



Formulation and Evaluation of Antiseptic Cream

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ABSTRACT :

The study's primary goal was to create and assess an antiseptic cream with castor seed extract utilising the oil-in-water method. This cream is made with castor seed extract and honey and has Antiseptic properties to treat bacterial skin diseases. Several evaluation techniques were used to evaluate the formulated product's quality. The formulation did not alter the physical characteristics in any way. During the formulation's research period, the cream's pH, consistency, and spreadability were all good, and there was no indication of phase separation. Stability parameters such as the formulated cream's viscosity, nature, and visual appearance demonstrated that there was no discernible change throughout the course of the trial. These creams exhibit strong Antiseptic activity against gram-positive bacteria and gram negative bacteria the antimicrobial action checked against the S aureus and P aeruginosa by using agar well diffusion method .

Keywords: Anti-septic Cream ,Caster Seed Extract, Coconut powder

2. Introduction:

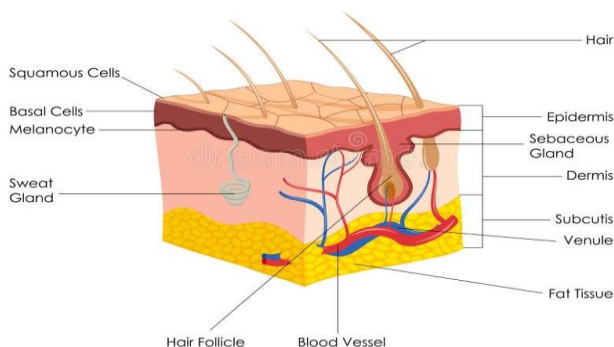
Topical drug administration is a method of localised drug delivery that can occur anywhere in the body via topical, vaginal, or ocular channels. The primary channel of topical medication delivery is the skin, which is also one of the most accessible organs on the human body for topical administration. Topical preparations can have a systemic, local, or superficial effect on the skin. The benefits of topical drug delivery are widely acknowledged. These formulations, which deliver the drug via the skin to achieve systemic therapeutic effect, avoid the problems associated with first-pass metabolism because systemic circulation is achieved without being impacted by the phenomenon of the first pass effect. Topical drug delivery also allows for a controlled transfer of a drug with minimal side effects, good efficiency, and maintenance of a therapeutic dose throughout topical administration. Topical medication administration . Among other pharmaceutical dosage forms, topical drug delivery systems include solid powders, semisolids, liquid formulations, and sprays. The most popular semisolid formulations for topical drug administration are gels, creams, and ointments. Human Epidermis: The largest organ in the body is the skin. The whole body is covered. It acts as a barrier to keep out heat, light, damage, and infections. The skin also serves as a barrier between the body and its surroundings, controls body temperature, stores fat and water, and is a sensory organ.

Human Skin ;

The largest organ in the body is the skin .It provide the protective shield against the sunlight, heat, injury and infenctions

- Is a sensory organ
- Store water and fat
- Prevent water loss
- Regulate the body temperature
- Act as barrier between environment and organisms

Human Skin



Pathology Of Skin:

The study of skin ailments, such as inflammatory, infectious, autoimmune, neoplastic (cancerous), and degenerative conditions, is known as skin pathology. As the largest organ in the body, the skin's functions include immune defense, sensibility, thermoregulation, and protection.

The Skin's Basic Structure:

There are two main layers to the skin:

- a) Epidermis: The outermost layer is called the epidermis, and it is mainly made up of keratinocytes, melanocytes that Langerhans cells, and Merkel cells
- b) Dermis: The middle layer that includes sweat glands, connective tissue, blood vessels, nerves, and hair follicles.
- c) Subcutaneous Tissue (Hypodermis): Connective tissue and fat that serves as a cushion and insulator.

Infections with Bacteria

- a) Impetigo: A mild skin infection brought on by Streptococcus pyogenes or Staphylococcus aureus.
- b) Cellulitis: A deep skin infection characterized by discomfort, warmth, and spreading erythema.
- c) Necrotizing fasciitis: A soft tissue infection that spreads quickly and is frequently brought on by Streptococcus pyogenes.

