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Research Article

FORMULATION AND EVALUATION OF POLYHERBAL EXFOLIATORS

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Abstract:

Many of the marketed products when applied on the skin cause dryness of skin after its long-term use which results in 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, fairness of skin. The use of natural ingredients to fight against acne, wrinkle and also to control secretion of oil is known as natural or herbal cosmetics. Herbal cosmeceuticals usually contain the plant parts which possess antimicrobial, antioxidant and anti-aging properties. Herbal cosmetics are the safest product to use routine with no side effects and cosmeceuticals are the product which influences the biological function of skin.

The main objective of present study was to prepare a polyherbal scrub. The use of natural ingredients to fight against acne, wrinkle and also to control secretion of oil is known as natural or herbal cosmetics. Herbal cosmeceuticals usually contain the plant parts which possess antimicrobial, antioxidant and anti-aging properties. Herbal cosmetics are the safest product to use routine with no side effects and cosmeceuticals are the product which influences the biological function of skin. In this preparation Walnut granules, rose water, turmeric, Aloe Vera gel, sodium lauryl sulfate, glycerine is used as active ingredients which is prepared with carbopol.

Key Word: Antiseptic , Anti- Infective , Antioxidant , Herbal scrub, Exfoliants.

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INTRODUCTION:

The word cosmetic was derived from the Greek word "kosm tikos" meaning having the power, arrange, skill in decorating¹. 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 attack from 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 medicine³. 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 addition of plant based active ingredient such as alpha-hydroxy acid, retinoic acid, ascorbic acid and coenzyme Q10⁵.

These active ingredients serves many purposes viz. increase in skin elasticity, delay in skin aging by reducing the wrinkles, protection against UV radiation by antioxidant property and to check degradation of collagen respectively⁶. The skin and hair beauty of individuals depends on the health, habits, routine job, climatic conditions and maintenance⁷. 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 infections⁸. The skin diseases are common among all age groups and can be due to exposure towards microbes, chemical agents, biological toxin present in the environment, and also to some extend due to malnutrition⁹. The science of ayurveda had utilized many herbs and floras to make cosmetics for beautification and protection from external affects¹⁰.

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 minerals¹¹. The cosmetics, according to the Drugs and Cosmetics Act is defined as articles intended to be rubbed, poured, sprinkled or sprayed on, introduced into or otherwise applied to the human body or any part thereof for cleansing, beautifying, promoting attractiveness or altering the appearance¹². 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 hair¹³. The natural herbs and their products when used for their aromatic value in cosmetic preparation are termed as herbal cosmetics¹⁴. There is common belief that chemical based cosmetics are harmful to the skin and an increased awareness among consumers for herbal products triggered the demand for natural products and natural extracts in cosmetics preparations¹⁵.

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 must not claim to penetrate beyond the surface layers of the skin nor should have any therapeutic effect¹⁶. The legal requirement and the regulatory procedures for herbal cosmetics are same as that for other chemical ingredients used in cosmetic formulations¹⁷.

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 oil¹⁸. 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 oils¹⁹. Moisturizing: The moisturizing helps the skin to become soft and supple. Moisturizing shows a healthy glow and are less prone to aging²⁰. Some of the herbal moisturizers include vegetable glycerin, sorbitol, rose water, jojoba oil, aloe vera and iris²¹.

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 are known 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, grime and oils which are also beneficial in keeping a skin pore clean. There are two ways to exfoliate the skin. 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 health²².

DIFFERENCE BETWEEN HERBAL AND SYNTHETIC PRODUCTS²⁵:

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

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.

ADVANTAGES OF FACE SCRUB

- Healthy, glowing skin, minimise spore, reduces breakout and acne, Hides wrinkles
- Allows absorption of the products, improve your tan, Maintain body pH.
- Scrubbing is the removal of dry/ dead skin cells on the surface of the skin and is one of the most important of skincare routine for face.
- Scrubbing not only helps many skin problems, it also increases blood circulation, which in turn helps you to achieve healthy and glowing skin.
- Abrasive scrub cleansers are used for mechanical exfoliation²⁵.

