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Research Article

Formulation And Evaluation Of Harbal Gel For Acne, By Using *Melaluca Alternifolia* Oil And *Lavedula Angustifolia* Oil

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ABSTRACT

"Acne" is a Greek word of acne which means "Prime of life." Acne is also called as acne vulgaris. It is caused due to aerobic bacterium "Propionibacterium acne.'' Tea Tree is known as aromatic medicinal herb since ancient time. Tea tree oil has several benefits and is consider one of the most effective in acne treatment and Lavender is also used to reduce acne and kill bacteria. Lavender preparation can be used as adjunct for treatment of acne and inflammation in the skin. The terpinene-4-ol contained in tea tree oil has broad-spectrum antimicrobial activity. Lavender oil contains linalool which also has antibacterial properties. So, they can be used for acne treatment. Herbal Antiacne gel are semisolid preparation was prepared by stirring method by using carbopol 940 as a gel base. The effectiveness of these product depends on the active ingredients. Herbal actiacne gel formulation showed satisfactory physical properties with smooth texture, good consistency, and can easily spread on infected part. It is concluded that Tea tree and Lavender has potential to developed a Gel for Acne. The zone of inhibition is seen on Streak plate method and the reading is compared with the standard. also anti-inflammatory activity are shows. The evaluation is done on the formulation. These studies suggest that composition of extract and base of Anti acne gel of F2 and F3 are more stable and safer and it may produce synergistic action.

INTRODUCTION

Herbs:

These are any crude plant material or product, like leaves, flowers, fruits, seeds, stems, wood, bark, roots, rhizomes, or other plant parts that may be entire, fragmented, or powdered.[1]

Herbal Medicines:

These are herbs, herbal materials, herbal preparations, and finished herbal products.[1]

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ACNE:

"Acne" is a Greek word of acne which means "Prime of life". Acne is a common inflammatory disorder which is common among the adolescent age groups. Even though it is not a life-threatening disease but it affects the patient's self-esteem. It is a chronic inflammatory disease. Acne is also called as acne vulgaris. It occurs on the parts like: face, neck, upper chest, upper back etc. It is caused due to aerobic bacterium "Propionibacterium acne'' which is a gram positive bacteria pathogenesis of acne. Acne vulgaris is a skin conditions that occurs when hair follicles are blocked with dead skin cells, bacteria, and oil.[2]

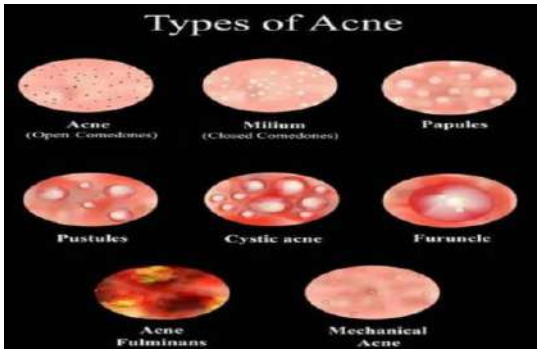

Fig.1. Types of Acne

SIGNS AND SYMPTOMS OF ACNE:

- It includes papules, nodules (large papules), seborrhea (increased oil-sebum secretion), comedones, pustules and scarring.
- The appearance of acne varies with skin color and it is also associated with psychological and social problems.
- Acne scars shows inflammation within the dermis and it is created by the wound healing resulting in collagen deposition at one spot.[3]

ADVANTAGES OF DRUGS THAT ARE USED IN ACNE:

- One of the naturally occurring compounds salicylic acid exfoliates the skin, destroys harmful microbes, and reduces inflammation.
- Topical retinoids help to get rid of acne scars. They reduce acne lesions, block inflammation expedite skin regeneration.
- Lactic acid helps to reduce the scars and make the overall skin texture smooth.

DISADVANTAGES OF DRUGS THAT ARE USED IN ACNE:

- Salicylic acid might cause allergic reactions in some hypersensitive persons.
- Retinoids may make skin sensitive to the sun, necessitating the use of sunscreen.
- The new cells on the skin formed drugs to the use of lactic acid, may skin sensitive to the sun moreover, this treatment may cause make skin irritation in some people.

