



“Formulation and Evaluation of Anti-Bacterial Herbal Ointment”

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Abstract: The main goal of research was to formulate and evaluate the antibacterial ointment which was prepared from 33333herbal plant. Herbal medicines has become a global important for both medical and economical. The antibacterial ointment prepared from herbal plant are more efficacious than synthetic medicines and which show some adverse effect. Ointments are semisolid system which behave as viscoelastic materials when shear stress is applied. They contains medicaments and are intended to be applied externally to the body or to the mucus membrane. The antibacterial activity of extract was predominantly against Gram positive organism. In the present study, herbal ointment containing Neem and Turmeric was formulated and evaluated to study antibacterial and antifungal activity. Plant material (leaves, steam, bulbs and roots) of many species of medicinal plant are used in the treatment of the skin conditions. Indigenous people are known to widely use the crude extract of many plants. Neem has become valuable plant in the world which shows the solution for hundreds and thousands problems. This herbal ointment of neem and turmeric extract can be used in the treatments of skin infections. The present work is to formulate and evaluate the ointment of ethanoic extract of Neem (*Azadirachta indica*) and Turmeric (*curcuma longa*). The prepared extracts also used to determine the membrane stabilizing effect. The ethanolic extract were prepared by using maceration method. The ointment base was incorporating the extract in the base by levigation method. After completion of formulation it was evaluated for its physicochemical parameters like colour, odour, pH, spreadability, washability also formulation was evaluated for its stability at various temperature conditions which shows no change in irritancy, spreadability and diffusion study.

Key Words: *Azadirachta indica*, Meliaceae, *curcuma longa*, Zingiberaceae, Ethanolic, Maceration, etc.

1: INTRODUCTION:

Ointment are topical formulation that offer better patient compliance and hence become more acceptable to patient.⁽¹⁾ Herbal medicine are also called as botanical or phytomedicine, refers to the use of plants, seeds, berries, roots, leaves, bark, or flowers for medicinal purpose.⁽²⁾ Plant drugs are frequently consider as less toxic and freer from side effects than the synthetic ones.⁽³⁾ The bacterial infection mainly occur with the injuries or ulcer or after the surgical treatment, antibacterial substances help to inhibit or kill bacterial cells.⁽⁴⁾ Ointments are used topically for several purposes, eg. as protectant, antiseptics, emollients, antipruritic, kerolytic, and astringents.⁽⁵⁾

Most of the medicinal plant have been used for long time and are assessed to be safer than isolated active compound.⁽⁶⁾ Neem (*Azadirachta indica*) is a traditional plant that mainly grows in India subcontinent and has been reported to have various clinical applications like antibacterial^(7,8), antiviral⁽⁹⁾, anticancer⁽¹⁰⁾. Neem is consist of leaves and other arial parts of *Azadirachta indica*, family- Meliaceae. Neem leaves and neem oil has many properties like antiseptic, insecticides also attributed antifertility and antiviral properties and is being screened for efficacy in treatment of AIDS. Turmeric consist of dried as well as fresh rhizomes of plant known as *curcuma longa*, Family- Zingiberaceae. It used as antiseptic, expectorant, condiment or spice. It is rich in antioxidants, research conducted has demonstrate uses of turmeric in the treatment of Arthritis, liver diseases, Alzheimer and depression management.^(11,12) Turmeric uses of rhizomes arises from volatile oil as a carminative and antifungal activity and yellow curcuminoids for anti-oxidative and anti-inflammatory properties. Active constituent in turmeric volatile oil are turmeron, attantone and zingeberon.^(13,14)

Turmeric is perennial herb with thick and ellip-solid-ovate rhizomes with orange cortex inside. It is cultivated in Thailand and other tropical and subtropical countries, and is also famous as spice and coloring agent.⁽¹⁵⁾ long practiced outside of conventional medicine herbalism is becoming more mainstream as up-to-date analysis and research shows their value in the treatment and prevention of disease. Recently, the world health organization estimated that 80% of people worldwide rely on herbal medicine for some aspect of their primary healthcare.⁽¹⁶⁾ Along with other dosage forms, herbal drugs are also formulated in the

form of ointment. An ointment is a viscous semi-solid dosage preparation used topically on variety of body surfaces. These include the skin and the mucus membranes of the eye, vagina, anus, and nose.⁽¹⁷⁾

2: MATERIAL AND EQUIPMENT:

2.1. MATERIAL:

TABLE NO 1: MATERIALS FOR ANTIBACTERIAL OINTMENT.

