RESEARCH ARTICLE

Pure Herbs Based D-Tan Face Pack: Formulation and Evaluation

Anshika Tyagi[1], Sachin Kumar[2*], Chanchal Chaurasiya[2]
[1]Student, NKBR College of Pharmacy and Research Centre, Meerut, Uttar Pradesh, India.
[2]Faculty , NKBR College of Pharmacy and Research Centre, Meerut, Uttar Pradesh, India.
Corresponding Author Email ID: dr.sachink86@gmail.com

Received: 10/05/2025 **Accepted:** 28/06/2025 **Published:** 15/07/2025

Abstract

The D-Tan face pack is a skincare formulation designed to reduce tanning caused by prolonged sun exposure, improve skin tone, and promote a brighter, more even complexion. This research focuses on the formulation development and evaluation of a natural D-Tan face pack composed of herbal ingredients known for their skin-lightening, anti-inflammatory, and antioxidant properties. Key components such as Sandal wood powder, Orange peel powder Multani mitti, Beet root powder, Rose petal powder, Gram flour, Rose water, Aloe vera gel, honey, and Vitamin E were selected based on their traditional use and scientific efficacy in reducing melanin accumulation and soothing sun-damaged skin. The face pack was evaluated for its organoleptic properties, physicochemical properties, physical properties, phytochemical properties, irritancy test and stability studies. Results indicate that the D-Tan face pack effectively lightens tanned skin, reduces pigmentation, and improves skin texture with no irritation. This study supports the potential of using natural bioactive ingredients in cosmetic formulations as safe and effective alternatives for skin de-tanning and rejuvenation.

Keywords: D-Tan, Skin lightning, Detanning face pack, Herbal D-Tan, Rejuvenate.
Journal of Applied Pharmaceutical Sciences and Research, (2025); DOI: 10.31069/japsr.v8i2.05

Introduction

A face pack is an application of a smooth powder to the face [1]. Since the beginning of time, people have utilized herbs to manage, clean, and beautify themselves. Cosmetics are items used to clean, beautify, alter one's appearance, or make one appear more appealing. and Packs create the appearance of smooth, glowing, and velvety skin [2]. The herbal paste used on the face to treat acne, blemishes, scars, and pigmentation is called "Mukha Lepa" in Ayurveda. "Mukha Lepana" is the term for applying a herbal mixture topically.[3]

A tan is the skin's natural protection against UV rays. When ultraviolet photons enter the skin, they produce pheomelanin, a reddish-brown pigment that protects the skin from burning. The result is a tan, which darkens the skin.[4]

The abbreviation DTAN, or D-Tan, stands for "de-tan," and it refers to skincare products or treatments that are intended to eliminate undesired sun damage or tan from the skin, leaving it with a natural shine and a more even tone. The Pack helps to remove dead skin cells, unclog pores, and reveal a brighter complexion. By incorporating nourishing elements, D-Tan Packs not only target pigmentation but also enhance skin texture and glow. These Packs can be particularly beneficial for individuals who frequently expose their skin to the sun and wish to counteract the effects of UV rays. Regular use can lead to a more uniform skin tone and improved skin clarity.[5,6]

Difference between dtan face pack and skin lighting product

The difference between D-Tan face Pack and Skin lightning products are shown in the Table 1.

Benefits and Limitations of using D-Tan face Pack[10-13]

The benefits and limitations of D-Tan face pack are shown in the Table 2.

Materials and Methods

Materials

All of the herbal substances used in the research project were bought from the neighbourhood market and prepared, processed and authenticated by pharmacognostic researchers. All the instruments and apparatuses used were of AI grade.

Methods

The D-tan face Pack is constituted of two parts: the powder phase, which is the mixing of all the herbal constituents in

Table 1: Difference between D-Tan face pack and Skin lightning products

D-Tan Face Pack	*Skin Lightening Products*
D-tan is a product used to remove tanning from the skin comes from the exposure of sunlight.	The term "skin whitening" refers to lightening the skin's complexion [7].
The Pack unclogs pores, eliminates dead skin cells, and brightens the complexion, improve skin texture and radiance in addition to targeting pigmentation by adding nourishing ingredients.	Attempt to lighten the skin by applying chemicals or any other agent that has the ability to depigment tone or enhance the complexion of the skin by lowering the melanin concentration, which will result in a decrease in the natural pigmentation of the skin.[8]
Medically used in case of sunburn or tanning from sunlight.	Medical professionals utilize skin-lightening solutions to treat a variety of skin conditions, such as hyperpigmentation.[9]

powder form. Additionally, the liquid solvent is made up of liquid herbal extracts and juices.

