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DEVELOPMENT AND ASSESSMENT OF HERBAL BLUSH POWDER INCORPORATING BEETROOT AND GREEN TEA

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Abstract:

Cosmetics play an important role in enhancing appearance and maintaining skin health, and there is an increasing demand for herbal cosmetic products due to their safety and minimal side effects. The present study was aimed at the formulation and evaluation of a herbal blushing powder using beetroot as a natural colouring agent. Beetroot, rich in natural pigments and antioxidants, was used along with green tea, acacia, citric acid, and talcum to prepare two herbal blush powder formulations (F1 and F2). The formulated products were evaluated for organoleptic properties, colour homogeneity, colour and physical stability, spreadability, flow properties, pH, and powder characteristics such as angle of repose, Carr's index, and Hausner's ratio. Both formulations showed satisfactory results with good colour uniformity, acceptable flow properties, suitable spreadability, and pH values within the normal skin range, indicating safety for topical application. Stability studies confirmed that the formulations remained stable without any significant changes over time. The study concludes that beetroot-based herbal blushing powder is a safe, effective, and economical alternative to synthetic blush products and has good potential for use in herbal cosmetic formulations.

Keywords: *Cosmetics, Beetroot, Blushing powder*

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INTRODUCTION:

The definition of cosmetic under the law varies slightly between countries but in general terms "cosmetic" means any article intended to be used by means of rubbing, sprinkling or by similar application to the human body for cleansing, beautifying, promoting attractiveness, altering the appearance of the human body and for maintaining health of the skin and hair, provided that the action of the article on the human body is mild. [1]

The word "cosmetic" shares its roots with the word "cosmos," which is derived from the Greek word "Kosmos," which means "order" or "ornament." They concentrate on maintaining the 'appearance' of the external body surfaces, such as the skin, hair, and teeth, as well as deodorizing or perfuming them to eliminate odours. [2]

Cosmetics are substances that are intended for application to the body for cleansing, beautifying, promoting attractiveness, or altering appearance. They are mixtures of chemical compounds derived from either natural sources or created synthetically.[3] Cosmetics have various purposes, including personal and skin care. They can also be used to conceal blemishes and enhance natural features (such as the eyebrows and eyelashes). Makeup can add colour to the face, enhance features, or alter appearance to resemble a different person, creature, or object.[4]

Nowadays cosmetics are one of the essential commodities of life. A subset of cosmetics is called make-up. which refers primarily to coloured products intended to alter the user's appearance. Cosmetics are mainly used for the two purposes, i.e. enhancing personal appeal of human being and care of body parts. The cosmetics helps in addressing the sun-burn and damaged skin. Certain cosmetics have transcended the barriers of age and gender and have assumed the role of protestants as they are now being used in form of cold cream, sunscreen, lip gels. The cosmetics are now finding greater distribution among all the economic sections of our society. The acceptance of cosmetics as appearance enhances by the people from lower congenial environment for the growth of cosmetic strata to the upper privileged has created industry.[5]

HERBAL COSMETICS

Fig 1: cosmetics

Fig 2: herbal cosmetics

Herbal cosmetics are beauty and personal care products formulated with natural ingredients derived from plants, such as herbs, flowers, roots, and oils, instead of synthetic chemicals. These products are valued for their potential to nourish, condition, and beautify the skin and hair by providing natural nutrients like vitamins and antioxidants, while also aiming to be safer, less allergenic, and have fewer side effects than traditional products.

Key characteristics:

Natural Ingredients: They use different parts of plants, like aloe vera gel, coconut oil, henna, and extracts from roots, leaves, and flowers.

Free from Synthetic Chemicals: They are intentionally made without harmful synthetic chemicals that may be toxic or cause adverse reactions on the skin.

Nutrient-Rich: Herbal cosmetics often contain natural nutrients, such as Vitamin E and Vitamin C, which are beneficial for skin health and appearance.