TEA TREE:

- Tea tree oil, also known as melaleuca oil, is an essential oil with a fresh camphoraceous odour and a colour that ranges from pale yellow to nearly colourless and clear.
- It occurs in south east Queensland and the north coast and adjacent ranges of New South Wales, Australia where it grows along streams and on swamps flats, and is often the dominant species where it occurs.
- Tea tree oil is claimed as useful for treating dandruff, acne, lice, herpes, insect bites, scabies and skin fungal or bacterial infections.
- Melaleuca alternifolia is a small tree that can grow to about 7 m (20 ft) with a bushy crown and whitish, papery bark.
- Tea tree leaves are soaked to make an infusion to treat sore throats or skin ailments.
- Tea tree oil is an effective treatment for demodex mite infestation.
- Tea tree is commonly used in treatment for acne.[4]

LAVENDER PLANT:

- Lavender (Lavandula angustifolia Mill.), a shrub from the Lamiaceae family found on the shores of the Mediterranean Sea.
- L. angustifolia flowers are used to obtain valuable lavender oil (LAO) by distillation.

The plants cultivated in Poland had a higher amount of geraniol (5.3%).

- Antibacterial and antifungal properties have made LAO one of the most commonly used oils on the skin's surface in the treatment of acne, eczema and psoriasis.
- It also improves skin condition.
- Lavender oil has a bactericidal effect, even on some antibiotic-resistant microorganisms, which is essential in the case of long-term a acne treatment.[4]

WHY WE USE TEA TREE AND LEVENDER OIL FOR ACNE TREATMENT:

Because Tea tree oil and lavender oil found to have antimicrobial effects against Cutibacterium Acnes, a type of bacteria that is found in healthy normal skin, but one that's also known to be involved in the formation of acne. This is why tea tree oil and lavender oil has been shown to reduce acne, especially inflamed red bumps.

GELS:

Gels are mainly semi-solid formulations having a liquid phase that has been thickened with some other components. Topical gel preparation is used for the skin application or percutaneous penetration of medicaments or local action to certain mucosal surfaces.[5]

Properties of Gels: -

1. The gelling agent must be inert, safe and cannot react with other constituents.
2. The gelling agent should produce a functional solid-like nature at the time of storage which is easily broken when exposed to shear forces produced by squeezing the tube, trembling the bottle or at the time of topical application.
3. It should have appropriate anti-microbial agent.
4. The topical gel must not be gluey.
5. The ophthalmic gel must be sterilized.
6. The apparent viscosity or gel strength increase
7. They exhibit the mechanical features of the solid state.
8. There is high degree of attraction amongst the dispersed phase and water medium the gels remain equally distributed upon standing and doesn't freely settle.[5]

Uses of Gels: -

1. For topical drugs applied directly to the skin, mucous membrane or the eye.
2. As long acting forms of drug injected intramuscularly or implanted into the body.
3. As binders in tablet granulation, protective colloids in suspensions, thickeners in oral liquid and suppository bases.
4. In cosmetics like shampoos, fragrance products, dentifrices and skin and hair care preparations.
5. Lubricant for catheters.
6. Bases for patch testing.
7. NaCl gel for electrocardiography.
8. Sodium fluoride & Phosphoric acid gel for dental care prophylactic.[5]

OBJECTIVE:

- To collect the oil of tea tree and lavender plant and study their properties.
- To formulate the herbal gel by using tea tree and lavender oil.
- To evaluate the investigated parameters including Spreadibility, PH and viscosity formulated herbal gel.
- Provide cure from skin problem.
- Biological evaluation of anti acne properties.
- The objective of Herbal gel is to destroy or inhibit the growth of bacteria.

Ideal characteristics: -

- Must be anti-microbial, analgesics, anti-inflammatory, anti-bacterial.
- Treat mouth wounds, mouth ulcer, food burns and bleeding gums.
- Reduce burning sensation and swelling.
- Acts against microbes in mouth gives soothing effect and relieves pain.

- It should have smaller and moderate molecular weight.

