iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 11 **Issue:** VII **Month of publication:** July 2023

DOI: https://doi.org/10.22214/ijraset.2023.54833

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International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 11 Issue VII Jul 2023- Available at www.ijraset.com

Formulation and Evaluation of Herbal Face Scrub

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I. INTRODUCTION

The word cosmetic‟s was derived from the Greek word "kosm tikos" meaning having thepower, arrange, skill in decorating[1]. The origin of cosmetics forms a continuous narrative throughout the history of man as they developed. The man in prehistoric times 3000BC used colours for decoration to attract the animals that he wished to hunt and also the man survived attackfrom the enemy by colouring his skin and adorned his body for protection to provoke fear in an enemy (whether man or animal)[2]. The origin of cosmetics were associated with hunting, fighting,religion and superstition and later associated with medicine[3]. Herbal Cosmetics, here in after referred as Products, are formulated, using various permissible cosmetic ingredients to form the base in which one or more herbal ingredients are used to provide defined cosmetic benefits only, shall be called as "Herbal Cosmetics"[4]. Beginning 1990's cosmetic manufacturer adapted a term 'cosmeceuticals' to describe the OTC skin care products that claims therapeutic benefit by additionof plant based active ingredient such as alpha-hydroxy acid, retinoic acid, ascorbic acid and coenzyme Q10[5].

These active ingredients serves many purposes viz. increase in skin elasticity, delay in skinaging by reducing the wrinkles, protection against UV radiation by antioxidant property and to check degradation of collagen respectively[6]. The skin and hair beauty of individuals depends on the health, habits, routine job, climatic conditions and maintenance[7]. The skin due to excessive exposure to heat will dehydrate during summer and causes wrinkle, freckles, blemishes, pigmentation and sunburns. The extreme winter cause damages to the skin in the form of cracks, cuts, maceration and infections[8]. The skin diseases are common among all age groups and can bedue to exposure towards microbes, chemical agents, biological toxin present in the environment, and also to some extend due to malnutrition[9]. The science of ayurveda had utilized many herbs and floras to make cosmetics for beautification and protection from external affects[10]. The natural content in the botanicals does not cause any side effects on the human body; instead enrich the body with nutrients and other useful minerals[11]. The cosmetics, according to the Drugs and Cosmetics Act is defined as articles intended to be rubbed, poured, sprinkled or sprayedon, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance[12]. The cosmetic does not come under the preview of drug license. The herbal cosmetics are the preparations containing phytochemical from a variety of botanical sources, which influences the functions of skin and provide nutrients necessary for the healthy skin or hair [13]. The natural herbs and their products when used for their aromatic value incosmetic preparation are termed as herbal cosmetics[14]. There is common belief that chemical basedcosmetics are harmful to the skin and an increased awareness among consumers for herbal productstriggered the demand for natural products and natural extracts in cosmetics preparations[15]. The increased demand for the natural product has created new avenues in cosmeceutical market. The Drug and Cosmetics Act specify that herbs and essential oils used in cosmetics mustnot claim to penetrate beyond the surface layers of the skin nor should have any therapeutic effect[16]. The legal requirement and the regulatory procedures for herbal cosmetics are same as thatfor other chemical ingredients used in cosmetic formulations[17].

The requirements for the basic skin care: Cleansing agent: which remove the dust, dead cells and dirt that chokes the pores on the skin. Some of the common cleansers include vegetable oils like coconut, sesame and palm oil[18]. Toners: The toners help to tighten the skin and keep it from being exposed to many of the toxins that are floating in the air or other environmental pollutants. Some of the herbs used as toners are witch hazel, geranium, sage, lemon, ivy burdock and essential oils[19]. Moisturizing: The moisturizing helps the skin to become soft and supple. Moisturizing shows a healthy glow and are less prone to aging[20]. Some of the herbal moisturizersinclude vegetable glycerin, sorbitol, rose water, jojoba oil, aloe vera and iris[21].

A. What is Exfoliant?

A facial scrub uses small particles, beads or chemicals to get rid of the old skin cells and make way for new once in a process known as exfoliation. The agents are used for exfoliation areknown as exfoliants. Exfoliating agents are those used to remove dead cells present on the skin and boost blood circulation, giving renewed and glowing skin. It keeps face free from dust, grimeand oils which are also beneficial in keeping a skin pore clean. Exfoliation involves the removal of the oldest dead skin cells from the skin's surface. The word comes from the Latin word exfoliate(to strip off leaves). Exfoliation is involved in all facials and can be achieved by mechanical or chemical means, such as microdermabrasion or chemical peels. Exfoliants are often advertised as treatments that promote beauty, youthful appearance, or health[22].

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B. Difference Between Herbal and Synthetic Products[25]:

Herbal scrub	Synthetic scrub
Herbal products are completely free from all the harmful chemicals as they are naturally derived.	Synthetic product are maybe slightly harmfulchemicals as they are Synthetically derived.
Herbal refer to products that are prepared fromplants for their medicinal value.	Synthetic refer to product that are preparedfrom chemicals.
Safe to use as compared to chemical-basedcosmetics.	They may be harmful for sensitive skin.
Synthetic refer to product that are preparedfrom chemicals.	More side effect than herbal product.
E.g. Plum Green Tea gentle revival face scrub.	E.g. Cetaphil Extra gentle daily scrub.