Therapeutic Properties: Many herbal ingredients offer functional actions like antioxidant, anti-inflammatory, and anti-bacterial benefits, which can improve skin texture and condition.

Safer and Less Irritating: Due to their natural composition, they are generally considered safer, less allergenic, and less likely to cause skin irritation compared to synthetic alternatives.

STRUCTURE OF SKIN

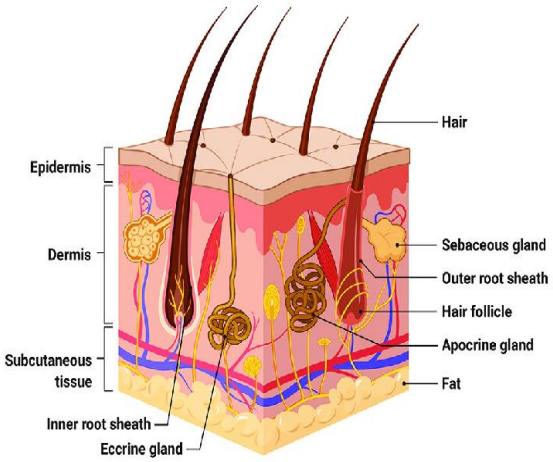

Fig 3: structure of skin

The skin is the largest organ in the body, covering its entire external surface. The skin has 3 layers—the epidermis, dermis, and hypodermis, which have different anatomical structures and functions. The skin's structure comprises an intricate network that serves as the body's initial barrier against pathogens, ultraviolet (UV) light, chemicals, and mechanical injury. This organ also regulates temperature and the amount of water released into the environment.

Skin thickness varies by body region and is influenced by the thickness of the epidermal and dermal layers. Hairless skin in the palms of the hands and soles of the feet is the thickest due to the presence of the stratum lucidum, an extra layer in the epidermis. Regions lacking this extra layer are considered thin skin. Of these regions, the back has the thickest skin because it has a thick epidermis.[6]

Epidermis

The epidermis, the skin's outermost layer, is composed of several strata and various cell types crucial for its function.

Layers of the epidermis:

Stratum corneum

This is the uppermost and thickest section of the epidermis consisting of 25−30 layers. The main cell type in this area is large and flat keratinocytes with no nucleus

Stratum lucidum

This section consists of 2−3 layers, and is the 'clear' layer of the skin, only found in thick-skin areas of the body, such as palms, soles and fingerprints. The transparent nature of this layer is due to presence of transparent keratinocytes.

Stratum granulose (granular layer)

This section (3−5 cell layers) consists of granular cells which differentiated from the spinous layer. These granular cells consist of either keratohyalin or lamellar granules:

Stratum spinosum (prickle/spinous layer)

This section (8−10 cell layers) thick is immediately above the basal layer and consists of polyhedral-shaped keratinocytes with cytoplasmic processes, sometimes referred to as "spines", which extend outwards and contact the neighbouring cells by desmosomes.

Stratum Basale /stratum germinativum (basal layer)

This layer is the deepest layer of the epidermis and consists of a single layer of undifferentiated keratinocytes also known as basal cells.

Dermis

The dermis is connected to the epidermis by the basement membrane. The dermis consists of 2 connective tissue layers, papillary and reticular, which merge without clear demarcation. The papillary layer is the upper dermal layer, which is thinner and composed of loose connective tissue that contacts the epidermis. The reticular layer is the deeper layer, which is thicker and less cellular. This layer consists of dense connective tissue composed of collagen fibre bundles. The dermis houses the sweat glands, hair, hair follicles, muscles, sensory neurons, and blood vessels.

Hypodermis

The hypodermis, also known as the subcutaneous fascia, is located beneath the dermis. This layer is the deepest skin layer and contains adipose

lobules, sensory neurons, blood vessels, and scanty skin appendages, such as hair follicles.[7]

TYPES OF SKIN

There are five types of healthy skin
1) Normal skin
2) Oily skin
3)Dry skin
4) Combination skin (dry + oily)
5) Sensitive skin

Normal skin

This skin is neither too dry nor to0 oily. It has re gular texture, no imperfections and a clean, soft appearance and does not need special care. Loose powder blush is suitable for normal skin

Oily skin

Oily skin has a porous. humid and bright appearance It is caused by excessive fat production by sebaceous glands and usually determined by genetic or hormonal causes. Loose powder blush suitable for oily skin.

