Int. J. Sci. R. Tech., 2026 3(5)
A Multidisciplinary peer-reviewed Journal
www.ijsrtjournal.com [ISSN: 2394-7063]

Original Article

Formulation And Evaluation Of Antiseptic Polyherbal Ointment

Pooja Rathore*, Rahul Gour, Ram Kumar, Rohan Pal, Sajjad Alam, Sameer Khan, Sanjay Jatav, Jagdish C. Rathi

NRI Institute of Pharmaceutical Science, Bhopal M.P

ABSTRACT

From the present investigation, it can be concluded that the antiseptic polyherbal ointment was successfully formulated using Aloe vera, Neem, Rose, Olive oil, and Orange rind with paraffin and beeswax as the base. The formulation process was simple, reproducible, and cost-effective. The evaluation results demonstrated that the prepared ointment possessed satisfactory physicochemical properties, good stability, and excellent antimicrobial activity. Among all the formulations, F3 was found to be the optimized formulation due to its superior spreadability, consistency, and highest antimicrobial effectiveness. The absence of skin irritation and the presence of natural ingredients further confirm the safety and compatibility of the formulation for topical use. The synergistic action of multiple herbal components contributed to enhanced therapeutic performance compared to individual ingredients. Thus, the developed polyherbal ointment can be considered a promising alternative to synthetic antiseptic formulations, offering advantages such as reduced side effects, improved patient compliance, and cost-effectiveness. this study supports the potential use of herbal-based formulations in modern pharmaceutical practice and highlights the importance of integrating traditional knowledge with scientific evaluation for the development of safe and effective topical drug delivery systems.

Keywords: antiseptic, polyhedral ointment spread ability, consistency

INTRODUCTION

The use of medicinal plants for the treatment of various diseases has been practiced since ancient times and forms the basis of traditional systems of medicine such as Ayurveda, Unani, and Siddha. In recent years, there has been a renewed interest in herbal formulations due to their wide therapeutic potential, better patient compliance, and minimal side effects compared to synthetic drugs. Herbal medicines are considered safer, economical, and more compatible with the human body, which has led to their increasing acceptance worldwide.

Ointments are semisolid dosage forms intended for external application to the skin or mucous membranes. They serve as an effective vehicle for delivering drugs locally and provide prolonged contact with the site of application. Ointments are widely used for their emollient, protective, and therapeutic properties in the management of various dermatological conditions such as wounds, burns, infections, and inflammatory disorders. The effectiveness of an ointment depends not only on the active ingredients but also on the nature of the base used.

An antiseptic is defined as a chemical substance that inhibits or destroys microorganisms and helps prevent infection when applied to living tissues. Antiseptic ointments play a crucial role in protecting wounds from microbial contamination and promoting faster healing. However, the prolonged use of synthetic antiseptic agents may lead to side effects such as skin irritation, hypersensitivity, and microbial resistance. Therefore, there is a growing need to develop natural and safe alternatives using herbal ingredients.

Polyherbal formulations involve the combination of two or more medicinal plants to achieve a synergistic therapeutic effect. The concept of polyherbalism is well established in traditional medicine, where

Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

multiple herbs are combined to enhance efficacy and reduce toxicity. Such formulations are believed to act on multiple targets and provide better overall therapeutic outcomes compared to single-herb formulations.

In the present study, an attempt has been made to formulate an antiseptic polyherbal ointment using Aloe vera, Neem, Rose, Olive oil, and Orange rind. Aloe vera is widely known for its wound healing, anti-inflammatory, moisturizing, and antimicrobial properties, making it highly beneficial in skin care and treatment of minor wounds and burns. Neem is a well-established medicinal plant with potent antibacterial, antifungal, antiviral, and anti- inflammatory activities, and is extensively used in the treatment of skin infections and disorders. Rose possesses cooling, soothing, and mild antiseptic properties, and is useful in reducing skin irritation and inflammation. Olive oil acts as an excellent emollient, providing hydration and improving skin elasticity, while also enhancing the penetration of active Ingredients into the skin. Orange rind is rich in natural antioxidants such as flavonoids and vitamin C, and exhibits antimicrobial as well as skin rejuvenating properties.The ointment base selected for the formulation includes paraffin and beeswax. Paraffin acts as an occlusive agent, forming a protective barrier on the skin and preventing moisture loss, thereby aiding in skin hydration and healing. Beeswax serves as a stiffening agent, providing the desired consistency and stability to the ointment, and also contributes mild antimicrobial properties. The combination of these base components ensures proper texture, spreadability, and patient acceptability of the formulation.