C. Types of Skin[27]

Skin Type	Features	Suitable Skin Care	
		Herbal	Essential Oils
Normal	Has even tone, soft, smooth texture, no visible pores or blemishes and no greasy patches or flaky areas.	Pomegranate leaves juice, Herbal Face Pack, Gingili Oil	Chamomile, Fennel, Geranium, Lavender, Lemon, Rose, Sandal Wood, Patchouli.
Dry	Low level of sebum and prone to sensitivity. Has a parched look, feels "tight. Chapping and cracking are signs of extremely dry, dehydrated skin.	Aloe Vera, Olive Oil, Calendula Comfrey	Chamomile, Fennel, Geranium, Lavender, Lemon, Rose, Sandal Wood Patchouli, Almond, Avocado
Oily	Shiny, thick and dull coloured Chronically oily skin has coarse pores and pimples and other embarrassing blemishes. Prone to blackheads	Aloe Vera, Burdock Root chamomile Horsetail, Oat Straw, Thyme, Lavender, Lemon Grass, Liquorice, Rose Buds, Witch Hazel	Bergamot, Cypress Frankincense Geranium, juniper, Lavender, Lemon, Sage Evening Primrose
Combination	Some parts of your face are dry or flaky, while the center part of your face, nose, chin, and forehead (called the T-zone) is oily.	Witch Hazel, Menthol, Aloe Vera, Turmeric, Wheat Germ, Sweet Flag	Citrus Oils, Jasmine Oil, Sandal Wood Oil

Table No. 1: Types Of Skin

D. Poly Herbal Scrub

The herbal face scrub is a popular face treatment which is made from natural ingredients from plants such as herbs, leaves, fruits, tree barks, cereals, seeds, beans, or flowers that can be used to exfoliate the dead skin cells and moisturize our skin.

1) How to use a face scrub

a) Step 1 - Cleanse. The first step on how to do scrub on face is to cleanse the skin. ...
b) Step 2 - Take The Right Amount. Take a dime size amount of your face scrub and apply it toyour palm. ...
c) Step 3 - And On To Your Face. ...
d) Step 4 - Massage Well. ...
e) Step 5 - Rinse Away. ...
f) Step 6 - Finish Off With A Moisturiser.

2) *Benefits of Scrub*

a) Helps in Removing Dead Cells: Facial or body scrubs are the cosmetic which goes beyondsurface level to remove dead skin and reveal the healthy glowing skin below.
b) Free the skin form Flakes: Loss of upper layer of skin (epidermis) is called as flaky skin. It gives rise to dry patches. Scrubbing your skin can help you to deal with flaky skin effectively.
c) Deep Cleaning of Skin: Scrubbing your skin helps skin to get free from dirt, oil and sweat.Other cleansing like face wash facial cleansers cannot clean the skin.
d) Thoroughly removing dust accumulated in the course of the skin, scrubbing does this workeffectively.
e) Clears Blemishes: Accumulation of dead skin, can block the pores of skin and causes blemishes. Scrubbing frequently helps to remove dead skin and clears blemishes.
f) Gives glow to skin and smooth texture: Scrubbing actually helps to give glow and smoothtexture to skin.
g) Remove the Acne Scars: As scrubbing used to remove dead skin cells, it also remove the acnes scars from skin.
h) Promotes Hydration of Skin: Facial scrubs contents moisturizing agents and hydrating Agents. Exfoliation of skin helps to absorb moisture and it leaves our skin with filling soft.
i) Reduces Stress: Exfoliation or scrubbing the skin gives good massage, which givesrelaxing feeling and reduces stress[26].

3) *Ideal Properties of Scrub*

a) It should be Non toxic
b) Possess small gritty particles
c) Mild abrasive
d) Non irritating
e) Non sticky
f) Able to remove dead skin cell[25]

4) *Advantages of Face Scrub*

a) Healthy, glowing skin, minimise spore, reduces breakout and acne, Hides wrinkles
b) Allows absorption of the products, improve your tan, Maintain body pH.
c) Scrubbing is the removal of dry/ dead skin cells on the surface of the skin and is one of themost important of skincare routine for face.
d) Scrubbing not only helps many skin problems, it also increases blood circulation, which inturn helps you to achieve healthy and glowing skin.
e) Abrasive scrub cleansers are used for mechanical exfoliation[25].

5) *Disadvantages of Scrub*

a) Hard scrubbing motions and hard scrubbing chemicals may cause skin irritation includingredness, inflammation. If you have a sensitive skin one can also have allergic reactions tothe chemicals present in the synthetic scrubs as well.
b) Over scrubbing can result in open pores which are exposed to pollution and UV rays at thesame time. It also leaves your skin more prone to infections and tanning[25].

E. Glycolic Acid

For many year glycolic acids (GA) have been used in cosmetic products to remove undesirable signs of skin ageing. Glycolic acids or defined by IUPAC as hydroxyethanoic acid isa type of fruit acids or alpha hydroxyl acid (AHA). Other names for glycolic acids are hydroxyacetic, glucohydroxyacid and kyselina glykolova.

Glycolic acids is crystalline, colorless, odorless and hydroscopic. Glycolic acids penetrateseasily into the skin as compared to other types of alpha hydroxyl acid because it is the smallest molecule within the homologous series of AHA with two carbon atoms. It has high acidity but easily soluble in water and proved to be an effective dermatologic and cosmetic ingredient as it can be used as natural skin exfoliant and moisturizer. It is also easy soluble in methanol, ethanol, acetone, ethyl acetate, ether and acetic acid.