Constituents and processing of dry powder

Sandal wood powder

Throughout history, sandalwood powder has served a number of functions, including being included into cosmetics, meals, and medications. The heartwood and roots of the Santalum album tree, a species of the Santalaceae family and popularly referred to as East Indian sandalwood, are the biological source of sandalwood [14]. The advantageous qualities of sandalwood are its antioxidant activity makes it useful, anti-inflammatory qualities, anti-proliferative properties, antimicrobial qualities and treat the cells from tanning and treat from sunburn due to its cooling effect [15].

The sandalwood powder was purchased from the local supplier readymade.

Orange peel powder

Orange peel is considered a rich source of several bioactive compounds such as carotenoids, flavonoids, minerals, vitamins, polyphenols, and omegas, which exhibit properties like diabetic support, anti-cancer activity, allergy prevention, and antimicrobial effects. These properties contribute to improving skin tone, nails, hair, and preventing xerosis, a condition characterized by chronic skin dryness due to insufficient oil in the skin [16]. It used as D-Tan for skin because remove dead skin cells, and unclog pores [17].

To prepare orange peel powder the fresh peels of oranges was collected, air dried grinded, screened for fine powder and stored in a air tight containers.

Gram flour

Other names for gram flour include ground garbanzo beans, chickpea flour, besan, and ground chana dal. The yellow-coloured besan powder is made by finely grinding either raw or roasted chickpeas. The nutritional content of chickpeas includes 372 calories, 20.8 grams of protein, 5.3 grams of fat, 56 milligrams of calcium, 5.6 milligrams of iron, 56 milligrams of thiamine, 0.18 riboflavin, 2.4 milligrams of niacin, 1 milligram of vitamin C, and 129 milligrams of vitamin E [18]. It is frequently used as a body scrub or as a component of a face pack and is thought to be excellent for skin care, particularly facial care. [19].

Table 2: Benefits and limitations of D-Tan face pack

Benefits	*Limitations*
• Tan Removal • Dark Spot Reduction • Hydration • Glowing Skin	• Skin irritation • Dryness • Sensitivity to sun

The gram flour powder was prepared in the lab using chana dal. The chana dal was sun dried, grind and screened to get a fine powder.

Beet root powder

Beta vulgaris Linn, often known as red beetroot or beetroot, is a member of the Chenopodiaceae family [20]. The benefits of beetroot for skin are numerous. It has a lot of antioxidants, especially betalains, which makes it a fantastic anti-aging element from a beauty perspective. others include increased collagen production reduce inflammation, main skin hydration and minimize the dark spot and brightens skin ,minimizes acne and blemishes; eliminates fine lines and wrinkles; and evens out and maintains the suppleness.

The beet root powder used in the preparation was purchased from the local supplier.

Multani mitti

Calcium bentonite is known as Multani Mitti. Multani Mitti helps the skin in many ways, such as shrinking pores, getting rid of whiteheads and blackheads, fading freckles, healing sunburns, cleansing the skin, and improving appearance in general. They enhance blood circulation, improve complexion, reduce acne and blemishes, and give the face a radiant appearance because they contain healthy nutrients. Magnesium chloride is common in Multani Mitti.

The raw multani mitti was purchased from the local market. That was milled and screened to get fine powder in the lab.

Rose petal powder

Originating from the Latin word "rosa," the rose is a flowering plant that belongs to the Rosaceae family. The rose petals contain terpenes, aroma alcohols, flavonoids, anthocyanin, phenolic acids, polyphenols, aldehydes, ketones, tannins, vitamin C (ascorbic acid), carotenoids, minerals which are useful for analgesic, anticonvulsive, hypnotic, cardiovascular, laxative, and antioxidant properties, aromatherapy,

perfumery, cosmetics and skincare, teas, natural colorant. The fresh petals of roses are collected, air dried , grinned and screened to get fine rose petal powder in the lab.

Constituents and processing of D-Tan face pack solvent

- *Rose Water*

The majority of rose water is made by distilling fresh rose blooms from Rosa damascena Herrm. It has multiple applications in different systems of medicines and in different countries.