DRUG AND EXCIPIENT PROFILE:

1. PLANT PROFILE:-

TEA TREE:-

Plant name:

Tea Tree

Biological source:

Tea tree oil is obtained by steam distillation of the leaves and terminal branches of Melaleuca alternifolia belonging to family Myrtaceae. [16]

Geographical source:

It is native to Australia although it is also cultivated in other countries with suitable climates, such as China and Kenya. [16]

Fig. No.2. Tea tree Leave

Taxonomical classification:

- Kingdom – Plantae
- Division – Angiospermae
- Class – Dicotyledoneae
- Order – Myrtales
- Family – Myrtaceae
- Genes– Melaluca
- Species – Melaluca alternifolia[16]

Chemical constituents:

Tea tree contains about 30% of Terpinen-4-ol, 15% of 1,8-Cineole, 10, γ-Terpinene, 5% α-Terpinene and other Constituents such as Limonene, Sabinene, Aramadendrene, δ-cadinine etc.[7]

Parts used:

Fresh Leaves are used.

Uses:

Tea Tree is used in treatment of Acne Vulgaries, Wrinkles, Dermatitis and scalp mycosis. As it has anti-inflammatory properties that can help reduce to inflammation.[7]

2. LAVENDER: -

Plant name:

Lavender

Biological source:

Lavender oil is an essential oil obtained by distillation from the flower spikes of certain species of Lavandula angustifolia belonging to family Lamiaceae. [17]

Geographical source:

Lavender is native to the Mediterranean region, particularly in countries such as France, Spain, Italy, and Greece. [17]

Taxonomical classification:

- Kingdom – Plantae
- Division Angiospermae
- Class – Dicotyledoneae
- Order – Lamiales
- Family – Lamiaceae
- Genius – Lavandula
- Species – Lavendula angustifolia[17]

Fig. No.3. Lavender plant

Chemical Constituents:

Lavender contains about linalool (27.3–42.2 %), linalyl acetate (27.2–46.6%), (Z)-β-ocimene (0.2–11.6%), terpinen-4-ol (0.70–4.6%), lavandulyl acetate (0.50–4.8%), β-caryophyllene (1.8–5.1%), (E)-βocimene (0.30–3.8 %), α-terpineol (0.30–2.0 %) and 1,8-cineole (0.10–1.2%).[9]

Uses:

Lavender is used in the treatment of various skin disorder such as Acne, Wrinkles, dermatitis as well as Fungal infections of Candida. Lavender

also posses Antioxidant, Anti-inflamatory and Antiparasitic Property. [9]

Drug Excipient Profile :-

Table No.1. List of excipients with their sources

Sr No.	Drug Excipients	Category	Properties	Uses	Sources
1.	Carbopol 940	Gelling agent, Viscosity enhancing agent	Swellable in water, glycerol and ethanol	It is widely used in cosmetic products for imparting them a luxurious texture.	Burgoyne Burbidge's and company
2.	HPMC	Thickening agent, Solubilizing agent, viscosity increasing agent.	Soluble in water insoluble in diethyl ether, acetone.	To treat dry eyes and eye irritation.	Burgoyne Burbidge's and company
3.	Triethanolamine	Adhesive and binding agent.	Miscible with water, Methanol, acetone. Soluble in benzene. Pale yellow viscous liquid, ammonia odor.	Antifoam agent, Softening agent, Emulsifier and plasticizer, Used as wood and paper processing.	Burgoyne Burbidge's and company
4.	Methyl Paraben	Preservative, acids, carbocyclic, benzene derivative.	Colorless, slightly soluble in water very soluble in ethanol	It is used for Preservative, cosmetics, eye solutions.	Burgoyne Burbidge's and company
5.	Propyl Paraben	Preservative, acids, carbocyclic, benzene derivative.	Colorless crystal or white powder. Odorless freely soluble in alcohol slightly soluble in boiling water and chloroform.	Used against bacteria. Antiseptics and antimicrobial. Pharmaceutical industry.	Burgoyne Burbidge's and company

MATERIALS AND METHODS:

Materials –

Table No.2. Materials

Sr No.	Name of material	Sources & Company
1	Carbopol 940	Burgoyne Burbidge's and company
2	HPMC	Burgoyne Burbidge's and company
3	Triethanolamine	Burgoyne Burbidge's and company
4	Methyl Paraben	Burgoyne Burbidge's and company
5	Propyl Paraben	Burgoyne Burbidge's and company

Equipment's:-

Table No.3. Equipment

Sr. No.	Name of equipment	Sources & Company
1	Incubator	Labline
2	Hot Air oven	Meta-Lab Scientific
3	PH meter	Systronics digital pH meter
4	Brook field viscometer	DV-I Prime
5	Magnetic stirrer	Equip-Tronics
6	Autoclave	ASI-254
7	U.V Spectrophotometer	UV-1700 Shimadzu

Collection of Herbal oils:-

The Collection of Tea Tree oil is Purchased from Cloud Lifestyle Pvt. Ltd, 406 , Block-1, Sumel-8. Rakhial, Ahmedabad-380023, Gujarat, India, from http://www.reynaturals.com and the Collection of Lavender oil is Purchased from ASG Mantra, New Delhi – 110060 http://www.organixmantra.com.

