

# FORULATION AND EVALUATION OF ANTIMICROBIAL HERABAL FACE WASH OF CYNODON DACTYLON

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**Abstract** - The aim of this work to formulate and evaluate an herbal antimicrobial facewash by using herbal cynodon Dactylon ethanolic extract and other ingredients such as guar gum, methyl paraben, propyl paraben, triethanolamine, polyethylene glycol, sodium lauryl sulphate, rose oil, etc. ethanolic extract gives by a extraction process. In our formulation cynodon dactylon ethanolic extract is a antimicrobial agent, gur gum as a gelling agent, methyl paraben and propyl paraben as a preservative, polyethylene glycol as a humectant, SLS as surfactant, Triethanolamine as emulsifier and rose oil as a flavouring agent through to make a herbal antimicrobial formulation. Thus have been describe in literature having good antimicrobial activity.

**Keywords** -Herbal facewash, Antimicrobial activity, Formulation, Evaluation.

## I. INTRODUCTION

### 1.1 skin care preparations :

Over time, the number of skin care products has increased dramatically. A variety of skin care products are used by people, including mouthwash, lipsticks, and from foot powders to face creams, among other products, the a desire to grow a pleasant personality, safeguarding their body and preventing odour. Preparations for skin care are defined as items that can be massaged, poured, sprinkled, or sprayed on, into, or in any other way affecting human body or any portion of the body, for cleansing, enhancing attractiveness or changing the skin's look. The use of numerous herbs in cosmetic preparations, such as amla and haldi, is described in Ayu rveda. European women in the seventeenth century whitened their skin using without being aware of the dangers they posed, lead carbonates they were killing themselves, and many of them perished from lead food poisoning.

### 1.2 skin care preparations for face wash:

- Cleansing creams and lotions
- Compact powders
- Rouges
- Face packs and masks
- Face washes

### 1.3 face wash:

a) Defination -Face wash is a type of facial care treatment that cleans the skin by removing oil, grime, makeup, dead skin cells, and other impurities. Additionally, it maintains your skin clean and fresh. It works well as a daily skin care regimen for clear, imperfection-free skin. Face wash is typically used instead of soap because it has numerous advantages that soap does not. They are less abrasive than soap and won't dry out. In actuality, the majority of face wash solutions create foam, exactly like soap, leaving you feeling clean and revived. Face wash foam helps to remove oil and

### b) Face wash varieties-

1. A face wash with cream
2. A face cleanser with gel.
3. Face wash with a liquid basis
4. Powder-based face wash

### c) type Face wash -

While a face wash typically works for all skin types, there are currently a variety of products available. that are available and designed to fit various skin types include: a facial wash for oily skin is designed for persons with oily skin issues, contains no oils, and leaves a thin oily film on the skin. on the skin, a film. There are numerous varieties of face washes on the market.

1. Face wash for oily skin
2. Face wash for dry skin
3. Regular face wash
3. Normal skin face wash

### d) Advantage of face wash -

- Cleanses the face.
- Hydrates the skin.
- Slows down signs of premature aging.
- Treats acne.
- Stimulates blood circulation.
- Helps other product to penetrate properly into the skin.

•Deals with multiple skin issues.

e)Uses of face wash-

- Face wash is a facial care cosmetic used to cleanse the skin.
- Used to improve skin pigmentation.
- Used to nourish the skin to make it bright.
- Used to improve the skin shining.
- Anti-aging
- Helps plug the pores clear.

f) Agents use in face wash-

1. Therapeutic agents use in face wash  
**Anti-inflammatory** It is a characteristic of a drug or treatment that lessens swelling or inflammation. Analgesics, which relieve pain, contain around 50% anti-inflammatory medicines. Rather of using opioids, decreasing inflammation reduces pain. which have a central nervous system-altering effect to prevent discomfort communication with the brain.  
**Antimicrobial** -An antibiotic is a substance that prevents the growth and reproduction of bacteria, according to the broadest definition. While both antimicrobials and antibiotics assault microorganisms, these expressions have developed throughout years might refer to two different concepts. antibiotics are currently most frequently described as tools needed to surfaces with disinfectant and get rid of possibly dangerous organisms.

