International Journal of Current Trends in Pharmaceutical Research
Home Page: https://pharmaresearchlibrary.org/journals/index.php/ijctpr
CODEN (USA): IJCTGM | ISSN: 2321-3760 | Publisher: Pharma Research Library
Int. J. Curnt. Tren. Pharm, Res., 2025, 13(1): 61-65
DOI: https://doi.org/10.30904/j.ijctpr.2025.4827

Formulation of Antiseptic Ointment from Mangifera Indica Seed and Leaf Powder Extracts

Ramyakrishna Samala[1*], Sravanthi Yamsani[1], Manjula Katkuri[1], Aleti Parameshwar[2]
[1]Department of Pharmaceutics, S.R.R. College of Pharmaceutical Sciences, Hanumakonda, TG, India
[2]Department of Pharmaceutical Analysis, S.R.R. College of Pharmaceutical Sciences, Hanumakonda, TG, India

A B S T R A C T

Background: Ointments are semisolid dosage form which usually actasvisco-elasticmaterials when shear stress is applied. They generally contain medicinal ingredients and are used to be applied externally to the body for therapeutic effect. Aim: Medicinal plant parts and extracts have been the focus of several researches. This is because there is increasing need to develop novel therapeutic and pharmaceutical products as alternatives to synthetic products. **Materials and Methods:** Mangifera indica, commonly used herb in ayurvedic medicine. Although review articles on this plant arealready published, but this review article is presented tocompile allt heupdated information on its phytochemical and pharmacological activities, which were performed widely cardiotonic , hypotensive, anti-inflammatory properties. **Results and Discussion:** Various studies have been conducted on extracts obtained from leaves, fruit peel, root, stem bark and seed kernel of M. indica to ascertain their antimicrobial activities. Quantity of extracts and quantity of phytochemicals in a particular extract are dependent on a number of factors which include type of solvent used, extraction method, seasons and environmental conditions. **Conclusion:** This study shows that MI has high potential as antimicrobial agent when formulated as ointment for topical use and could, therefore, explain the successes claimed in the folk use of the plant in the treatment of common skin conditions. Among the Prepared Formulation Batches, F5 showed the higher zone of inhibition against S. aureus, C. albicans, E. coli, M. smegmatis. Formulation F1, F2, F3, F4 of Ointment have lesser zone of inhibition compared with F5 ointment.

Keywords: Mangifera indica, Phytochemicals, Antimicrobial agent, Common skin conditions

A R T I C L E I N F O

Corresponding Author
Ramyakrishna Samala
Department of Pharmaceutics,
S.R.R. College of Pharmaceutical Sciences,
Hanumakonda, TG, India

Article History:
Received : 22 April 2025
Revised : 20 May 2025
Accepted : 24 June 2025
Published : 09 July 2025

Citation: Ramyakrishna Samala, *et al.* Formulation of Antiseptic Ointment from Mangifera Indica Seed and Leaf Powder Extracts. Int. J. Curnt. Tren. Pharm, Res., 2025, 13(1): 61-65.

C O N T E N T S

1. Introduction

Ointmentsaresemisoliddosageformwhichusuallyactasvisco-elasticmaterials when shear stress is applied. They generally contain medicinal ingredients and are used to be applied externally to the body for therapeutic effect. Many therapeutic agents used for topical application to intact or broken skin or to mucous membranes are presented in the form of semisolid consistency variously designated as ointments, creams, pastes etc. It is used mainly as protective or emollient for the skin[1-5]. The first step towards the goal is screening of plants used in popular medicine. Along with other dosage forms, herbal drugs also used in the form of ointment. Pharmaceutical semi-solid dosage form include: ointments, gels, pastes, cream, plasters and foams. They contain one or more active ingredient dissolved or uniformly dispersed in a suitable base and any suitable excipients such as emulsifier, viscosity increasing agents

and microbial agents and antimicrobial agents antioxidants or stabilizing agent etc. Semisolid dosage form is a topical dosage form used for the therapeutic protective or cosmetic functions they may be applied to the skin or used nasally, vaginally, rectally.

Advantages of semi-solid dosage form

It is used externally

- Probability of side effect can be reduce
- First pass gut and hepatic metabolism is avoided
- Convenient dosage form for bitter drugs
- More stable than liquid dosage form.
- Disadvantages of semi- solid dosage form.
- There is no dosage accuracy in semisolid dosage forms.
- They are bulky to handle
- Application with finger may cause contamination Physico –chemically less stable than solid dosage form May cause irritation or allergy to some patient.
- Bases used in semi-solid dosage form Hydrocarbon bases (oleaginous bases) Paraffin, Lanoli

Absorption bases[6-9]

- Coldcream, anhydrous lanolin
- Water removal bases Oil in water
- Water soluble bases Polyethylene glycol.
- Antioxidant used in semi- solid dosage form
- Butylated hydroxyl anisole Butylated hydroxy toluence

Permeation Enhancers-oleic acid

Emulsifier

Emulsifyingagent

Sodiumlauryl sulfate (o/wemulsion),

Sodium stearate and calcium stearate

Glyceryl monostearate- weak w/o emulsifying agent

Humectant is also used

Buffers: sodium acetate sodium citrate

Antimicrobial Preservatives

Parabens, phenols, benzoicacid.