The distillation procedure was used in the lab to prepare the rose water. After being cut into strips, the petals were put in a distillation flask with water. The flask was heated to a moderate temperature while the condenser was turned on. A receiving flask was filled with the distillate. We gather the first three fractions. Every six minutes, a fresh receiving flask was used. There were two reasons for doing this. The more vaporizable chemicals separate first because various compounds may have different boiling points. This could affect the distillation of laboratory equipment. Furthermore, temperature can alter the rose's aroma, and certain chemicals may undergo chemical modifications.

- *Aloe vera gel*

Aloe vera, also referred to as Barbados or Curaçao aloe, is a botanical remedy that has been used for many years by many different cultures.

Fresh aloevera juice was put in a beaker, heated for two to three minutes, and then set aside to cool in order to make aloe vera gel. Simultaneously, another beaker containing 0.01 grams of methyl paraben was taken. 15 milliliters of purified water were added to the concoction, and it was thoroughly mixed. This solution was appropriately stirred while being stored in a water bath. The methyl paraben was dissolved and then set aside to cool. Using a magnetic stirrer, carbopol 934 was added once it had cooled. The methyl paraben solution was mixed with 35 milliliters of aloevera juice. well combined.

- *Honey*

A naturally occurring sweet material, honey is produced by honeybees from plant nectar, plant secretions, or insect excretions from living plants. After gathering these components and modifying them by combining them with specific plant materials, the bees produce honey. The nectar and sweet deposits from plants are collected, processed, and stored in honeycombs by honeybees of the genera Apis and Meliponini to produce honey, a naturally occurring substance. Honey is considered particularly suitable for skin care, and regular application is believed to keep the skin looking young and prevent wrinkles[].

The food and cosmetic grade honey was purchased from local supplier.

- *Vitamin E capsule*

An essential fat-soluble antioxidant, vitamin E aids in the removal of chain reactions in the polyunsaturated fatty acids of cellular membranes that are started by free radicals. Maintaining the stability and functionality of bodily tissues, especially cell membranes and subcellular organelles like mitochondria, nuclei, and the endoplasmic reticulum and lysosomes. Because vitamin E has antioxidant qualities, applying it to the skin helps shield fragile skin from harm. It also has a high-water content, acting as a "emollient" and "humectant" to help your skin retain and absorb water. In certain cases, it has also been demonstrated to lessen eczema.

The vitamin E capsule was purchased from the market.

Preparation of D-Tan face pack and solvent

All the constituents were weighed and mixed well using a pastel mortar. Sieve the powder and packed in a air tight container.

All the liquid components were mixed in mixing vessel, filtered and packed in a air tight container.

The dry powder D-tan face pack is dispensed with liquid D-Tan Solvent. The composition of Dry powder D-Tan face pack and solvent vehicle is given below in the Table 3:

Characterization of D-Tan face pack and solvent

The prepared D-Tan face pack was assessed based on the following criteria to guarantee its superiority:

Organoleptic assessment

Color, odor, look, texture, and consistency were among the organoleptic parameters that were assessed for the prepared

Table 3: Composition of D-Tan Face Pack and Face Pack Solvent

S. No.	*Ingredient*	*Quantity taken (gm)*	*S.No.*	*Ingredient*	*Quantity taken (gm)*
1	Multani Mitti	10	1	Rose Water	25
2	Orange Peel Powder	15	2	Aloe Vera Gel	25
3	Rose Petal Powder	15	3	Honey	20
4	Sandal Wood Powder	10	4	Vitamin E	05
5	Beet Root Powder	15	5	Water	25
6	Besan	15	Total Weight		100
7	Liquid solvent	20			
Total Weight		100			

face pack. Touch and feeling, respectively, were used to visually assess color, odor, and texture.

Physicochemical evaluation

Physicochemical data, such as the extractive value, ash value, pH, and moisture content, were measured.

Physical evaluation

The microscope approach was used to test the particle size. The dry powder's flow characteristics of Angle of repose using the funnel method, bulk density, and tapped density using the tapping method were used to evaluate the composite form.

Phytochemical evaluation

The aqueous extract of the herbal face pack was evaluated for the presence of different phytoconstituents as per the standard procedures.

Irritancy test

Mark an area (1sq.cm) on the left-hand dorsal surface. Definite quantities of prepared D-Tan face packs powder was mixed with dispensed solvent, and applied to the specified area and time was noted. Irritancy, erythematic, edema, was checked if any for regular intervals up to 24 hrs and reported.

