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Review Article

Review on formulation and Evaluation on Anti Acne Cream

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ABSTRACT

Acne is a common skin problem associated with the microbial infection and need anti-microbial agent for the treatment. Herbal product containing essential oil as anti-microbial agent are undoubtedly a growing trend. Clove oil is reported to have anti-microbial activity against acne causing microorganisms such as propionibacterium acnes, staphylococcus epidermidis, staphylococcus aureus, and candida albicans. Hence the present study was undertaken with aim to formulate develop Antiacne cream by using clove oil. The essential oil was extracted by steam distillation method and cream formulation Bureau of Indian Standard guidelines BIS guidelines and for Antimicrobial activity against the microorganism responsible for acne by agar well diffusion technique. Also all the anti-acne cream formulation where subject stability studies and subjective evaluation of the panel of human volunteers. The result showed that the anti-acne cream (F3) containing clove oil is effective against microorganisms responsible for acne. Clove oil is an effective anti-acne agent hence can prove to be incorporating in anti-acne preparation.

INTRODUCTION

Acne is a chronic inflammatory pilosebaceous unit. It is characterized by the information of comedones, papule, pustules, inflamed nodules, superficial pus, filled cysts and in extreme cases canalizing and deep scarring. Acne develops on the those areas where sebaceous gland are most numerous: the face, scalp, neck, chest, back, upper arms, shoulders. The bacteria propionibacterium acnes, staphylococcus epidermidis, staphylococcus epidermis, staphylococcus aureus,

the fungus candida Albans are almost the commonly present the pustular contain of the acne. Acne is a common skin problem associated with microbial infection. For it is treatment antimicrobial agent are required. Various antimicrobial agent used in cosmetic preparation form natural and synthetic sources. Normally synthetic materials are used because of low cost and strong antimicrobial synthetic material may give adverse effect to human and environment also faith of consumer on herbal product is growing

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Essential oils have to find out effective natural antimicrobial agent. Essential oils have a wide application in folk medicine, food flavoring and preservation as well as in fragrance industrial. The antimicrobial properties of essential oil have been known for many centuries. In recent years, a large number of essential oils and their constituents have been investigated for their antimicrobial properties against some bacteria, some fungi. It is reported that essential oil provided a gentle and

inexpensive way of treating acne, clearing infection and healing acne scarring. India has a rich heritage of traditional remedies. In India, spices are used extensively for adding aroma and taste to food. They are used widely in Ayurvedic preparation, flavor and perfume industries. Clove consists of dried flower buds of (*Eugenia caryophyllus*) (Thunberg) (syn. *Syngium aromaticum*) (Linn.) (Merrill and Perry) belonging to the family (Myrtaceae).



Fig 2. Clove tree.

Fig. Clove Plant

Classification of Acne :

1) Non-inflammatory Acne

- Closed comedones
- Open comedones

2) Inflammatory Of Acne

- Papules - Small pink bulb appears on the skin.
- Pustules - lesion with central visible core containing pus.
- Nodules - fill with deeper pus and heal with scar. Comedonal, papulopustular, and nodulocystic. Pustules and cysts are considered inflammatory acne. Mild acne. This patient has a few erythematous papules and occasional pustules mixed with comedones. Acne vulgaris is characterized by non-inflammatory, open or closed comedones and by inflammatory papules, pustules, and nodules. Acne vulgaris typically affects the areas of skin with the densest population of sebaceous follicles; these areas include the face, the upper part of the chest, and the back.

Causes of acne:

- There are three major factors that cause acne:
- Overactive sebaceous glands (oil), abnormal shedding of dead skin, and a proliferation of acne-causing bacteria.
- None of these factors have to do with skin care or lack thereof, and they all must be present for acne to occur.
- Excess oil (sebum) production, hair follicles clogged by oil and dead skin cells; bacterial inflammation. Acne typically appears on the face.
- Hyperactive sebaceous glands (overactive lipid secretion).
- Hyperkeratosis (accelerated keratinization) at hair infundibulum.
- Activity of bacteria (*Propionibacterium acnes*) promoting comedogenesis.
- Cyclic hormonal levels in women. Occupational hazards such as chronic exposure to chemicals and air contaminants, high humidity.

- Other stimuli and events associated with acne include seasonal effects, excessive sexual activity, emotional or psychological stress, mechanical manipulation of the skin surface, and certain drugs such as corticosteroids.