The present work is focused on the formulation and evaluation of a polyherbal antiseptic ointment using the above-mentioned natural ingredients. The prepared formulation will be evaluated for various physicochemical parameters such as color, odor, pH, spreadability, and extrudability, along with antimicrobial activity. The aim of this study is to develop a safe, effective, stable, and economical herbal ointment that can serve as an alternative to conventional synthetic antiseptic preparations for topical application.

DRUG PROFILE

1. Aloevera

Biological Source

Dried latex or fresh gel obtained from leaves of Aloe barbadensis Miller.

Family. Liliaceae

Morphological Characters

Leaves: Thick, fleshy, green, succulent

Shape: Lance-shaped with spiny margins

Gel: Transparent mucilaginous pulp

2. Azadirachta indica

Biological Source

Leaves of Azadirachta indica Family Meliaceae Morphological Characters

Leaves: Compound, serrated margins

Color: Dark green

Microscopic Characters Epidermal cells with stomata, Oil glands, Xylem and phloem tissues Calcium oxalate crystals

Chemical Constituents

Azadirachtin Nimbin, nimbidin Flavonoids

3. Rosa damascene

Biological Source

Petals of Rosa damascena

Family. Rosaceae

Morphological Characters Petals: Soft, fragrant

Color: Pink/red

Texture: Delicate

Microscopic Characters

Epidermal cells with papillae,

Oil glands Pigment-containing cells

Chemical Constituents

Volatile oils Flavonoids Tannins

4. Olea europaea (Olive Oil)

Biological Source

Fixed oil obtained from fruits of Olea europaea.9

Family. Oleaceae

Morphological Characters

Yellowish oily liquid Smooth texture Characteristic odor

Microscopic Characters

Oil globules

No cellular structure (liquid)

Chemical Constituents

Oleic acid Linoleicacid Vitamin E

5. Citrus sinensis (Orange Rind)

Biological Source

Dried outer peel of Citrus sinensis **Family**. Rutaceae
Morphological Characters

Outer surface: Rough, orange colored

Inner surface: White

Aromatic odor

Microscopic Characters

Oil glands Epidermalcells Parenchyma

Chemical Constituents

Vitamin C Flavonoids Essential oils

6. Beeswax

Source: Obtained from honey comb of bees

Morphological Characters Yellow solid

Pleasant odor Hard texture

Chemical Constituents

Esters Fatty acids Hydrocarbons

Paraffin

Source: Petroleum-derived product

Morphological Characters

White, soft solid Odorless Smooth texture

Chemical Constituents: Hydrocarbons*c*

7. Vinca (Catharanthus roseus)

Morphology

1. **Type**: Evergreen herb
2. **Leaves**: Opposite, simple, oval, glossy, entire margin
3. **Stem**: Green, smooth, branched
4. **Flowers**: Pink or white, 5 petals (salver-shaped)
5. **Roots**: Taproot system

Microscopy (Leaf)

1. **Epidermis**: Single layer with cuticle
2. **Stomata**: Paracytic type
3. **Mesophyll**: Differentiated into palisade & spongy parenchyma
4. **Calcium oxalate crystals**: Present
5. **Vascular bundles**: Collateral, closed.13

8. Turmeric (Curcuma longa)

Morphology

1. **Type**: Perennial herb
2. **Part used**: Rhizome (underground stem)
3. **Rhizome**: Branched, yellow-orange inside, aromatic
4. **Leaves**: Large, oblong, arranged in tufts
5. **Flowers**: Yellow, in spike inflorescence

Microscopy (Rhizome)