Dry skin

Dry skin is caused by external factors such as the weather, low air humidity, immersion in hot water and it usually temporary. Compact blush is more suitable than loose powder blush for dry skin.

Combination skin (dry + oily)

Based on its location. it presents characteristics of both dry and oily skin. Since distribution of sebaceous and sweat gland s not homogenous. Both compact and loose powder blush are suitable for combination skin.

Sensitive skin

Sensitive skin is more prone to react to stimuli to which normal skin has no action It is a fragile skin, usually accompanied by feelings of discomfort such as heat, tightness, redness or itching. It is a delicate skin that needs more care to fight dryness roughness and usual appearance. Mineral based loose powder blush are suitable for sensitive skin.[8]

FUNCTIONS OF SKIN

1. Protection – Acts as a barrier against microorganisms, chemicals, UV radiation, and physical injury.
2. Sensation – Contains nerve endings that sense touch, pressure, pain, and temperature.
3. Temperature regulation – Controls body temperature through sweating and blood vessel dilation or constriction.
4. Excretion – Removes waste products like urea and salts through sweat.
5. Absorption – Can absorb certain substances like medicines and chemicals.
6. Vitamin D synthesis – Produces vitamin D when exposed to sunlight
7. Immunity – Contains immune cells that help fight infections.[9]

BLUSH

Fig 4: Blush

Powder blush is a makeup product with a powdered texture that creates a matte or satin, long-lasting flush on the cheeks, making it ideal for oily or combination skin and for everyday or glamorous looks. It is applied using a brush to blend onto the apples of the cheeks, offering buildable colour for a natural or dramatic effect. Powder blush is a popular choice due to its longevity and ease of use for beginners, but can cling to dry patches and may not provide the hydration that dry skin types need, making cream blush a better option for those with dry or normal skin.

HERBAL BLUSH:

An herbal blush is a cosmetic product that uses natural, plant-based ingredients for colour instead of synthetic chemicals. These products are typically formulated with herbal extracts or botanical powders to add colour and often provide additional skin-nourishing benefits.

Ideal characteristics of herbal blush:

1. Natural ingredients – Made from safe herbal extracts and plant-based colorants.
2. Non-irritant – Should not cause skin irritation or allergies.
3. Good colour payoff – Gives a natural and even color to the cheeks.
4. Smooth texture – Should spread easily and blend well on the skin.
5. Long-lasting – Colour should stay for several hours without fading.
6. Pleasant fragrance – Mild and natural scent, not overpowering.
7. Free from harmful chemicals – No parabens, synthetic dyes, or preservatives.
8. Skin-friendly pH – pH should be close to skin's natural level (around 5–6).
9. Non-greasy – Should not make the skin oily or sticky.
10. Stable formulation – Should remain unchanged in colour, texture, and smell over time.

ADVANTAGES OF BLUSH POWDER

1. Good chemical stability compared with cream blush.
2. Easy to carry.
3. Suitable for most of all type skins.
4. Easy to apply.
5. Economical as compared to other formulations.

DISADVANTAGES OF BLUSH POWDER

1. Difficult to protect powder containing hydroscopic or aromatic materials from decomposition.
2. Susceptible to physical instability.
3. Loss on application is higher.[10]

BEETROOT

Fig 5: beetroot

Family: Amaranthaceae
Species: Beta Vulgaris
Subspecies: Beta Vulgaris subsp. Vulgaris Cultivar Group: Conditiva group
Origin: Sea Beet (Beta Vulgaris subsp. maritima)
Beetroot (Beta vulgaris L.) is belonged to Amaranthaceous family having bright crimson colour, famous for its juice value and medicinal properties; and known by several common names like beet, chard, spinach beet. Beetroot includes a variety of edible taproots originated from the Middle East, which have been spreading over the Americas, Europe and Asia. Beetroot has a health-promotional characteristics, antioxidant and anti-inflammatory effects, anti-carcinogenic and diabetic activities and hepato-protective, hypotensive and wound healing properties and therefore used in various ingredient and as a supplementation.