Symptoms of acne:

- Whiteheads (closed plugged pores)
- Blackheads (open plugged pores)
- Small red, tender bumps (papules)
- Pimples(pustules) Red spots or swelling on the skin, generally known as pimples; the swelling may become inflamed and filled with pus. They typically appear on the face, chest, shoulders, neck or upper portion of the back. Dark spots with open pores at the centre(blackheads).

Acne is a chronic skin condition that affects most people at some point during their life. It causes spots to develop on the skin, usually on the face, back and chest. The symptoms of acne can be mild, moderate or severe. Acne is thought to be caused by changes in hormones that are triggered during puberty. Acne can cause great distress and have an adverse effect on a person's quality of life and self-esteem. Therefore, healthcare professionals recognise that the condition requires effective and sometimes aggressive treatment.

How Common Is Acne -

- Acne is the most common type of skin condition. It is most widespread among older children, teenagers and young adults.
- Around 80% of 11 to 30-year-olds are affected by acne. Most acne cases in girls occur between the ages of 14 to 17 and in boys the condition is most common in 16 to 19-year-olds. Most people will experience repeated episodes, or flare-ups, of acne for several years before finding that their symptoms gradually start to improve as they get older. The symptoms of acne usually disappear when a person is in their twenties.

- However, in some cases, acne can continue into adult life, with approximately 5% of women and 1% of men over 25 continuing to experience symptoms.

4. Objective

- acne product work by killing the bacteria that causes acne inflammation.
- Other the remove excess oil form the skin or speed up the growth of new skin cell and the removal of dead skin cell
- Protective skin. Decreasing the sebum Production.
- To Assess patient Compliance In Acne vulgaris.
- To protective skin and killing of bacteria
- And Remove from papules and acne.
- To Assess patient Compliance In Acne vulgaris .
- Clove oil is a very effective drug in the treatment of acne vulgaris by topically. The objective of present study was formulation development of anti-acne cream.
- clove oil contains a compound called as eugenol that helps in treating acne. It fights the acne bacteria and helps in reducing swelling and redness. Clove is filled with antibacterial and antiseptic properties.
- Clove oil contains a compound called as eugenol that helps in treating acne. It fights the It also prevents allergies and bacterial growth in the skin, which in turn helps in getting a health looking skin.
- Apart from solving your acne issues, this magical oil can work wonders in preventing early signs of aging, and it also helps to get an even tone skin
- Scroll Down to find out the benefits and usage of clove oil.
- Acne bacteria helps in reducing swelling.

Cream:

Cream is dairy product composed of the higher fat layer form the skin in un- homogenized milk the



fat, that less dense, eventually cream skimmed formed. Using a face cream is important because it keeps the moisture and elasticity in the skin, which can help reduce wrinkles, age, spots, and other fine lines. Face cream also act as protective barrier.

Face creams are cosmetic creams or lotion, consisting of any various substances in the form of a thick liquid, applied to the face to improve the complexion and for softening and moisturizing the skin. A cream is a preparation usually for application to the skin. Creams are semi-solid emulsions of oil and water.

Types of cream:

- Oil in water (o/w) cream
- Water in oil(w/o) cream

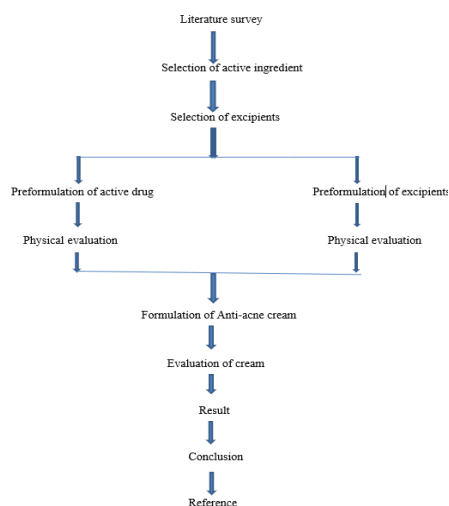
ADVANTAGES:

- It works as protective layer for the skin.
- It acts as barrier to the skin
- It gives moisture and elasticity in the skin.
- It penetrate deeper into the skin, to give required pharmaceutical effect.
- It remove dead skin, blackheads, pimples, and whiteheads.
- It protects from direct U.V (ultraviolet rays).
- Some creams are used for fungal infection.

DISADVANTAGES:

- Stability is not as good as oilment
- They are less hydrophobic than other semisolid preparation, so risk of contamination is high then the others.