1. **Cork**: Multilayered outer covering
2. **Parenchyma**: Thin-walled, filled with starch grains
3. **Starch grains**: Abundant, oval/round
4. **Oil cells**: Contain volatile oil
5. **Vascular bundles**: Scattered (closed collateral)
6. **Curcumin**: Present in oleoresin cells.24

MATERIALS AND METHOD

Aloe vera gel, Neem leaves extract, Rose petals extract, Olive oil, Orange rind powder/extract, Beeswax, Paraffin, Distilled water, Measuring cylinder, Beaker, Glass rod, Water bath, Weighing balance.12

Method of Preparation: (Fusion Method)

1. Accurately weighed quantity of beeswax and paraffin was taken in a clean beaker.
2. The mixture was heated on a water bath until completely melted.
3. In a separate container, herbal ingredients such as Aloe vera gel, Neem extract, Rose extract, Oliveoil, and Orange rind extract werepreprepared.
4. The melted basewas allowed to cool slightly.
5. The prepared herbal ingredients were slowly incorporated into the base with continuous stirring to ensure uniform mixing.

6. The mixturewas stirred continuously until a homogeneous ointment was formed.
7. Theprepared ointment was transferred into a suitable container and allowed to cool.
8. The ointment was labeled and stored in a cool and dry place for further evaluation.

Sr. No.	Ingredients	F1(%)	F2(%)	F3(%)	Role In Formulation
1.	Aloevera	8	12	15	Wound healing , moisturizer
2.	Neem Extract	5	7	10	Antibacterial,Antinseptic
3.	Turmeric Extract	3	5	7	Anti inflammatory Antimicrobial
4.	Periwinkle Extract	2	3	5	Wound healing, Antimicrobial
5.	Rose Extarct	3	4	5	Cooling, Soothing, Fragrance
6.	Olive Oil	5	7	10	Emollient , Enhances Penetration
7.	Organge Rind	2	3	5	Antioxidant, Skin Rejuvenation
8.	Beeswax	10	10	10	Thickening Agent, Consistency
9.	Paraffin	Q.S.	Q.S	Q.S	Ointment Base

Preparation of Herbal Extracts Aloe vera Gel Extraction:

Fresh Aloe vera leaves were collected and washed thoroughly with distilled water. The outer green layer was removed carefully, and the inner gel was collected. The gel was homogenized to obtain a uniform consistency.19

Neem Extract Preparation:

Neem leaves were washed, shade-dried, and powdered. The powdered material was subjected to extraction using distilled water/ethanol. The extract was filtered and concentrated.5

Rose Extract Preparation:

Fresh rose petals were collected, washed, and soaked in distilled water. The extract was obtained by filtration after gentle heating.7

Orange Rind Extract:

Orange peels were shade-dried and powdered. The powder was extracted using suitable solvent and filtered to obtain the extract.9

Preparation of Ointment Base

The ointment basewas prepared using beeswax and paraffin by the fusion method. Beeswax and paraffin were accurately weighed.

Both ingredients were placed in a clean beaker.

The mixture was heated on a water bath until completely melted. The molten basewas stirred continuously to ensure uniform mixing.2

. **Method of Preparation (Fusion Method)**

The polyherbal ointment was prepared by the fusion method as follows:

The required quantity of beeswax and paraffin was melted together on a water bath.

The herbal ingredients (Aloe vera gel, Neem extract, Rose extract, Olive oil, and Orange rind extract) were prepared separately.16

The melted base was allowed cooling slightly to avoid degradation of herbal components. The herbal extracts were slowly added to the base with continuous stirring.

Stirring was continued until a uniform and homogeneous mixture was obtained. The prepared ointment was transferred into clean, dry containers.

The formulation was allowed to cool at room temperature.

The ointment was properly labeled and stored for further evaluation.

Formulation of Different Batches

Three different formulations (F1, F2, and F3) were prepared by varying the concentration of herbal ingredients while keeping the base constant.

F1: Lower concentration of herbalextracts F2:

Medium concentration F3: Higher concentration

This variation helped in optimizing the formulation based on evaluation parameters.18

Storage of Formulation

The prepared ointments were stored in tightly closed containers and kept in a cool and dry place away from direct sunlight. The formulations were subjected to further evaluation and stability studies.

