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FORMULATION AND EVALUATION OF ANTI ACNE HERBAL GEL CONTAINING OF ETHANOLIC EXTRACT OFAZADIRACHITA INDICA AND BOUGAINVILLEA GLABRA LEAVES

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ABSTRACT
Pimples, acne, marks and pigmentation are issue that affected every indivual at least once during life time. Consumers are start to search a product that can cure the skin issue and grant them with a good andhealthy skin such as a anti-acne gel. Most of anti-acne gels are available in market contain lots of chemical that may have some kinds of side effect to the consumer. The present study was conducted to formulate and evaluate the anti-acne herbal gel containing azadirachita indica and bougainvillea glabra extract. **Aim:** Formulation and evaluation of anti acne gel for the treatment of acne vulagaris using herbalplants. **Need:** Now a days people are used various types of synthetic gel products, but due to use of chemicalvarious problems are occurs such as acne, pigmentation, tanning, blackheads, whiteheads problem associated with face. To overcome this problem, we can use herbal gel products which are helpful to reduce acne reduction, used as antiseptic, antimicrobial and protectans. The herbal gel made by combining azadirachta indica and bougainvillea glabra. Although gel minicures can be beautiful and long lasting, they can be tough on nails. Gel manicures can cause nail brittleness, peeling and cracking, and repeated use can increase the risk for skin cancer and premature skin aging on the hands. **Objectives:** 1. Benefits of gel-based products. 2. Makes the skin feel fresh. Who doesn't love that refreshing feeling of washing the face. 3. Hydrates the skin. Dehydrated skin is skin that lacks nourishment. 4. Leaves the skin feeling plump. 5. Soothes the skin. 6. Great for summers. 7. Doesn't slip off. 8. Works for sensitive skin. **Conclusion**: Demand for herbal formulations is rising globally. An excellent attempt has been made to create a herbal gel with an aqueous extract of bougainvillea glabra and azadirachta indica, also known as neem. The plant is said to have good antibacterial, anti-inflammatory, anti- microbial, refreshing, and cleansing properties. Its formulations (F1, F2, and F3) are made with varying concentrations of extract and evaluated based on a number of parameters, including color, appearance, consistency, washability, spredibility, excrudability, and skin irritation. The resultsare compared with commercial formulations. Following an evaluation research, both formulations demonstrate positive effects when compared to commercial formulations; neither formulation exhibits any negative or side effects. All diseases benefit from natural remedies. On the worldwide market, herbal formulas are highly sought after. Herbal medicines are believed to be safer than allopathic ones. Considering evaluation standards including extrudability, spreadability, pH, and physical attractiveness, The anti-acne efficacy and medication content of each formulation were optimized. After evaluation, this study concludes that formulation batch F1, or the gel that combined the two extracts, was noticeably better than formulations F1 and F2. It is safe and effective to use azadirachta indica and bougainvillea glabra gel as a topical preparation for acnetreatment, we may infer.

KEYWORD: Azadirachita Indica, Bougainvellia Glabra, Anti-bacterial,Anti-fungal, Anti-inflammatory, Anti-0xidant, Treating skin infection, Wound healing.

INTORDUCTION
Acne is mostly to blame for reducing self-assurance and confidence, which over time makes a person more vulnerable both socially and psychologically. In truth, acne is a complex, long-lasting inflammatory ailment that a pilosebaceous duct that contains closed and open non-inflammatory expanded pores together with inflammatory papules, pustules, nodules, and cysts. The

face, back, chest,and arms had the highest concentration of pilosebaceous unit lesions. Around 85% of the population suffers from acne, a dermatological condition that is most common in teens and adults. Acne has a complex etiology that includes disruption of sebaceous follicles, excessive sebum production from sebaceous glands brought on by hormonal stimulation, and the proliferation of proinflammatory mediators and chemotactic proteins of Propionibacterium acnes, responsible for inflammation, later cause follicle breakups and inflammation progression in the dermis.