**Anti-acne** -A skin condition known as acne causes an outbreak of zits or pimple-like blemishes. The most typical manifestation of the illness in teenagers is dubbed vulgar acne. Anti-acne medication is the prescription drugs to treat acne, blackheads, and whiteheads, as well as more serious lesions that occur in teenagers with acne

2. Additives used in face wash

**Antioxidants**

are chemicals, either manmade or natural, that may stop or postpone various types of cell damage. Many foods contain antioxidants, including vegetables and fruits. They can also be found as nutritional supplement Examples; Lycopene, Vitamin A, Vitamin C, Vitamin Preservative

Preservatives are primarily used to make foods safer by reducing the impact of biological ageing factors. The biggest risk to customers is that their food will decay or turn hazardous due to the presence of microorganisms (such as bacteria, yeast, or mould). Toxic compounds (sometimes known as "toxins"), which some of these creatures are capable of secreting and which are harmful to human health and even lethal, can be released. Examples include propyl and methyl parabens.

**Humectants**

The antithesis of a desiccant, humectants are hygroscopic substances that are employed to maintain moisture in objects. It is frequently a molecule having many hydrophilic groups, most frequently hydroxyl groups; although, amines and carboxyl groups, occasionally esterified, can also be found (its propensity to make hydrogen bonds with water molecules being the key characteristic). They are an ingredient in a variety of goods, including as food, cosmetics, pharmaceuticals, and insecticides.

The humectants bring water vapour into and/or beneath the surface of the organism or object by absorption, attracting and holding onto the moisture in the air surrounding. Hexylene glycol, butylene glycol, and propylene glycol are among examples.

**Gelling agent**

Gelling agents are substances that can transform an oil or water phase into a thicker yet flexible gel. thickened emulsions with gelling agents will be less rigid and more fluid and mobile. With force, some of these gels will thin. (thixotropic), and when the force is removed, removed. These gels enable the creation of thick goods that can be stirred or shaken at rapid speeds shear, to make bottling or spraying easier. Examples include gaur gum

**foaming substance**

A foaming agent is a substance like a surfactant or a blowing agent that promotes the creation of foam. agent. Small amounts of a surfactant can lower a liquid's surface tension (lessen the effort required to produce foam) or raise the colloidal stability of a substance by preventing bubbles from coalescing. A blowing agent is a gas that creates the foam's gaseous component.

G). Using herbs in face washes

a) Benefits of using natural cosmetics over synthetic ones natural colours made from herbs are available. The most recent fashion and beauty trend is herbal cosmetics. Since natural products provide the body with nutrients, improve health, and provide satisfaction because they are free from synthetic chemicals and have comparatively fewer side effects than synthetic cosmetics, most women choose natural products over chemicals for their personal care to enhance their beauty. The following are some benefits of utilising natural cosmetics that make them preferable to synthetic ones

1. Suitable for all types of skin
2. wide selection to choose from
3. Fits your budget
4. not tested on animal
5. No side effect

b) *Cynodon Dactylon* (Bermuda Grass)

A perennial grass called *Cynodon dactylon* is one of the most prevalent weeds in India. It is referred to as dhub, doob, or harialil often; other Common names are garikoihallu and durba (Bengali). (Marathi), durva, or haritali are all possible. Sanskrit, Tamil, Telugu, and Arugampullu (garikagoddi) as well as dhubhabbal (Punjabi). It is a hardy perennial. grass is found everywhere in the world, but it is very native to tropical and warm temperate climates. It is a strong, drought-resistant creeping grass. Light green in hue, rough in texture, and swift growing. Short cylindrical fragments of it are found in about 3 to 20 mm long and 2 to 3 or occasionally 4 mm in size diameter. India's traditional medicine, *Cynodon dactylon*, is well known for its effectiveness in treating minor ailments. Having a variety of antibacterial, anti-inflammatory, and anti-acne properties as well.

Taxonomical Classification of *Cynodon Dactylon*

- Kingdom – Plantae
- Division – Magnoliophyta
- Class – Liliopsida

- Order – Cyperales
- Family – Poaceae
- Genus – Cynodon
- Species – Cynodon dactyl

1.chemical constituents

Cynodon dactylon plant extract contain chemical constituents like flavonoids, glycoside sugars, sterols, steroidal saponins, phenols, alkaloids, tannins, proteins, carbohydrate and amino acid having different biological activity.

2. Drug Profile of herbal face wash

a)herbal remedies

Cynodon Dactylon (Bermuda Grass)



Fig.No.1 Cynodon Dactylon

Synonym: Bermuda grass, hariali, dhurva.