Plan of work



Literature survey :

1.K.S.Misar,S.B.Kulkarni,W.B.Gurnule et.al.2020.formulation and evaluation of antiacne cream by using clove oil demonstrated that antiacne cream containing 1% clove oil was acceptable in view of improvement in acne skin condition and contain good characters of skin cream clove oil is effective antiacne agent hence can prove to be beneficial in incorporating in antiacne preparation. The optimum concentration of clove oil to be used antiacne agent can be 1% for antiacne cream formulation.

2.Adity vats Pranav sharma 2012 etal. Formulation and evaluation of topical antiacne formulation of

coriander extract studied that coriander aqueous extract found to be have potency against once including bacterio. The formulation developed from it also showed the same activity so it can be further developed and sued commercialy for treatment of acne.

3.muhammad athar abbasi, isha kausar, aziz –ur –rehman, hena saleem sadia mohmannad Jahangir shabbad ara sidhigi and viqar udin ahmad at 2010 prepration of new formulation of anti acne cream and their efficiency studied that diplicate that these repared new formulation are very good theurapeutic composition for acne specially one and two exhibited much higher nigligiable side

effect, so they seem most suitable to be commercially.

4. Deepika Joshi, Sneha Bahuguna, Priya Shaarma, Bhavna and Nidhi Sameval et al. 2022. Novel approaches in herbal medication for acne vulgaris studied that acne vulgaris is a common skin problem affecting millions of people, there are many important aspects to consider for treatment of acne.

5. Mhaendra Shekhar and Foziya Hymeen Abdul Haleem et al. 2017. Formulation and evaluation of natural anti-acne cream containing *Syzygium somarangense* fruit extract studied that to make this product into a commercial standard, we recommended that to formulate the cream can be successfully

used for skin infection which includes acne vulgaris, after the confirmation of clinical and technological studies in future.

Drug and excipient profile

1] clove

Clove are the aromatic flower buds of the tree in the native Maluku islands in Indonesia and are commonly used as a species only, flavouring or fragrances in consumer products.

Scientific name – *Syzygium aromaticum*

Family- *myrtaceae*

Order- *myrtales*

Kingdom- *plantae*



Fig 3 Clove Plant



Fig. 1. Dried flower buds of clove.

2] Ingredients

A] stearic acid :

Stearic acid is an emulsifier, emollient and lubricant that can soften skin and help to keep product from separating. Stearic acid is used in hundreds of personal care products, moisturiser, sunscreen and makeup cream.

Formula – $C_{18}H_{36}O_2$

Molar mass- 284.48 g/mol

Melting point – 69.3°C

Appearance- white solid

Odor- pungent oily

Density- 0.94 g/cm³

B] Acetyl alcohol –

This medication is used as a moisturiser to treat and prevent dry, rough, itchy skin and minor skin infections.

Formula – $C_4H_8O_2$

Molar mass – 88.10 g/mol

Fig 4 Clove Buds

M.P -49.3°C

Appearance- White crystal

Odor – very faint wax

Density – 0.811 g/cm³

C] Bees wax –

It is used in the cosmetic industry within acne for dry skin, fine lines and wrinkles. Emulsified solution and increases water holding capacities of cream.

Formula- $C_{15}H_{31}CO_2C_{30}H_{61}$

Molar mass- 61-65°C

M.P- 64.5°C

Appearance – white colour

Density- 0.95

D] glycerine monostearat-

It is used as a thickener of emulsions and preservative agent and emulsifying agent for oil waxes and solvents. A protective coating for hygroscopic powders, a solidifier and a controlled release agent in pharmaceuticals and resin lubricant.

Formula- C₂₁H₄₂O₄

Molar mass-358.57 g/mol

m.p- 55°C

appearances – white waxy powder

E] Mineral oil-

They are used in chemical industry . it is highly purified ingredient used in body lotion, cold cream andc many other personal care product , due to it ability to help to reduce water loss from skin. It moisturise

Formula – C₁₆H₁₀N₂Na₂₀Z₅₂

Molar weight- 452.363

m.p - -24°C

Apperance- colourless liquid

Physical state- oil

Density – 0.85

F] Propyl paraben-

It is used in pharmaceutical industry. Propyl paraben function as preservative in cosmetic an personal care product antimicrobial. Further by limiting the growth of bacteria and fungi prsevaties like isobutylpropen help keeps us from infection and other diseses

Formula – C₁₀H₁₂O₃

Molar weight- 180.2 gm/mol

m.p- 95-98°C

apperances- olourless crystals white powder

density-106 gm/cm

5.MATERIAL AND METHODS

• **Collection and authentication of clove:**

Dried flower buds of Clove, were collected from the local market of Ahmednagar, Maharashtra.

