



Formulation And Evaluation Of Herbal Ointment Containing Neem And Karanj Oil

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Abstract: Even in locations where modern treatment is available, interest in and use of herbal medicines has risen dramatically in recent years. Because medicinal plants are the largest source of bioactive molecules used in traditional and modern medicine, plant-derived substances and herbal medicines have recently sparked a lot of interest in their wide range of applications. The goal of this study is to formulate and evaluate a Neem (*Azadirachta indica*) and Karanj (*Millettia pinnata*) seed oil ointment. The 100% pure and authentic seed oil of both Neem and Karanj is used for study. The ointment base was created, and the ointment was prepared by using the levigation process to incorporate the extract into the base. It was assessed for physicochemical criteria such as colour, smell, pH, spreadability, extrudability, consistency, diffusion studies, solubility, and washability once the formulation was completed. Once the formulation was complete, it was evaluated for physicochemical parameters such as colour, odour, pH, spreadability, extrudability, consistency, diffusion studies, solubility, and washability. As a result, it might become a medium for efficiently and readily using the medicinal components of Neem and Karanj as a simple dose form.

Keywords: Neem, Karanj, seed oil, Formulation, Evaluation tests.

I. INTRODUCTION

In recent years, the demand for herbal products has increased in developed countries. Herbal formulations are well recognised as effective treatments for a variety of ailments. These goods are rising in demand as pharmaceutical, nutraceutical, and cosmetic products. In India, there are over 6000 herbal manufacturers. Ayurvedic medications are produced in about 4000 units.

When shear stress is applied to ointments, they often act like viscoelastic materials. They usually contain medications and are designed to be administered to the body or mucous membrane externally. Non-medicated ointments, also known as ointment bases, are non-medicated ointments that are used to make medicated ointments or for emollient or lubricating properties. Polyherbal formulations are those that include two or more herbs in the composition. Numerous research have been undertaken using extracts of neem seed oil (*Azadirachta indica* Family-Meliaceae) and karanj seed oil (*Millettia pinnata* Family-Fabaceae) in combination with a variety of other herbal medications.

Herbal medications are also available in the form of ointment, a semisolid preparation used topically for a variety of reasons such as protectants, antiseptics, emollients, antibacterials, keratolytics, and astringents, in addition to other dosage forms.

Neem is consists of leaves, seeds and other aerial parts of *Azadirachta indica* Family- Meliaceae. Neem oil contains a variety of qualities, including antiseptics, insecticides, antifertility, and antiviral effects, and it is currently being tested for efficacy in the treatment of AIDS.

Karanj consist of seeds, roots as well as fresh leaves of plants known as *Millettia pinnata* family- fabaceae, It is used in skin disorder, Psoriasis, anti-dandruff as well as it help for wound healing.

II. RESEARCH METHODOLOGY

Collection Plant Material

Oil of Neem and Karnaj seed was collected from B-34, 11nd Floor, Lawrence Road industrial Area, Dehli. The part used for extraction of oil is seeds. The method which is used for extraction process is Cold pressed method. The quality of extracted oil is 100% pure, authentic and natural. This data is obtained from technical data sheet provided by the industry. The manufacturer of oil is Alvia Cosmeceuticals Pvt. Ltd. The extracted oil is stored in air tight container amber colored bottle with the dropper.

Karanj seed oil

Properties	Specifications
Appearance	Amber yellow to brown colored liquid
Odour	Characteristics mild odour
Refractive index	1.473 – 1.479 at 40°C
Specific gravity (g/ml)	0.925 – 0.940 at 30°C
Moisture (%)	Maximum 0.25
Unsaponifiable matter (%)	Maximum 3.0
Saponification value (mgKOH/g)	185 – 195
Peroxide value (meq O ₂ /kg)	Less than 10
Iodine value (g I ₂ /100g)	80 – 90
Acid value (mgKOH/g)	Less than 10

Neem seed oil

Properties	Specifications
Appearance	Golden yellow to reddish brown colored liquid
Odour	Characteristic herbaceous, bitter
Refractive index	1.462 – 1.471 at 40°C
Specific gravity (g/ml)	0.910 – 0.950 at 20°C
Mositure and insoluble impurities (%)	Maximum 0.3
Saponification value (mgKOH/g)	175 – 205
Unsaponifiable matter (%)	Maximum 2.0
Peroxide value (meq O ₂ /kg)	Less than 20
Iodine value (g I ₂ /100g)	65 – 80
Azadiractin content (ppm)	Greater than 1000
Acid value (mgKOH/g)	Less than 15

Formulation of Ointment**Table 1:** Formulation of Ointment base (according to 10gm)

Sr. No	Ingredients	Quantity (gm)
1.	Wool fat	0.5 gm
2.	Cetostearyl alcohol	0.5 gm
3.	Hard paraffin (Paraffin wax)	0.5 gm
4.	Yellow soft paraffin	8.5 gm

**Figure 1:** Ingredients used for Ointment base**Table 2:** Formulation of herbal Ointment

Sr. No	Ingredients	Qunatity (gm)
1.	Neem seed oil	0.06 gm
2.	Karanj seed oil	0.06 gm
3.	Ointment base q.s	10 gm

Procedure for preparation of herbal Ointment

D) Initially, the ointment base was made by properly weighing grated hard paraffin and placing it in an evaporating dish over a water bath. Following the melting of the hard paraffin, the other ingredients were added and gently agitated to promote melting and homogenous mixing, followed by cooling of the ointment base.