Infections by Viral Agents:

- a) Vesicular lesions caused by the Herpes The simplex protocol Virus (HSV) frequently reoccur in the same spot (HSV-1 oral, HSV-2 vaginal).
- b) Varicella-Zoster Virus (VZV): Causes shingles (herpes zoster) and chickenpox (varicella).
- c) Warts are caused by the human papillomavirus (HPV), and certain strains are linked to malignancies of the skin and mucous membranes.

Fungal infections, such as tinea or dermatophytosis:

- a) Tinea unguium (nails), tinea corporis (ringworm), tinea pedis (athlete's foot), and tinea capitis (scalp). caused by species of Microsporum, Trichophyton, or Epidermophyton.

Infestations of Species

- b) Scabies: Sarcoptes scabiei infestation, which results in burrows and severe itching.

Leishmaniasis: This disease, which is brought on by Leishmania protozoa, causes nodules and ulcers.

3. Material & Equipment:

Sr No	Drug
1	Caster seed extract
2	Honey
3	Coconut oil
4	Bees wax
5	Borax
6	Rose water
7	Liquid paraffin

List Of Material :

Materials use in dissertation work is listed in tables

Sr No	EQUIPMENT
1	Stirrer
2	Pair of tongue
3	Beaker
4	Petri Plate
5	Container
6	Digital weighing balance
7	Digital Ph Meter
8	TLC plate
9	Brookfield viscometer
10	Burner

4. Drug Profile :

1. Caster seed extract :

Synonyms: Ricinus communis .

Biological source : Castor extract comes from the seeds of the Ricinus communis plant, also known as the castor bean.

Geographical source : Castor extract comes from the castor plant seed, Ricinus communis, which is native to tropical Africa. The plant is now grown in many parts of the world, including India, China, and Brazil. Origin The castor oil plant originated in northeast tropical Africa. It was cultivated in Egypt around 6,000 years ago. It has been domesticated in Eastern Africa.



Figure 1

Chemical constituent :

Castor extract is made up of fatty acids, triglycerides, and other minor compounds.

Fatty acid :

Ricinoleic acid: The main fatty acid in castor seed extract , making up 75–90% of the oil

Oleic acid: Makes up about 3% of castor extract

Linoleic acid: Makes up about 4% of castor extract

Stearic acid: Makes up about 1% of castor extract

Linolenic acid: Makes up less than 1% of castor extract

2. Honey

Biological Source: Apis mellifera, Apis dorsata, Apis florea, Apis indica, and other Apis species that belong to the Apidae family (Order: Hymenoptera) store honey, a viscid and delicious secretion, in their honey combs.

Geographical Source: Africa, India, Jamaica, Australia, California, and Chile are all rich in honey. Moisture 14–24%, Dextrose 23–36%, Fructose 31–48%, Sucrose 0.4–6%, Dextrin and Gums 0–7%.



Figure 2

Chemical constituents: Essential oil, beeswax, pollen grains, formic acid, acetic acid, succinic acid, maltose, dextrin, colouring pigments, vitamins, and an enzyme mixture are all found in trace levels in it. Uses: Honey has calming effects on the skin and demonstrates strong Antiseptic, anti-inflammatory, and antipyretic properties.

Uses: Antioxidant and Heart Care

3. Coconut oil :

Synonyms: coco, coco palm, coconut palm, and cocoa palm

Biological source: The coconut (*Cocos nucifera*) is a member of the palm family (Arecaceae). It is a monoecious perennial tree that is native to Southeast Asia and the islands of the Indian and Pacific Oceans. Origin and spread The coconut's exact origin is unknown, but it is believed to have spread from Southeast Asia to India, East Africa, West Africa, and the America



Figure 3

Chemical constituents : It including fatty acids, phytochemicals, and electrolytes. Fatty acids Coconut kernel is made up of 90% saturated fatty acids and 10% unsaturated fatty acids The saturated fatty acids are mostly medium-chain triglycerides (MCTs) with 6 to 12 carbon atoms in their chain acid (C12) is a major MCT in coconut

Phytochemicals:

Coconut contains: phenols, tannins, flavonoids, triterpenes, steroids, and alkaloids Coconut fiber contains polyphenols, such as catechins, epicatechins, tannins, and flavonoids Coconut also contains lignin, pentose, and furfural

Electrolytes: Coconut water contains electrolytes like potassium, sodium, calcium, magnesium, iron, and manganese Coconut water also contains trace amounts of boron, nickel, and aluminum .