• **Extraction of clove oil:**

- 1) Dried flower buds of Clove, were subjected to size reduction and then subjected to steam distillation for the separation of volatile constituents.
- 2) It was done by the distillation of 100 g of Clove with water (300 ml) by using 3)Clevenger's apparatus . Distillation was continued for 5 h and the oil thus obtained was

dried over anhydrous silica gel by using desiccator to remove any traces of moisture and stored in a refrigerator at 4 C until use.

- eugenol acetate (2–17%) and caryophyllene as its main constituents.
- 4) Among the other constituents present, the most important is methyl-n-amyl ketone, to which the oil owes its fresh and fruity aroma.
- 5)Other substances present in traces are methyl salicylate, methyl benzoate, methyl alcohol, benzyl alcohol, furfural, methyl furfural, dimethyl furfural, a-pinene, methyl-n-heptyl ketone, methyl-n-amyl carbinol (2-heptanol), methyl-n-heptyl carbinol and vanillin
- 6) The Cloves are acrid, bitter, aromatic and refrigerant; used widely as culinary spice and as condiments in adding taste and aroma to food preparations. Clove bud oil is reported to have antibacterial, antifungal, insect
- 7)Clove bud oil is reported to have antibacterial, antifungal, insecticidal and antioxidant properties and are used traditionally as flavouring agent and antimicrobial agent in food products. Clove oil is also reported as an anti-carcinogenic agent due to its antioxidant properties
- 8) The high levels of eugenol content in Clove essential oil are responsible for strong antimicrobial activity.
- 9) This phenolic compound can denature proteins and reacts with cell membrane phospholipids changing their permeability.



Fig. 1. Dried Flower buds of clove.

6. Formulation of antiacne cream by using clove oil:

1] antiacne cream base was formulated by using formulation given in table 1:

All ingredients of phase a were taken in beaker beaker was kept on water bath till the temperature reached 75°C. stirring it well by mechanical stirrer Emulsification of cream was proceed. The cream was allowed to cool down and transfer to suitable container.

Formulation table:1

Sr.no	Ingredients	Quantity
1	Stearic acid	12
2	Cetyl alcohol	2
3	Bees wax	4
4	Glyceryl mono stearate	-
5	Mineral oil	3
6	Propyl paraben	0.15

7. Evaluation parameter:

- 1] Ph:4.0-9.0
- 2] total fatty substances content, % by mass : min. 5%
- 3] microbial content limit : not more than 1000cfu/g
- 4] Thermal stability: no oil separation

8. RESULT AND DISCUSSION:

Acne is a common skin disorder which required antimicrobial agents for its treatment common microorganism associated with acne skin conditions are Propionibacterium associated with acne skin conditions are staphylococcus epidermis, it is reported that clove oil possesses analgesic, antimicrobial and aromatic properties, despite these properties, the common spice clove is nit popular in cosmetic. It is a normal experiences that werener any formulation is to be developed containing essential oil, the stability of product possess challenge. Thus the stability of antiacne creams was studied by observing changes in parameters like odour ,color,pH, viscosity and particle size undrr extrem conditions and antiacne creams were found to be substantially stable.

9. CONCLUSION:

In India there are many medicinal plants which are used from ancient times for skin care. Acne is a common skin problem associated with the microbial infections and many other causes also. Acne is not health threatening disorder but it definitely cast negative impact on one's personal self-image. The demand for more and more cosmetics from plant sources is continuously increasing. The prolonged chemical-based treatments and the high rate of recurrence suggest the opportunity for alternative options. Despite of having reported antibacterial and antifungal properties, Clove oil is not popular as Antiacne agent for incorporation in cosmetic formulations may be because of inadequate documentation and nonavailability of any scientific evidence regarding their activity in cosmetic formulations. So this study was undertaken with the aim to formulate, develop and evaluate Antiacne cream by using three different concentrations of clove oil. From the results of the present study it can be concluded that Antiacne cream containing 1% Clove oil (C-6) was acceptable in view of improvement in acne skin condition and contains all good characters of skin cream. Clove oil is effective Antiacne agent hence can prove to be beneficial for incorporating in Antiacne preparations. The optimDeclaration of Competing Interest The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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