Benefits of Glycolic Acid

1) There are a lot of benefits from GA such as stimulated the synthesis of new collagen and decreasing keratinocytes cohesion.
2) Researchers found that GA in low concentrations decreases corneocyte cohesion bypromoting exfoliation of the outer layers of the stratum comeum. This is important becausemost pigmentation alterations associated with photo damage can be attributed to bethickening of the stratum corneum.
3) GA can act as a useful adjuvant for the treatment of acne. The combination with topical retinoid makes it more effective in preventing comedonal acne.
4) Repeated and regular applications of GA to the face have been shown to diminish fine facial wrinkles significantly.
5) Application of Glycolic Acid Glycolic acid, perhaps the best-known AHA, is used in various fields. It is widely used especially in dermatology, medical and pharmaceutical applications. The concentration of glycolic acid in biological fluids has been used as an index for differential diagnosis of the hyperoxaluria. It is also used as inhibitors for harmful oxidation biochemical processes.
6) GA is one of the most important fine chemicals. It is used in numerous areas of technologysuch as in adhesive, metal cleaning, textiles, leather processing, electroplating [29].

II. LITERATURE REVIEW

Vidya Keshav Kakad (2002) - A review on Herbal face scrub for skin exfoliation. Many of themarketed products when applied on the skin cause dryness of skin after its long-term use whichresults less life of skin problems of acne and redness. Solution for this problem is use of scrub which consist all herbal ingredients which increases cleansing, softening, moisturizing, fairnessof skin.

Rutuja Prashant Nangare, Trupti Asok Thange (2022) - In comparison to other cosmetic products available in the market, natural and herbal cosmetics are easy, safe and effective to use. The use of polyherbal face scrub gives effectiveness and healthier skin type.

Miss.Gadge Rutuja, Miss Bhore Shruti, Miss Pathan Saniya Mr.Tambe Sager (2022) – the present study was attempted to preparation polyherbal scrub. the polyherbal scrub was evaluated using parameter and was found to be satisfied for the application on the skin to make healthy andglowing without any side effect.

Pooja Dave (2022) - the research aimed to produce an herbal facial scrub .The scrub comprises various natural components that are safe for use .The main ingredient is coffee that results suggestthat new scrub formulation is safe for use and coffee use to get good effect as scrubbing agent. Themajority of the substance are natural and there low chances of adverse effect.

A Surjushe (2008) - studied the effect of aloevera Cited by 1067 - It‟s moisturizing effects has also been studied in treatment of dry skin associated with occupational exposure where aloe vera gel gloves improved the skin.

S J Hewling (2017) - studied that Turmeric (curcumin) can helps in management of inflammatoryand oxidative condition. The World Health Organization refers to “Good-Health” as a state of physical and mental wellbeing not altered by any disease or ailment (Arumugam et al., 2014).

Chauhan ET AL (2002) - studied that glycolic acid is crystalline, colourless, odorless.it has highacidity but easily soluble in water and poured to be an effective dermatologic and cosmetic ingredients as it can be used as a natural skin exfoliant.

III. PLAN OF WORK

1) Review of Literature
2) Material and Method
3) Determination of Need and Objectives
4) Pre-formulation
5) Experimental Review Method
a) Sample Collection
b) Identification Test
c) Make Extraction of Herbal Drug Powde
d) Filter Out the Extract

6) Evaluation Test
a) Physical Appearance
b) Homogeneity
c) P^H

d) Extrudabilit
e) Determination of Spreadability of Scrub
f) Irritability
g) Washability
h) Viscosity
i) Stability Study

IV. AIM AND OBJECTIVE

A. AIM

Formulation and evaluation of polyherbal exfoliators(Scrub).

B. Objective

1) The main objective of present study was to prepare a herbal facial scrub.
2) In this formulation of herbal facial scrub, we used glycolic acid as a active ingredient andturmeric, Walnut granules, rose water, aloevera, neem, tulsi, etc are other ingredients used in this facial scrub formulation.
3) The first and foremost benefit of using a facial scrub is removing the dead skin cells fromyour face.
4) Dead skin cells make your face look dry and dull.
5) These also clog your skin pores. remove the dead skin cells.

V. MATERIAL AND METHOD[24]

A. Neem Leaves Powder

1) Synonym - Neem
2) Biological source - It consists of dried leaves ofAzadircta indica
3) Family- Meliaceae.
4) Description Colour - Green
5) Odour - Pungent
6) Taste - Bitter.
7) Chief chemical constituents - Nimbinin, Nimbidin,Quercetin.
8) Uses - Skin toner, lightens skin blemishes, Removeblackheads.



Fig.No.1: Neem Leaves Powder

B. Tulsi Leaves Powder

1) Synonym - Tulsi
2) Biological source - It consists of dried leaves ofOcimum sanctum L.
3) Family - Lamiaceae.
4) Description Colour - Green
5) Odour - Aromatic
6) Taste - Pungent
7) Chief Chemical constituents - oleanolic acid,ursolic acid, rosmarinic acid
8) Uses - Prevents acne and pimples, Improve skintexture, Cleanser



Fig.No.2: Tulsi Leaves Powder

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C. Turmeric Powder

1) Synonym - Curcuma longa
2) Biological source - It consists of dried rhizomes of Curcuma longa
3) Family - Zingiberaceae.
4) Description - Colour - Yellow
5) Odour - Aromatic
6) Taste - Bitter
7) Chief chemical constituents- Curcumin, Curcuminoids
8) Uses - Reduce acne, Glowing skin, Lightens skin.



