



FORMULATION OF POLYHERBAL OINTMENT USING *Tridax procumbens*, *Kedrostis foetidissima*, *Myristica fragrans*, *Azadirachta indica* AND ITS ANTI-MICROBIAL ACTIVITY

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Abstract: The purpose of this research was to formulate and assess a polyherbal wound healing ointment from extracts of *Tridax procumbens*, *Kedrostis foetidissima*, *Myristica fragrans*, and *Azadirachta indica*, four herbals traditionally and pharmacologically used for skin healing. The plants were harvested, identified, dried, and extracted using a Soxhlet apparatus with ethanol as a solvent. The polyherbal extracts were incorporated into an ointment base of beeswax, coconut oil, olive oil, vitamin E, aloe vera gel, and lavender oil. The product was analyzed for phytochemical constituents, physical properties (pH, spreadability, stability), and antimicrobial activity against *Staphylococcus aureus* and *Escherichia coli*. Phytochemical screening established the presence of flavonoids, tannins, alkaloids, and saponins, which are healing agents. The ointment demonstrated satisfactory physical stability, skin pH compatibility (5.8), and efficient antimicrobial zones of inhibition. The results confirm the synergistic wound healing potential of the chosen herbs and suggest this formulation as a promising natural alternative to the traditional topical agents.

Keywords - Polyherbal formulation, *Tridax procumbens*, *Kedrostis foetidissima*, *Myristica fragrans*, *Azadirachta indica*, Phytochemical analysis, Soxhlet extraction, Antimicrobial activity, Topical herbal ointment, Natural remedies, Medicinal plants.

I. INTRODUCTION

The use of plants in treating the majority of health ailments has always been done conventionally by traditional medicine, especially for skin infections and wounds. In recent years, polyherbal preparations—products created by blending several medicinal plants—have become widespread. They are reported to work better when combined, with increased healing, fewer side effects, and fewer chances of bacteria developing resistance (Goyal et al., 2011).

Even the simplest of bacterial infections of the skin resulting from pathogens like *Staphylococcus aureus* and *E. coli* are now becoming resistant to treatment with conventional antibiotics (Mandal et al., 2017). Herbal remedies, however, consist of natural products such as flavonoids, alkaloids, and essential oils, which have been known to fight off bacteria and cure the skin (Cowan, 1999).

1. *Tridax procumbens* (Coat Button)

The most abundant roadside weed, *Tridax procumbens*, has been utilized in traditional Indian medicine for cuts, injuries, and bruises that bleed. It is a healing agent that causes no inflammation. Flavonoids, tannins, and carotenoids in the leaves are responsible for tissue repair and inhibiting bacterial growth (Kumar et al., 2012; Ravikumar et al., 2005).

2. *Kedrostis foetidissima* (Stinking Passionflower)

This flowering creeper is less familiar but suitably utilized in traditional systems like Ayurveda and Siddha. It is used to cure skin diseases, fever, and inflammation. Its leaves are rich in alkaloids, flavonoids, and phenols that have very strong antimicrobial and antioxidant properties (Guruprasad et al., 2021).

3. *Myristica fragrans* (Nutmeg)

Nutmeg is not just a spice in the kitchen but a medicinal herb. It has been used traditionally to treat indigestion, toothaches, and skin infections and contains vital oils like myristicin and safrole that fight bacteria and constrict swelling (Mathew & Kamath, 2014).

4. *Azadirachta indica* (Neem)

Neem is the most widely used medicinal herb in India as well. It contains leaves and oil that are used for skin diseases, infections, and the process of wound healing. It contains compounds like azadirachtin and nimbidin that possess antibacterial, antifungal, and anti-inflammatory activities (Biswas et al., 2002; Subapriya & Nagini, 2005).

II. AIM

To formulate and evaluate a polyherbal ointment using extracts of *Tridax procumbens*, *Kedrostis foetidissima*, *Myristica fragrans*, and *Azadirachta indica*, and to assess its wound healing efficacy based on its antimicrobial.

III. MATERIALS AND METHODS

COLLECTION AND SAMPLE PREPARATION:

- *Tridax procumbens* (Coat Buttons)
- *Kedrostis foetidissima* (Stinking *Kedrostis*)
- *Myristica fragrans* (Nutmeg)
- *Azadirachta indica* (Neem) were harvested.

GRINDING OF DRIED SAMPLES:

- Dried leaves of the plants were ground into powder form using a mechanical grinder.