Active pharmaceutical ingredients:- TEA TREE, LAVENDER

Method of Gel Preparation

Dispersion Method -Gelling agent was dispersed in water with stirring at 1200 rpm for 30 min . Drug was dissolved in non-aqueous solvent with preservative. This solution was added in above gel with continous stirring.

EXPERIMENTAL WORK:

PRE-FORMULATION STUDIES OF OIL:

1. Organoleptic Properties :-

Colour

Odour

2. Density : -

The density of the Tea tree oil and Lavender oil was determined by taking the weight of sample and divides it by its corresponding volume. [18]

Density = Mass / Volume

3. Detrmination of Acid Value :-

Five (5)g the oil sample was weighed into clean conical flask and mixture of 25 ml diethyl ether and 25 ml ethanol was added and used to dissolve the oil in the mixed neutral solvent. 1 ml of phenolphthalein added and the solution was carefully titrated with 0.1N KOH until a pink colour which persists for 15 seconds was obtained. [18] The acid value is calculated as thus:

$$\text{Acid Value} = \frac{56.1 \times N \times V}{M}$$

Where, 56.1 = molecular weight of KOH

N = normality of KOH

V = volume of KOH used

M = mass of the sample

4. Determination of Saponification Value :

Five (5)g of the oil sample was weighed into a conical flask. 50 ml of 0.5N KOH was added to the sample, a reflux condenser was attached to the flask and heated for 30 minutes for perfect dissolution of the sample. It was allowed to cool then 1 ml of phenolphthalein indicator solution was added and the content was titrated with 0.5N HCl to an end point. The same process was repeated using blank sample. [18] The saponification value was calculated using the formula

$$\text{Saponification Value} = \frac{56.1 \times N\ (V2 - V1)}{\text{Weight of sample}}$$

Where; 56.1 = Molecular weight of KOH

N = Normality of the KOH

V1= Titre value for sample

V2= Titre value for blank

5. Determination of pH:-

The pH of oil was determined using digital pH meter. One 1ml of Tea tree and Lavender oil was dissolved in 100 ml of demeneralised water and

stored for two hours. The measurement of pH of oil was done in triplicate. Instrument was calibrated before use with standard buffer solutions at pH 4, 7, and 9. [12]

6. Preliminary phytochemical screening:-

Test for carbohydrate

Molish's test:-2mL filtrate + 2 drops of alcoholic α–naphthol + 1mL conc. H2SO4 (along the sides of test tube). A violet ring is formed.

Test for Reducing sugars:-

- **Benedict's test:-** 0.5mL filtrate + 0.5mL Benedict's reagent + Boiled for 2 min. Green/yellow/red colour is formed.
- **Fehling's test**:- 1mL each of Fehling's solution A & B + 1mL filtrate + boiled in water bath. A red precipitate is formed.

Test for starch:-

Iodine Test:-

3mL extract solution + few drops of iodine solution A blue colour, which disappears on boiling and reappears on cooling.

Tannic acid test:-

Acidified extract + 10% tannic acid solution A buff colour precipitate is formed.

Test for proteins:-

Millon's test:-

2mL filtrate + few drops of Millon's reagent . A white precipitate is formed.

Biuret test:-

2mL filtrate + 1 drop of 2% copper sulphate sol. + 1mL of 95% ethanol + KOH pellets. A pink coloured solution is formed.