Sr. No.	Material
1.	Neem extract
2.	Bees wax
3.	Methyle paraben
4.	Turmeric extract
5.	Cetosteryle alcohol
6.	Rose oil

2.1.1. NEEM :



Fig. No. 1: NEEM

- I) **Synonym:** Azardirachta indica.
- II) **Family:** Meliaceae.
- III) **Chemical constituents:** Nimbolinin, Nimbicol, Salanin, Quercetin.
- IV) **Use:** Anti-bacterial.

2.1.2. TURMERIC:



Dig. No. 2: TURMERIC

- I) **Synonym:** Haldi.
 II) **Family:** Zingiberaceae.
 III) **Chemical constituents:** curcumin, curcuminoid, bisdemethoxycurcumin, demethoxycurcumin.
 IV) **Use:** Anti-oxidant.

2.2. EQUIPMENTS:

TABLE NO1: INSTRUMENTS

Sr. No.	Instrument
1.	pH Meter
2.	Viscometer

TABLE NO 2: GLASSWARES

Sr. No.	Glassware
1.	China Dish
2.	Ointment Slab
3.	Steel Spatula
4.	Tile
5.	Graduated Cylinder

3. METHODS OF PREPARATION:

3.1. COLLECTION OF PLANT MATERIAL:

Leaves of neem were collected from the local area and dried rhizomes of turmeric were purchased from local market.

3.2. PREPARATION OF NEEM EXTRACT:

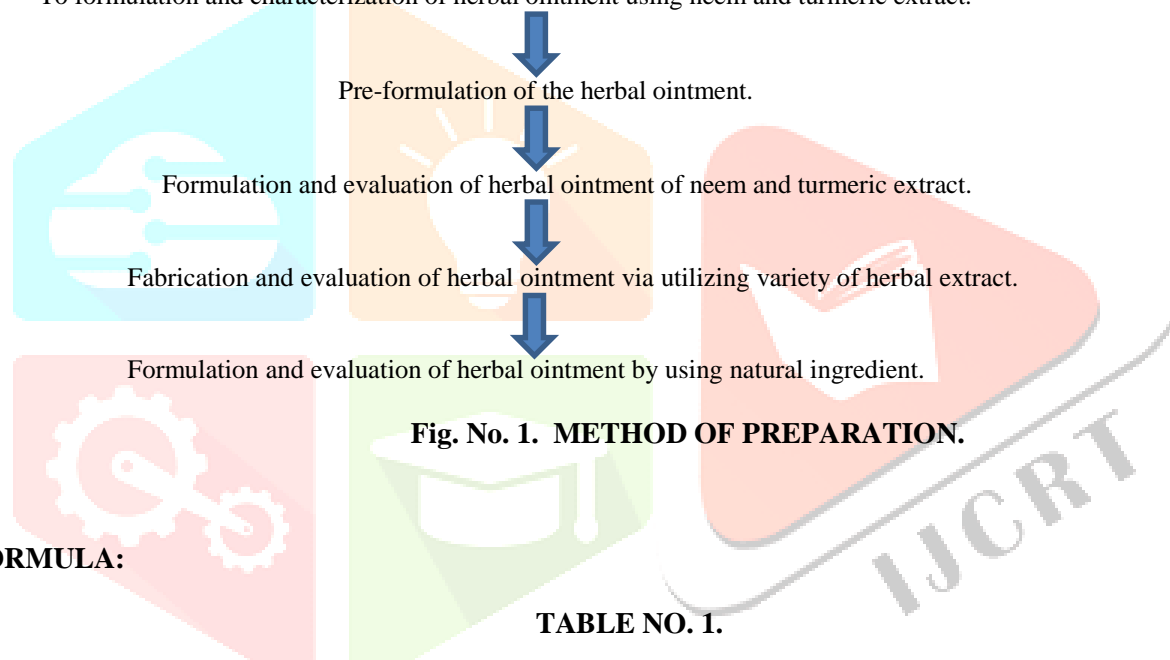
Leaves of plant were collected and washed thoroughly with distilled water and shed dried for 10 days. Dried leaves were ground into powder form. 100 gm powder were imbibed in 350 ml of 90% ethanol for 3 hrs and transferred to percolator with addition of 150 ml of 90% ethanol for maceration for 7 days with occasional stirring. Finally ethanolic extract was collected and concentrated to get blackish green residue. The extract was stored in the airtight container at cool and dark place.