Acne is thought to be caused by the fast growth of the bacteria Propionibacterium acnes, Staphylococcusaureus, and Staphylococcus epidermidis. The side effects of the drug it is currently taking include skin peeling, redness, stinging, dryness, and itching and sun sensitivity, which includes retinoid creams, topical/oral antibiotics, salicylic acid, benzoyl peroxide, low-dose contraceptives, azelaic acid, and isotretinoin. Isotretinoin is known to cause serious birth abnormalities. Topical therapy is recommended as the first line of treatment for mild acne, whereas systemic medication is preferable for moderate to severe cases. Sebum can build up inside the clogged pores due to oil and dead skin cells, which can result in acne, an inflammatory skin disorder. It is a persistent skin ailment that arises from clogged hair sacs caused by dead skin cells. The disorder is commonly referred to as acne vulgarism. The range of ages of Patients with this condition range in age from 16 to 25. Adolescence is a frequent time for minor acne, but severe cases can look unsightly and leave scars long after treatment. In practical terms, there are three types of acne symptoms: mild, moderate, and severe.

There are two primary elements that impact acne.
Genetics Hormone.[1]
Gels In Pharmaceuticals are Homogeneous, Semisolid preparations usually consisting ofsolutions or dispersion ofone or more medicaments in suitable hydrophobic and hydrophilic bases. Pimples may happen when the sebaceous organs associated with pores liable for moving dead cells to the surface space of the skin get hindered. This blockade usually results in bacterial colonization and attack on the sebum, resulting in whiteheads, blackheads, and finally, inflammation and scars when the body's mechanism tries to fight back. *Propionibacterium acnes* assume significant parts concerning inflammatory acne and shallow disease by utilizing sebaceous fatty substances into unsaturated fats, to which neutrophils are pulled in Medicinal plants have the advantages of patient tolerance and wide acceptability. For example, *Azadirachta indica* and *Bougainvellia Glabra* have been folk lorically used as anti acne agents and also have antimicrobial, anti-inflammatory, and antioxidant activities that significantly treat skin infections. They are additionally known to have nutrients and minerals to improvethe general strength of the skin. Acne accounted for 5.3% of all skin diagnoses reported, and acne vulgaris was the second most common by gender.[2]

Fig. 01: Plant of Azadirachta Indica.

Fig. 02: Plant of Boigainvellia Glabras.

MATERIAL AND METHODS

Material:- Neem[3], Bougnvillieaglabra, Carbapol, Propyleneglycol, Glycerine, Triethanolamine, Propyl Parabean, Methyl Parabean, Distiiled Water.

METHODS

Collection of material:- Neem leaves and bougnvilliea glabra leaves were collected from local region ofatapadi sangali, Maharashtra.

Extraction of plant material used in preparation of gel.

A) Extraction of Azadirachta Indica

1. The fresh leaves of Bougainvillea glabra plantis collected.
2. Then leaves are dried in shadow.
3. Then accurately weight the leaves & take 47 gm of leaves powder.
4. The leaves powder are filled in a Thimble of soxhlete apparatus.
5. Then add 180ml of ethanol.
6. Set the assembly of extraction.
7. Extraction process is continued at 80°c to 90°ctemp.
8. Extraction process is cntinued up to 4 to 6 Cycles completed.
9. Then extract is collected in a beaker.
10. Extract is kept forever evaporation.
11. After evaporation of extract semi solid mass is formed.
12. Then semi-solid mass is filled in a container.[4]

Fig:-03 extraxtion of Azadirchita Indica.

B) Extraction of Bougainvellia Glabra

1. The fresh Leaves of neem (Azar- dirachta indica) plant is collected
2. then leaves are a dried in shadow
3. After drying of leaves weight accurately 60 gm of leaves of neem.
4. then leaves are filled in thimble of soxhlet apparatus.
5. Then add 200ml of Alcohol as a Solvent.
6. Set the assembly of the extraction. The Extraction process is continued at 80°c to 90°c temp.
7. Extraction process is continued up to 5 to 6 cycle of this process.
8. Then extract is collected and measure the weight of the extract (114).
9. After that extract is kept for evaporation.
10. After evaporation of extract semisolid mass is formed. 11. This semisolid mass is taken in a container.[5]

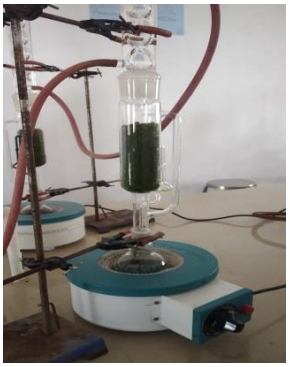

Fig:-04 Extraction of Bougainvellia Glabra.