Test for amino acids:-

Ninhydrin test:-

2mL filtrate + 2 drops of Ninhydrin solution (10mg ninhydrin + 200mL acetone) . A purple coloured solution is formed

Test for Tyrosine:-

Heat 3 ml extract and 3 drops of Million's reagent the Solution shows dark red color.[19]

B. PREPARATION OF GEL:-

1. PROCEDURE:

Preparation of gel base with Carbopol 940 :-

- Take 60 ml of distilled water in a beaker disperse specified amount of Carbopol 940 in it with continuous stirring by using magnetic stirrer.
- Kept the beaker aside to swell the Carbopol for half an hour.
- Take another beaker add 5ml of distilled water in it with required quantity of methyl paraben and add it to the mixture of Carbopol.
- Continuous stirring is done for the formation of gel base.
- Triethanolamine is added to adjust the pH (6.8-7).[20]

Table No.4. Ingredients required for preparation of gel base

Sr. No.	Ingredients	Quantity (mg/ml)
1	Carbopol 940	Quantity sufficient
2	Distilled water	60ml
3	Methyl paraben	1 gm
4	HPMC	3gm
5	Triethanolamine	Quantity sufficient

Fig. No.4. Gel preparation by using Magnetic stirrer

PREPARATION OF FORMULATION

1. Take accurately amount of tea tree oil and Lavender oil in a Beaker and mixed them continuously using stirrer.
2. Add this mixture to the weight amount of gel base.
3. Stir it continuously until it forms homogenous mixture. Then add accurately weight measured amount of Methyl paraben in it and mixed it continuously.
4. Add Vitamin E in it and continuously stirring is done.
5. The product will be obtained from stirring vigorously. All the prepared gel formulation was subjected to evaluation test in order to select best formulation.[21]

Table No.5. Preparation of formulation F1, F2, F3

Sr. No	Ingredients	F1	F2	F3
1	Tea tree oil	0.4ml	0.8ml	1.2ml
2	Lavender oil	0.2ml	0.4ml	0.6ml
3	Gel base	q.s	q.s	q.s
4	Methyl paraben	0.05g	0.05g	0.05g
5	Vitamin E	400mg	400mg	400mg
6.	Total	40.00gm	40.00gm	40.00gm

Fig. No.5: Herbal gel formulation F1, F2, F3

C. EVALUATION OF HERBAL ANTI ACNE GEL:-

1. Physical evaluation:

- Colour
- Odour
- State
- Consistency
- Homogenity

2. Spreadibility:

Spreadability was determined by the apparatus which consists of a wooden block, which was provided by a pulley at one end. By this method spreadability was measured on the basis on slip and drag characteristics of gels. An excess of gel (about 2 gm) under study was placed on this ground slide. The gel was then sandwiched between this slide and another glass slide having

the dimension of fixed ground slide and provided with the hook. A one kg weighted was placed on the top of the two slides for 5 min. to expel air and to provide a uniform film of the gel between the slides. Excess of the gel was scrapped off from the edges. The top plate was then subjected to pull of 80 gm. With the help of string attached to the hook and the time (in sec.) required by the top slide to cover a distance of 7.5 cm be noted. A shorter interval indicates better spreadability. [6]

Spreadability was calculated using the following formula:

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

Where, S= Spreadability,

M= weight in the pan (tied to upper slide),

L= Length moved by the slide,

T= Time (in sec.)

3. Washability Test:

Washability was determined by rubbing the little amount of base on hand for test. [12]

4. Irritancy test:

Small quantity of ointment applied on skin and wait for 10 minutes after 10 minutes we evaluate that ointment properties on skin.

5. Clarity test:

The clarity of all the three batches was determined by visual inspection.

6. Measurement of pH:

The pH of oil was determined using digital pH meter. One 1ml of Tea tree and Lavender oil was dissolved in 100 ml of demeneralised water and stored for two hours. The measurement of pH of oil was done in triplicate. Instrument was calibrated before use with standard buffer solutions at pH 4, 7, and 9. [12]

7. Viscosity:

The measurement of viscosity of the prepared gel was done using Brookfield digital Viscometer. The viscosity was measured using spindle no. 64 at 10 rpm and 250C. Before measurement deaeration of gel was done and the gel was filled in appropriate wide mouth container. Samples of the gels were allowed to settle over 30 min at the assay temperature (25 ± 10C) before the measurements.[12]

