

Formulation and Evaluation of Body Lotion by Using the spesia Populnea Extract

Amithas(Associate Professor) Azimsha, Gayathri Raveendran, Hashna Hussain,Shilpa Reji,Mary Helena Smiya,

Dr.Joseph Mar Thoma Institute Of PharmaceuTicalsciences And Research, Kayamkulam

Date of Submission: 28-06-2025

Date of Acceptance: 08-07-2025

ABSTRACT

This study reports the formulation and evaluation of a novel body lotion incorporating Thespesia populnea extract, renowned for its antimicrobial property. The lotion was prepared using a combination of natural ingredients, including Shea butter, Beeswax, Coconut oil, Vitamin E oil, Cetyl alcohol and Lavender oil as a perfume. Thespesia populnea extract was incorporated to impart antimicrobial activity, while rose water and Borax were added to enhance the lotion's texture and stability. The formulated lotion was evaluated for its physiochemical properties, antimicrobial efficacy, and skin moisturizing ability. Results showed that the lotion exhibited significant antimicrobial activity against staphylococcus aureus, while also demonstrating excellent moisturizing and emollient properties. The lotion's PH and viscosity were within acceptable ranges, ensuring skin compatibility and stability. This novel body lotion offers a natural, effective, and antimicrobial moisturizing solution for skin care, leveraging the therapeutic potential of Thespesia populnea extract.

I. INTRODUCTION

Cosmetics as "articles intended to be rubbed, poured, sprinkled, or sprayed on, introduced into, or otherwise applied to the human body...for cleansing, beautifying, promoting attractiveness, or altering the appearance. Some products meet the definitions of both cosmetics and drugs. This may happen when a product has more than one intended use. For example, an antidandruff shampoo is a cosmetic because its intended use is to cleanse the hair, and it is also a drug because its intended use is to treat dandruff. Among other cosmetic/drug combinations are toothpastes with claims to freshen breath and cleanse the teeth that contain fluoride. Similarly, deodorants that are also antiperspirants, and moisturizers and makeup marketed with sun-protection claims are cosmetic/drug products. Such

products must comply with the requirements for both cosmetics and drugs. Body Lotion is a low-viscosity topical preparation intended for application to the skin. By contrast, creams and gels have higher viscosity, typically due to lower water content. Lotions are applied to external skin with bare hands, a brush, a clean cloth, or cotton wool. While a lotion may be used as a medicine delivery system, many lotions, especially hand lotions and body lotions and meant instead to simply smooth, moisturize, soften and, sometimes, perfume the skin. Some skincare products, such as sunscreen and moisturizer, may be available in multiple formats, such as lotions, gels, creams, or sprays.

MATERIALS AND METHODS

Thespesia populnea Extract

Shea butter

Beeswax

Coconut oil

Cetylalcohol

Tween 20

Borax

Glycerin

Rose water

Vitamin E Oil

Perfume

EXTRACTION METHOD

The air dried leaves of Thespesia populnea were powdered and passed through 20 mesh sieve. 14g of powder were weighed and was extracted with 70 ml of methanol using soxhlet apparatus with temperature maintained for extraction was 55⁰ C. The duration of soxhlet extraction was 16 hours. The extracts were concentrated by pouring them into clean round bottom flask and were allowed for evaporation of solvents by using distillation apparatus. Then the concentrated crude extract was stored in air tight bottle until further use.

METHOD OF PREPARATION

Phase A

Weigh and melt the shea butter, beeswax, cetylalcohol , vitamin E oil and coconut oil using a water bath at around 70⁰ C.Once melted, add Tween 20 and then mix well.

Phase B

Heat rose water to around 70⁰C in a separate container. Dissolve borax and glycerin in the warm rose water and mix until fully dissolved.

1. Slowly pour the water phase into oil phase while continuously stirring with a mechanical stirrer at moderate speed.

2. Continue to stir for 5 to 10 minute until smooth, creamy emulsion is obtained.

3. Allow to cool to 40⁰C and add thespesia extract and perfume.

4. Mix well to distribute evenly.

The formulation was carried out with four different trials (F1, F2,F3 and F4) of body lotion

FORMULATION BODY LOTION BY USING THESPESIA POPULNEA EXTRACT

SL.NO	INGREDIENTS	F1 (%)	F2 (%)	F3 (%)	F4 (%)
1	Thespesia populnea Extract	4	4	4	4
2	Shea butter	4	6	7	8
3	Beeswax	16	14	13	12
4	Coconut Oil	24	24	24	24
5	CetylAlcohol	4	4	4	4
6	Tween 20	2	2	2	2
7	Borax	0.7	0.7	0.7	0.7
8	Glycerin	23	23	23	23
9	Rose Water	22	22	22	22
10	Vitamin E Oil	0.3	0.3	0.3	0.3
11	Perfume	Qs	Qs	Qs	Qs

EVALUATION OF THE DEVELOPED BODY LOTION

Organoleptic Properties

Physical appearance for the developed formulation were evaluated and tabulated as follows. All the formulation complied with the standard colour, odour, texture,state

SL.NO	PARAMETER	OBSERVATION
1	Colour	Pale-yellow
2	odour	Pleasant
3	texture	Smooth
4	state	Semi-solid

Homogeneity

The formulation were tested for homogeneity by visual appearance and by touch.

pH determination

0.5 g body lotion was taken and dispersed in 50 ml distilled water and then PH was measured by using digital pH meter.