Fig.No.2: Turmeric Powder

D. Multani Mitti

1) Synonym - Multan clay
2) Biological source - It consists of hydrous aluminum silicates (clay minerals).
3) Description Colour - White
4) Odour - Pleasant
5) Taste - Pleasant
6) Chief chemical constituents - Montmorillonite, Kaolinite, Attapulgite
7) Uses - Nourishes skin, reduce oiliness, Removeblackheads

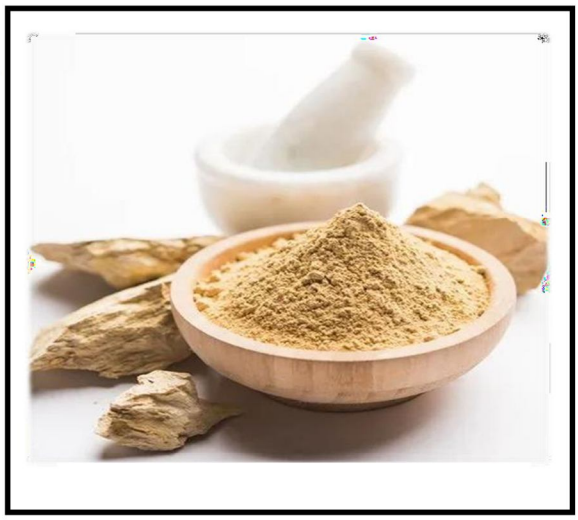


Fig.No.2: Multani Mitti

E. Aloe Vera

1) Synonym - aloe vera, burn plant
2) Biological source - dried latex of leaves of it also known as cape aloe
3) Family - liliaceae
4) Description Colour - clear to slightly yellow or translucent gold
5) Odour - similar like rotten garlic or onion
6) Taste - Bitter
7) Chemical constituents - aloe emodin
8) Uses - heals burns and clears acne



Fig.No.2: Aloe Vera

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F. Sugar Cane

1) Synonyme - Sacchrum, Nobel cane
2) Biological source - saccharum officinarum
3) Family - poaceae
4) Chief chemical constituent - Cellulose, hemicellulose, lignin, glycolic acid
5) Uses - Antiaging, fine skin line , moisturizingthe skin .



Fig.No.6: Sugar Cane

G. Ingredients, uses and their role

Sr.No.	Ingredients	Uses
1	Sugar cane	Exfoliate the skin, Clear pores, Sun damage, Hydrate the skin.
2	Neem (Extract)	Treat dry skin, stimulate collagen production, reduces scar, heal wounds, treat acne, minimize warts and moles.
3	Tulsi (Extract)	Anti-infective
4	Aloe vera	Soothe sunburn, moisturize the skin, fights skin aging, reduces acne, lightens blemishes
5	Carbopol 934	Thickening agent, Gelling agent
6	Methyl paraben	Preservative
7	Triethanolamine	Neutralizer
8	Glycerin	Emollient
9	Fullers Earth (Multani mitti)	Oil and impurities absorber, provide fairness and glow, fights acne and pimples, improves skin elasticity
10	Turmeric (Haldi)	Reduce acne and any resulting scars, antiinflammatory, anti-oxidant, provides glow and lustre
11	Walnut granules	Scrubing agent.
12	Sodium lauryl sulphate	Surfactant used as a cleaning and foaming agent
13	Rose water	Perfume

Table No. 2 Ingredients, Uses And Their Role

1) Materials and Instruments

The brief description of the glass ware, instruments, reagents and chemicals which were used in the study are given below.

2) Glass Ware

Conical flask, Funnel, Glass rod, Pipettes, Measuring cylinder, Reagent bottle, Test tube, Beaker, Slide, Brush, Dropper, Crucible, Capillary tube, Iodine flask.

3) Instrument

Water bath, Electronic weighing machine, Rotatory flask shaker, Hot air oven, Soxhlet extraction unit, Desiccator, Test sieves, Mixer Grinder, Spatula, Heating mantle, Needle, Mortal pistle.

4) Reagents

Fehling‟s solution A & B, Dragendorff‟s reagent, Mayer‟s reagent, Alpha nephthol solution, Wagner‟s reagent, Anthrone‟s reagent, Folin Denis reagent, Million‟s reagent, Hager‟s reagent, Aqueous basic lead acetate solution, Ammonia solution, Phosphoric acid.

5) Preparation of Sample Extracts

For analysis of phytochemicals, macerated the 2g of sample of extract with 100 ml distilledwater separately in a closed iodine flask for 24 hours, shaking frequently during first 6 hours and allowed to stand for 18 hours. Then the solution was filtered by using whatman filter paper No.1.The extracts were used for the analysis of different bioactive constituents.

H. Preliminary Phytochemicals Screening of Saccharum officinarum (linn.) Stem.[30]

The extracts obtained from successive solvent extraction were then subjected to various qualitative chemical tests to determine the presence of various phytoconstituents like Alkaloids, Carbohydrates, Proteins, Resins, Saponins, Starch, Flavonoids, Steroids, Glycosides, Tannins, Quinones and Phenolic Compounds Was Analysed by Following Methods.

1) Test for Alkaloids

- Mayer's test: Added few drops of Mayer‟s reagents to 1 ml of the acidic, aqueous extract of the powder.
- Hager’s test: To 1 ml of alcoholic extract of powder and added few drops of Hangers reagent.
- Dragendroff’s Test: Dissolved few mg of alcoholic or aqueous extract of powder in 5 ml of distilled water, added 2 M HCl until an acid reaction occurs, then added 1 ml of Dragendroff‟s reagent.

2) Test for Carbohydrate

- Anthrone’s test: To 2 ml of anthrone‟s test solution, added 0.5 ml of aqueous extract of powder. Fehling‟s Test: To 2 ml of aqueous extract of powder, added 1 ml of mix. of equal parts of Fehling‟s solution A and Fehling‟s solution B and boiled the content of the test tube for few minutes.
- Molish’s **test:** To 2 ml of aqueous extract of the powder, added 2- drops of freshly prepared 20%alcoholic solutions of naphthol and Poured 2 ml of conc. Sulfuric acid so as to form a layer belowthe mixture.

