olive oil and heated. Both phases were mixed at same temperature. Rose water essence and vitamin E were added at 35°C. The mixture was poured into lipstick mould in excess amount and mould was kept on the ice bath. After solidification surplus amount was scrapped with blade. Lipstick

were removed from mould and flamed. Prepared lipstick were fitted in lipstick container and used for further evaluation.

Figure 8: Dragon fruit lipstick.

Evaluation parameter

The following evaluation parameters were performed to ensure the quality of prepared polyherbal lipstick.[10-13,16,22,32]

1) Physical evaluation[36-38]

I. Color & Texture

Check the formulated lipsticks for Colour, glossiness, and smooth texture.

II. pH

The pH of formulated lipsticks was checked for pH using pH strips.

III. Melting point

Melting point was determined by the capillary tube method. approx. A 10mg sample of lipsticks was taken and melted filled into the capillary cooled for 24hrs and increased with a thermometer then the thermometer and tube on full water. Placed on a magnetic stirrer heating, and stirring started slowly to a fixed speed. The temperature at which material passes through a capillary tube was regarded as the melting point.

IV. Breaking point

Test carried out for a maximum load of lipstick can withstand before breaks. held lipstick horizontally in the socket inch away from the edge support. The weight increased gradually by 10 gm at a specific interval of 30 sec and the weight at which breaks was considered as breaking point.

V. Hardness

Select randomly formulated lipstick and measure using a Monsanto hardness tester. The average result of every formulation was calculated and recorded.

VI. Spreadability

The test is performed by using lipstick on a glass slide checking the spreadability and divide into 3 categories

1. Good,
2. Intermediate,
3. Bad

VII. Stability

Prepared formulations were tested for 60 days, to record stability.

VIII. Fragrance stability

Prepared lipstick was tested for 60 days to record fragrance.

IX. Force of application

Test to determine the force applied during application In this parameter cut down 2 determines the force required to pull the paper.

2) Organoleptic evaluation[39, 40]

I. Skin irritation test

The test involves applying the product to the skin for 10 minutes and checking for any irritation.

II. Aging stability

Store lipstick at 40°C in the refrigerator, 20°C to 250°C in the room, and 30°C to 300°C in the high temperature for 1 hour. Various characteristics such as blending, catering, and blooming are noted.

3) Physiochemical evaluation[41-49]

I. Solubility test

We evaluated the solubility of the polyherbal lipstick formulation by dissolving it in a variety of solvents (Ethanol, Water, Chloroform, and Methanol and petroleum ether.).

II. Microbiology test

The lipstick sample was tested in two different culture conditions to see bacterial growth and colony formation. For nutrient agar medium, dissolve 5 gm of yeast extract, 5 gm of NaCl, and 10 gm of peptone in 1000 ml of dist. Heat water in a two-liter beaker in a water bath. Add 25 grams of powdered agar and continue cooking until fully dissolved. To adjust the PH to 7.4, use a PH meter and filter the solution through a lint cloth. Fill a 20 ml tube with the solution, seal it with cotton, sanitize it, and autoclave it at 121°C.

Procedure: Aseptically weigh and transfer 0.5 gm samples to four melted nutritional agar tubes, shake to combine, and pour into sterile Petri dishes. Incubate for 48 hours at 370 °C. Determine the average number of colonies per gram of sample in a nutrient agar tube.

III. Surface anomalies

Surface flaws were investigated, such as the production of crystals on surfaces contaminated by molds and fungus, the formation of wrinkles, and liquid exudation. Substances and solid fatty materials

Preliminary phytochemical test for extract

Phytochemical analysis showed the presence of phytochemicals namely.[24,30,31]

A. Test for alkaloids (Dragendorff's test)

Adding 1ml of Dragendorff's reagent into 2ml of extract, if an orange-red precipitate was formed means alkaloids are present.

B. Test for anthraquinones

1ml of extract was boiled with 2ml of 1o% HCL soln. for a few min. in a water bath then filter and cool, add an equal volume of chloroform in filtered. Add 10% ammonia to the mixture and heat it. If a rose pink color is seen means anthraquinones are present.