DISADVANTAGES OF SCRUB

- Hard scrubbing motions and hard scrubbing chemicals may cause skin irritation including redness, inflammation. If you have a sensitive

skin one can also have allergic reactions to the chemicals present in the synthetic scrubs as well.

- Over scrubbing can result in open pores which are exposed to pollution and UV rays at the same time. It also leaves your skin more prone to infections and tanning²⁵.

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 is a 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 penetrates easily 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

- There are a lot of benefits from GA such as stimulated the synthesis of new collagen and decreasing keratinocytes cohesion.
- Researchers found that GA in low concentrations decreases corneocyte cohesion by promoting exfoliation of the outer layers of the stratum comeum. This is important because most pigmentation alterations associated with photo damage can be attributed to bethickening of the stratum corneum.
- 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.
- Repeated and regular applications of GA to the face have been shown to diminish fine facial wrinkles significantly.
- 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.
- GA is one of the most important fine chemicals. It is used in numerous areas of technology such as in

adhesive, metal cleaning, textiles, leather processing, electroplating²⁷.

Neem leaves powder

- Synonym - Neem
- Biological source - It consists of dried leaves of *Azadirachta indica*
- Family- Meliaceae.
- Description Colour - Green
- Odour - Pungent
- Taste - Bitter.
- Chief chemical constituents - Nimbinin, Nimbidin, Quercetin.
- Uses - Skin toner, lightens skin blemishes, Remove blackheads.



Figure 1. Neem leaves powder

Tulsi leaves powder

- Synonym - Tulsi
- Biological source - It consists of dried leaves of *Ocimum sanctum* L.
- Family- Lamiaceae.
- Description Colour - Green
- Odour - Aromatic
- Taste - Pungent
- Chief Chemical constituents - oleanolic acid, ursolic acid, rosmarinic acid.
- Uses - Prevents acne and pimples, Improve skin texture, Cleanser.



Figure 2. Tulsi leaves powder

Turmeric powder

- Synonym - *Curcuma longa*
- Biological source - It consists of dried rhizomes of *Curcuma longa*
- Family - Zingiberaceae.
- Description - Colour - Yellow

- Odour - Aromatic
- Taste - Bitter
- Chief chemical constituents - Curcumin, Curcuminoids
- Uses - Reduce acne, Glowing skin, Lightens skin.



Figure 3. Turmeric powder

Multani mitti

- Synonym - Multan clay
- Biological source - It consists of hydrous aluminum silicates (clay minerals).
- Description Colour - White
- Odour - Pleasant
- Taste - Pleasant
- Chief chemical constituents - Montmorillonite, Kaolinite, Attapulgite
- Uses - Nourishes skin, reduce oiliness, Remove blackheads.



Figure 4. Multani mitti

Aloe vera

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



Figure 5. Aloe vera

Suger cane

- Synonyme - Sacchrum, Nobel cane
- Biological source - saccharum officinarum
- Family - poaceae
- Chief chemical constituent - Cellulose, hemicellulose, lignin, glycolic acid.
- Uses - Antiaging, fine skin line , moisturizing the skin.



Figure 6. Sugar cane

Ingredients, uses and their role**Table No. 1: Ingredients, Uses And Their Role**

Sr. no.	Ingredients	Uses
1	Suger 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	Triethanola-mine	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	Caffein	Scrubbing agent, anticellulite ,
12	Sodium lauryl sulphate	Surfactant used as a cleaning and foaming agent
13	Rose water	Perfume

MATERIALS AND INSTRUMENTS

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

A. Glass ware

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

B. 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 pestle.

C. Reagents

Fehling's solution A & B, Dragendorff's reagent, Mayer's reagent, Alpha naphthol 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.

Preparation of Sample Extracts:

For analysis of phytochemicals, macerated the 2g air dried powder with 100 ml alcohol and distilled water 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.Both the extracts (alcoholic & aqueous) were used for the analysis of different bioactive constituents.

