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Moisturizing gel containing *Plumeria Alba*

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Abstract

The aim of the study was to Formulate Moisturizing gel containing *Plumeria Alba* Extract belonging to family Apocynaceae. *Plumeria Alba* is small laticiferous tree or shrub is a native of tropical America, commonly known as White Champa .The flowers were evaluated for its phytoconstituents, which is used in several traditional medicines to cure various skin diseases. The extracts from P. alba obtained from the leaves, bark, and flowers, are commonly used to manage bacterial, fungal, and viral infections such as herpes, scabies, and fungal infections. Essential oils are known to possess many biological properties such as antimicrobial and antioxidant activities. The constituents of the P. alba plant flowers have shown moisturizing properties. Although studies have confirmed that extracts from Plumeria species are effective against microbial infections.

The herbal gel was prepared by using heat add the required amount of all the ingredients to form a homogenous mass of gel. This gel was formulate by using suitable ingredients like, Flower of *Plumeria Alba*, lavender oil, triethalonamine, carbomer and aloe Vera gel. In different properties the herbal gel was evaluated by different parameters such as a pH measurement, viscosity test, skin irritation test, physical appearance, spread ability test and Drug content determination.

Keywords: *Plumeria Alba*; *Plumeria Alba* flower oil; Formulation; Evaluation

1. Introduction

Topical drug delivery is widely used in various diseases because of the advantages of not passing through the gastrointestinal tract, avoiding gastrointestinal irritation and hepatic first-pass effect, and reaching the lesion directly to reduce unnecessary adverse reactions. The skin helps the organism to defend itself against a huge majority of external aggressions and is one of the most important lines of defense of the body. The effectiveness and toxicity of topical products are influenced by at least four factors. These are

- Percutaneous absorption of drugs or other chemicals from a product;
- The application conditions used;
- The skin physiology in the person using the product; and
- Product perception by the patient and in the consumer marketplace.

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Figure 1 Topical drug delivery System

Plumeria Alba is a species of flowering plant in the genus Plumeria native to Puerto Rico and the Lesser Antilles in the Caribbean. It has been planted in tropical regions worldwide. The genus Plumeria(family Apocynaceae) comprises a large number of species distributed globally. The members of this genus are small laticiferous trees or shrubs having a characteristic smell, grown in tropical and sub-tropical regions. It is mainly grown for its ornamental and fragrant flowers *Plumeria Alba*, commonly known as temple tree/pigeon wood/caterpillar tree/white frangipani/pagoda tree, is one of the important. Home premises for its beautiful and fragrant flowers.The different parts of white frangipani are traditionally used for the treatment of several diseases.

WhiteFrangipani is well-known for its intensely fragrant, lovely, spiral-shaped blooms which appear at branch tips June through November. The tree itself is rather unusual in appearance; the 20-inch-long, coarse, deciduous leaves clustered only at the tips of the rough, blunt, sausage-like, thick, grey-green branches. Branches are upright and rather crowded on the trunk forming a vase or umbrella shape with age. They are rather soft and brittle and can break but are usually sturdy unless they are mechanically hit or disturbed. A milky sap is exuded from the branches when they are bruised or punctured.

Figure 2 White Frangipani Plant and Flowers

1.1. Description: [2-5]

- **Scientific name:***Plumeria Alba*
- **Common name(s):** White Frangipani
- **Family:**Apocynaceae
- **Height:** 20 to 25 feet
- **Spread:** 20 to 25 feet Crown uniformity: symmetrical canopy with a regular (or smooth) outline, and individuals have more or less identical crown forms
- **Crown shape:** round; vase shape
- **Crown density:** open
- **Growth rate:** slow
- **Texture:** coarse
- **Flower**
- **Flower color:** white
- **Flower characteristics:** fall flowering; pleasant fragrance; spring flowering; summer flowering; very showy.

Preliminary Phytochemical Screening of flower extracts: The preliminary phytochemical screening was carried out on the different extracts of Plumeria rubra flowers for the detection of various phytochemicals such as Alkaloids, Glycosides, Carbohydrates, flavonoids, tannins, proteins, amino acids, fixed oil, fats, sterols and starch.

Objectives

- To prepare the essential oil from fresh flowers of *P. alba* Linn.
- To evaluate the Formulation of gel by different parameter.
- To determine Drug content in formulation

2. Materials and methods

2.1. Collection of plant materials

Plants flowers were collected from SMBT campus of Nasik, India. The Fresh Flowers of *Plumeria Alba*were wash with distilled water and cut into small pieces. Take 100 gm of *Plumeria Alba* Flowers put into RBF co0ntaining 400 ml of distilled water, set the temperature 100°C ,after boiling the water minimize the temperature up to 40-50 °C.allow to stand for 4 hours, Separate the essential oil from flowers by hydro distillation in a Clevenger-type glass apparatus after the4hrs.The distilled oils were preserved in sealed container and stored under refrigeration.