Preformulation study

The main objective of study was to prepare mefenamic acid and peppermint oil ointment.To prepare ointment we used incorporation method, there is also fusion method for prepare ointment. In pre formulation study there is three steps.

Identification of drug Drug and excipients

Characterization of herbal substance.

Types of ointments

Various types of ointments are:

- Un medicated ointments
- Medicated ointments
- Unmedicated ointments
- Medicated ointments

These are of several sub-types:

- Dermatologica lointments
- Opthalmicointments
- Rectalointments
- Vaginal ointments
- Nasalointments

Advantages

Handling of ointments is easier than bulky liquid dosage form.

They are chemically more stable than liquid dosage forms.

They prolong the contact time between the drug and effected area.

Disadvantages

- They are bulkier than solid dosage forms.
- They are less stable than solid dosage form.

Ointment Applications

There are various parts of the body surfaces, skin and mucous membranes where ointment is applied for curing certain skin or disease conditions.

Ointment is applied on hands, legs, face, eyes, ears, vagina, anus

There are various problems when an ointment is suggested for treatment such as

Ointment for burns Ointments for cuts Ointments for pain, inflammation, Ointments for boils and scars

Preparation of ointments

A well-made ointment is-

Uniform throughout i.e.it contains no lumps of separated high melting point ingredients of the base, there is no tendency for liquid constituents to separate and insoluble powders are evenly dispersed.

Methods of preparation must satisfy this criteria.

Fusion, in which ingredient same altered. Trituration, in which finely-subdivided insoluble medicaments are evenly distributed by grinding with a small amount of the base or one of its ingredients followed by dilution with gradually increasing amounts of the base.

Plant Profile

Mango[Mangiferaindica]

Synonyms:

Mango,MangiferaambaForssk,MangiferaanisodoraBlanco

Biologicalsource: Flowering part of an cardiaceae

Family : Anacardiaceae

Genus : Mangifera

Kingdom: Plantae

Mangifera indica, commonly used herb in ayurvedic medicine. review articles on this plant are already published,butthisreviewarticleispresentedtocompilealltheup dated information on its phytochemical, pharmacological activities, which were performed widely cardiotonic, hypotensive, anti-inflammatory properties. Various effects like antibacterial, anti fungal, anthelmintic, antiparasitic, antitumor, anti HIV, antispasmodic, antipyretic, antidiarrhoeal, antiallergic, immune modulation, hypolipidemic, antimicrobial, hepato protective, gastro protective have also been studied. Clinical trials using mango for a variety of conditions should also be conducted.

2. Methodology

Chemicals:

Analytical grade chemicals were used for the study. The solid media and broth used for microbial culture were procured from Pharmaceutical lab. Ethanol, Woolfat, Hard Paraffin, CetostearylAlcohol,Whitesoft paraffin.`

Collection and extraction of plantparts:

The leaves were washed thoroughly with water to remove dirt. They were dried under direct sunlight and grinded into

verysmall units withthe help ofa grinding machine. The wastages are removed using a fine strainer, and finally, weight was taken. After drying, crushing, and removing wastages, the weight of 1 kilogram leaves was found to be 318 gram. Raw, dried, and crushed leaves

Figure.1

Collection of mango seed:

Ripe mangoes Lily cultivar seeds were collected from the local market. The seeds were washed with tap water to remove their impurities and dried in the oven at 70 °C overnight. Then, the dried seed's kernels were separated manuallyusing a kitchen knife to recover the seeds and dried in the oven at 50 °C for 24 hours.

Preparation of extracts:

The extraction was carried out using methanol,400g of dry seeds of MI fruit were extracted with 80% methanol using Sox-8 h till the color of the solvent returned colorless. Solvent was evaporated under reduced pressure using the Rotary evaporator apparatus (BUCHI Rotavapor R-200/20). Extract was finally allowed to dry at air at room temperature till complete dryness. Extraction using methanol followed the above procedures.

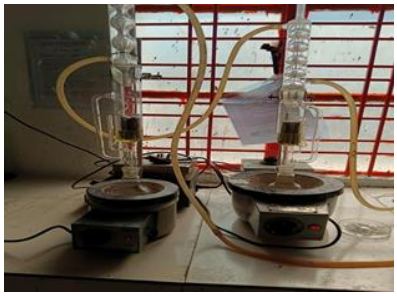


Figure.2

Evaluation

The above formulated ointment of MIL. were subjected to evaluation of or the following parameters as per the method described.