Other constituents:

Coconut liquid albumen contains vitamins B, biotin, pantothenic acid, riboflavin, and folic acid Coconut also contains plant hormones, enzymes, and growth-promoting factors

Uses:

Coconut oil is an increasingly popular cooking oil. Many people praise it for its health benefits, including antimicrobial and antioxidant properties, improved skin and oral health, and weight loss potential.

4. Bees Wax:

Synonyms : Cera Flaba

Biological source. : Beeswax is a biological product that comes from glands in the abdomen of worker honey bees. The bees secrete the wax to build honeycomb.

Chemical Composition: Approximately 80% of beeswax is made up of melissyl palmitate, 15% is free cerotic acid, and trace amounts of cerolein, an aromatic compound. Uses: Beeswax serves as a foundation for cerates and plasters and is a pharmaceutical need in ointments.

Uses:

Beeswax is used as a Pharmaceutical necessity in ointment and as a base for cerates and plasters .

5. Borax :

Physical properties :

Borax is a colourless, crystalline solid that turns into a basic solution when dissolved in water. It is frequently offered in granular or powder form.

Applications:

To stop bacteria from growing, borax is used in the cosmetics business. Additionally, it is utilised to eliminate dead skin cells and skin microorganisms. Cold cream's water and oil components were less likely to separate on standing borax thanks to an emulsifier produced by the chemical reaction. Borax-based cold creams were therefore more stable

6. Liquid paraffin

Physical characteristics of liquid paraffin include its oiliness, transparency, and colourlessness. It doesn't dissolve in glycerol or water. It is soluble in

ethanol, benzene, and ether.

Uses: It improves dry skin disorders such ichthyosis, eczema, and geriatric pruritus. One is liquid paraffin.

Method of Preapration :

- Melt beeswax in a china dish on a hot plate.
- After adding liquid paraffin, it is heated to 70°C on a hot plate.
- In the beaker, borax was dissolved and heated with coconut oil.
- After adding Caster oil and honey to the beaker, borax solution was added at 70°C.
- To add scent, a few drops of rose oil are added

5. Formulation of Cream:

Sr. No	Ingredient	Quantity
1.	Caster seed extract	50 ml
2.	Coconut Oil	5 ml
3.	Honey	10 ml
4.	Bees Wax	10 gm
5.	Borax	10gm
6.	Rose Water	5 ml
7.	Liquid Paraffin	10 ml

6. Evaluation Test :

The cream's colour, odour, and homogeneity were assessed visually. pH: A digital pH meter was used to measure the pH of cream. After preparing a 10% cream solution in distilled water, the mixture was submerged in a pH meter. Washability: For ten minutes, a layer of cream was applied to the hand's skin and let to run under the pressure of running tap water. It was recognized when the cream was totally gone. The parallel plate method was used to assess the cream's spreadability. Two 20/20 cm glass slides were chosen.

One of the slides was covered with roughly one gram of the cream formulation. A 125 g weight was placed on the top slide to press the cream between the two slides evenly into a thin layer, and the other slide was placed on top of the cream so that the cream was sandwiched between the slides. After removing the weight, the spread diameter was measured. Test of irritation: Mark a region of the left hand's dorsal substance up to 1 sq.cm. The cream was then administered, and the time was recorded. Check for irritation for up to 24 hours.

Five batches of cream were prepared, and they were stored out of direct sunlight in a closed container between 25 and 100 °C. Phase separation was then examined for 24 hours for a formulation weighing 100 grams. Viscosity: The LV-3 spindle was used to measure viscosity in a Brookfield viscometer. 50 rpm was chosen as the new rotational speed. The viscosity of the prepared cream was measured when it was immediately submerged in the spindle.