C. Test for flavonoids

1 ml of extract was dissolved in 1 ml of dil. 0.2 M NaOH and 1 ml 10% HCL if the yellow color turned colorless means flavonoids are present.

D. Test for glycosides (Fehling test)

0.1 ml of extract was hydrolyzed with 1 ml of 10% HCL soln. and neutralized with 1 ml of 0.2M NaOH soln. a few drops of Fehling soln. A and B if red precipitates occur means glycosides are present.

E. Test for terpenoids (Salkowski test)

1 ml of extract was mixed with 2 ml of chloroform and 3 ml of conc. Sulphuric acid is carefully added to form a layer. If a reddish-brown color is present means terpenoids are present.

F. Test for saponins

1ml of extract added with 5.9ml of dist. Water and heated to boil if the appearance of a creamy mist of small bubbles indicated the presence of saponins.

G. Identification test of coloring agents

I. Dragon fruit (Test for Betalain)

Take 1 ml extract then add a few drops of hot HCL to convert the pink solution to colorless and after adding NaOH it converted into dull yellow**.**

RESULT

Table 3: Table of phytochemical tests.

Chemical test	Observation	Results
1. Test for alkaloids	Red precipitates	+ve
2. Test for anthraquinones	pink color solution	+ve
3. Test for flavonoids	Yellow to colorless solution	+ve
4. Test for glycosides	Red precipitates	+ve
5. Test for terpenoids	Reddish brown solution	+ve
6. Test for saponine	Small bubble in solution	+ve
7. dragon fruit identification	Dull yellow solution	+ve

Figure 9: Test for alkaloids.

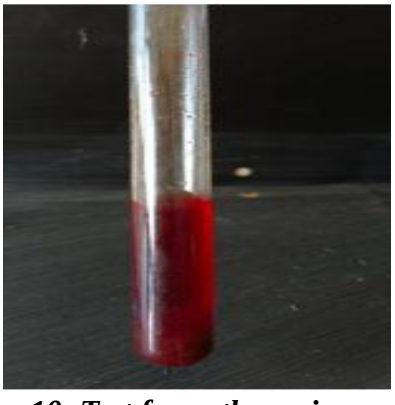

Figure 10: Test for anthraquinons.

Figure 11: Test for flavonoids.

Figure 12: Test for glycosides.

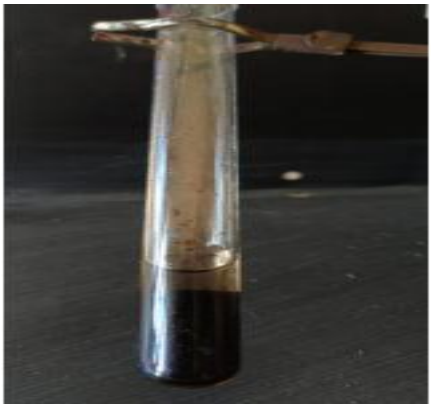

Figure 13: Test for terpenoids.

Figure 14: Test for saponins.

Figure 16: Test for betalain.

Table 3: Physical Evaluation

Parameter	F1	F2	F3	Standard
Color	Light red	Light Red	Light Red	Light Red
Texture	Smooth	Smooth	Smooth	Smooth
PH	6.4	6.0	6.7	6 -7
Melting point	55-65˚ C	52-55˚ C	55-63˚ C	55-65˚ C
Breaking point	33gm	32gm	33gm	33 gm
Hardness	++	+	++	+++

Spreadability	Good	Average	Average	Good
Stability	Yes	Partial	Partial	Yes
Fragrance stability	+++	++	++	+++
Application of force	Good	Hard	Hard	Easy/Good/ Hard

(+ = **Good**, ++ = **Best**, +++ = **Excellent**

Table 4: Organoleptic evaluation table.

Parameter	**F1**	**F2**	**F3**	**Standard**
Skin irritation test	No	No	No	No
Aging stability	Smooth	Smooth	Smooth	Smooth

Table 5: Physicochemical evaluation table.

