

## FORMULATION AND DEVELOPMENT OF ANTI-ACNE CREAM OF RICE BRAN WAX & TAZAROTENE

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### ABSTRACT

Acne, one among the very fashionable socially distressing skin conditions created by hormones called androgens appear to be part of the underlying mechanism, by causing increased production of sebum. Another common factor is the excessive growth of the bacterium *Cutibacterium acnes*, which is present on the skin. have generally been treated, with the use of tazarotene (retinoid). A class of medication used in the treatment of acne by slowing skin cell growth and inflammation, keeping the very fact in the background formulation of anti acne cream is done by using rice bran wax (a natural alternative for synthetic waxes), which provides smooth and creamy texture to the cream and also acts as emollient. the cream developed was then evaluated for the organoleptic properties, spread ability, washability, viscosity, pH, and invitro drug irritation study.

**KEYWORDS:** Acne vulgaris, rice bran wax, tazarotene.



## INTRODUCTION

Acne, also known as *acne vulgaris*, is a long-term skin condition that occurs when deadskin cells and oil from the skin clog hair follicles.

Typical features of the condition include blackheads or whiteheads, pimples, oily skin, and possible scarring.

It primarily affects skin with a relatively high number of oil glands, including the face, upper part of the chest, and back. The resulting appearance can lead to lack of confidence, anxiety, reduced self-esteem.

acne is primarily genetic in 80% of cases. The roles of diet and cigarette smoking in the condition are unclear, and neither cleanliness nor exposure to sunlight appear to play a part. In both sexes, hormones called androgens appear to be part of the underlying mechanism, by causing increased production of sebum. Another common factor is the excessive growth of the bacterium *Cutibacterium acnes*, which is present on the skin.

### Types of acne

#### \*Comedonal acne

This is characterized by bumpiness, blackheads, and milia (small white bumps) rather than inflamed pimples.

**\*Cystic acne:** The most severe form of acne vulgaris, this type can occur anywhere on the face or body and consists of inflammation and large, painful blemishes.

#### \*Nodular acne

Another serve type of acne vulgaris, breakouts are made up large, hard & deep blemishes called nodules.

### Signs and symptoms

Typical features of acne include increased secretion of oily sebum by the skin, microcomedones, comedones, papules, nodules (large papules), pustules, and often results in scarring. The appearance of acne varies with skin colour. It may result in psychological and social problems.

## RAW MATERIALS

**1. RICE BRAN WAX:** Rice bran wax is edible and can serve as a substitute for carnauba wax in most applications due to its relatively high melting point. In cosmetics, rice bran wax is used as an emollient, and is the basis material for some exfoliation particles. It has been observed that rice bran wax at concentrations as low as 1 w% in triglycerides can crystallize to form stable gels & creams.

It is used in paper coatings, textiles, explosives, fruit and vegetable coatings, confectionery, pharmaceuticals, candles, moulded novelties, electric insulation, textile and leather sizing, waterproofing, carbon paper, typewriter, ribbons, printing inks, lubricants, crayons, adhesives, chewing gum and cosmetics.

**2. Tazarotene:** Tazarotene, sold under the brand name Tazorac, among others, is a third-generation prescription topical retinoid. It is primarily used for the treatment of plaque psoriasis and acne. Tazarotene is also used as a therapeutic for photoaged and photodamaged skin. It is a member of the acetylenic class of retinoids. Tazarotene was approved for medical use in 1997 and is available as a generic medication.

Tazarotene is most commonly used topically to treat acne vulgaris and psoriasis. Like other topical retinoids, such as tretinoin and adapalene, tazarotene can be combined with benzoyl peroxide or an oral antibiotic, such as clindamycin or dapsone, for the treatment of acne. This results in increased efficacy compared to tazarotene monotherapy. For psoriasis, a combination therapy of tazarotene and a mid- to high-potency corticosteroid is more effective than either treatment alone.

**3. Acacia gum:** Acacia gum is a natural gum which originally consisting of the hardened exuded of two species of the *Acacia* tree, *Senegalia senegal* and *Vachellia seyal*.

In cosmetics, Acacia gum powder can be used as emulsifier, emulsion stabilizer, demulcent, suspension agent, & foam stabilizer in cosmetics such as skin care products & bath & body products.

Gum Arabic is complex mixture of glycoproteins and polysaccharides, predominantly polymers of arabinose and galactose. It is soluble in water, edible, and used primarily in the food industry and soft-drink industry as a stabilizer.

**4. Potassium Hydroxide:** Potassium hydroxide is a highly alkaline ingredient used in small amounts in cosmetics.

KOH disinfectant used to clean hands, skin, and surfaces. Potassium hydroxide, also known as lye is an inorganic compound with the chemical formula KOH. Potassium hydroxide<sup>2</sup> potent base that is marketed in several forms including pellets, flakes, and powders.