SOXHLET EXTRACTION:

- The powdered herbal blend was extracted by Soxhlet using ethanol as the solvent.
- A Liebig condenser was employed in the setup to cool the vapors of the solvent and provide continuous extraction.

CONCENTRATION OF EXTRACT:

- The solvent was evaporated after the extraction and the Petri plate containing the concentrated herbal extract.
- The Petri plate was left on a steam bath to dehydrate any remaining moisture.

PREPARATION OF OINTMENT (DOUBLE BOILING METHOD):

- Beeswax was melted in a clean container using the double boiling method.
- After melting, coconut oil, olive oil, and polyherbal extract were added and blended well, followed by the addition of vitamin E oil, lavender oil, and aloe vera gel.
- The blend was shaken well until a uniform texture was reached.

COOLING AND STORAGE:

- The resultant mixture was cooled and hardened into an ointment texture.
- The ointment prepared was packed in tight containers for further analysis.

IV. RESULT AND DISCUSSION**PHYTOCHEMICAL ANALYSES**

Phytochemical analyses were done for polyherbal plant extract. The plant extract has shown the presence of alkaloids, carbohydrates, flavonoids, glycosides, phenols, saponins, tannins, and terpenoids.

PHYTOCHEMICAL	PRESENCE (+) / ABSENCE (-)
Alkaloids	+
Saponins	+
Phenols	+
Tannins	+
Flavonoids	+
Terpenoids	+
Carbohydrates	+
Glycosides	+

ANTI-MICROBIAL ACTIVITY

- The antimicrobial efficacy was evaluated using the agar well diffusion method.
- The polyherbal extract ointment exhibited zones of inhibition against *Staphylococcus aureus* and *Escherichia coli*.

<i>Staphylococcus aureus</i>	Zone of inhibition
Positive control (gentamicin 10µg)	20mm
Sample 100µl	16mm
Sample 50µl	9mm
Negative control (DMSO)	Nil
<i>Escherichia coli</i>	Zone of inhibition
Positive control (gentamicin 10µg)	21mm
Sample 100µl	14mm
Sample 50µl	8mm
Negative control (DMSO)	Nil

PHYSICAL EVALUATION OF OINTMENT

- Color: Greenish, indicating natural composition
- Odor: Pleasant herbal aroma, herbal leaves dominant
- Consistency: Smooth, semi-solid, homogenous
- Spreadability: Easily applicable
- pH: 6.2–suitable for skin application
- Stability: Stable for 30 days at 37°

FINAL PRODUCT



POLYHERBAL OINTMENT

V. CONCLUSION

This research sought to design and assess a polyherbal ointment from four medicinal plants: *Tridax procumbens*, *Kedrostis foetidissima*, *Myristica fragrans*, and *Azadirachta indica*, each of which has traditional and pharmacological significance against inhibiting microbes. The process of formulation involved the extraction of the plant constituents and their inclusion in an ointment base and resulted in a stable, homogenous, and acceptable product.

The bioactive components were extracted using ethanolic extraction, which is widely known for its capacity to isolate a wide range of phytochemicals, such as flavonoids, tannins, phenols, and essential oils—molecules that are well-documented to contribute to antimicrobial activity.

These extracts were subsequently formulated into an economical ointment base made up of beeswax, coconut oil and olive oil. The final ointment was analyzed through a series of physicochemical tests to determine its topical suitability. The product had a smooth, even texture with no indication of grittiness or phase separation. Its pH range is 6.2, which compares well with natural human skin pH and thus minimizes the risk of irritation. Spreadability was satisfactory, meaning that it was easy to apply and distribute evenly onto the skin surface. The preparation also exhibited excellent washability and maintained physical integrity.

during a period of 15 days, without any detectable color, odor, or consistency changes, and without indication of microbial growth, as a proof of short-term stability.

The formulated polyherbal ointment was stable, skin-friendly, and possessed desirable physical and organoleptic characteristics. Although biological activity was not evaluated in this stage of the study, the established properties of the plant ingredients clearly indicate that the formula could be of therapeutic value for wound care.

The therapeutic value of the formula is borne out by the established antimicrobial properties of the individual herbal constituents. While the tests were done, the polyherbal combination, aided by traditional use and phytochemical proof, portends exciting healing performance. This natural product can be a safe, economic, and useful alternative to synthetic drugs.

VI. REFERENCE

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