Parameter	**F1**	**F2**	**F3**	**Standard**
Solubility test	Soluble in solvents	Partial soluble	Partial Soluble	Soluble in solvents
Microbiological Test (ZOI)	11 mm	9 mm	10mm	10-12 mm
Surface anomalies	No defect	No defect	No defect	No Defect

RESULT

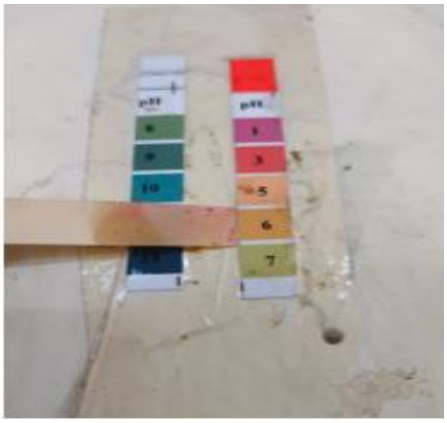

Figure 17: pH Test of F1.

Figure 18: Melting Point of F1.

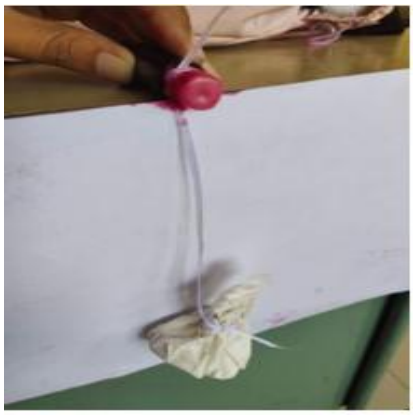

Figure 19: Breaking point of F3.

Figure 20: Color and texture of F1.

Figure 21: Aging Stability of F1.

Figure 22: Skin Irritation Test of F1.

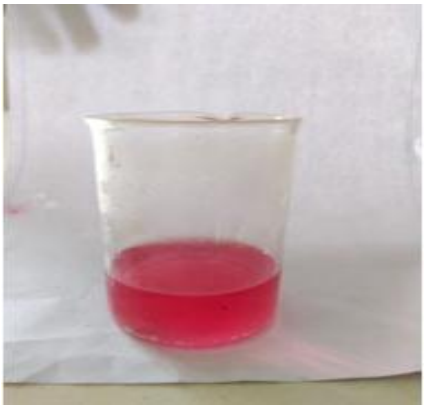

Figure 23: Solubility test.

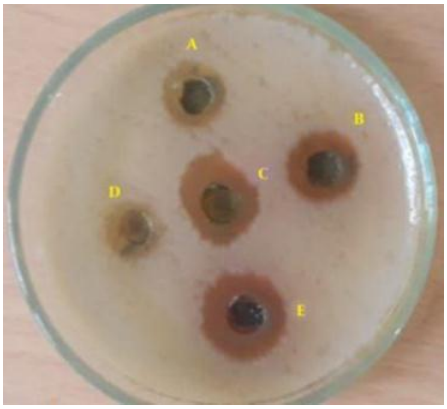

Figure 24: Microbiological test.

- Result for formulation 1 (Dragon fruit): After performing the evaluation parameter, formulation 1 has shown more satisfactory results in comparison to formulation 2 and 3.

DISCUSSION

To lessen or eliminate the negative effects of commercial formulations and improve the product's appearance with health benefits like moisturizing and anti-microbial properties, the current study on the formulation and evaluation of polyherbal lipstick used a variety of herbs, including olive oil and dragon fruit.

The formulation (tables No. 1, 2) and evaluation (tables No. 3, 4,5) revealed that, when compared to the marketed formulation, the bloom-up formulation from each batch produces comparable results. Because of their many advantages, the current study and analysis of these herbal lipsticks are therefore superior choices for women. Dragon fruit lipstick is made up of several ingredients that do different things. In addition to having strong antioxidant action that hydrates lips and color pigment that imparts color, beta lain also possesses hydrating properties. Flavonoids, or tannins with vitamins B3, B6, and B9, are a component of dragon

fruit that has strong antibacterial activity against both +ve and -ve germs. So, bloom's formulation is a better option for women with minimal side effects a detailed clinical trial may be done to assess the better efficiency of the formulation.