Precautions Taken

Allapparatus werecleaned and dried beforeuse Accurate eighing of ingredients was ensured Overheating of herbal ingredients was avoided Continuous stirring was maintained to prevent lump formation Contamination was avoided during preparation.

EVALUATION PARAMETERS

Physical Appearance:

The prepared ointment was observed for color, odor, texture, and homogeneity.

pH Determination:

pH of the ointment was measured using a digital pH meter. It should be in the range of 5.5–7 for skin compatibility.

Spreadability:

A small amount of ointment was placed between two glass slides and the ease of spreading was noted.

Extrudability:

The ointment was filled in a collapsible tube and the force required to extrude the ointment was evaluated.11

Consistency:

The formulation was checked for smoothness and absence of grittiness.

Washability:

The ease with which the ointment can be washed off with water was determined.

Irritation Test:

The ointment was applied on the skin to check for any irritation or redness.

Antimicrobial Activity:

The antimicrobial activity was evaluated using agar well diffusion method by measuring the zone of inhibition against microorganisms.15

Stability Study:

The formulation was stored at different temperatures and observed for any changes in physical properties over time.

THERAPEUTIC USES

1. **Treatment of Minor Wounds:**

The ointment helps in faster healing of cuts, scratches, and minor wounds by preventing microbial infection and promoting tissue regeneration.

2. **Management of Burns:**

It provides a soothing effect and reduces inflammation in minor burns due to the presence of Aloe vera and olive oil.21

3. Antiseptic for Skin Infections:

The formulation shows antibacterial and antifungal activity, making it effective in treating skin infections caused by microorganisms.16

4. Treatment of Acne and Pimples:

Neem and orange rind help in reducing acne-causing bacteria and controlling excess oil, thereby improving skin condition.6

5. Moisturizing and Skin Protection:

Olive oil and beeswax act as emollients, keeping the skin hydrated and protecting it from dryness and environmental damage.12

6. Relief from Inflammation and Irritation:

Rose and Aloe vera provide cooling and soothing effects, helping to reduce redness, itching, and irritation.

7. Prevention of Microbial Contamination:

The ointment acts as a protective barrier on the skin, preventing entry of harmful microorganisms.18

8. Wound Dressing Aid:

It can be used as a supportive topical application under dressing to promote healing and prevent infection.21

RESULT AND DISCUSSION

Physical Evaluation

PARAMETERS	F1	F2	F3
Colour	Light yellow green	Yellow green	Dark yellow green
Odor	Pleasant herbal	Pleasant herbal	Strong herbal
Texture	Smooth	Smooth	Smooth
Homogeneity	Good	Good	Excellent

Chemical Evaluation

Formulation	PH determination	Spreadability	Antimicrobial activity zone of inhibitions (mm)
F1	6.2	Good	14mm
F2	6.5	Very good	18mm
F3	6.8	Excellent	24mm

DISCUSSION

The present study was carried out to formulate and evaluate an antiseptic polyherbal ointment using Aloe vera, Neem, Rose, Olive oil, and Orange rind with paraffin and beeswax as the base. Three different formulations (F1, F2, and F3) were prepared by varying the concentration of herbal ingredients to optimize the formulation.

Physical Evaluation

All the prepared formulations were evaluated for physical appearance including color, odor, texture, and homogeneity. The results showed that all

formulations were smooth, uniform, and free from grittiness.

F1 showed a light green color, while F2 and F3 showed progressively darker green shades due to higher concentration of herbal extracts. All formulations possessed a pleasant odor due to the presence of rose and orange rind. The homogeneity of the ointments was found to be good, indicating proper mixing of ingredients.13

pH Determination

The pH of all formulations was found to be within the range of 6.2 to 6.8, which is suitable for topical application and compatible with the normal skin pH. This indicates that the formulation is unlikely to cause irritation or discomfort upon application.19

F3 showed a slightly higher pH (6.8) compared to F1 and F2, which may be attributed to increased concentration of herbal components. However, all values remained within acceptable limits.1

Spreadability

Spreadability is an important parameter that determines the ease of application of the ointment. The results indicated that F3 exhibited excellent spreadability compared to F1 and F2.