Physical evaluation of the formulation:

The formulations were inspected visually for their color, homogeneity, consistency, and phase separation.

Measurement of pH:

The pH was measured using a pH meter, which was calibrated before each use with standard buffer solutions at pH4,7,9. The electrode was inserted into the sample 10 min prior to taking the reading at room temperature.

Uniformity of weight:

A total of 10 bottles were filled randomly and weighed. Ointment and creams were removed from each bottle, and each empty bottle was washed with methanol. The empty bottles were dried, and their weight was taken. The difference between two weights was calculated as net weight of the ointment and cream of bottle.

Average bottle content=Total content of 10 bottles/No of bottles

Viscosity:

The viscosity was determined by CAP-2000 Brookfield viscometer. Test sample was taken in a clean and dry250 ml beaker, and the viscosity of the test sample was determined by standard operating procedure of Viscometer using spindle nos.1–4.Eachspindlewasused for finding the viscosity of the sample at speeds of0.3, 0.6, 1.5, 3, 6, 12, 30 and 60 r.p.m., respectively. Their rheological characteristics were also tested at 250 C using Brookfield viscometer.

S =M.L/T

Where, M=wt. tied to the upper slide, L= length of glass slides T = time taken to separate the slides.

Acute skin irritation study:

The primary skin irritation test was performed on male albino rats, weighing about150–200g. A set of six rats was used in the study for each formulation. The animals were maintained on standard animal feed and free access to water. The animals were kept under standard laboratory conditions. The dorsal hairs on the back of the rats were clipped off 1-dayprior to the study. 50 mg of the different formulations was applied over a1cmareaofintact skin on different animals. After the formulation was applied to the skin of rats, the animals were returned to the cages.

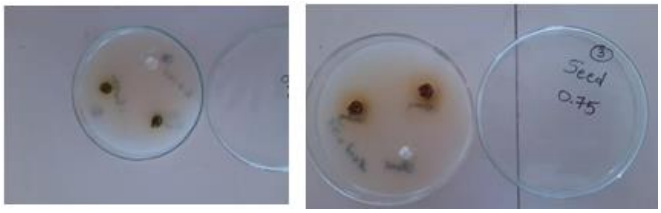
After 48 h of exposure, the formulation was removed. The test site was wiped with tap water to remove any remaining residue[10-13].

Stability study:

All the developed formulations were subjected to accelerated stability testing for about 5weeks. Room temperatures were maintained as per(ICHguidelines1993). The parameter of formulation such as color, texture, Spreadability, pH, phase separation, skin irritation and viscosity were determined for all the formulations.

Antimicrobial activity:

The prepared formulations and control (base) were screened for their antimicrobial activity by Discplate method. It was tested on nutrient medium against S.aureus, B.subtilis, A.niger and E. coli which are representative types of Gram positive and Gram negative organisms. The activity was determined by measuring the diameter of zone of inhibition recorded. The test strains of S. aureus, B. subtilis, A. niger and E. coli were collected from Department of Microbiology. The plates were inoculated with test cultures and were incubated at 37±1°C for 24h.The next day, the wells (6 mmdiameter) were made with help of 6 mm diameter cork borer and the wells were loaded with prepared formulations namely1, 2, 3, 4, 5 and 6 along with base as a control. After 24 h of incubation, the test determined the efficacy of the product in terms of zone of inhibition of the organism.



F1 **F2**

F3 **F4**

3. Results and Discussion

Table.1: Uniformity of Weight

S.No.	Bottle No.	Bottle conte Nt(mg)	91%-109 %
1.	1	210	97
2.	2	211	96.5
3.	3	196	103.9
4.	4	206	98.8
5.	5	204	99.8

Table.2: pH of Ointments

Formulation	Phmeasurement
F1	6.37
F2	6.34
F3	6.28
F4	6.98
F5	6.91

Table.3: Viscosityofointments

Formulations	Viscosity measurement
F1	81
F2	81.1
F3	81.2
F4	83.3
F5	83.2

Table.4: Spreadabilityofoinment

Formulations	T	Spreadibility measurement
F1	**18.5**	**202.7**
F2	**18.2**	**206.04**
F3	**17.7**	**211.86**
F4	**21.6**	**173.6**
F5	**21.2**	**181.15**

Table.5: Anti-Microbial activity

Product	Zone of inhibition 100mg	150mg	Blank
Leaf 0.125	0.3cm	0.5cm	-
Leaf 2.5	0.6cm	0.9cm	-
Seed 0.25	0.2cm	0.3cm	-
Seed 0.75	0.6cm	0.7cm	-
Leaf and seed 0.5+0.5	0.6cm	0.8cm	-
Leaf and seed 1.25+1.25	0.9cm	1cm	-