Stability studies

Stability testing of prepared formulation was conducted by storing at different temperature conditions for the period of one month. The packed glass vials of formulation stored at different temperature conditions like, room temperature and 400C and were evaluated for physical parameters like color, odour, pH, consistency and feel.

Results

Constituents and processing of dry powder

Sandal wood powder

The sandal wood powder as shown in the Figure 1., of Food and cosmetic grade was purchase from local supplier.

Orange Peel Powder

The orange peel powder as shown in the Figure 2., was prepared in the lab.

Gram flour

The gram flour as shown in the figure 3., was prepared in the lab.

Beet root powder

The beet root powder used in the preparation was purchased from the local supplier.

Multani mitti

The raw multani mitti was purchased from local supplier, that was furthered furnished in the lab to get a fine powder.

Rose petal powder

The fine rose petal powder is prepared in the lab as shown in the Figure 4.

Constituents and processing of D-Tan face pack solvent

Rose water

The rose water was prepared in lab.

Aloe vera gel

The fresh aloe vera gel was prepared in the lab.

Honey

The food and cosmetic grade honey is purchased from local supplier.

Vitamin E

The vitamin e is obtained from the marketed capsules of vitamin E.

Distilled. water

Freshly prepared distilled water is used in the preparation.

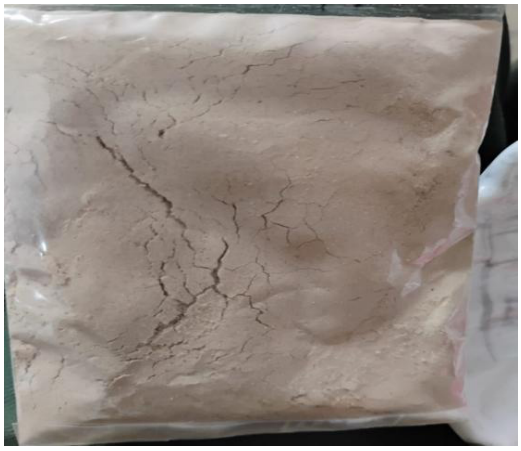

Figure 1: Sandal Wood Powder

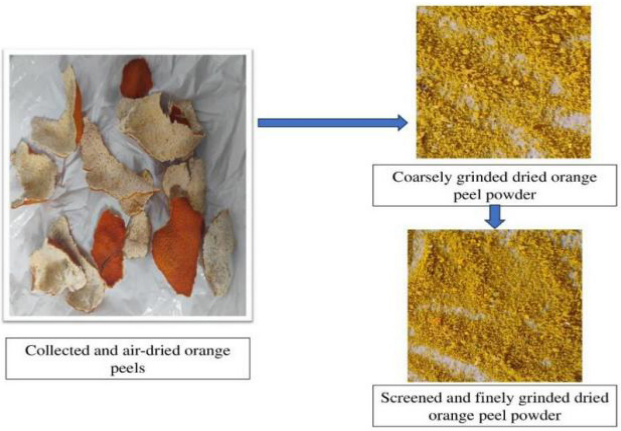

Figure 2: Prepared Orange peel powder

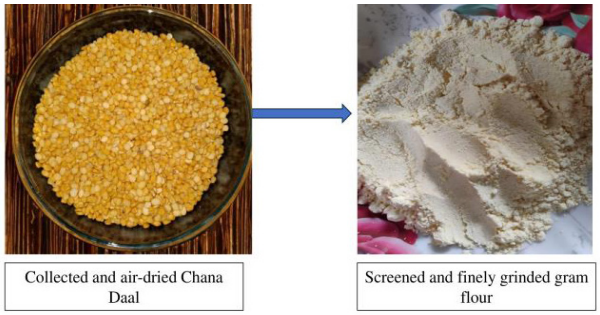

Figure 3. Prepared Gram Flour

Preparation of D-Tan face pack and solvent

All the ingredients were mixed as mentioned in the Table to get D-Tan dry face pack powder and Liquid solvent.

Characterization D-Tan face pack and solvent

Organoleptic assessment

Herbal D-Tan face pack was evaluated for morphological parameters showed in the Table 5.

Physicochemical evaluation

Herbal D-Tan face pack was evaluated for physicochemical parameters showed in the Table 6. The formulation's pH was discovered to be nearly neutral. Both the moisture and ash contents were within acceptable bounds. The formulations' particle sizes were found to be between 24.3 and 2.5 µm.