8. Antibacterial activity:

The antibacterial activities of different formulations were determined by modified agar well diffusion method. In this method, nutrient agar plates were seeded with 0.2 ml of 24 h broth culture of S Auresus and E Coli , a causative organism for acne vulgaris. The agar plates were allowed to solidify. A sterile 8 mm borer was used to cut wells of equidistance in each of the plates. 0.5 ml of formulations, herbal extracts and marketed Ampicillin were introduced into the wells at randomly. The plates were incubated at 37^{o}C for 24 hours. The antibacterial activities were evaluated by measuring the zones of inhibition (in mm).[13]

9. Anti inflammatory:

Protein Denaturation Test (Pain Killer)

Preparation of reference drug (Positive Control)

NSAID (ibuprofen) were used as reference dr Ibuprofen was crushed into fine powder. About 0.2 g of Ibuprofen drug powder was measured using a digital analytical balance and was added to 20.0 ml of distilled water. The solution was mixed well.

Serial dilution

Serial dilution from 1000 ug/ml to 0.01 µg/ml was performed for 3 sample extract and for reference drugs (ibuprofen). All samples contained 5.0 ml of total volume. Reaction mixtures were prepared using 2.8 ml of phosphate-buffered saline (pH 6.4) and 0.2 ml of egg albumin (from fresh hen's egg). Then 2 ml of extract from each different concentration were mixed gently with reaction mixtures. A similar procedure was used for reference drugs (ibuprofen) and they were used.[22]

$$\% \text{ Inhibition} = \left[\frac{\text{Absorbance of control} - \text{Absorbance of test sample}}{\text{Absorbance of control}}\right] \times 100$$

10. Rancidity:

This test is performed by using the Phloroglucinol solution. The rancidity is due to the oxidation of the fats and oils; during oxidation free fatty ults are shown acids are liberated. These free fatty acids react with the Phloroglucinol solution and gives pink colour. This indicates the rancidity of the product.10 ml of melted ointment was taken then added 10 ml of concentrated hydrochloric acid and 10 ml of Phloroglucinol solution.Shaken for one minute. The material shall be taken to have passed the test if no pink colour developed. [23]

11. Loss on draying:

Procedure:

1. Weigh about 1.5 g of the powdered drug into a weighed flat and thin porcelain dish.
2. Dry in the oven at 100° c or 105° c, until two consecutive weighings do not differ by more than 0.5 mg.
3. Cool in a desiccators and weigh. The loss in weight is usually recorded as moisture.[24]

RESULT AND DISCUTION:

PREFORMULATION STUDIES OF OILS-

Table No. 6: Preformulation studies of Oils

Sr. No.	Tests	Tea Tree oil	Lavender oil
1.	Colour	Pale yellow	Colorless
2.	Oduor	Camphor like smell	Floral to Camphor like smell
3.	Density	0.95 gm/ml	0.93 gm/ml
4.	pH	7.21	7.14
5.	Acid value	2.244 mgKOH/gm	1.40 mgKOH/gm
6.	Saponification Value	45.02	35.06

Table No. 7:Preliminary Phytochemical Screening tests of Oils

Sr No.	Plant constituents	Test/Reagent	Tea tree oil	Lavender oil
1	Carbohydrate	Molish Test	+	+
2	Reducing sugars	Benedict's test	+	-
		Fehling's test	+	-
3	Starch	Iodine Test	-	-
		Tannic acid test	-	-
4	Proteins	Millon's test	+	+
5	Amino acids	Ninhydrin test	+	+
		Tyrosine test	+	+

EVALUATION PARAMETERS OF ANTI ACNE GEL –

In the evaluation parameter of herbal gel, we perform different types of evaluation tests of gel.

Table No.8: Evaluation test

Sr. No.	Formulation	Color	Odour	State	Texture	Homogeneity	Consistency	Types of smear
1	F1	White	Characteristic	Semisolid	Smooth	Homogeneous	Good	Non-greasy
2	F2	White	Characteristic	Semisolid	Smooth	Homogeneous	Good	Non-greasy
3	F3	White	Characteristic	Semisolid	Smooth	Homogeneous	Good	Non-greasy

Sr. No.	Formulation	Spreadability	Washability	Skin irritation test	pH	Viscosity	Rancidity	Loss on drying
1	F1	56.66g.cmsec^{-1}	Slightly washable	No reaction	7.21	2829 cp	No Pink Colour	32%
2	F2	64.54g.cmsec^{-1}	Slightly washable	No reaction	7.14	3287 cp	No Pink Colour	31%
3	F3	60.83g.cmsec^{-1}	Slightly washable	No reaction	6.91	3299 cp	No Pink Colour	34%