FORMULATION OF HERBAL GEL

Table no:-01.

Sr.no.	Ingredient	F1 (gm)	F2(gm)	F3(gm)
1.	AzadirachitaIndica	0.50	0.25	0.75
2.	BougainvilleaGlabra	0.50	0.75	0.25
3.	Carbopol 940	0.12	0.25	0.37S
4.	Propylene glycol	1.25	2.5	3.7
5.	Metyl parabean	0.05	0.05	0.05
6.	Propyl parabean	0.025	0.025	0.025
7.	Glycerine	0.25	0.25	0.25
8.	Triethanolamine	Q.S	Q.S	Q.S
9.	Rose water	Q.S	Q.S	Q.S
10.	Dist.water	25ml	25ml	25ml

METHOD OF PREPARATION

1. Accurate weighed carbapol 934 was taken in a beaker & dispersed in Distilled water.(15ml)
2. Kept the beaker a side to swell the carbapol for half an hour & then stirring should be done using mechanical / lab Stirrer at 1200rpm for 30 min.
3. Take Propylene glycol in another beaker & add weighed quantity of propyl parabean & methyl parabean and required quantity of extract & stirred property.
4. After all Carbopol dispersed & preservative solution were added with Constant stirring.
5. Finally volume made upto 25 ml by adding remaining dist. H20 ← triethanolamine was added dropcwise to the formulation gel at required consistency.

Fig. 05: Formulation of herbal gel.

EVALUATION OF HERBAL GEL

The prepared herbal gel were evaluated using a range of parametric in accordance wuth conventionalprotocols.

1. Physical evaluation

Checks were made for physical characteristics like color, look, consistency, and feel.Color: The formulations' hues were examined in comparison to a white background. Consistency: The application on skin was used to verify the consistency.

Greasiness: The skin's greasiness was evaluated through application.

Odor: The gels' smell was assessed by dissolving the gel in water and inhaling the fumes.

2. Determination of pH

A digital pH meter was utilized to ascertain the formulation's pH level. After being dissolved in 100 milliliters of demineralized water, one gram of gel was kept for two hours. The three separate measurements of the formulation's pH were made. Prior to usage, the instrument was calibrated usingstandard buffer solutions at pH 4, 7, and 9.

3. Spreadability: Spreadability is a term used to describe how much of an area gel easily distributes when applied to skin or other affected areas. The spreading value of a formulation affects its medicinal efficacy as well. Spreadability is measured in terms of the number of seconds it takes for two slides separated by gel to separate under a specific force applied in between them.

4. Viscosity study

A Brookfield digital viscometer was used to measure the produced gel's viscosity. Spindle number 64was utilized to measure the viscosity at 250C and 10 rpm. The gel was de-aired prior to measurement, and it was then put into the proper wide-mouth container. Prior to measurements, the gel samples wereallowed to settle for 30 minutes at the assay temperature, which is 25 ± 10C.

S = M. L / T is the formula used to compute it.

The variables M and T represent the weight attached to the upper slide, L and T respectively, and the length of the glass slides. Using a modified agar well diffusion method, the antibacterial activity of several formulations was assessed. Using this technique, 0.2 cc of a 24-hour broth culture of P. acnes was used to seed nutrient agar plates. For one hour, the plates were left to dry. Four equal-distance wells were cut into each plate using a sterile 8 mm borer, and 0.5 ml of marketed herbal formulation solutions were inserted into each well at random. The plates underwent a 24-hour incubation period at 370°C. The diameter of the inhibitory zones (measured in millimeters) was used to assess the antibacterial activity. The trials were conducted four times.[6]

6. Washability

After applying formulations to the skin, the degree and ease of water washing were manually assessed.

7. Stability Study

The prepared gel formulation batch (F1,F2,F3) is kept for 1 week at defferent temperature (20,40,60^{0}C). Then observed for 1 week.

8. Skin irritation Test

The gel prepration (0.25 gm) applied on dorsal side of both hands for 60 min and observe changes in skin colour, rashres, skin irritation, and skin readness.[8]

RESULT AND DISCUSSION

In order to determine antibacterial activity of the herbal gel, the current study was conducted to formulate and assess a herbal antibacterial gel employing ethanolic extract. A range of physical evaluation factors, including physical characterstics, Ph, spredibility, viscocity, and further stabilitystudies, were applied to the formulation. The following are the outcomes of the same.