KOH Is used in cosmetics to maintain & establishing pH of the cosmetics.

**5. Stearic acid:** Stearic acid is a long-chain fatty acid. It occurs in a variety of natural sources, including shea butter and coconut oil.

Stearic acid is a form of emollient that is quite effective in moisturizing and hydrating the skin. It protects the skin by forming a moisture barrier from moisture loss and keeps it hydrated for longer. It is especially beneficial for people with dry skin, as it effectively retains the skin's natural moisture.

**6. GLYCEROL:** Glycerol, also called glycerine or glycerin, is a simple triol compound. It is a colourless, odourless, viscous liquid that is sweet-tasting and non-toxic. The glycerol backbone is found in lipids known as glycerides. Glycerin is used safely in numerous cosmetics and personal care products such as soaps, toothpaste, shaving cream, and skin/hair care products to provide smoothness and lubrication. It is also a well-known humectant that prevents the loss of moisture from products so they don't dry out as quickly.

**7. Sorbitol:** Sorbitol is a type of carbohydrate that falls into a category of sugar alcohols called polyols. It's found in some fruits and is also commercially manufactured to preserve moisture and add sweetness.

Sorbitol is used at a dosage of 2-5% in a variety of products, such as cleansers, peelers, creams, liniments, face mask, deodorants, hair sprays, mouthwashes and toothpastes. It is primarily used as humectant as it draws water into the skin so is especially good for dry and maturing skin.

## FORMULA AND PROCEDURE

### Formula

1> Aqueous phase		
Ingredient	volume	role
Glycerine	1.4ml	Humectant & lubricant
Potassium hydroxide	0.4g	Maintain & established the pH
Acacia gum	0.4g	Emulsifier
Sorbitol	0.5g	Moisturizer & humectant
Propylene glycol	1ml	Preservative
Water	12ml	Vehicle

2> Oil phase		
Ingredient	volume	role
Rice bran wax	0.3g	Provides soft & creamy texture to the cream
Stearic acid	3g	Emollient
Alcohol	1ml	Emulsifier
Tazarotene	0.3g	Anti-acne agent

### Procedure

#### 1. Preparation of aqueous phase

Requirements for aqueous phase: Glycerin, potassium hydroxide, propylene glycol, sorbitol, Acacia gum, water.

- \*In beaker, 0.5 g of sorbitol is added along with 0.4 g of potassium hydroxide.
- \*Add 12ml of water in the beaker to melt the ingredients.
- \* To the beaker, add 1,4ml of glycerin + 1ml of propylene glycol with a continuous mixing.
- \*0.4gm of acacia gum is added to the beaker with continuous stirring to melt the acacia gum
- \* In water bath, the beaker is heated up to 70C, then the mixture is added to the oil phase

#### 2. Preparation of oil phase

Requirements for aqueous phase: Stearic acid, Rice bran wax, Tazarotene, alcohol.

- \*In China dish, 3g of Stearic acid is added to the China dish.
- \*Add 0.3g of Rice bran wax to the steric acid.
- \*To the mixture, 0.1g of tazarotene is added to the China dish.
- \*0.4 ml of alcohol is added to the mixture.

\*In Water bath, the China dish is added to melt the mixture, the mixture is heated up to 70C, Borax is added to the product as coloring agent.

### 3. Preparation of the cream

\*When the oil phase and aqueous phase are prepared, the aqueous phase is added slowly to the oil phase with a continuous stirring to mix the ingredients.

\*Keep stirring of the mixture until the formation of the cream

\*Leave the product to cool, then transfer the product into suitable labeled container.



## RESULTS

Sl. No	Parameters	observation	inference
1.	Appearance	Light brown	-
2.	Odour	Pleasant	-
3.	Texture	Smooth	-
4.	pH	6.1	Passed
5.	Viscosity(cps)	4750± cps	Passed
6.	Spread ability (g cm/sec)	41.78± Cm/s	Passed
7.	Washability	Washable	-
8.	Skin sensitivity	No reaction	Passed
9.	Rheology	Good flow	Passed

## DISCUSSION AND CONCLUSION

\*In this study an attempt was made to develop the sustained release formulations of rice bran wax and Tazarotene for acne treatment. The experimental work was divided into pre-formulation studies, formulation development, stability study, in vitro skin irritation study.

\*The raw materials were brought from authentic source and were good in terms of quality.

\*Preformulation study was carried out to verify that the drug does not react with the excipients and affect the shelf life of dosage form.

\*Cream was developed using vanishing cream base and evaluated for organoleptic properties, spread ability, washability, viscosity, pH, drug content.

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## Conflict of interest

There are no conflict of interest.

## Financial support

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## REFERENCE

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