Figure 2: Ingredients are melted on water bath

II) Herbal ointment was made by levigating correctly weighed Neem and Turmeric extract into the ointment base to make a smooth paste with 2 or 3 times the weight of base, progressively incorporating more base until homogeneous ointment was formed, and then transferred to a suitable container.

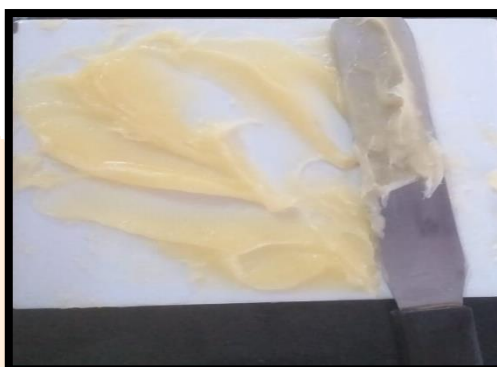


Figure 3: Levigating ointment base with oils



Figure 4: Final formulated herbal ointment

Evaluation of Herbal Ointment

Color and Odour

Visual analysis was used to analyse physical aspects such as colour and odour. The color and odour of ointment was found to be pale yellow and characteristic odour respectively.

Consistency

It is smooth and there is no greediness to be found in the product.

pH

A digital pH metre was used to determine the pH of the produced herbal ointment.

100ml distilled water was used to make the ointment solution, which was then set aside for 2 hours. For the answer, the PH was measured three times and the average value was derived. The model of pH meter used to calculate pH was Systronics. The pH for formulated herbal ointment was found to be 5.81.

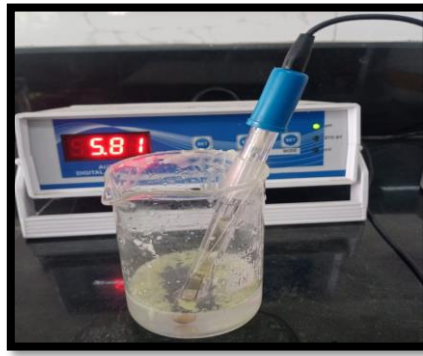


Figure 5: Determination of pH

Spreadability

The spreadability was determined by sandwiching an excess of sample between two slides that were compressed to uniform thickness by applying a fixed weight for a fixed period of time. Spreadability was determined by the time it took to separate the two slides. The shorter the time required to separate two slides, the better the 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

The spreadability of the formulated ointments was found to be good.

Extrudability

The mixture was placed in a collapsible tube container. The extrudability was measured in terms of the weight of ointment required to extrude 0.5cm of ointment ribbon in 10 seconds. The ointment was extruded smoothly and easily. So, the formulated ointment was considered to be passable.

Diffusion study

The diffusion experiment was carried out by making an agar nutrient medium. A hole board was placed in the centre of the medium, and ointment was placed in it. The time it took for the ointment to diffuse was recorded. (60 minutes later).

This study is performed to check the diffusion rate of the ointment through the skin to get the desired therapeutic effect.

Loss On drying (LOD)

LOD was determined by placing the formulation in a petri dish on a water bath and drying it at 105°C.

Solubility

It is soluble in cosmetic esters and fixed oils; Insoluble in water.

Washability

The formulation was applied to the skin, and the ease of washing with water was evaluated. As this formulation is oil-in-water formulation. It have good washability.

Non irritancy Test

A prepared herbal ointment was applied to the skin of a human being and the effect was observed. The test is performed by applying the small amount of sample to the hand and observed for 24 hours to check the effect like redness, erythema, inflammation, etc. Hence, no such effects was observed, it is non- irritant to the skin.

Stability study

The herbal ointment's physical stability was tested for four weeks at different temperatures such as 25°C and 37°C. Within four weeks, the herbal ointment was found to be physically stable at different temperatures, namely 25°C, and 37°C.

Viscosity

The viscosity of the formulated ointment was check by using brookfield viscometer. The Model CAP 2000+ is used to evaluated the viscosity.



Figure 6: Determination of Viscosity

III. RESULTS AND DISCUSSION

The current study was carried out in order to prepare and evaluate the herbal ointment. The herbal seed oil were prepared using a cold pressed process to obtain a high yield of oil with 100% pure and natural with no harm to the chemical constituents or their activity.

The levigation method was used to prepare the ointment, resulting in uniform mixing of the herbal extract with the ointment base that was stable during storage.

The physicochemical properties were investigated, and the results for spreadability, extrudability, washability, solubility, loss on drying, and other properties were found to be satisfactory.

Within four weeks, the formulation was also subjected to a stability study at various temperatures such as 25°C, and 37°C. There were no differences in spreading ability, diffusion study, or irritant effect.

Table 3: Physicochemical evaluation of formulated herbal ointment

Physicochemical parameters	Observation
color	Pale yellow
odour	characteristic
Consistency	Smooth
ph	5.81
Spreadability(seconds)	6
extrudability	0.45 gm
Diffusion study	0.6 cm
Loss on drying	25%
solubility	Soluble in cosmetic esters and fixed oils; Insoluble in water
washability	Good
Non irritancy	Non irritant
Stability study (25°C and 37°C)	stable

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V. CONCLUSION

Since ancient times, Neem and Karanj have been used for their various medicinal properties such as antibacterial, antifungal, anti-inflammatory, wound healing and so on. As a result, this ointment could be used as a medium to effectively and easily use these medicinal properties as a simple dosage form. Physicochemical parameters of herbal ointment is evaluated by several tests such as spreadability, diffusion, stability, non-irritancy test. So, all the result which was obtained by performing tests are good.

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