BENEFITS OF BEETROOT AS COSMETICS INGREDIENTS

1. Natural Colorant

- Beetroot contains betanin, a red pigment used as a natural dye in lip balms, lip tints, blushes, and cheek stains.
- It gives a rosy glow without synthetic chemicals.

2. Skin Hydration

- Beetroot is rich in vitamin C and antioxidants, which help keep skin soft, hydrated, and radiant.
- It can improve skin texture when used in masks or creams.

3. Anti-aging Properties

- The antioxidants in beetroot (like betalains and polyphenols) fight free radicals, reducing wrinkles, fine lines, and dullness.
- Promotes youthful, glowing skin.

4. Skin Brightening

- Beetroot helps in reducing pigmentation and dark spots due to its vitamin C content.
- Regular use can result in a more even skin tone.

5. Lip Care

- Acts as a natural lip stain and moisturizer.
- Helps in treating dark or pigmented lips and adds a soft pink tint.

6. Acne and Blemish Control

- Its anti-inflammatory and antiseptic properties help in reducing acne, pimples, and blemishes.
- Beetroot juice can purify the skin and reduce excess oil.

7. Scalp and Hair Health

- Beetroot contains silica, iron, and folate, which promote hair growth and improve scalp circulation.
- Helps reduce dandruff and adds shine to hair.

8. Detoxifying Effect

- Detoxifies the skin when used in masks or scrubs, removing impurities and giving a fresh, clean appearance.[11]

LITERATURE REVIEW

- **Chen M X *et al*** (2016) formulated and evaluated antibacterial creams and gels containing metal ions, specific ally zinc and copper sulphate, for topical application. The researchers aimed to investigate the synergistic activity between these two metal ions as antimicrobial ingredients in topical formulations. The formulations were evaluated for their organoleptic characteristics, physicochemical properties, and invitro antibacterial activity against Escherichia coli and Staphylococcus aureus. Results showed that zinc sulphate and copper sulphate had a strong synergistic antibacterial activity in the creams and gels, with a minimum effective concentration of 3w/w% for both active ingredients against the tested

microorganisms. The study confirms the potential use of these metal ions in topical formulations for their antimicrobial properties.