Biological source : Cynodon dactylon.

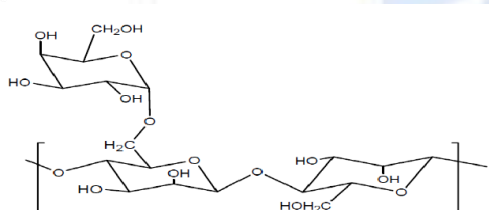
Family: Poaceae.

Use : Antimicrobial, Anti-inflammatory, Analgesic, Antioxidant, Antiseptic, Anti-acne

b)Excipient Profile

1.Guar Gum

structure-



IUPAC name : CYAMOPSIS TETRAGONOLOBUS (L.)

Other names : luster bean, guar and guaran

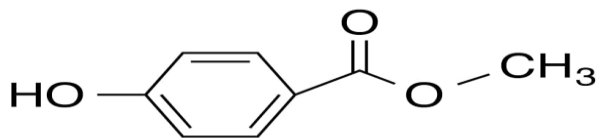
Chemical formula : C<sub>10</sub>H<sub>14</sub>N<sub>5</sub>Na<sub>2</sub>O<sub>12</sub>P<sub>3</sub>

Molar mass : 50,000-8,000,000

Uses: Improve product glide by lubricating the skin. Stop water loss. Avoid losing any additional liquid from a gel formulation (a process known as "syneresis"). Make solid particles float prolong the product's shelf life. For greater elasticity, condition your hair and skin.

2.Methyl paraben

Structure :



IUPAC name : Methyl 4hydroxybenzoate

Other names : Methyl paraben

Chemical Formula : C<sub>8</sub>H<sub>8</sub>O<sub>3</sub>

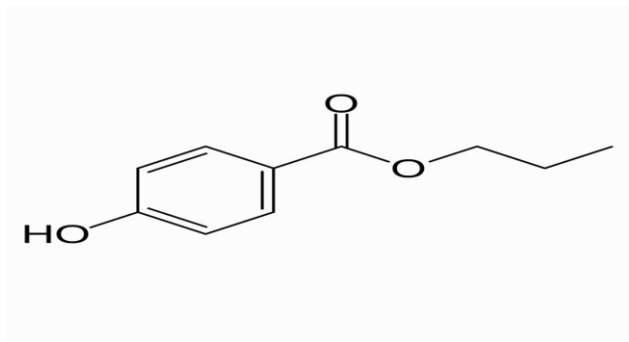
Molar mass : 152.15 g·mol<sup>-1</sup>

Uses : Methyl paraben is an antifungal agent often used in a variety of cosmetics and personal care products. It is also used as a food preservative. Methyl paraben is commonly used as a fungicide in Drosophila food media.

3.Propyl paraben

Structure:





IUPAC name : propyl 4hydroxybenzoate..

Other names : 4Hydroxybenzoësäurepropylester;

Chemical formula : C<sub>10</sub>H<sub>12</sub>O<sub>3</sub>

Molar mass : 180.2 g/mol

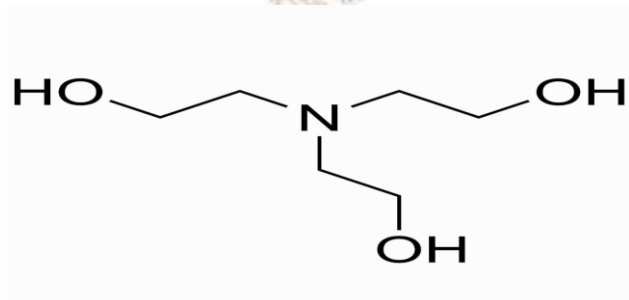
Density : 1.0630 g / cm<sup>3</sup>

Melting Point : 96 to 99 °C ( 205 to 210 °F; 369 to 372 K )

Use : In cosmetics, pharmaceuticals and foods.