Phytochemical evaluation

Herbal D-Tan face pack was evaluated for phytochemical parameters showed in the Table 7. It was found to be a presence of phytoconstituents such as carbohydrates, alkaloids, glycosides, tannins and volatile oil which act as good nourisher for the skin.

Physical evaluation

The physical characteristics (powder property) of the herbal face pack were assessed and are displayed in Table 8. The herbal face pack's flow (powder) qualities were validated by rheological results. It was discovered to be non-sticky and free-flowing.

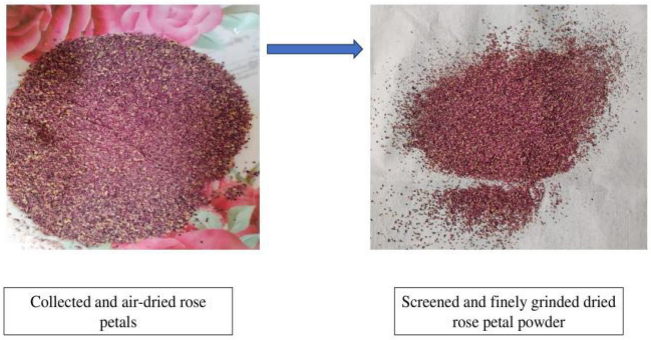

Figure 4: Prepared Rose petal powder

Table 4: Results of morphological evaluation of prepared D-Tan Face Pack

S. No	*Parameter*	*Observation*
1.	Color	Pinkish yellow
2.	Odour	Pleasant
3.	Appearance	Uniform
4.	Texture	Fine
5.	Smoothness	Smooth and finished

Irritancy test

The irritancy test results were displayed in Table 9. In irritancy tests, the formulation did not cause any irritation, redness, or swelling. This composition is safe to apply to the skin.

Stability study

The stability results were displayed in Table 10. At the specified stability circumstances, no changes in color, texture, smoothness, or odor were seen, with the exception of pH. At 400C, the stability tests revealed a minor shift in the formulation's pH.

Table 5: Results of Physicochemical evaluation of prepared D-Tan Face Pack

Sr. No	*Parameter*	*Observation*
1.	pH	7.3
2.	Loss on Drying	1.9
3.	Ash content	91 ± 0.221
4.	Particle size (µm)	21.4 ± 1.6

Table 6: Results of Phytochemical evaluation of prepared D-Tan Face Pack

S. No	*Phytoconstituents*	*Observation*
1.	Carbohydrates	+
2.	Alkaloids	+
3.	Glycosides	+
4.	Tannins	+
5.	Volatile oil	+

Table 7: Results of Physicochemical evaluation of prepared D-tan face pack

Sr. No.	*Parameter*	*Observation*
1	Tapped density	1.527gm/ml
2	Bulk density	1.10gm/ml
3	Angle of repose	30.01^0
4	Hausner's ratio	1.122
5	Carr's index	20.44%

Table 8: Results of irritancy test of prepared D-Tan Face Pack

S. No.	*Parameter*	*Observation*
1.	Irritation	Not observed
2.	Redness	Not observed
3.	Swelling	Not observed

Table 9: Results of Stability study of prepared D-Tan Face Pack

S. No	*Parameter*	*Room temperature*	*40°C*
1.	Color	Not changed	Not changed
2.	Odour	Not changed	Not changed
3.	$_{P}H$	7.3 ± 0.12	7.3 ± 0.13
4.	Texture	Fine	Fine
5.	Smoothness	Smooth	Smooth

Conclusion

Because natural medicines are thought to be safer and have less adverse effects than synthetic ones, they are more widely accepted. The need for herbal formulations is rising globally. In addition to helping to keep the skin supple, tan free and clean the pores, herbal D-Tan face packs are used to increase blood flow and revitalize the muscles. With natural herbal components like orange peel powder, gram flour, beet root powder, rose petal powder, multani mitti,sandal wood,rose water, aloevera gel, honey, vitamin E and water, we have made a considerable effort in creating this herbal D-Tan face pack. After testing, we discovered that the face packs had good qualities; they didn't irritate the skin and were consistent even under stable storage circumstances, effective tanning free skin-glow effect.