Table.6: Skin Irritant Test

Formulations	Observations
F1	**Nosignof redness**
F2	**Nosignof Redness**
F3	**Nosignof redness**
F4	**Nosignof Redness**
F5	**Nosignof redness**

Discussion:

Medicinal plant parts and extracts have been the focus of several researches. This is because there is increasing need to develop novel therapeutic and pharmaceutical products as alternatives to synthetic products. The interesting pharmacological use of medicinal plants for therapeutic purposes is intended to solve the issue of environmental contamination associated with synthetic products in addition to the growing antimicrobial resistance crisis which is a public health issue of concern. Almost every part of mango plant is used in traditional medicine for the treatment of different health issues14-15. It has been established that phytochemicals are the scientific basis for the pharmacological activities of mango plant parts. Although it is well known that many secondary metabolites possess pharmacological abilities, the major phytochemicals attributed with these properties are the phenolic compounds. Polyphenols, a group of phenolic compounds, are abundantly presentinplants.

Theyarecharacterizedbythepresenceofaromatichydroxylgrou psandare categorized according to the nature of their carbon skeleton. Several researches have been conducted to investigate pharmacological potentials of polyphenols. These potentials include antioxidant, anticancer, anti-inflammatory, anti-diabetic, antimicrobial, anthelmintic, gastroprotective, hepatoprotective, immunomodulatory and antiplasmodial properties antimicrobial activity of plant part extracts is also dependent on the type of microorganism involved. Extracts containing higher concentration of tannin in comparison with other phytochemicals will be limited in antimicrobial activityagainst Gram-negative E. coli [30]. This is because tannin is unable to inhibit E.coli due to (1) the bacteria negatively charged outermembrane (2) tannin'spossessionofrelativehighnegativechargeandlargemo lecular size in contrast to other phytochemicals.

4. Conclusion

This study shows that MI has high potential as antimicrobial agent when formulated as ointment for topical use and could, therefore, explain the successes claimed in the folk use of the plant in the treatment of common skin conditions[14-16]. Among the Prepared Formulation Batches, F5 showed the higher zone of inhibition against S. aureus, C. albicans, E. coli, M. smegmatis. Formulation F1, F2, F3, F4 of Ointment have lesser zone of inhibition compared with F5 ointment. The formulated formulations showed acceptable physical properties, and hence, were compatible with the skin. In addition, the formulated formulations passed the short-term stability, indicating the physical and

chemical stability of the product. Hence, the formulated formulations of the MI were safe and efficient carriers, with potent Antimicrobial activity.

5. References

[1] Schulz V, Hansel R, TylerVE. A Physician's Guideto Herbal Medicine. 4thed.Berlin: Springer-Verlag; 2001. Rational Phytotherapy.

[2] Bannerman RB, ButonJ, Chieh CW.Traditional Medicine and Health Care Coverage. Africa: World Health Organization; 1983. pp. 9–13.

[3] MominA.1st International Seminaron Unani Medicine. New Delhi: 1983. Role of Indigenous Medicine in Primary Health Care; p. 54.

[4] Carter SJ. Cooper and Gunn's Dispensing for Pharmaceutical Students: Ointments, Pastes and Jellies. 12th ed. India: CBS Publishers and Distributors; 1983. pp. 192– 210.

[5] Daniels R, Knie U. Galenics of dermal products - vehicles, properties and drug release. J Dtsch Dermatol Ges. 2007; 5: 367–83.

[6] Scartezzini P, SperoniE. Review on some plants of Indian traditional medicine with antioxidant activity. J Ethnopharmacol. 2000, 71: 23–43.

[7] Ross JA. Medicinal Plants of the World. New Jersey: Human Press Inc;1999.p.199.

[8] Vaghasiya Y, Patel H, Chanda S. Antibacterial Activity of Mangifera indica L. Seeds against some human pathogenic bacterial strains. Afr JBiotechnol. 2011, 10: 15788– 94.

[9] Sofowora A. Medicinal Plants and Traditional Medicinesin Africa. New York: John Wiley and Sons Ltd; 1982.

[10] GuptaGD, Ground RS. Release rate of nimesulide from different gellants. Indian J Pharm Sci. 1999; 61: 229–34.

[11] WoodJH, CatacalosG, LiebermanSV. Adaptation of commercial viscometers for special applications in pharmaceutical rheology. II. Severs extrusion rheometer. J Pharm Sci. 1963, 52: 375–8.

[12] ShivharUD, JainKB, Mathur VB. Formulation development and evaluation of diclofenac sodium gel using water soluble Poly acrylamide polymer. Dig J Nanomater Biostruct. 2009, 4: 285–90.