Preliminary phytochemicals Screening of saccharum officinarum(Linn.) stem.²⁸

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.

Test for Alkaloids

Mayer's Test: Added few drops of Mayer's reagents to 1 ml of the acidic, aqueous extract of the powder.

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.

Hager's Test: To 1 ml of alcoholic extract of powder and added few drops of Hangers reagent.

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. H₂SO₄ so as to form a layer below the mixture.

Test for Proteins

Biuret Test: To 1 ml of hot aq. extract of sugarcane powder, added 5 – 8 drops of 10% w/v NaOH solution followed by 1 or 2 drops of 3% w/v CuSO₄ solutions.

Ninhydrin test: The Ninhydrin reagent is 0.1% w/v solution of Ninhydrin in n-butanol. A little of this 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 with it, then boil for 1 min and cool under tap water. Add 5 drops of 1% sodium nitrite.

Test for resins

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

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.

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 an aq. extract of Sugarcane powder.

Test for flavonoids:

Shinoda's test: To 0.5 ml of alcoholic extract of sugarcane powder, added 5-10 drops of concentrate HCl followed by small 0.5g of 'Mg' metal.

Alkaline reagent test: To the test solution added sodium hydroxide solution.

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.

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.

Test for tannins:

Ferric chloride test: To 1 – 2 ml of extract of Sugarcane powder, added few drops of 5% FeCl₃ solutions.

Test for quinones

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

Test for phenolic compounds

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

Composition of developed formulation

Sr. No.	Ingredients	Quantity taken for 30g gel		
		F ₁	F ₂	F ₃
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.2: Composition of developed formulation

METHOD OF PREPARATION**1. Collection**

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

2. Preparation of extract

Leaves of neem, rhizomes of turmeric, leaves of tulsi, were kept in hot air oven for the purpose at 45°C temperature and grinded into small pieces to make powder with the help of grinder.

Preparation of neem and tulsi extract:-

- Desired quantities of herbal drugs were weighed and each herb macerated with ethanol in conical flask.
- 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 were collected in vessels separately²⁹.

Preparation of turmeric extract:-

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

Preparation of aloe vera gel:-

Fresh aloe vera leaves collected and remove the gel manually. Gel was grinded into mixer to get homogeneous form.²⁶

Extraction of glycolic acid from sugarcane²⁷

1. Collection of sugarcane
2. It is washed to remove impurities
3. Pressing the cane to extract the juice

Isolation of glycolic acid from sugarcane juice

1. Add ethylene glycol to sugarcane juice
 2. Ethylene glycol act as catalyst for extraction of glycolic acid via an oxidation process
 3. 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.

3. Filtration

Filtration of extract was done by using simple filter paper and funnel for 2 times²⁹.

4. Evaporation

Evaporation process was done with the help of water bath. Filtrates were allowed to evaporate in evaporating pan at 60° temperature until the desired concentration of the extract was obtained²⁹.

5. Development of formulation

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

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

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

Step 3- Add carbopol in little quantity of alcohol, add aloe vera gel in the mixture and triturate well in pestle mortar.

Add the contents of steps 1, 2 into 3 with gentle continuous stirring in a pestle mortar. Add Rose water gradually till a semi solid consistency preparation was not formed²⁶.

EVALUATION PARAMETER OF FACIAL SCRUB

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

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 the fragrance of perfume.

C) Consistency - The consistency of the formulation and particles were used to check the texture and 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 scrub between the thumb and index finger.

2. Washability - This test was performed directly on skin, preparation applied on skin and wash with 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.

4. Viscosity - For Viscosity measurement, Brookfield viscometer "DV-I, LV-I, SPINDLE, USE" used and result observed as 505-705 cp at 20 rpm.

5. 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 filled in 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.

6. 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 effect²⁶.

7. 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 was kept 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).

L -Length of the glass (6.5 cm).

T -Time in 23sec³¹.

8. Patch test: Patch testing is well established method for diagnosing the hypersensitivity as well as to determine the potential of a specific substance to cause the allergic action on patient skin. In patch 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 days³¹.