CONCLUSION

Herbal lipstick was effectively formulated with the major ingredient (dragon fruit) F1, F2, and F3. Also three formulations of each, with various ratios F1, F2, and F3, and were assessed various organoleptic, physicochemical, and physical criteria was evaluated. Among The F1 formulation was chosen for comparison with the commercial product based on the outcome of the evaluation parameters. When the prepared and marketed formulations were compared, the formed lipstick produced results in the evaluation parameters that were comparable to the marketed formulation with additional antibacterial effect.

ACKNOWLEDGMENT

The authors are thankful to the Management and Staff members of Shri Dhanvantary Pharmacy College, Kim for their support and for providing us necessary facilities in the college.

REFERENCES

1. Formulation and Evaluation of herbal lipstick by Aboli bornare, Tejasvi tribhuvawan, Shrutika magare, Aishwarya shinde, Swati tarkase from NSCP- Aurangabad. published by international journal of creative research thoughts.
2. Bharat, V., et. al, formulation and evaluation of herbal lipstick, int. J of drug discovery herbal research, 2011.
3. Benett, W. et.al, cosmetic formulary, chemical publishing company, new york, 1983; 1.
4. Nandakrni A.K. Indian materica medica, popular prakashan, Mumbai, 2.
5. Chattopadhyay, P. K. herbal cosmetics and ayurvedic medicins, I.ed. national institute of industrial research, 2005.
6. Kokate C.K., purohit AP, Gokhale SP, text of pharmacognosy. Nirali prakashan, 49.
7. Anilkumar V., Kalyani R., Sangeeta Kumari, Ashwini Lavanya, P., evaluation of herbal lipstick from natural color pigments international journal pf pharmacy and pharmaceutical research, 2020; 18.
8. Nileshwari P. chaudahari, namarata U. chaudahari, A review on herbal lipstick from different natural coloring pigmenst, Indian journal of drug, 6.
9. Sharma P.P., cosmetics formulation and quality control, 3rd ed. Vandana publication.

10. Fartade Rukhmani, Mahesh bhoshle – A review on herbal lipstick from beetroot extract, 3: 10(12).
11. Shreya talreja, et.al. from LMCP, Lucknow- the development and evaluation of herbal lipstick formula utilizing a various extract by journal of pharmaceutical and biological sciences.
12. Yadav S. formulation and evaluation of herbal lipstick world J pharma rs, 9(4).
13. Patel P. formulation and evaluation of herbal lipstick using beta vulgaris and punica. Int j pharma science, 25(2).
14. kruthika VS. formulation and evaluation of natural lipstuck from colored pigments of beta vulgaris taproot. Res rev pharma sci, 4(5).
15. S. Chandran, et.al. pigment identification and antioxidant properties of red dragon fruit, African journal of biotechnology, 9(10).
16. Rebecca OPS. Et.al. determining pigment extraction efficacy and pigment stability of dragon fruit J. bio. sci, 8(7).
17. Carle R. et.al. betalain stability and degradation structural and chromatic aspects. J. bio. sci, 71
18. Sun M. et. al. antioxidants activity of betalains from plants of the Amaranthaceae. J.agri. food chem, 51.
19. Rasheed N. formulation and evaluation of herbal lipstick. Res J. pharm tech, 13(4).
20. Drx. Sneha yadav, K.J. baid et.al. formulation and evaluation of herbal lipstick. world J. pharmaceutical rs, 8(4).
21. Dr. Singh S. et al. Review on natural lip balm. International journal of research in cosmetic science, 5(1).
22. M.D. Dhanaraju, V. Anilkumar A review on herbal lipsticks. Journal of pharmaceutical advanced research, 4(4).
23. Indian standards (IS), lipstick (PCD 19: cosmetics), 1990.
24. Jain A., et.al. potential of herbs as cosmeceuticals. Int. J. research appl. Pharmacy, 1.
25. Nayak BS., et. al. phytochemical investigation and in-vitro evaluation of fruit extracts. Asian J. chem, 24(8).
26. Brown RP., et. al. Z. Rhodiola rosea, A Phyto medical overview. Herbalgram, 56.
27. Craig WJ. Health promoting properties of common herbs AM. J. CLIN. NUTR, 70.
28. Panda S. et. al. preparation and evaluation of herbal lipstick J. pharm. Adv. Res, 1(2).
29. Nayak L. Sahu BP. A review on herbal medicine and health. J pharma. Adv. Res, 1(1).
30. speroni E. Review on some plant of Indian traditional medicine with anti oxidant

activity. J. Ethnopharmacol, 71.