3) Test for Proteins

- Biuret test: To 1 ml of hot aq. extract of sugarcane powder, added 5 – 8 drops of 10% w/v NaOHsolution followed by 1 or 2 drops of 3% w/v $CuSO_4$ solutions.
- Ninhydrin test: The Ninhydrin reagent is 0.1% w/v solution of Ninhydrin in n-butanol. A little ofthis reagent was added to the test extract.
- Millon’s test: Take little residue was taken with 2 ml of water add millon‟s reagent and mix withit, then boil for 1 min and cool under tap water. Add 5 drops of 1% sodium nitrite.

4) Test for Resins

Dissolved 1 ml of extract in 1 ml of acetone and poured the solution into 5 ml distill water.

5) Test for Saponins

- Foam test: To 5 ml of aq. extract of Sugarcane powder, added few drops of sodium bicarbonate.Shaked vigorously and left it for few minutes.

6) Test for Starch

Dissolved 0.015g of iodine and 0.075g of KI in 5 ml of distilled water and added 2 -3 drops of anaq. extract of Sugarcane powder.

7) Test for Flavonoids

- Shinoda's test: To 0.5 ml of alcoholic extract of sugarcane powder, added 5-10 drops ofconcentrate HCl followed by small 0.5g of „Mg" metal. Alkaline Reagent Test: To the test solution added sodium hydroxide solution.

8) Test for Steroids

- Salkowski's reaction: Added 1 ml of concentrate Sulfuric acid to 2 ml of chloroform extract of the Sugarcane powder carefully, from the side of test tube.

9) Test for Glycosides

- Borntrager's test: One ml of benzene and 0.5 ml of dilute ammonia solution were added to the ethanolic extract of sugarcane powder.

10) Test for Tannins

- Ferric chloride test: To 1 – 2 ml of extract of Sugarcane powder, added few drops of 5% $FeCl_3$ solutions.

11) Test for Quinones

1 ml of the sample extract was treated with alcoholic potassium hydroxide solution.

12) Test for Phenolic Compounds

The extract was taken in water and warmed; to this added 2 ml of ferric chloride solution and observed.

I. Composition of Developed Formulation

Sr.No.	Ingredients	Quantity Taken For 30g Gel		
		F1	F2	F3
1	Sugarcane(glycolic acid)	2.4ml	2ml	2.2ml
2	Neem	0.8ml	1ml	1ml
3	Tulsi	0.5ml	0.5ml	0.4ml
4	Aloe vera	2.4ml	2ml	2ml
5	Turmeric	0.1ml	0.1ml	0.3ml
6	Carbopol934	0.5gm	0.6gm	0.6gm
7	Methyl paraben	0.4gm	0.6gm	0.6gm
8	Triethylamine	0.4ml	0.4ml	0.3ml
9	Glycerine	1.5ml	2ml	2ml
10	Fullers earth	2.1gm	2gm	2.2gm
11	Exfoliating Walnut granules	8gm	8gm	8gm
12	Sodium lauryl sulphate	0.8gm	0.8gm	0.8gm
13	Rose water	Q.S	Q.S	Q.S

Table No. 3 Composition Of Developed Formulation

1) Method of Preparation

a) Collection

Leaves of neem, sugarcane, rhizomes of turmeric, aloe vera, leaves of tulsi, were collected fromthe local area.

b) Preparation of Extract

Leaves of neem, rhizomes of turmeric, leaves of tulsi, were kept in hot air oven for the purpose at45°C temperature and grinded into small pieces to make powder with the help of grinder.

c) Preparation of Neem and Tulsi Extract

- Desired quantities of herbal drugs were weighed and each herb macerated with ethanol in conicalflask.
- Dried herbs were mix with ethanol by moderate shaking of conical flask for 3 days separately.
- After 3 days, contents were filtered out by using simple filtration method and filtrates werecollected in vessels separately[31].

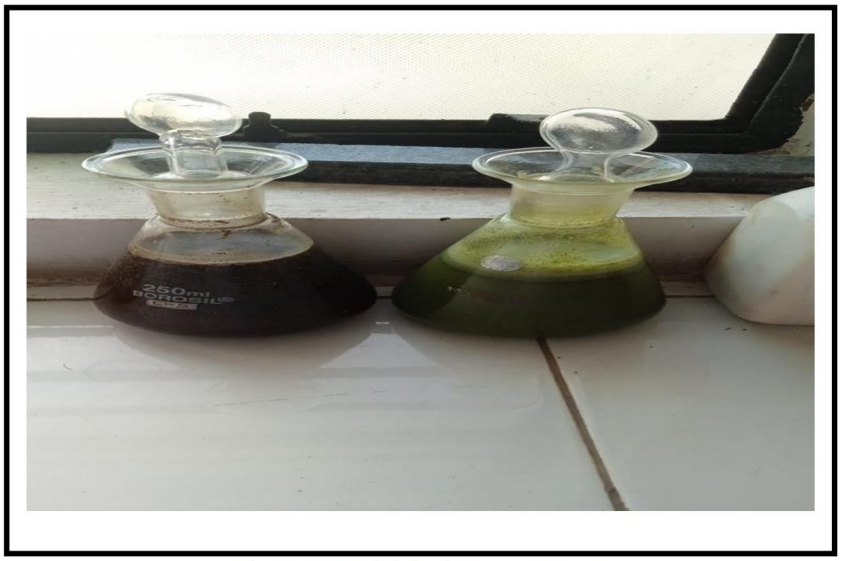


Fig No.7: Tulsi And Neem Extract

d) Preparation of Turmeric Extract

Turmeric extract was prepared by using soxhlet apparatus. Extraction was dried and stored indesiccator for further use.