- **Chauhan L *et al*** (2020) discussed the use of pharmaceutical creams for wound healing and their importance in cosmetic and pharmaceutical products. It provides a detailed review of cream preparation methods, classification, characteristics, and evaluation parameters. The article emphasizes the potential of topical drug delivery systems to improve wound healing.
- **Agrawal S *et al*** (2021) formulated and evaluated colour cosmetics using beetroot as natural colouring material. The article highlights the adverse effects of synthetic colours on the user's system and the increasing awareness of users towards the products they use. Beetroot powder, a natural colouring material, provides nourishment, a natural glow, and healing power to the skin. The study aims to develop eco-friendly and health- protective compositions containing natural ingredients and colours with multiple benefits.
- **Sari S W *et al*** (2021) formulated blush preparations using natural colouring from red beetroot extract. There searchers added 2% ,4%, 0r 6% of dry extract to create loose powder, compact powder, and cream, then tested for quality parameters. Results showed that all forms were homogeneous and easy to apply, with no fractures in the breakage test.
- **Sahishna S S *et al*** (2022) studied an overview of blushing powder, a cosmetic product used to highlight and add colour to the cheeks. The authors describe the history of cosmetics and blushing, as well as the different types of blushing powder available including loose powder, compact powder, and cream blush. They also have discussed consumer buying behaviour and the importance of choosing cosmetics based on skin type. The article concludes with a description of the formulation and evaluation of loose blush powder.
- **Sharma S *et al*** (2022) discussed the evaluation parameter for powder flow ability using various methods, including compendial and non-compendia techniques The authors describe the us the powder rheometer and the FT4 powder rheometer which simulates different production environments and has applications in various industries. The article highlights the importance of accurate powder characterization and multi- dimensional analysis for understanding powder behaviour under different processing conditions.
- **Michelle Guthrie *et al*** in their study entitled, “The Effects of Facial Image and Cosmetic Usage on Perceptions of Brand Personality” stated that in the total quantity of cosmetic consumption, the consumer’s facial image may have an influence. Women tend to use more cosmetics when they have self-satisfaction of their facial image. The investigators opined that the consumers who were with a positive facial image had more confidence in using cosmetics to enhance their beauty. They creatively manipulated their facial features which resulted in higher level of cosmetic use.
- **Nicolas Guegen** conducted a controlled experiment to observe “The Effect of Women’s Cosmetics on Men’s Approach”. The study revealed that women wearing make-up have a greater earning potential and get more prestigious jobs than those who were not very enthusiastic about their make-up. The researcher found that the use of cosmetics increased facial symmetry, improved skin texture and increase their facial attractiveness.
- **Thomas F. Cash *et al*** conducted a controlled experiment and published the article, “Effect of Cosmetics Use on the Physical Attractiveness and Body Image of American College Women”. The result of the study revealed the following facts: male consumers felt that women who were physically attractive were wearing cosmetics; women without cosmetics were not beautiful to the eyes of others.
- **Urvashi Makkar *et al*** in th eir study “Changing Attitude of consumers from Chemical to Herbal Cosmetics in India” concluded that the middle class population that has a sizeable growth in disposable income was the important

AIM AND OBJECTIVES

AIM

To prepare blushing powder by using beetroot and evaluate it.

OBJECTIVES

- Collection of raw material for the preparation of blushing powder.
- Preparation of blushing powder by using beetroot.
- Evaluation of formulated blushing powder.

- Comparison of formulated blushing powder with marketed product by microbial test.(Ecoli)

MATERIALS REQUIRED

CHEMICALS REQUIRED

- Beetroot powder
- Green tea
- Acacia
- Citric acid
- Talcum

LABORATORY GLASS WARES

- Petri dish
- Measuring cylinder
- Mortar and pestle
- Beaker
- Sieve mesh-85

Beetroot powder:

Beetroot powder is the main ingredient in this preparation. The botanical name of Beta vulgaris. The flesh of the beetroot is used for the preparation of the blushing powder. The beetroot also acts as the colouring agent in the powder blush.[12]

Fig 6: beetroot powder

Green tea:

Green tea is used as an antioxidant and antimicrobial agent in this preparation. Green tea powder is a finely ground powder made from green tea leaves, the camellia sinensis. it helps to calm irritation, protect against UV damage, reduce inflammation, gently exfoliate, and promote a brighter, more youthful complexation.[13]

Fig 7: green tea

Acacia:

Acacia which is used as the binding agent. Acacia powder, also widely known as gum arabic or acacia gum, is a natural, edible, and water-soluble dietary fiber derived from the hardened sap (exudate) of certain species of acacia trees, primarily Senegalia Senegal.[14]

Fig 8: acacia

Talcum

Purified talc acts as a crucial, inert excipient, primarily functioning as a glidant (improving powder flow), lubricant (preventing sticking in tablet presses), and diluent (filler) in tablets, capsules, and powders.[15]

Fig 9: talcum

Citric acid

Citric acid is a versatile pharmaceutical excipient used for pH adjustment, taste masking, buffering, and as an antioxidant to stabilize drugs, enhancing patient compliance and product shelf-life**.** it act as a preservative.[16]

Fig 10: citricacid

METHOD OF PREPARATION

A. METHOD OF PREPARATION OF BEETROOT POWDER:

STEP 1

Selecting Roots

- Wash Harvest or buy mature firm, freshly harvested beetroots. These should have bruises.
- The flesh of the beetroot should be reddish with no cracks and few fibrous roots.