References

1. Avhad, Dixit Sanket, Bhakare Amol, Akiwate Shweta, Aswale Jayashri, Digvijay, Rahul. Formulation and Evaluation of Polyherbal Face Pack. Journal of Drug Delivery and Therapeutics. 2022;12:153-155.
2. Shoba rani R, Hiremanth. Textbook of Industrial Pharmacy, Drug delivery systems & Cosmetics & Herbal drug technology. Universities Press (India) Ltd. 2005;2:126-135.
3. Millikan, Larry E. Cosmetology, cosmetics, cosmeceuticals: definitions and regulations. Clinics in dermatology. 2001;19(4):371-374.
4. Sonavane Siddheswar, Sabale P.N., Thorat Vidhya, Patil Abhishek, Tribhuvane Omkar, Singh Gourav, Singh Sourav. Polyherbal Anti-Tan Mask. International journal of creative research thoughts. 2023;11(7):g25-g40.
5. Pattankar YS, Padvi SJ, Saindane DB, Pawar PG, Ahirrao RA. Formulation and evaluation of herbal D-Tan face pack. International journal of creative research thoughts. 2024;12(7):a343-a353.
6. Pal RS, Pal Y, Wal P. In-house preparation and standardization of herbal face pack. Open Dermatol. 2017;11(1):72-80.
7. Fiske Akanksha, Wasnik Shradha, Sabale Vidya. A Systematic Review on Skin Whitening Product. Int. J. Pharm. Sci. Rev. Res. 2021;71(1):102-116.
8. Yetunde MO. Use of skin lightening creams. BMJ.2010; 341: C6102.
9. Alanzi ME, Alghamdi RA, Alsharif OM, Alghamdi KS, El Sayed SM. Health knowledge, cosmetic interests, attitude, and the need for health education regarding the use of topical bleaching agents among women in West Saudi Arabia: a cross-sectional study. J Cosmet Sci. 2018;69(2):101-120.
10. Pal RS, Pal Y, Saraswat N, Wal P, Wal A. Current review on herbs for derma care. Open Dermatol J. 2019;15 (1):84-90.
11. Bijauliya RK, Alok S, Kumar M, Chanchal DK, Yadav S. A comprehensive review on herbal cosmetics. Int J Pharm Sci Res. 2017;8(12):4930-49.
12. Joshi LS, Pawar HA. Herbal cosmetics and cosmeceuticals: An overview. Nat Prod Chem Res. 2015;3:170-179.
13. Arora R. Herbal active ingredients used in skin cosmetics: Herbal actives for skin. Asian J Pharm Clin Res. 2019;12(9):7-15.
14. Srinivasan, VV, Sivaramakrishan, VR, Rangaswamy CR, Ananthapadmanavha HS and Shankaranarayana KH. Sandal (Santalu album L.). ICFRE, Dehra Dun. 1992;2:168-179
15. Sensarma P. Plants in the Indian Puranas: An Ethnobotanical Investigation, Naya Prokash, Calutta, 1989.
16. Jaiswal S, Gaur SS. Orange Peel and Skin Health: An Exploratory Study on Potential Benefits.J Food Chem Nanotechnol. 2023;9(S1):S91-S99.
17. Sir Elkhatim KA, Elagib RA, Hassan AB. Content of pheno lic compounds and vitamin C and antioxidant activity in wasted parts of Sudanese citrus fruits. Food Sci Nutr. 2018;6(5):1214-1219.
18. Solanke, Nikhil & Ughade, Jayashri. Study the Physical and Functional Properties of Chickpea and Black Gram Flours. International Journal of Current Microbiology and Applied Sciences. 2021;10:277-282.
19. Mamatha GT , Chandana AG, Bhanu Shree S, Kavya BS, Sinchana R, Madhu Kumar MT and Hemanth KS. Formulation and evaluation of facial peel off mask gel containing gramflour. World Journal of Pharmaceutical Research. 2022;11(8): 890-897.
20. Chauhan Shivani, Chamoli Kartik, Sharma Shilpa. A Review Paper-Beetroot, Journal of Pharmacognosy and Phytochemistry. 2020;9(2):424-427.

How to cite this article: Tyagi A, Kumar S, Chaurasiya C. Pure Herbs Based D-Tan Face Pack: Formulation and Evaluation. Journal of Applied Pharmaceutical Sciences and Research. 2025; 8(2):38-3 Doi : 10.31069/japsr.v8i2.05