Antimicrobial Studies:

Using the modified agar well diffusion method against Gram-positive (*Staphylococcus aureus* NCIM 2654) and Gram-negative (*Pseudomonas aeruginosa* NCIM 2200) bacterial pathogens with minor adjustments, the gel's antimicrobial activity was assessed. Pathogens were disseminated on the surface of nutrient agar plates using a sterile spreader for the antimicrobial activity test after the corresponding test pathogen suspension was made in sterile saline for additional research. Then a sterile cork borer with a diameter of 0.7 cm was used to construct an agar well. The formulations were then aseptically added to the appropriate well after a predetermined quantity was weighed on an analytical balance. An analytical scale was used to weigh the formulations, and the corresponding well was aseptically filled with the red amount. After 10 minutes of sample diffusion in a culture medium at 34°C, plates were moved to an incubator set at 37°C for 24 hours. Additionally, the results were documented and the inhibitory zone's diameter was determined in millimeters.

Result:

Physical test for antiseptic cream-

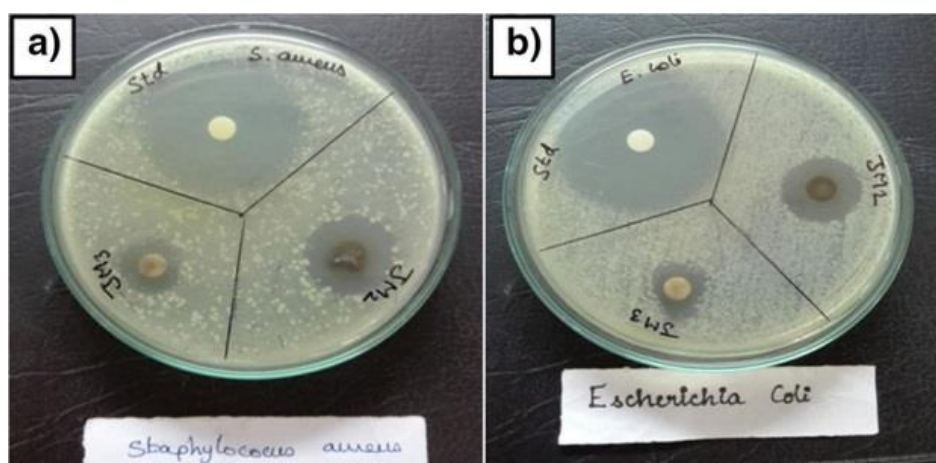
Sr. No	Parameters	Observation
1.	Nature	Semi Solid
2.	Colour	Yellowish
3.	Odour	Pleasant
4.	Texture	Cream Smooth

- **pH:** By using ph meter the ph of the meter was found to be 7
- **Washability:** The time taken for completely removal of cream 5 min
- **Spredability:** Investigation revealed that formulation have greater spredability it was found to be 5.29
- **Irritancy Test:** No skin irritation was present
- **Viscosity:** Viscosity of formulation was measured by using Brookfield Viscometer

Sr. No	RPM	CPS
1.	50	11570

Anti – Microbial Activity:

Sr. No	Test Organism	Zone of inhibition of respective compound in mm		
		Cream	Ethanol	
1.	S.aures	20	00	25
2.	Escherichia Coli	19	00	20



Summary and Conclusion:

In this study, a topical Antiseptic cream was created. Important characteristics like pH, viscosity, irritancy, washability, and spread ability were assessed as part of the formulation optimization process. Every parameter was discovered to be within an acceptable range. No evidence of microbiological growth was seen when the cream's Antiseptic activity against Staphylococcus aureus and Escherichia Coli was examined. According to the aforementioned findings, the cream formulation had good consistency, spread ability, viscosity, pH, and washability. It also exhibited no phase separation during the study period, was safe to use, and showed no symptoms of redness or irritation. The cream's Antiseptic efficacy against skin infections was good. Given that the cream was created using natural ingredients like honey and caster seed extract.

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