4. Triethanolamine

Structure :



IUPAC Name : Tris (2hydroxyethyl) Amine

Other Names : Triethylolamine

Chemical Formula : C<sub>6</sub>H<sub>15</sub>N<sub>3</sub>O<sub>3</sub>

Molar Mass : 149.19 g·mol<sup>-1</sup>

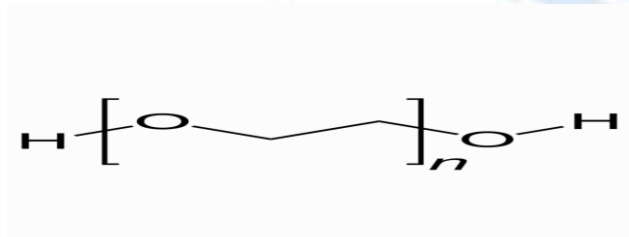
Density : 1.124 g mL<sup>-1</sup>

Melting Point : 21.60 °C; 70.88 °F; 294.75 K

Use :Triethanolamine is used primarily as an emulsifier and surfactant. It is a common ingredient in formulations used for both industrial and consumer products. The triethanolamine neutralizes fatty acids, adjusts and buffers the pH, and solubilises oils and other ingredients that are not completely soluble in water.

5.Polyethylene glycol

Structure:



IUPAC Name: poly(ethylene oxide)

Other Name :Polyoxyethylene(POE)

Chemical formula:C<sub>2n</sub>H<sub>4n</sub>O<sub>n+1</sub>

Molar mass:44.05n+18.02g/mol

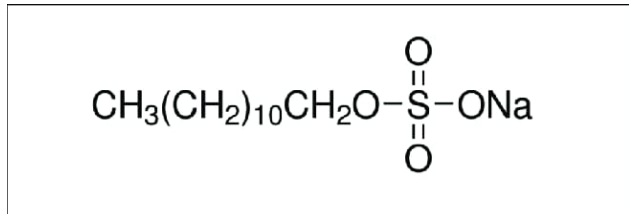
Density:1.125

Melting point:5.8 and 62°C

Use: Polyethylene glycol is a medication that is used in the treatment of constipation. It is the laxative class of drugs. This activity describes the indications, action, and contraindications for polyethylene glycol as a valuable agent in the treatment of constipation.

6. Sodium lauryl sulphate

Structure :



IUPAC Name : Sodium lauryl sulfate

Other Names : Sodium monododecyl sulfate

Chemical Formula : NaC12H25SO4

Molar Mass : 288.372 g/mol

Density : 1.01 g/ cm3

Melting point : 206 °C (403 °F; 479 K)

Use : SLS is mainly used in detergents for laundry with many cleaning applications.SLS is a highly effective surfactant and is used in any task requiring the removal of oily stains and residues

II. FORMULATION OF HARBAL FACE WASH-

- in our formulation we have selected active agent like bermuda grass ethanolic extract to achive antibacterial activity. In our formulation we have to use gaur gumwas used as a gelling agent .methyl and propyl paraben which as used as a preservatives triethanolamine was used as good stability agent .polyetylene glycol which gives emollient effect on skin. sodium lauryl sulphate which gives a good foam in formulation.processing of plant
- 1.the leaves are wash in running water and cut into small parts to facilitate drying.
- 2.the pieces of plant matrial which dried for 12hrs in a hot air oven.
- 3.the plant material or leaves which are grounded using a electric blender to give a fine powder.
- 4.the powder are passed through a 2mm sieve to give a finer particles. the powder sample was store in a clean glassware container until needed for analysis.

III. EXTRACTION OF PLANT

- 1.500mg of powdered plant material which separately dispensed in 1000ml of eachwater and solvent used
- 2.the powder plant material which deffate with petroleum etherfor 24hrs 20 c and extracted with chloroform,ehanol and methanol in the soxhlet apparatus for 72hrs at 40 c respectively.
- 3.the thick mass which obtain by evaporate the solvent under room temperaure .
- 4.it transfer a gummy concentrates of chocolate black colour. the gummy concentrate which designated as a crude extract.
- 5.the extract obtained which used for the phytochemical screening.

1]detection of alkaloids

a) wagners test filtrates were treated with wagner`s reagent [iodine in potassium iodide].and observed .formation of brown or reddish brown precipitate indicated the presence of alkaloids .

2]detection of flavonoids

a]lead acetate tast the extract were treated withfew drops of 10 lead acetate solution .the formation of yellow precipitate confirmed the presence of flavonoids.

a]froth`s test

3]detection of saponins the extract[alcoholic and aqueous ]were diluted with 20ml of distilled water separately and further shaken for 15min in a graduated cylinder . a layer of foam measuring about 1cm was formed which indicated the presence of saponins.