1. Phytochemical Test (Neem)[9]

Table no. 02.

test	observation	Inferance
1.Test for alkaloids:a)Dragandroffs test: 2ml of sample was treted withdragandroff reagent b)Hagger's test: 2ml ofsample + std. solutionof picric acid	Red ppt. Yellow ppt	positive positive
2.Test for tannins: 0.5gm sample+ few drops offecl3 solution	Bluish green colour	positive
3. Test for saponin: 5ml of sample+ 3ml dist. water and shake for 5min.	Froth formation	positive
4. Test for steroids: 4ml sample + 2ml acetic acid then allow the solution to cool in refrigerator followed by theaddition of	Violet to bluish green	positive

conc. H2SO4		
5.Test for flavonoids: 2.5ml of dil. amonia solutionwere added to part of the crude extract followed by addition of conc. H2SO4	Yellow colour appear	positive
6.Test for terpenoids: Extract + CHCl3 + conc.H2SO4	Golden yellow colour	positive

2. phytochemical test (Bougainvillea glabbra)

Table no. 03.

Test	observation	inferance
1.Test for alkaloids: 0.5ml of plant extract wastaken and then add 0.5 ml saturated solution of picric acid (Hagger's reagent) wasadded	Yellow colour appear	postive
2.Test for phenol: 2ml filtrate+ few drops of 10percent fecl3 solution added.	Brown colour appear	positive
3.Test for steroids: 2ml chloroform + extract +few drops conc. H2SO4 solution + acetic acid	Greenish colour	positive
4.Test for flavonoids: 2.5ml of dil. ammonia solutionwere added to part of the crude extract followed by addition of conc. H2SO4	Yellow colour appear	positive
5.Test for glycoside: 5ml of extract +0.3 ml fellingsolution A and B was added until it turn to alkaline indicating the presence of gylcoside	Alkaline solution	positive

3. Physical Properties

The physical properties and all formulated gel were judged by it's colour, odour and it's texture. Tableno. physical properties of gel.

Table no:-04.

Test	F1	F2	F3
Colour	green	green	green
Odour	pleasent	pleasent	pleasent
Appearance	smooth	smooth	smooth

4. pH of gel

The result of Ph of prepaed gel was found to be around 7 which are suitable for topical application. Table no:-05 pH of gel.

Sr.no.	formulation	pH
1.	F1	6.8
2.	F2	7.3
3.	F3	7.2

5. Irritation test

Table no:-06 irritation test.

Test	F1	F2	F3
Irritation test	No irritation	No irritation	No irritation

6. Wash Ability

Table no. 07: wash ability.

parameter	F1	F2	F3
Wash ability	Esily wash	Esily wash	Esily wash

7. Stability test for F1.

Table no:-08

Test	At 20	At 40	At 60
Physical appearance	semisolid	semisolid	senisolid
Texture	ok	ok	ok
colour	green	green	green
odour	ok	ok	ok
pH	6.8	6.8	6.8
Degradation of product	nil	nil	nil

For F2: Table no:-09.

Test	At 20	At 40	At 60
Physical appearance	semisolid	semisolid	senisolid
Texture	ok	ok	ok
colour	green	green	green
odour	ok	ok	ok
pH	7.3	7.3	7.3
Degradation of product	nil	nil	nil

For F3: Table no:-10.

Test	At 20	At 40	At 60
Physical appearance	semisolid	semisolid	senisolid
Texture	ok	ok	ok
colour	green	green	green
odour	ok	ok	ok
pH	7.2	7.2	7.2
Degradation of product	nil	nil	nil

8. Anti-microbial Activity

The herbal gel shows good antibacterial activity. The prepared herbal gel kill the bacteria which are grow in culture media. The study investigated antibacterial properties of Azadirachita Indica and bougainvillea glabra plants aginst Staphylococcus aureus. Results showed strong antibacretial activity, with extract showing significant resistant. Culture media were prepared using cup agar diffusion and disc diffusion methods. Staphylococcous aureus grew within five to seven days, and the ehanol extract, at a dosage of 1gm /ml, produced and inhibitory zone 25.9 + or -. The study concluded that Azadirachita indica and Boungainvillea glabra have potent antibacterial properties.[10]

Fig. 06: Antibacterial activity of herbal gel.

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