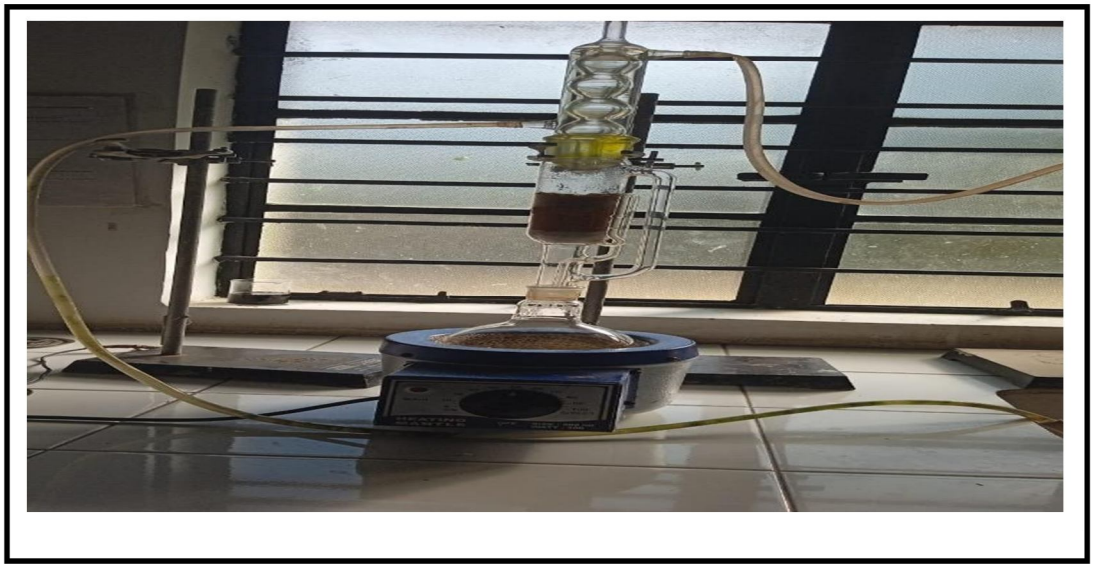


Fig No.8: Turmeric extract was prepared by using soxhlet apparatus

e) Preparation of Aloe Vera Gel

Fresh aloe vera leaves collected and remove the gel manually. Gel was griended into mixer to gethomogeneous form.[28]

J. Extraction of Glycolic acid from Sugarcane[29]

- Collection of sugarcane
- It is washed to remove impurities
- Pressing the cane to extract the juice

1) Isolation of Glycolic Acid from Sugarcane Juice

a) Add ethylene glycol to sugarcane juice

b) Ethylene glycol act as catalyst for extraction of glycolic acid via an oxidation process

c) It was expected that microbial conversion of ethylene glycol to glycolic acid

This was attractive method for the value added production of glycolic acid with no by- production

2) Filtration

Filtration of extract was done by using simple filter paper and funnel for 2 times[31].



Fig No.9: Filtration Process

3) Evaporation

Evaporation process was done with the help of water bath. Filtrates were allowed to evaporatein evaporating pan at 60° temperature until the desired concentration of the extract was obtained[31].

4) Developement of Formulation

Preparation of Carbopol Base: Required quantity of carbapol 934 taken in a separatebeaker. Add rest of ingredient one by one in to it with continuous and homogeneous stirring.

a) Step 1- Trietylonamine, glycerin and methayl paraben together in a separator beaker.

b) Step 2- Mixed neem extract, tulsi extract, aloe vera gel, Walnut granules, multani mitti, glycolicacid and methyl paraben in another container.

c) Step 3- Add carbopol in little quantity of alcohol, add aloevera gel in the mixture and triturate wellin pestle mortar.

Add the contents of steps 1, 2 into 3 with gentle continuous stirring in a pestle mortar. AddRose water gradually till a semi solid consistency preparation was not formed[28].

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VI. EVALUATION PARAMETER OF FACIAL SCRUB

Formulation was tested for physical appearance, color, texture, odor, pH, viscosity,irritability, washability, homogeneity, extrudability and spreadibility.

1) *Organoleptic Properties*

a) *Colour* - The color of formulation was checked manually and observed as mustered yellow.

b) *Odour* - The smell of formulation was checked by applying preparation on hand and feels thefragrance of perfume.

c) *Consistency* - The consistency of the formulation and particles were used to check the textureand homogeneity of preparation on the skin such as stiffness, grittiness, greasiness effect. Preparation found semi-solid in nature.

d) *Homogeneity and Texture* - It was tested by pressing a small quantity of the formulated scrubbetween the thumb and index finger.

2) *Washability*

This test was performed directly on skin, preparation applied on skin and washwith normal water, after washing clean and clear skin observed.

3) P^H: P^H of 1% aqueous solution of formulation was measured by using a calibrated digital pH meter and result found 7.3-7.7.

5) *Viscosity:* For Viscosity measurement, Brookfield viscometer "DV-I, LV-I SPINDLE, USA"used, and result observed as 505-705cp at 20 rpm.

