



## Research Article

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# Formulation and evaluation of herbal ointment containing Neem and Turmeric extract

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## Abstract

Even in areas where modern medicine is available, the interest on herbal medicines and their utilization have been increasing rapidly in recent years. Plant derived substances and herbal medicines have recently attracted the great interest towards their versatile application, as medicinal plants are the richest source of bioactive compounds used in traditional and modern medicine. The present work is to formulate and evaluate the ointment of Neem (*Azadirachta indica*) and Turmeric (*Curcuma longa*) extract. The ethanolic extracts were prepared by using maceration method. The ointment base was prepared and formulation of ointment was done by 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, extrudability, consistency, diffusion study, solubility, washability. Also the formulation was evaluated for its stability at various temperature conditions which shows no change in the irritancy, spreadability and diffusion study. Thus it could become a media to use the medicinal properties of Neem and Turmeric effectively and easily as a simple dosage form.

**Keywords:** Maceration, Levigation, Extrudability, Spreadability.

## INTRODUCTION

Certain European and oriental countries have been exploring the use of herbs and has been in practice since the centuries. Great work has been done which eluded the common man's reach and knowledge. With the techno-savvy lifestyle in 21<sup>st</sup> century human sufferings are coming out with different names. The basic herbs have the answer with no side effects and effective remedies and the golden fact is use of herbal treatment is independent of any age group. When two or more herbs are used in the formulation they are known as polyherbal formulations.<sup>[1]</sup> Numerous studies have been conducted with the extracts of Neem leaves (*Azadirachta indica* Family-Meliaceae) and extract of turmeric rhizomes (*Curcuma longa* Family-Zingiberaceae) with the combination of many other herbal drugs.<sup>[2,3]</sup>

Along with other dosage forms herbal drugs are also available in the form of ointment which is semisolid preparation used topically for several purposes e.g. as protectants, antiseptics, emollients, antipruritics, keratolytics and astringents.

Neem is consists of leaves and other aerial parts of *Azadirachta indica* Family- Meliaceae. Neem leaves and neem oil has many properties like antiseptics, insecticides also attributed antifertility and antiviral properties and is being screened for efficacy in treatment of AIDS.<sup>[4]</sup>

Turmeric consists of dried as well as fresh rhizomes of plant known as *Curcuma longa*. Family-Zingiberaceae. It is 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.<sup>[4,5]</sup>

## MATERIALS AND METHOD

### Collection of Plant material

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

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### Preparation of Neem extract

Leaves of the plant were collected and washed thoroughly with distilled water and shade dried for 10 days. Dried leaves were ground into powder form. 100gm powder was imbibed with 350ml of 90% ethanol for 3hrs. and transferred to percolator with addition of 150ml 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.

### Preparation of Turmeric 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 colour was obtained and stored at cool and dark place in air tight container.

### Formulation of Ointment

**Table 1:** Formulation of ointment base

S. No.	Name of Ingredient	Quantity to be taken
1.	Wool fat	0.5gm
2.	Cetostearyl alcohol	0.5gm
3.	Hard paraffin	0.5gm
4.	Yellow soft paraffin	8.5gm

**Table 2:** Formulation of Herbal ointment

S. No.	Name of Ingredient	Quantity to be taken
1.	Prepared Neem extract	0.06gm
2.	Prepared Turmeric extract	0.06gm
3.	Ointment base q.s.	10 gm

### Procedure for preparation of herbal ointment

- Initially ointment base was prepared by weighing accurately grated hard paraffin which was placed in evaporating dish on water bath. After melting of hard paraffin remaining ingredients were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment base.
- Herbal ointment was prepared by mixing accurately weighed Neem and Turmeric extract to the ointment base by levigation method to prepare a smooth paste with 2 or 3 times its weight of base, gradually incorporating more base until to form homogeneous ointment, finally transferred in a suitable container.

### Evaluation

#### Colour and Odour

Physical parameters like colour and odour were examined by visual examination.

#### Consistency

Smooth and no greediness is observed.

### p<sup>H</sup>

p<sup>H</sup> of prepared herbal ointment was measured by using digital P<sup>H</sup> meter. The solution of ointment was prepared by using 100ml of distilled water and set aside for 2hrs. P<sup>H</sup> was determined in triplicate for the solution and average value was calculated.

### Spreadability

The spreadability was determined by placing excess of sample in between two slides which was compressed to uniform thickness by placing a definite weight for definite time. The time required to separate the two slides was measured as spreadability. Lesser the time taken for separation of two slides results better spreadability. Spreadability was calculated by following formula

$$S=M \times L / T$$

Where,

S= Spreadability

M= Weight tide to the upper slide

L= Length of glass slide

T= Time taken to separate the slides

### Extrudability

The formulation was filled in collapsible tube container. The extrudability was determined in terms of weight of ointment required to extrude 0.5cm of ribbon of ointment in 10 seconds.

### Diffusion study

The diffusion study was carried out by preparing agar nutrient medium. A hole board at the center of medium and ointment was by placed in it. The time taken by ointment to get diffused through was noted. ( after 60 minutes)

### LOD

LOD was determined by placing the formulation in petri-dish on water bath and dried for the temperature 105°C.

### Solubility

Soluble in boiling water, miscible with alcohol, ether, chloroform.

### Washability

Formulation was applied on the skin and then ease extend of washing with water was checked.

### Non irritancy Test

Herbal ointment prepared was applied to the skin of human being and observed for the effect.

### Stability study

Physical stability test of the herbal ointment was carried out for four weeks at various temperature conditions like 2°C, 25°C and 37°C. The herbal ointment was found to be physically stable at different temperature i.e. 2°C, 25°C, 37°C within four weeks.

## RESULT AND DISCUSSION

The present study was done to prepare and evaluate the herbal ointment. For this the herbal extracts were prepared by using simple maceration process to obtain a good yield of extract and there was no any harm to the chemical constituents and their activity.

The levigation method was used to prepare ointment so that uniform mixing of the herbal extract with the ointment base was occurred which was stable during the storage.

The physicochemical properties were studied which shows satisfactory results for spreadability, extrudability, washability, solubility, loss on drying and others.

Also the formulation was placed for a stability study at different temperature conditions like 2°C, 25°C and 37°C within four weeks. There were no changes observed in spreading ability, diffusion study as well as irritant effect.



Figure 1: Dried ethanolic extract of Turmeric and Neem

### Physicochemical evaluation of formulated ointment

Table 3: Physicochemical evaluation of formulated ointment

Physicochemical parameters	Observation
Colour	Yellow
Odour	Characteristic
Consistency	Smooth
p <sup>H</sup>	5.4
Spreadability(seconds)	7
Extrudability	0.4 gm
Diffusion study (after 60 min)	0.7 cm
Loss on drying	30%
Solubility	Soluble in boiling water, miscible with alcohol, ether, chloroform
Washability	Good
Non irritancy	Non irritant
Stability study (2°C, 25°C, 37°C)	Stable

## CONCLUSION

From the ancient time Neem and Turmeric is used for their various medicinal properties like antibacterial, antifungal, anti-inflammatory etc. Thus this ointment could become a media to use these medicinal properties effectively and easily as a simple dosage form.

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