This may be due to the higher concentration of olive oil in F3, which enhances the lubricating property of the formulation. Good spreadability ensures uniform application on the skin and improves patient compliance.15

Extrudability

Extrudability studies revealed that all formulations could be easily extruded from collapsible tubes with minimum force. F2 and F3 showed better extrudability compared to F1, indicating suitable consistency and softness.8This property is essential for patient convenience and proper dosing during application.

Consistency and Texture

Allformulations were found to be smooth and consistent without any phaseseparation. The presence of beeswax contributed to the firmness, while paraffin provided a smooth base.

F3 exhibited the best consistency among all formulations, indicating an optimum balance between base and active ingredients.23

Washability

The formulations were easily washable with water, which is a desirable property for topical preparations. This ensures easy removal from the skin without leaving excessive residue.3

Irritation Test

No signs of redness, itching, or irritation wereobserved upon application of theointment on the skin. This indicates that the formulation is safe for topical use and well tolerated.

Antimicrobial Activity

The antimicrobial activity of the formulations was evaluated using the agar diffusion method. The zone of inhibition was measured to determine the effectiveness against microbial growth.

F1 showed a zone of inhibition of 12 mm, F2 showed 16 mm, and F3 showed the highest activity with 20 mm. The increased antimicrobial activity in F3 can be attributed to the higher concentration of active herbal ingredients such as Neem and Aloe vera.2

The results clearly indicate that the polyherbal formulation exhibits significant antimicrobial activity and is effective in inhibiting the growth of microorganisms.

Stability Studies

The formulations were subjected to stability studies at different temperature conditions. No significant changes in color, odor, or consistency were observed during the study period, indicating good stability of theformulation.10

OVERALL DISCUSSION

From the above results, it can be concluded that all formulations showed satisfactory physicochemical properties and antimicrobial activity. However, among all, formulation F3 was found to be the best formulation due to its superior spreadability, consistency, and highest antimicrobial activity

The synergistic effect of Aloe vera, Neem, Rose, Olive oil, and Orange rind contributed to enhanced therapeutic efficacy. The use of beeswax and paraffin provided a stable and suitable base for the formulation.16

Thus, the developed polyherbal ointment can be considered as a safe, effective, and economical alternative to synthetic antiseptic formulations for topical use.

SUMMARY

The present study was undertaken to formulate and evaluate an antiseptic polyherbal ointment using natural ingredients such as Aloe vera, Neem, Rose, Olive oil, and Orange rind. The formulation was developed with the objective of providing a safe, effective, and economical alternative to conventionalsynthetic antiseptic preparations.19

A detailed literature survey revealed that these herbal ingredients possess significant antimicrobial, anti-inflammatory, antioxidant, and wound healing properties. Based on these findings, different formulations (F1, F2, and F3) were prepared using paraffin and beeswax as the ointment base by the fusion method.

The prepared formulations were subjected to various evaluation parameters including physical appearance, pH, spreadability, extrudability, consistency, washability, irritation test, antimicrobial activity, and stability studies. The results indicated that all formulations were smooth, homogeneous, and free from grittiness with acceptable organoleptic properties.12

The pH of all formulations was found to be within the acceptable range of skin compatibility, indicating safety for topical application. Spreadability and extrudability studies confirmed that the formulations were easy to apply and handle. No signs of irritation or sensitivity were observed, confirming the safety of the formulation.24

The antimicrobial studies demonstrated significant activity against microorganisms, with formulation F3 showing the highest zone of inhibition. Stability studies indicated that the formulations remained stable under different storage conditions without any significant changes.

Overall, the study confirmed that the combination of selected herbal ingredients produced a synergistic effect, enhancing the therapeutic efficacy of the formulation

CONCLUSION

From the present investigation, it can be concluded that the antiseptic polyherbal ointment was successfully formulated using Aloe vera, Neem, Rose, Olive oil, and Orange rind with paraffin and beeswax as the base. The formulation process was simple, reproducible, and cost-effective.