3.3. PREPARATION OF TUMERIC EXTRACT:

Dried rhizomes of turmeric were ground and the powder obtained was followed for extraction same as that for neem leaves extract. The extract with crimson red color was obtained and stored at cool and dark place in air tight container.

3.4. METHOD OF PREPARATION:

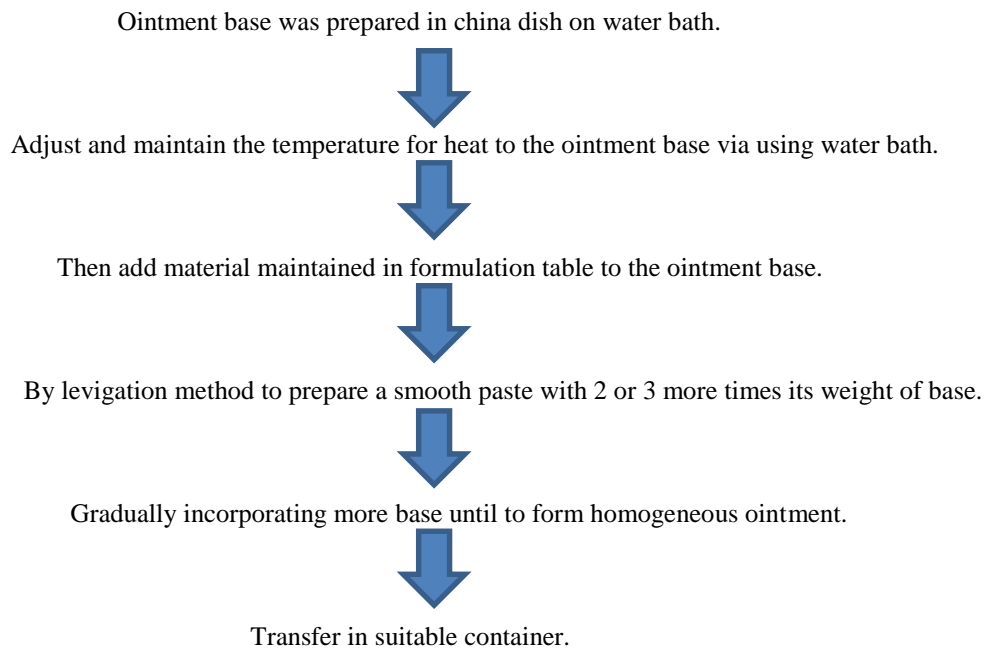
To formulation and characterization of herbal ointment using neem and turmeric extract.



4. FORMULA:

TABLE NO. 1.