Table No.9: Antimicrobial test

Evaluation parameter	Marketed formulation	Herbal preparation		
Antibacterial activity	(Ampicillin)	F1	F2	F3
Zone of inhibition (mm)	For E. Coli			
	8.1 mm	3.2 mm	3.8 mm	4.0 mm
	For S. Aures			
	9.0 mm	4.0 mm	5.6 mm	7.2 mm

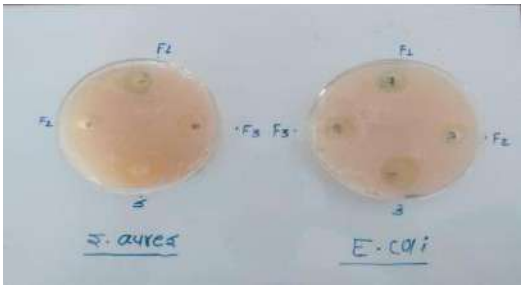

Fig. No.6. Bacterial Zone of Inhibition

Table No.10: Solubility test

Sr. No.	Formulation F1, F2, F3	Solubility
1	Water	Slightly soluble
2	Alcohol	Insoluble
3	Chloroform	Insoluble
4	Ether	Insoluble

Anti-inflammatory activity of Gel Formulations:- The anti-inflammatory activirty was found to be

Table No. 11. Anti-inflammatory activity of ibuprofen

Sr No.	Concentration of Ibuprofen (ppm)	Absorbance of Blank	Absorbance of Ibuprofen	Percentage Inhibition
1	10	0.725	0.474	34.62%
2	20		0.342	52.82%
3	30		0.270	62.75%
4	40		0.161	77.79%
5	50		0.107	85.24%

Table No. 12. Anti-inflammatory activity of Formulation

Sr No.	Concentration of Sample (ppm)	Absorbance of Blank	Absorbance of Sample	Percentage Protein Denaturation
1	10	0.725	0.520	28.27%
2	20		0.486	32.96%
3	30		0.398	45.10%
4	40		0.295	59.31%
5	50		0.249	65.65%

Fig. No.7. Sample Solution

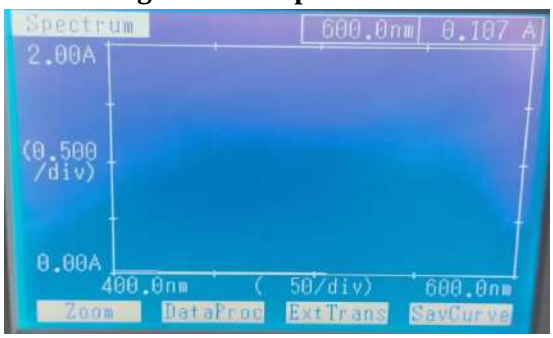

Fig. No.8. UV Absorbance

SUMMARY:

In the present work Tea tree oil and Lavender oil were selected which gives anti acne, anti-inflammatory, antifungal, activity. The formulation F2 and F3 showed the best result, may be because of Tea tree contain terpinene-4-ol, 1,8-Cineole and Lavender contain linalool, linalyl acetate these chemical have inhibitory effect on acne bacteria. Up to date, numerous product such as salicylic acid, benzoyl peroxide and retinoic acid have been available for the treatment of Acne. Although many patients may have benefit from this product, some may be allergic to them. In addition, some of this product may have side effect at higher concentration such as hypersensitivity. Plant derived product have been used extensively in Traditional Medicine. Recently researchers have studied the anti-acne effect of herbal drug for the treatment of Various type of acne diseases. Another important issue that deserve, attention towards the safety of these herbal product as there were no reported adverse effect. Based on the finding of the present study, the relevance of Tea tree and Lavender as natural, effective, and safe treatment for, mouth ulcer is clearly reported.

CONCLUSION:

Based on the study, it can be concluded that prepared Anti acne gel formulation F2 using tea tree and Lavender is suitable for the treatment of Acne and show better activities than Allopathy Gel. Hence it reduces the side effect as compared to Allopathy preparation and it does not show any harmful effect on the skin.

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