STEP 2

Peeling

- peel the beetroot and remove the stalk, leaves by using a sharp knife.
- Failure to peel properly will result in off-colour in the final product.

STEP 3

Washing

- Wash peeled beetroot with clean water to remove any dirts including sand, soil or other impurities.

STEP 4

Grating

- The beetroots are chopped and ground in a fine grater or a food processor.

STEP 5

Drying

- The finely chopped beetroot was dried spreading it in a clean black plastic sheet placed on a gentle slope in full sun.

STEP 6

Milling

- Once the beetroot is completely dry transfer it into a grinder or a food processor. Mill the dried beetroot to produce flour.

STEP 7

Sifting

- Using a simple homemade sieve, sift the milled flour to remove fibrous materials and any lumps. This is important to obtain high-quality free-flowing flour, free of fibre with a good particle size.

STEP 8

Packaging and storing

- Pack, sifted beetroot flour in air tight moisture proof black plastic bag.
- Sealed bag using a burning candle and label with date of manufacture and expiry date (after 6 month)
- Pack bags in a carton to protect them from light.
- Store the carton in a well-ventilated, cool, dry place.
- The packed flour will keep for about six months.

B. METHOD OF PREPARATION OF BEETROOT BLUSH POWDER

- The ingredients including the dry extract of beetroot loose powder, Green Tea, Acacia, Citric acid, Talcum where weighed.
- The weighed powder was then mixed and grinded with a portion of talc in a clean mortar until it becomes homogenous.
- Next step was to mix the other ingredients and then grinded again until homogenous and soft for about 15-20min to disperse completely it. And then sieved using a sieve of 85 mesh.
- The powder was then placed in a tightly close container.[17]

EVALUATION TEST FOR POWDER BLUSH

1. ORGANOLEPTIC EVALUATION:

The colour, odour, appearance of the powder is evaluated by simple visualization.

2. COLOUR HOMOGENEITY TEST:

Loose Powder Homogeneity test was done by applying the sample on a piece of glass or other suitable transparent material. The blushes should show a homogeneous arrangement and show no coarse grains. The homogeneity test is important because it can determine whether the resulting blush preparation meets the aesthetic requirements or not. A good colour homogeneity is indicated by the distribution of dyes evenly among the news carriers. The colour homogeneity test was carried out on the blushes to determine whether the carrier particles or the dye could mix well to create colour when applied to the skin.

3. COLOUR STABILITY AND PHYSICAL STABILITY TEST:

The formulation was stored at 8 room temperature were tested for the color stability on the 1st, 7th, 14th, 21st, 28th days & 3 months using the Stability Chamber.[18]

4. SPREADABILITY:

A sufficient amount of sample (0.20g) is divided between two glass slides, and the slides are then subjected to a 100g weight for five minutes.[19]

Spreadability index = A/M

Where;

A=Area

M=Mass

5. ANGLE OF REPOSE

Determined by using funnel method. Funnel was placed in a place , 4cm above the bench surface.

Flow	Angle Of Repose
Excellent	25-30
Good	31-35
Fair	36-40
Passable	41-45
Poor	46-55
Very Poor	56-65
Very Very Poor	>66

6. TAPPED DENSITY

It can be measured after tapping in increment 50, 75, 100 taps.

Tapped Density = Mass of granules / vol. of granules

7. pH

pH of human skin is usually acidic, in the range of 4–6, which has historically acted as a defence mechanism against organisms. This steep pH gradient of 2–3 units between the stratum corneum and the epidermis and dermis occur due to the influence of the body internal environment which is close to pH 7–9 (neutral). The physiological role of the skin properties has historically been regarded as a defence mechanism against organisms that attack. Age, skin site, and pigmented skin are some factors that influence the pH of the skin. The pH test was performed at 8 and 30 °C to observe the safety on the skin and also the stability of the dosage so that the difference in the temperature will indicate whether there has been a change of pH during the preparation. The temperatures of 8 and 30 °C are the proper temperatures to observe whether the dosages remain stable in this research. The proper pH of skin plays an important role in maintaining the skin because it creates a skin barrier and skin resistance to the external physical and chemical agents after the testing, the loose powder had average pH of ±6 . Therefore, it can be concluded that the loose powder form met the skin pH requirements and are safe to use on the skin.