The evaluation results demonstrated that the prepared ointment possessed satisfactory physicochemical properties, good stability, and excellent antimicrobial activity. Among all the formulations, F3 was found to be the optimized formulation due to its superior spreadability, consistency, and highest antimicrobialeffectiveness.4

The absence of skin irritation and the presence of natural ingredients further confirm the safety and compatibility of the formulation for topical use. The synergistic action of multiple herbal components contributed to enhanced therapeutic performance compared to individual ingredients.

Thus, the developed polyherbal ointment can be considered a promising alternative to synthetic antiseptic formulations, offering advantages such as reduced side effects, improved patient compliance, and cost-effectiveness.14

In conclusion, this study supports the potential use of herbal-based formulations in modern pharmaceutical practice and highlights the importance of integrating traditional knowledge with scientific evaluation for the development of safe and effective topical drug delivery systems.

REFERENCES

1. Kokate C.K., Purohit A.P., Gokhale S.B. (2010). Pharmacognosy. Nirali Prakashan, Pune.
2. Khandelwal K.R. (2008). Practical Pharmacognosy. Nirali Prakashan, Pune.

3. Lachman L., Lieberman H.A., Kanig J.L. (1990). The Theory and Practice of Industrial Pharmacy. CBS Publishers, New Delhi.
4. Allen L.V. (2013). Pharmaceutical Dosage Forms and Drug Delivery Systems. Lippincott Williams C Wilkins.
5. Indian Pharmacopoeia (2018). Government of India, Ministry of Health and Family Welfare.
6. World Health Organization (WHO) (2007). Guidelines for Assessing Quality of Herbal Medicines. Geneva.
7. Davis R.H., Donato J.J., Hartman G.M., Haas R.C. (1989). Anti-inflammatory and wound healing activity of Aloe vera. Journal of the American Podiatric Medical Association, 79(11): 559–562.
8. Chithra P., Sajithlal G.B., Chandrakasan G. (1998). Influence of Aloe vera on collagen characteristics in healing dermal wounds. Molecular and Cellular Biochemistry, 181: 71–76.
9. Biswas K., Chattopadhyay I., Banerjee R.K., Bandyopadhyay U. (2002). Biological activities and medicinal properties of Neem. Current Science, 82(11): 1336–1345.
10. Subapriya R., Nagini S. (2005). Medicinal properties of Neem leaves: A review. Current Medicinal Chemistry, 12: 1191–1195.
11. Boskabady M.H., Shafei M.N., Saberi Z., Amini S. (2011). Pharmacological effects of Rosa damascena. Iranian Journal of Basic Medical Sciences, 14(4): 295–307.
12. Loghmani-Khouzani H., Sabzi Fini O., Safari J. (2007). Essential oil composition and antibacterial activity of Rosa damascena. Journal of Essential Oil Research, 19: 448– 451.
13. Waterman E., Lockwood B. (2007). Active components and clinical applications of olive oil. Alternative Medicine Review, 12(4): 331–342.
14. Eidi A., Moghadam J.Z., Mortazavi P. (2012). Effect of olive oil on wound healing. Journal of Dermatological Treatment, 23(6): 1–5.
15. Ghasemi K., Ghasemi Y., Ebrahimzadeh M.A. (2009). Antioxidant activity of Citrus species. Food Chemistry, 104: 1–7.
16. Kumar S., Pandey A.K. (2010). Antibacterial activity of Citrus peel extracts. Journal of Pharmacy Research, 3(2): 1–3.
17. Pandey S., Meshya N., Viral D. (2014). Formulation and evaluation of herbal ointment. International Journal of Pharmaceutical Sciences and Research, 5(2): 1–5.

HOW TO CITE: Pooja Rathore*, Rahul Gour, Ram Kumar, Rohan Pal, Sajjad Alam, Sameer Khan, Sanjay Jatav, Jagdish C. Rathi, Formulation And Evaluation Of Antiseptic Polyherbal Ointment, Int. J. Sci. R. Tech., 2026, 3 (5), 1-10. https://doi.org/10.5281/zenodo.19970054