Figure No.7: Day



Figure No.8: Day 3

9. Accelerated stability test:- Accelerated stability testing of prepared formulation was conducted for 2 most stable formulation at room temperature studied for 7 days³⁰.

10. Grittiness: The product was checked for the presence of any gritty particles by applying it on the skin³¹

RESULTS AND DISCUSSION:

Preliminary phytochemical screening of aqueous extract (Sugar cane) result :

Table No.3: Preliminary phytochemical screening of aqueous extract (Sugar cane)
Preliminary phytochemical screening of aqueous extract result

Sr.no	Name of experiments	Observations	Result
1	Alkaloids <ul style="list-style-type: none"> Mayer's test Hager's test Dragendorff's test 	White colour appear Light yellow colour appear Orange colour appear	Present Absent Present
2	Carbohydrate <ul style="list-style-type: none"> Anthrone's test Fehling's test Molish's test 	Green colour appear Brick-red colour appear Red-violet colour appear	Present Present present
3	Proteins <ul style="list-style-type: none"> Bieuret's test Millon's test Ninhydrin test 	Red colour appear Light red colour appear Purple colour appear	Present Present Present
4	Resins	Turbidity are seen	Present
5	Saponin test <ul style="list-style-type: none"> Foam test 	Honey comb like structure are formed	Present
6	Starch test	Redish colour appear	Absent
7	Tannin test <ul style="list-style-type: none"> Ferric chloride test Potassium dichromate test 	orange colour appear orange colour appear	Absent Absent
8	Phenolic compounds	Yellow colour appear	Absent

9	Flavonoids test <ul style="list-style-type: none"> Shinoda's test Alkaline reagent test 	Pink colour appear Yellowish colour appear	Present Present
10	Steroid test <ul style="list-style-type: none"> Salkowski's test 	Light yellow colour appear	Absent
11	Glycoside test <ul style="list-style-type: none"> Borntager's Test 	Reddish pink colour appear	present

Table No.4: Preliminary phytochemical screening of aqueous extract

Sr.No.	Name of experiments	Observations			
		Neem	Tulsi	Turmeric	Aloe vera
1	Alkaloids <ul style="list-style-type: none"> Mayer's test 	Positive	Negative	Positive	Positive
2	Carbohydrate <ul style="list-style-type: none"> Anthrone's test 	Positive	Negative	Negative	Positive
3	Proteins <ul style="list-style-type: none"> Millon's test 	Positive	Negative	Negative	Negative
5	Saponin test <ul style="list-style-type: none"> Foam test 	Negative	Negative	Positive	Positive
7	Tannin test <ul style="list-style-type: none"> Ferric chloride test 	Negative	Negative	Positive	Positive
8	Phenolic compounds	Positive	Positive	Positive	Positive
9	Flavonoids test <ul style="list-style-type: none"> Shinoda's test 	Positive	Negative	Positive	Positive
10	Steroid test <ul style="list-style-type: none"> Salkowski's test 	Positive	Negative	Negative	Positive
11	Glycoside test <ul style="list-style-type: none"> Borntager's Test 	Negative	Positive	Positive	Negative

Result of evaluations parameter

Table No.5: Result of evaluation parameter

Sr.no.	Parameters	Observation		
		F ₁	F ₂	F ₃
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	Washable
7	pH	7.7	7.6	7.4
8	Viscosity	505cp	655cp	705cp
9	Extrudability	Good	Easily extruded	Good
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

Formulation F₁, F₂, F₃ was tested using various evaluation parameters. Spreadability, viscosity and pH of F₂ formulation was found very good when compared to F₁ and F₃.

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

Sr.no.	Parameters	Observation of F ₂ 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	washable	Easily washable	washable
7	pH	7.4	7.6	7.3
8	Viscosity	505cp	550cp	530cp
9	Extrudability	Good	Easily extruded	Good
10	Spreadability	5.10 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

All the ingredients used in this poly herbal facial scrub are our food 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.

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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