6) *Extrudability:* It is usual empirical test to measure the force required to extrude the material from tube. More quantity extruded, better the extrudability. The formulation under study was filledin a clean, aluminum collapsible tube with nozzle tube of 5mm opening and applies pressure on tube by the help of finger. Tube extrudability was then determined by measuring amount of formulation extruded through the tip when the pressure was applied on tube.

7) *Skin Irritation:* Small quantity of the preparation was applied on the dorsal part of hand and kept for few minutes and found to be non-irritant, No redness and edema or any other adverse effect[28].

8) *Spreadability:* Spreadability: Two slides are taken and herbal sample was placed on one slide.Other slide was placed on the first slide. 100 g of weight was kept on the slides so that it spreads as a thin layer. Weight was been eliminated much high than the prisons. Next weight of 20 g waskept on the upper slide. It was performed for 3 times and average was calculated. Spreadability was calculated by using the following formula,

$$S=M\times L/T$$

Where, S- Spreadability; M- Weight tied to the upper slide (20 g); Length of the glass (6.5 cm); Time in 23sec[33].

9) *Patch Test:* Patch testing is well established method for diagnosing the hypersensitivity as wellas to determine the potential of a specific substance to cause the allergic action on patient skin. Inpatch test a small area of skin is exposed to those chemicals in dilute form whose specific effect on skin is to be studied. In patch test reaction of formulation on skin is observed in 2-3 days[33].



Fig. No.10: Day1



Fig. No.11: Day 3

Fig.No.12: Observation Of Patch Test

10) *Accelerated Stability Test:* Acclerated stability testing of prepared formulation was conductedfor most stable formulation at room temperature studied for 7 days[32].
11) *Grittiness:* The product was checked for the presence of any gritty particles by applying it onthe skin[33].

VII. RESULTS AND DISCUSSION

Preliminary phytochemical screening of aqueous extract (sugar cane) result

Sr.No.	Name of experiments	Observations	Result
1	Alkaloids • Mayer‟s test • Hager‟s test	White colour appear Light yellow colour appear	Present Absent
2	Carbohydrate • Anthrone‟s test • Fehling‟s test	Green colour appear Brick-red colour appear	Present Present
3	Proteins • Bieuret‟s test • Millon‟s test	Red colour appear Light red colour appear	Present Present
4	Resins	Turbidity are seen	Present
5	Saponin test • Foam test	Honey comb like structure are formed	Present
6	Starch test	Redish colour appear	Absent
7	Tannin test • Ferric chloride test • Potassium dichromate test	orange colour appearorange colour appear	Absent Absent
8	Phenolic compounds	Yellow colour appear	Absent
9	Flavonoids test • Shinoda‟s test • Alkaline reagent test	Pink colour appear Yellowish colour appear	Present Present
10	Steroid test • Salkowski‟s test	Light yellow colour appear	Absent
11	Glycoside test • Borntager‟s Test	Reddish pink colour appear	present

Table No.4: Preliminary Phytochemical Screening Of Aqueous Extract (Sugar Cane) Result

Preliminary phytochemical screening of aqueous extract result

Sr.No.	Name of experiments	Observations			
		Neem	Tulsi	Turmeric	Aloe vera
1	Alkaloids • Mayer‟s test	Positive	Negative	Positive	Positive
2	Carbohydrate • Anthrone‟s test	Positive	Negative	Negative	Positive
3	Proteins • Millon‟s test	Positive	Negative	Negative	Negative
5	Saponin test • Foam test	Negative	Negative	Positive	Positive
7	Tannin test • Ferric chloride test	Negative	Negative	Positive	Positive
8	Phenolic compounds	Positive	Positive	Positive	Positive
9	Flavonoids test • Shinoda‟s test	Positive	Negative	Positive	Positive
10	Steroid test • Salkowski‟s test	Positive	Negative	Negative	Positive
11	Glycoside test • Borntager‟s Test	Negative	Positive	Positive	Negative

Table No.5: Preliminary phytochemical screening of aqueous extract

Result Of Evaluation Parameter

Sr.No.	Parameters	Observation		
		F1	F2	F3
1	Colour	Mustard Yellow	Mustard Yellow	Mustard Yellow
2	Odour	Characteristic	Characteristic	Characteristic
3	Nature	Semisolid	Semisolid	Semisolid
4	Consistency	Smooth	Smooth	Smooth
5	Homogeneity	No Aggregation	No Aggregation	No Aggregation
6	Washability	Washable	Easily Washable	Washable
7	pH	7.7	7.6	7.4
8	Viscosity	505cp	655cp	705cp
9	Extrudability	Extruded	Easily Extruded	Easily Extruded
10	Spreadability	5.70 Cm/Sec	5.60 Cm/Sec	5.66 Cm/Sec
11	Skin Irritation	No Irritant Action	No Irritant Action	No Irritant Action
12	Grittiness	Small Gritty Particle	Small Gritty Particle	Small Gritty Particle
13	Patch Test	No Allergic Reaction	No Allergic Reaction	No Allergic Reaction

Table No.6: Result Of Evaluation Parameter

Formulation F_1, F_2, F_3 was tested using various evaluation parameters. Spreadability,viscosity and pH of F_2 formulation was found very good when compared to F_1 and F_3.

Stability Studies: stability studies of F2 formulation gives good results during 7 days and the values are below.