A measure of the acidic or basic nature of the formulation. The pH of the loose powder blush is determined to avoid the irritation to the skin. The pH was determined by using pH meter.

8. CARSS'S INDEX:

The bulk and tapped densities were used to calculate Carr's compressibility index to provide measure of the flow properties and compressibility of powders.

Carr's index = Tap density – bulk density/ tap density * 100

Flow	Carr's index
Excellent	<10
Good	11-15
Fair	16-20
Passable	21-25
Poor	26-31
Very Poor	32-37
Very Very Poor	>38

9. HAUSNER RATIO:

It is indicative of flow properties. It is derived property from bulk and tapped density. Lower the Hausner's ratio is indicating better flow whereas higher ratio indicates poor flow of granules.

Hausner's ratio is calculated by the following formula:

Hausner's ratio = Tap density/ Bulk density.[20]

Flow	Hausner ratio
Excellent	1.0-1.11
Good	1.12-1.18
Fair	1.19-1.25
Passable	1.26-1.34
Poor	1.35-1.45
Very Poor	1.46-1.59
Very Very Poor	>1.60

MICROBIAL TEST

Compare the antimicrobial activity of herbal blush powder incorporated with green tea and a marketed blush powder against Escherichia coli using the streak plate method

Procedure

1. Nutrient agar was prepared, sterilised and pour into sterile petri plate and allowed to solidify.
2. Separate suspension of the herbal blush and marketed blush powder were prepared using sterile distilled water.
3. A loopful of E.coli cultured was streaked uniformly on three nutrient agar plates using a sterile inoculating loop
4. Plate 1 (control): only E. coli culture was streaked without any sample
5. Plate 2(formulation 1): herbal blush suspension was applied on the streaked plate
6. Plate 3(marketed blush powder): marketed blush powder suspension was applied on the streaked plate
7. All plates were incubated at 37°c for 24 hours
8. After incubation plates were observed for bacterial growth.

CONCLUSION:

The study successfully formulated and evaluated a herbal blushing powder using beetroot as a natural colouring agent along with green tea and other excipients. The prepared formulations showed good colour, uniform appearance, satisfactory, spreadability, and acceptable flow properties. The incorporation of natural ingredients such as beetroot and green tea enhanced the cosmetic and protective value of the formulation by providing antimicrobial benefits. The pH of the formulations was within the normal skin pH range, indicating that the product is safe and non-irritating for skin application. Stability studies confirmed that the blush powder remained physically and chemically stable over time. The microbial evaluation indicated that the herbal blushing powder was microbiologically safe, supporting its suitability for regular use. Hence, the formulated herbal blushing powder can be considered a safe, effective, and natural alternative

to synthetic blush products .Overall, the study highlights the potential of herbal ingredients in developing eco-friendly, economical, and consumer-acceptable cosmetic products with minimal risk of adverse effects.

REFERENCES:

1. Mitsui, T. (1997). introduction of cosmetics (Takeo Mitsui ed.). Netherland: Elsevier Science B.V. Page no: - 3-4
2. Stephen Barton, A. E. (23 September 2020). Discovering Cosmetic Science (illustrated ed.). (A. E. Stephen Barton, Ed.) United Kingdom: Royal Society of Chemistry, 2020. Page no: - 3-5
3. Schneider, Günther; Gohla, Sven; Schreiber, Jörg; Kaden, Waltraud; Schönrock, Uwe; Schmidt-Lewerkühne, Hartmut; Kuschel, Annegret; Petsitis, Xenia; Pape, Wolfgang (2001). Skin Cosmetics. Ullmann's Encyclopedia of Industrial Chemistry. John Wiley & Sons, Ltd. doi:10.1002/14356007.a24_219. ISBN 978-3-527-30673-2. OCLC 910197915. Archived from the original on 21 February 2022. Retrieved 21 February 2022.
4. Nutrition, Center for Food Safety and Applied (16 March 2023). "Cosmetics & U.S. Law". FDA. Archived from the original on 5 November 2023. Retrieved 5 November 2023.
5. Bonifant H, Holloway S. A review of the effects of ageing on skin integrity and wound healing. Br J Community Nurs. 2019 Mar 01;24(Sup3):S28-S33
6. Ravara B, Hofer C, Kern H, Guidolin D, Porzionato A, De Caro R, Albertin G. Dermal papillae flattening of thigh skin in Conus Cauda Syndrome. Eur J Transl Myol. 2018 Nov 02;28(4):7914. [PMC free article] [PubMed]
7. Karim N, Phinney BS, Salemi M, Wu PW, Naeem M, Rice RH. Human stratum corneum proteomics reveals cross-linking of a broad spectrum of proteins in cornified envelopes. Exp Dermatol. 2019 May;28(5):618-622. [PubMed]
8. I.V. Yannas,Regeneration of skin, Tissue and Organ Regeneration in Adults, Springer New York, New York, NY (2001), pp. 89-136
9. O'Connell RL, Rusby JE. Anatomy relevant to conservative mastectomy. Gland Surg. 2015 Dec;4(6):476-83. [PMC free article] [PubMed]
10. Giancola G, Schlossman ML. Decorative cosmetics. Cosmeceuticals and Active Cosmetics. 2015 Sep 18:191-219.
11. Sari SW, Djamil R, Faizatun F. Formulation of Blush Preparations by Using Natural Coloring from Red Beetroot Extract (Beta vulgaris L.). Indonesian Journal of Chemistry.;21(4):860-70
12. Clifford, T., et al. (2015). Benefits of red beetroot supplementation. Nutrients, 7(4), 2801–2822.
13. https://www.google.com/search/biological-source-of-green-tea-family https://www.encyclopedia.com/literature-and-arts/literature-other-modern-languages/Russian-and-eastern-European-literature/green-tea
14. Abdalla, M. H. 1988. Isolation of aflatoxin from Acacia and the incidence of Aspergillus flavus in the Sudan. My pathologia 104:143–148.
15. Gottschalck TE and Breslawec HP. International Cosmetic Ingredient Dictionary and Handbook. 14 ed. Washington, DC: Personal Care Products Council, 2012
16. Archer Daniels Midland Co. pH of citric acid-sodium citrate solutions. Unpublished data submitted by the Council on Nov. 19, 2010. (1 p).
17. Miraj, S., 2016, Chemistry and pharmacological effect of Beta vulgaris: A systematic review, Pharm. Lett., 8, (19),404–409
18. Yuliana, A., Nurdianti, L., Fitriani, F., & Amin, S. (2020). Formulation and evaluation of decorative cosmetic blush from angkak (Monascus purpureus) extract as a coloring agent using lecithin as a skin moisturizer. Fitofarmaka: Jurnal Ilmiah Farmasi, 10(1), 1–11.
19. Sayyed BS, Tungar RB, Sarode LS. Formulation and evaluation of blush preparation by using natural coloring from red beetroot powder (Beta vulgaris L.). 2024.
20. Hnin N Y , Kanlayavattankul M; Evaluation on physicochemical properties and stability of bark powder for natural face powder products. Top conference series: materials science and engineering 2022; 1234(1): 17-28.
21. Mbata TI. Debiao L and Saikia A. Antibacterial Activity Of The Crude Extract Of Chinese Green Tea (Camellia sinensis) On Listeria monocytogenes . The Internet Journal of Microbiology. 2006: 2(2).