Skin sensitivity test

A portion of lotion was applied on the forearm and left for 20 mins. After 20 mins any kind of irritation if occurred was noted. From the study it was observed that there is no such irritation occurred after the usage of formulation.

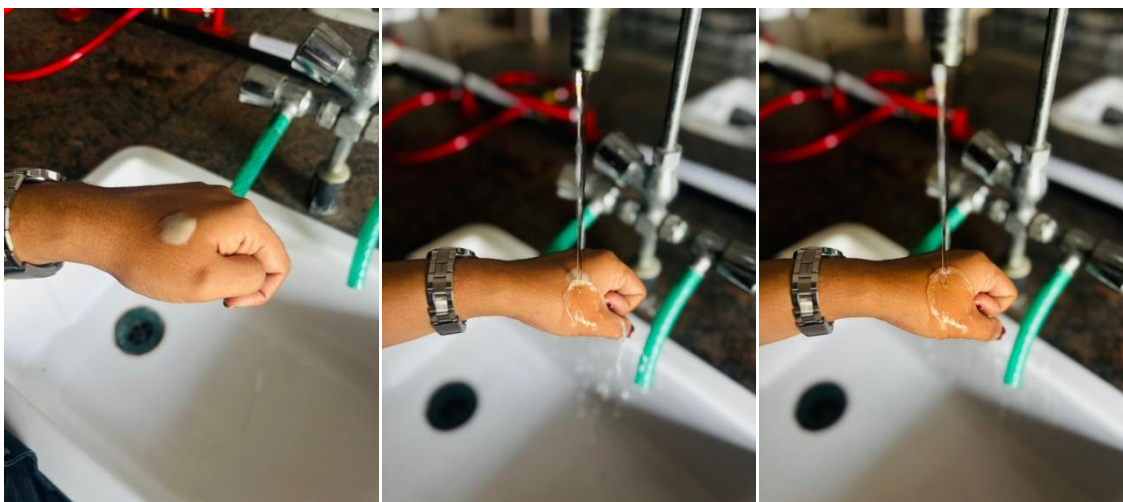


(a) Before application, (b) During application, (c) After application

Wash ability

A portion of lotion was applied over the skin of hand and allowed to flow under the force of

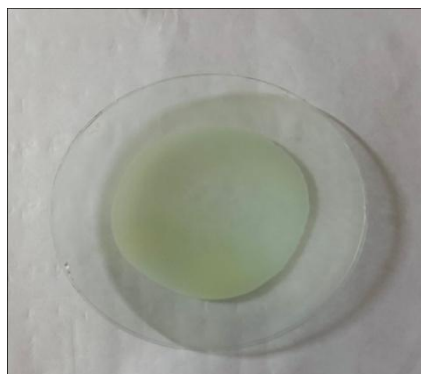
flowing tap water for 10 minutes. The time when the lotion completely removed was noted.



Determination of washability test under tap water (a) Before washing (b) During washing (c) After washing

Determination of Spreadability

The preparation is weighed as much as 0.5 g, placed on top of the watch glass, put another watch glass, given a weight of 150g, and left for 60seconds. After that, the diameter was measured, and the lotion distribution was recorded. Standard power spread range from 5-7 cm.



Determination of spreadability

Determination of Emulsion

Colouring is given to lotion by adding methylene blue. The preparation is homogeneous with methylene blue so lotion is an o/w type emulsion.



Determination of emulsion type

Viscosity Test

The formulation is put into the container. Spindle No.2 is installed, ensuring the rotor is immersed in the practice. Then, turn on the viscometer and make sure that spindle rotates. The test uses a viscometer at a reading of 20 rpm. Observation was made on the viscometer needle, leading to viscosity scale number, and the observation was carried out. The requirement for

suitable viscosity for topical preparation in the form of lotion is 2000-50000.



Determination of viscosity using brook field viscometer.

Acid value

Take 10gm of substance dissolve in accurately weighed in 50ml mixture of equal volume of alcohol and solvent ether. The flask was connected reflux condenser and slowly heated, until sample was dissolved completely. To this 1ml of phenolphthalein added and titrated with 0.1N NaOH, until faintly pink colour appears after shaking for 30sec.