Sr.No.	Parameters	Observation Of F2 Formulation		
		Day 1	Day 3	Day 7
1	Colour	Mustard Yellow	Mustard Yellow	Mustard Yellow
2	Odour	Characteristic	Characteristic	Characteristic
3	Nature	Semisolid	Semisolid	Semisolid
4	Consistency	Smooth	Smooth	Smooth
5	Homogeneity	No Aggregation	No Aggregation	No Aggregation
6	Washability	Easily Washable	Easily Washable	Easily Washable
7	pH	7.4	7.6	7.3
8	Viscosity	505cp	550cp	530cp
9	Extrudability	Easily Extruded	Easily Extruded	Easily Extruded
10	Spreadability	5.40 Cm/Sec	5.60 Cm/Sec	5.30cm/Sec
11	Skin Irritation	No Irritant Action	No Irritant Action	No Irritant Action
12	Grittiness	Small Gritty Particle	Small Gritty Particle	Small Gritty Particle
13	Patch Test	No Allergic Reaction	No Allergic Reaction	No Allergic Reaction

Table No.7: Result Of Stability Studies

All the ingredients used in this poly herbal facial scrub are our natural ingredients. So, the chances for its side effects are less. F2 is more effective than F1 and F3. We can use this herbal facial scrub for getting best results for skin.

VIII. CONCLUSION

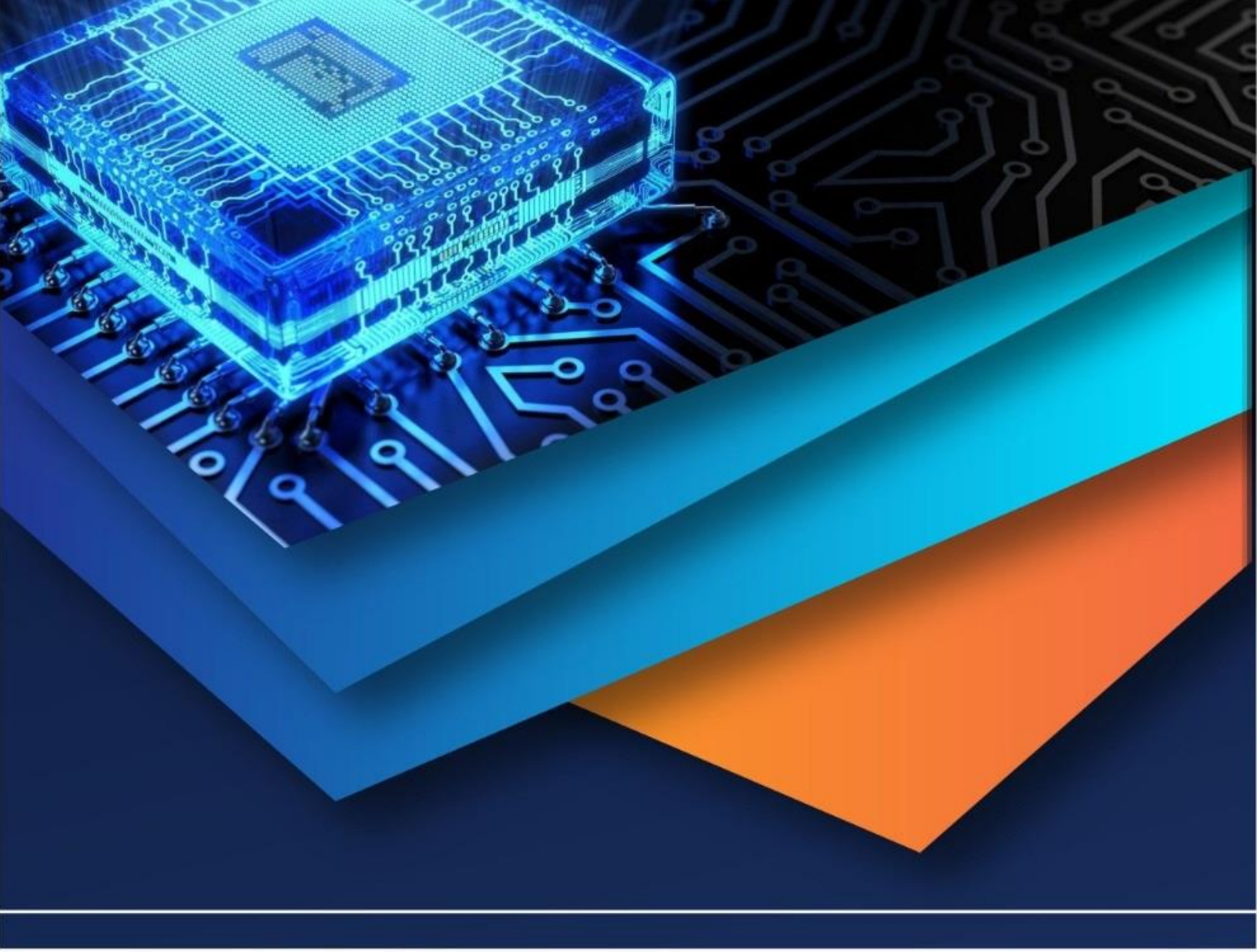
In the current study herbal face scrub was formulated, evaluated for various parameters. The results indicated that the formulation passed the tests. The prepared poly-herbal formulation nourish, moisturize, cleanses, protect the skin against premature aging, acne, and pimples. From the above results it is concluded that new formulation polyherbal scrub can be safe to use and the sugarcane juice in which some amount of glycolic acid is present which used as a scrubbing/cleansing agent showing good effects and as mostly ingredients are natural ingredients so chances for side effects are less. It can be used for any type of skin i.e. normal, oily and dry. It gives best results and make the skin glowing and healthy. . It produces better results and leaves the skin looking radiant and bright. A less amount of the mixture was applied to the dorsal area of the hand for some times and found to be non-irritating, with no redness or other adverse effects.

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