Sr. No.	Ingredient	Quantity Taken	Quantity Given	Use
1.	Neem extract	8.0 ml	3.8 ml	Anti-bacterial
2.	Bees wax	28 gm	10.8 gm	Base
3.	Methyl paraben	2.5gm	1.3gm	Preservative
4.	Turmeric extract	6.8 ml	1.6 ml	Anti-oxidant
5.	Cetosteryl alcohol	2.5 ml	1.1 ml	Anti-microbial
6.	Rose oil (Qs)	Qs	Qs	Fragrance and moisturizing

5. FORMULATION:**Fig. No. 2. FORMULATION.**

Ointment base was prepared by heating bees wax in china dish on water bath. After melting of cetistearyl alcohol remaining ingredients methyl paraben were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment base. Then add the accurate weighed neem and turmeric extract to the ointment base by levigation method to prepare a smooth paste. Gradually incorporate more base until to form homogeneous ointment .finally transfer the prepared ointment into a suitable container. ⁽¹⁸⁾

**6. EVALUATION:****6.1. PHYSICAL EVALUATION:** ⁽¹⁹⁾

- i) **Organoleptic parameters:**
Organoleptic parameters like odour, colour, of the formulation was carried out by visual examination.
- ii) **pH:**
The pH of various formulation was determined by using digital pH meter. The 0.5 gm of the weighed formulation was dispersed in 50 gm of distilled water and the pH was noted.
- iii) **Homogeneity:**
All the developed ointment was tested for homogeneity by visual inspection. They were tested for their appearance with no lumps.

6.2. VISCOCITY: ⁽²⁰⁾

The measurement of viscosity of prepared ointments was carried out with Brook-field viscometer (model LV-DV-II, Helipath spindle type S-96). The values of each ointment formulation were done in triplicate.

6.3. LOSS ON DRYING: ⁽²¹⁾

The loss in weight, in the sample so tested, principally is due to loss of water and small amount of volatile material from it. Loss on drying was determined by placing 1gm of ointment formulation of different batches in a petri dish on water bath and dried until constant weight was obtained.

6.4. STABILITY STUDY: ⁽²²⁾

Formulations were evaluated for their stability at an amount condition of pressure and temperature for two weeks. Formulation were observed for phase separation and particle agglomeration.

6.5. CENTRIFUGATION: ⁽²³⁾

It is believed to be unique tool for the evaluation of accelerated deterioration of ointments. It was determined by using Remi centrifuge in 10 ml graduated cylinder of 10,000 rpm for 10 minute.

6.6. SPREADABILITY: ⁽²⁴⁾

The spreadability is expressed in terms of time in second taken by two slides to slip off from ointment, placed in between two slides under the direction of certain load. Lesser the time taken for separation of two slides, better the spreadability of ointment.

6.7. WASHABILITY: ⁽²⁵⁾

Prepared ointment formulation were applied on the skin and then is extend of washing with water and checked. Washability was checked by keeping applied skin area under the tap water for about 10 minutes.

RESULT:

This ointment could become a media to use these medicinal properties effectively and easily as simple dosage form. Natural remedies are more acceptable as they are safer with fewer side effects than synthetic once, so a herbal ointment formulation is nontoxic, safe, effective and improve patient compliance as it contains herbal ingredients from the ancient time. These prepared ointment was evaluated for various parameters.

CONCLUSION:

Since ancient time, herbs plays major role in the treatment because of less side effects, cost and easy availability. The neem leaves extract can be formulate by four different formulation with different bases like methyl paraben, cetostearyl alcohol, and formulation evaluated for physical parameter and standardized as per pharmacopoeial standard. The result of the physical evaluation of ointment preparation with extract of neem and turmeric indicated the stability of method for the production of ointments. Further investigation are necessary to determine therapeutic efficiency of prepared herbal ointment formulation.

Since ancient times neem and turmeric have been used for their various medicinal properties, such as antibacterial, antimicrobial, antifungal, anti-inflamatory, wound healing and so on. As a result, this ointment could be used as medium to effectively and easily use these medicinal properties as a simple dosage form, physicochemical parameter of herbal ointment is evaluated by several test. Such as spreadability, stability, washability, viscosity test. So all the results which was obtained by performed test are good.

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