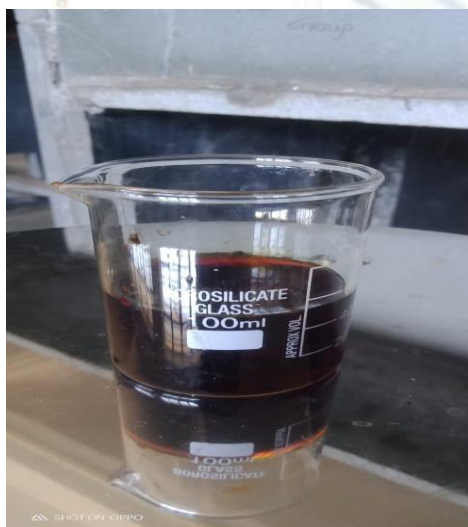


fig no.2-wagner test

Fig no.3-Lead acetate

Fig no.4-Froth`s test

Sr	Name of ingredients	Property
1	Ethanolic extract of Cynodon dactylon	Antibacterial
2	Gaur Gum	Gelling Agent
3	Methyl Paraben	Preservative
4	Propyl paraben	Preservative
5	Triethanolamine	Neutralizer
6	Polyethylene glycol	Humectants
7	Sodium lauryl sulphate	Foaming agent
8	Distilled water	Vehicle
9	Rose water	Flavouring agent

preparation of face wash-

1. gaur gum was dissolved in distilled water and beaker kept aside to swell the gaur gum to form gel.
2. Take distilld water and required quantity of propyl paraben and methyl paraben and dissolved by heating water bath and solution was cooled then PEG 400 and SLS was added as a surfactant agent.
3. then add required quantity of extract and mixed to the above mixture and add this solution into gaur gum with continuously stirring then add triethanolamine dropwise for adjustment of requird skin PH and obtain the gel at required consistency

Sr	Name of ingredients	F1	F2	F3
1	Ethanolic extract of Cynodon dactylon	0.03 gm	0.03 gm	0.03 gm
2	Gaur gum	0.05 gm	0.7 gm	1 gm
3	Methyl paraben	0.03 gm	0.03 gm	0.03 gm
4	Propyl paraben	0.03 gm	0.03 gm	0.03 gm
5	Triethanolamine	Q.s .	Q.s	Q.s
6	Polyethylene glycol	0.5 ml	1 ml	1 ml
7	Sodium lauryl sulphate	1 gm	0.05 gm	0.03 gm
8	Distilled water	Q.s to 3 ml	Q.s to 3 ml	Q.s to 3 ml
9	Rose water	1 ml	1ml	1 ml

Placebo batch-



IV. Result:- Therefore three different batches of Cynodon dactylon were prepared having varing concentrations. Of the three batches F3 batch showed optimized results for the properties of gel and evaluation parameters were evaluated for the F3.

#### V. EVALUATION PARAMETER

face wash was prepared and following evaluation test was performed

1. colour : colour of face wash was checked by visually.
2. odour : odour was checked by smellig it.
3. Consistency: consistency was determined by manually.
4. PH: PH of the formulation was determined by using caliberated digital PH meter at const temperature.
5. foamability: small amount of gel was taken in to beaker containing water then initial volume of solution was marked and beaker was shaken for 10 times and final volume was noted.
6. viscosity; the formulated sample which taken in the beaker and checked on digital viscometer and then obsevation will be recorded .
7. washability; when the formulation will be applied on the skin and then easy and extent of washing with water was checked .
8. spreadability;the spreadability which determine by using spreadability testing apparatus.phytochemicals tests of ethanolic extract of cynodon dactylon.Spreadability was then calculated by using formula

$$S = M \times L/T = 20 \times 11/65 = 3.38 \text{ gm.cm / sec}$$

Where, S = is spreadability.

L = length moved by glass slide.

M = weight in the pan.

T= time taken to separate the slide com pletely from each other





Fig No- 5 Washability



Fig No- 6 Foamability



Fig No - 7 Spreadability Apparatus



Fig No – 7 Brookfield viscometer

## VI. CONCLUSIONS

Using gaur gum as a gelling agent, a herbal face wash gel containing Cynodon dactylon extract was effectively created. a total of three batches formulated, batch F3 exhibits superior performance. for the gel's creation. Tests of evaluation were conducted. hue, consistency, pH, and other factors for batch F3 It demonstrated spreadability, washability, and foamability cogent outcomes. According to the studies, it was it was determined that the produced formulation can used successfully for facial care.

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