Anti microbial activity

Petriplates containing 20 ml Muller Hinton Agar Medium were seeded with bacterial culture of Staphylococcus aureus (Growth of culture adjusted according to McFarland Standard, 0.5%). Wells of approximately 10 mm was bored using a well cutter and 100 mL samples were added. The plates were then incubated at 37°C for 24 hours. The anti-microbial activity was assayed by measuring the diameter of the inhibition zone formed around the well (NCCLS, 1993). Streptomycin was used as a positive control.

II. RESULT AND DISCUSSION

The preparation of body lotion was done successfully by using Thespesia populnea extract and the evaluation parameters are checked

Organoleptic Evaluation: The developed formulation exhibited desirable organoleptic properties, characterized by a pale-yellow color, pleasant odor, smooth texture, and semi-solid state.

pH Evaluation: The PH of the body lotion was found to be 5.04, which is close to the natural PH of the skin.

Homogeneity Evaluation: The homogeneity evaluation showed that F3, and F4 were homogenous, indicating good stability and acceptability. F1 and F2 were non-homogenous, indicating poor stability and acceptability.

Determination of Emulsion: The emulsion test showed that F3 and F4 had stable emulsions, indicating good stability and acceptability. F1 and F2 had an unstable emulsion, indicating poor stability and acceptability.

Viscosity evaluation: The viscosity evaluation showed that F3 and F4 had a moderate viscosity, indicating good spreadability and acceptability. F1 and F2 had a lower viscosity, indicating thinner texture.

Spreadability Evaluation: The spreadability evaluation showed that F3 and F4 had a spreadability of (below 7), indicating good spreadability and acceptability. F1 and F2 had a higher spreadability (above 7), indicating poorer spreadability.

Skin sensitivity test: It is one of the tests that focused on the incidence of any allergic reaction or skin reactions occurred during the application of the product. The test was carried out in our laboratory and the results revealed the absence of any skin irritation and skin damage and proved for its good moisturizing power with cooling effect. The corresponding figures are represented in Fig No:

Washability Evaluation: The washability evaluation showed that F1, had poor washability, indicating poor safety and acceptability. F2 and F3 had moderate washability, F4 had good washability indicating good safety and acceptability.

Acid value: The acid value of the body lotion was found to be 4.9 mg KOH/g, which is within the acceptable limit.

Anti microbial activity



Sample	Concentration(µg)	Zone of inhibition(mm)
Herbal facewash tablet	Streptomycin(100µg)	27
	250	Nil
	500	11
	1000	12

Overall, F4 was found to be the most suitable formulation, with good physical and chemical properties, non-irritant, and good washability. F3 was also found to be a suitable formulation, with slightly better spreadability than F2 and F1. F1 and F2 were found to be unsuitable due to their poor physical and chemical properties and poor washability.



III. CONCLUSION

In this study, body lotions were formulated using *Thespesia populnea* extract, with four different formulations labeled F1 to F4. The evaluation parameters were carried out and were found to be within the standard range. The ideal formulation F4 met all the evaluation parameters and was selected as the best formulation. *Thespesia populnea* extract showed moderate antimicrobial activity. Body lotion shows better washability, spreadability and is not sensitive to skin. Further studies may be needed to refine the formulations and evaluate their long-term stability and efficacy in real-world applications.

REFERENCE

- [1]. Podębniak P, Kalinowska-Lis U. A survey of preservatives used in cosmetic products. *J Cosmet Sci.* 2025;76(2):123-134.



- [2]. Chourasiya S, Rathore M, Chandrakar TR, Bhatia T. Best effective solvent system for analysis of cosmetic products. *Mater Today Proc.* 2023;89(2):76-83.
- [3]. Rangani J, Kumari A, Patel M, Brahmabhatt H, Parida AK. Phytochemical profiling, polyphenol composition, and antioxidant activity of the leaf extract from the medicinal halophyte *Thespesia populnea* reveal a potential source of bioactive compounds and nutraceuticals. *J Food Biochem.* 2018;43:e12731.
- [4]. Wankhade UD, Katarak RB, Darandale SS. Review on an ideal skin care formulation - The lotion. *World J Pharm Pharm Sci.* 2020;9(5):1773.
- [5]. Pal D, Suthar S, Naskar A, Jain SK. *Thespesia populnea* for the management of diverse diseases: An overview. *Int J Pharm Sci Res.* 2024;15(4):990-1005. .
- [6]. Parthasarathy R, Singh A, Bhowmik D. Pharmacognostical studies on *Thespesia populnea* leaf. *Pharmacogn Mag.* 2016;8(1):45-50.