Figure 3 Separate of essential oil from *Plumeria Alba* flowers by hydro distillation in a Clevenger- glass apparatus

2.2. Formulation Table

Table 1 Ingredient and their quantity

Sr. No.	Name of Ingredients	Formulation (Quantity)				Uses
		F1	F2	F3	F4	
1	*Plumeria Alba* flower oil	1ml	o.5 ml	1ml	1ml	Moisturizer, Antimicrobial and antioxidant properties.
2	Aloe Vera gel	1gm	1gm	1gm	1gm	Anti-inflammatory & Gelling agent
3	Cabomer 940	0.75 mg	0.5 mg	0.5 mg	0.75 mg	Stablilizer, Thickning agent & Gelling agent
4	Lavender oil	0.5ml	0.5ml	0.5ml	0.5ml	Relieve the dry skin
5	Triethalonamine	qs	qs	Qs	qs	Buffer

6	Methyl paraben	0.01 mg	0.01 mg	0.01 mg	0.01 mg	Preservatives
7	Propyl Paraben	0.05 mg	0.05 mg	0.05 mg	0.05 mg	Preservatives

2.3. Preparation of gel

Formulations were prepared from *Plumeria Alba* flowerextract using carbomer and aloe Vera gelas gelling agents. Gels were prepared by mechanical method.Required quantity of carbomer and aloe Vera gel was weighed individually, and sufficient amount of distilled water were mixed in a separate beaker, after which it was continuously stirred by mechanical stirrer till the soaked in the water and kept for 24 h at room temperature.

With continuous stirring, now the appropriate quantity of methyl paraben and propyl paraben was added which acts as a preservative. Small quantities of triethanolamine were added with continuous stirring to achieve neutral pH. Finally Olive oil and *Plumeria Alba* flower oil was added to gel with continuous stirring till oil get dispersed completely. The prepared gel was filled and sealed in the wide mouth bottle container.

Figure 4 Formulation of gel

2.4. Evaluation of gel formulations: [6]

Prepared formulations were evaluated for various physicochemical parameters such as color, Odour.consistancey, homogeneity, pH, spreadability, grittiness, washability, viscosity and drug content.

- **Organoleptic characteristic**: as rule, gels have a viscous consistency, they was homogeneous, transparent, fluid, elastics and plastic. The organoleptic characteristics were observed as a seeing form and which type of gel is see in vitro observation.The herbal gel was evaluated by color, odor and texture.
- **pH:** 5 gm of gel formulation was dispersed separately in 45 ml of water, and the pH of the suspension was determined using digital ph.7 Measurements of pH of all formulations were carried out in tree times and the averages of three readings were noted.
- **Homogeneity** Formulations were tested for homogeneity by visual inspection after the formulations have been set in the container. They were tested for their appearance and presence of any aggregates.
- **Viscosity:** The viscosity of gel was determined by using a Brookfield viscometer DVII model with a T-Bar spindle in combination with a helipath stand 50 g of gel was filled in a 100 ml beaker. T-bar spindle (64) was used for the measurement of viscosity of all the gels. The helipath T-bar spindle was moved up and down and viscosity was measured at 6 and 10 rpm.
- **Skin irritation test:** the method uses the skin ethic reconstructed human epidermis model and involves the topical application of a chemical for 42 minutes. The preparation of gel was apply on skin and kept form 30 minutes and observes the any irritation may occur there, was no any itching or redness on skin.
- **Spread ability test:** the gel was weighing to be as high as 0.5 g and then placed on graph paper coated with glass. Then, we put another glass above the gel mass. The gel diameter was calculated by measuring the diameter length of several sides Spread the formulate gel on the wound; it is spread easily and smoothly without any small particles.

Figure 5 PH of gel

Figure 6 Viscosity of gel

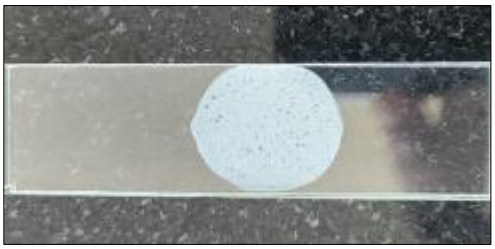

Figure 7 Spreadability of gel

2.5. Drug content determination

Drug content was determined by dissolving accurately weighed 1 g of gel in phosphate buffer of pH 6.8. After suitable dilution, total phenolic content were determined UV spectrophotometrically. Absorbance was recorded by using UV-visible spectrophotometer at 282 nm and the concentration is determined for estimating drug content.