31. Khandelwal KR. Practical pharmacognosy Nirali prakashan, 12.
32. Kaur CD. Phytoconstituents as photo protective novel cosmetics formulation, pharmacogno. Rev, 4(7).
33. Vishal bhawde, et.al. formulation and evaluation herbal lipstick. Int. J. of novel res. and development, 7(12).
34. Carle R. et.al. betalain stability and degradation structural and chromatic aspects. J. bio. sci, 71.
35. Nayak BS., et. al. phytochemical investigation and in-vitro evaluation of fruit extracts. Asian J. chem, 24(8).
36. Margaret A. Selling dreams inside the beauty business. London: JM Dent & Sons Ltd, 1981.
37. Bashinski R. What the shape of your stick might say about you/ Freudian slip of the lip. New York: Daily News, 1999.
38. Nadkari AK. Indian Materica Media. Mumbai: Popular Prakashan, 1975; 3: II.
39. Cabral C, Francisco V, Cavaleiro C, Gonçalves MJ, Cruz MT, Sales F. Essential Oil of Juniperus communis alpina (Suter) Celak Needles: Chemical Composition, Antifungal Activity and Cytotoxicity. Phytother Res, 2012; 26(9): 1352-1357.
40. Melvina M, Dorothy G, Frank M, Joanne E, Margaret S, Cheryl S. Herbal Therapies and Diabetes among Navajo Indians. Diabetes Care, 2005; 28(6): 1534-1535.
41. Anis E, Anis I, Ahmed S, Mustafa G, Malik A, Choudhary MI. Alpha-glucosidase inhibitory constituents from Cuscuta reflexa. Chem Pharm Bull, 2002; 50(1): 112-114.
42. Yang L, Chen Q, Wang F, Zhang G. Antiosteoporotic compounds from seeds of Cuscuta chinensis. J Ethnopharmacol, 2011; 135(2): 553- 560.
43. Rehman HU, Yasin KA, Choudhary MA. Studies on the chemical constituents of Phyllanthus emblica. Nat Prod Res, 2007; 21(9): 775-781.
44. Tiwari V, Kuhad A, Chopra K. Emblica officinalis corrects functional, biochemical and molecular deficits in experimental diabetic neuropathy by targeting the oxido-nitrosative stress mediated inflammatory cascade. Phytother Res, 2011; 25(10): 1527-1536.
45. Sukanya DH, Lokesha AN, Datta G, Himabindu K. Phytochemical diversity in ashwagandha (Withania somnifera). J Med Aromat Plants, 2010; 1(2): 27-30.
46. Mishra LC, Singh BB, Dagenais S. Scientific basis for the therapeutic use of Withania somnifera (Ashwagandha): A Review. Altern Med Rev, 2000; 5(4): 33-38.
47. Ruan B, Kong LY, Takaya Y, Niwa M. Studies on the chemical constituents of Psoralea

corylifolia. J Asian Nat Prod Res, 2007; 9(1): 20-25.

48. Zhao G, Li S, Qin GW, Fei J, Guo LH. Inhibitive effects of Fructus psoraleae extract on dopamine transporter and noradrenaline transporter. J Ethno Pharmacol, 2007; 112(3): 498-506.
49. Pino JA, Bayat F, Marbot R and Aguero J. Essential oil of Chamomilla recutita (Linn.) Rausch. J Essent Oil Res, 2002; 14: 407-408.
50. Panda S, et al. Preparation and evaluation of Herbal Lipstick. J Pharm Adv Res, 2018; 1(2): 117-119.