FTIR of formulated gel: FTIR data were c+ollected in transmission mode using a Thermo Scientific Nicolet iS10 spectrometer, which was maintained at ambient temperature (16°C) and purged with N_2, at a resolution of 0.5 cm^{-1} and 32 scans/specimen. Solutions were analyzed liquid spectrophotometer cell with NaCl windows and 1-mm path length. Gels were analyzed using a liquid sample transmission holder (i.e., no windows were required).

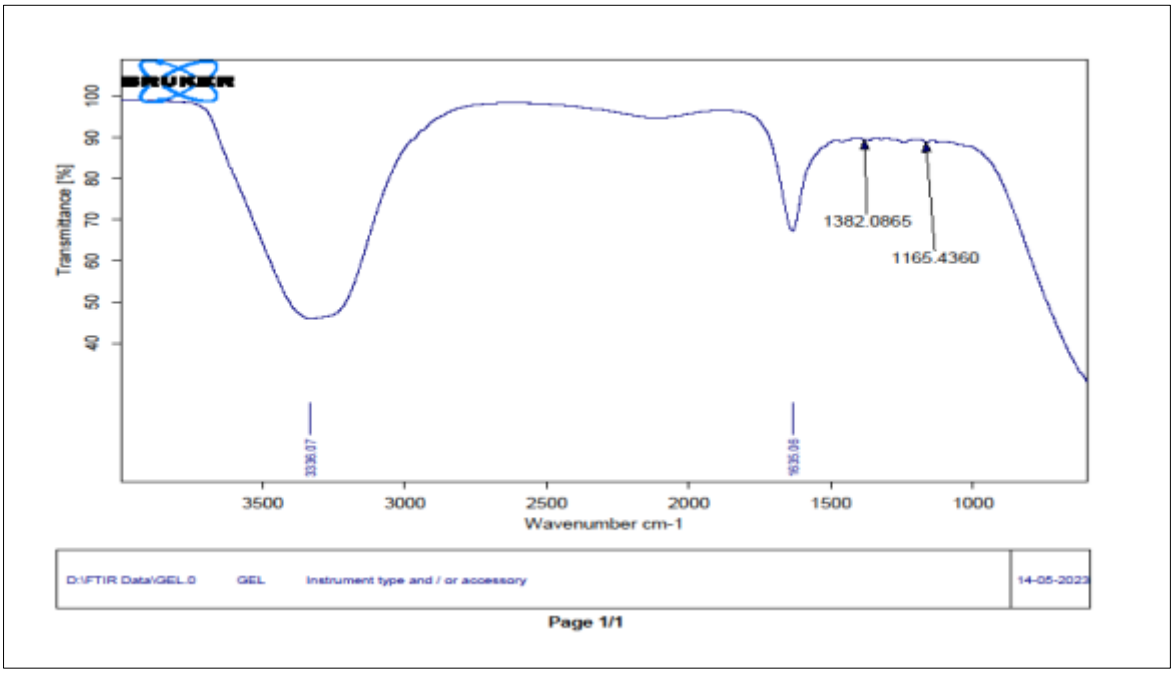

Figure 8 FTIR of gel

2.6. Evaluation Parameter of Gel

Table 2 Evaluation Test

Sr.No	Evaluation Parameter	Observation			
		Formulation1	**Formulation2**	**Formulation3**	**Formulation4**
1	Color	LightGreen	LightGreen	LightGreen	LightGreen
2	Odor	Lavender	Lavender	Lavender	Lavender
3	Texture	Smooth	Smooth	Smooth	Smooth
4	PH	6.30 ± 0.02	5.09 ± 0.04	7.00 ± 0.02	6.80 ± 0.03
5	Homogeneity	Good	Good	Good	Good
6	Viscosity	41840 cps	39800 cps	41880 cps	46600 cps
7	Skin irritation test	No itching /irritation	No itching /irritation	No itching /irritation	No itching /irritation
8	Spread ability	3.5 ± 0.30 cm	3.3 ± 0.20 cm	2.9 ± 0.10 cm	3.5 ± 0.50 cm
9	Drug content	89.167 %	87.220 %	85.170 %	89.042%

3. Results and discussion

Gel formulations were prepared using polymers such as carbomer and aloe Vera gel as gelling agent. Triethanolamine was used in formulations to neutralize the pH and methyl paraben; propyl paraben were used as preservatives.

Gel formulations showed light green color, lavender odor, good homogeneity and spreadability. The pH of gel formulations was in the range of 5 to 7in the normal pH range of the skin. Drug content of all the formulation was found to be 87.5 %

4. Conclusion

Topical gels containing *Plumeria Alba* flower oil can be successfully prepared using carbomer and aloe Vera gel as a gelling agents for making an ideal topical preparation. The moisturizer gel prepared from mixture carbomer and aloe Vera gel will be better gelling agent for making an ideal moisturizer preparation. *Plumeria Alba* flower extract in the form of gel possess significant topical moisturizing properties.

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