

Formulation and Evaluation of Ointment and Liniment Using Moringa Oleifera Seed Extract

Suraj T. Jadhav¹, Nitin A Gaikwad², Indrajeet V Mane³, Manohar D Kengar⁴, Abhishek S. Pujari⁵

^{1, 5}Department of Pharmaceutics, Shree. Santkrupa College of Pharmacy, Ghugaon, Maharashtra, India- 415411

^{2, 3, 4}Department of Pharmaceutics, Rajarambapu College of Pharmacy, Kasegaon, Maharashtra, India- 415404

Abstract: Traditional medicine is an important source of potentially useful new compounds for the development of chemotherapeutic agents. *Moringa oleifera* is the most widely cultivated species of a monogenetic family, it is now widely cultivated and has become naturalized in many locations in the tropics. It is a perennial softwood tree with timber of low quality, but which for centuries has been advocated for traditional medicinal and industrial uses as well as used in treatment of Anti inflammatory, Antioxidant, Coagulant. The Natural remedies are more acceptable in the belief that they are safer with fewer side effects than synthetic ones herbal formulation have growing demand in the world market. it is very good attempt to establish the herbal ointment and liniment containing ethanolic extract of moringa oleifera seed powder.

Keywords: Solubility, Anti inflammatory, Antioxidant, Coagulant, Extract

1. Introduction

Medicinal plants are believed to have therapeutically important as they are rich in various phytochemical constituents which treat many diseases ^[1]. Topically applied plant preparations in the form of cream or liniment are made available ^[2]. *Moringa oleifera* is the most widely cultivated species of a monogenetic family, the Moringaceae, that is native to the sub - himalayan tracts Indian, Pakistan, Bangladesh and Afghanistan this rapidly growing tree (also known as the horseradish tree, drumstick tree benzolive tree, kelor, marango, mlonge, moonga, mulangay, nebeday, saijhan or Ben il tree) was utilized by the ancient Romans, Greeks and Egyptians; it is now widely cultivated and has become naturalized in many locations in the tropics. It is a perennial softwood tree with timber of low quality, but which for centuries has been advocated for traditional medicinal and industrial uses. It is already an important crop in India, Ethiopia, the Philippines and the Sudan, and is being grown in West, East and South Africa, tropical Asian, Latin America, the Caribbean, Florida and the Pacific Islands. All parts of the *Moringa* tree are edible and have long been consumed by humans. The World Health Organization (WHO) has appreciated the importance of medicinal plants for public health care in developing nations and has evolved guidelines to support the member states in their efforts to formulate national policies on traditional medicine and to study their potential usefulness including evaluation, safety, and efficacy ^[3].



Image no. 1: *Moringa oleifera*

According to the many uses for moringa include alley cropping (biomass production) animal forage (leaves and treated seed-cake) biogas (from leaves) domestic cleaning agent (crushed leaves) blue dye (wood) fencing (living trees) fertilizer (seed-cake) foliar nutrient (juice expressed from the leaves) green manure (from leaves) gum (from tree trunks) honey and sugar cane juice clarified (powdered seeds) honey (flower nectar) medicine (all plant parts) ornamental plantings biopesticide (soil incorporation of leaves to prevent seedling damping off) pulp (wood) rope (bark) tannin for tanning hides (bark and gum) water purification (powdered seeds). *Moringa* seed oil (yield 30-40% by weight) also known as ben oil is a sweet non-sticking non-drying oil that resists rancidity. It has been used in salads for fine machine lubrication and in the manufacture of perfume and hair care product (158). In the West one of the best known uses for *Moringa* is the use of powdered seeds. Make Comments 3 to flocculate contaminants and purify drinking water (11,50,113) but the seeds are also eaten green, roasted, powdered and steeped for tea or used in curries (50). This tree has in recent times been advocated as an outstanding indigenous source of highly digestible protein, Ca, Fe, Vitamin C and carotenoids suitable for utilization in many of the so-called "developing regions of the world where undernourishment is a major concern. Drugs presently in use for the management of inflammation are associated with well-known side and toxic effects ^[4].

1.1 Uses

The seed powder of *Moringa oleifera* powder

- 1) It is used as anti inflammatory (analgesic)
- 2) It is used as antioxidant
- 3) It is also used as coagulant

1.2 Scientific Classification



Image no. 2: Moringa oleifera

1.3 Synonyms

Guilandina moringa l, Hyperanthera moringa Vah, Moringa pterygosperma Gaertn . nom.illeg.

Moringa oleifera-

Kingdom	:	Plantae
(Unranked)	:	Angiosperms
(Unranked)	:	Eudicots
(Unranked)	:	Rosids
Order	:	Brassicales
Family	:	Moringaceae
Genus	:	Moringa
Species	:	M.oleifera
Binomial name	:	Moringa oleifera

2. Materials and Methods

Fresh leaves of Moringa oleifera was collected from local Area Yelur, Tal- Walwa, Dist- Sangali, Maharashtra, India and Extraction process performing Chemistry Lab in Shree. Santkrupa College of Pharmacy, Ghugaon

2.1 Ointment Formulation from Seed of Moringa Oleifera

Ointment – ointment are the semisolid preparation meant for application to the skin or mucous membrane.

1) Formula of ointment

Table 1: Ointment Formulation table

Ingredient (Water extract) F1	Quantity	Ingredient (Ethanol extract) F2	Quantity
Propylene glycol	3gm	Propylene glycol	3gm
White bees wax	0.5gm	White bees wax	0.5gm
Hydrous wool fat	0.5gm	Hydrous wool fat	0.5
Methyl paraben	0.1gm	Methyl paraben	0.1
Propyl paraben	0.5gm	Propyl paraben	0.5
Triethanolamine	0.5gm	Triethanolamine	0.5gm
Moringa oleifera seed water extract	0.5gm	Moringa oleifera seed water extract	0.5gm

Procedure

- 1) The ethanol extract and the water extract separately were incorporated in to the molten simple ointment base.
- 2) Add Moringa oleifera seed powder extract and stir till it solidifies

- 3) Transfer to a suitable container, cork it, attach prepared label and submit.

Evaluation

Colou and Odour

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

Consistency

Smooth and no greediness is observed

pH

pH of prepared ointment was measured by using digital pH meter .The solution of ointment was prepared by using 100ml of distilled water and set aside for 2hrs pH was determined in triplicate for the solution and average value was calculated. The pH measurements were done by using a digital type pH meter by dipping the glass electrode into the ointment formulation ^[5]

Spread ability

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

$$XS=M \quad I/T$$

Where,

S = spreadab

M = Weight tide to the upper

L = length of glass slide

T=Time taken to separ

Extrudability

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

The Shaikh et al. Universal Journal of Pharmaceutical Research ISSN: 2456-8058 39 CODEN (USA): UJPRA3 extruadibility of prepared Moringa oleifera ointment formulations was calculated by using following formula ^[6].

$$\text{Ext} = \frac{\text{Amount of ointment extruded from the tube} \times 100}{\text{Total amount of ointment filled in the tube}}$$

Diffusion Study

In Franz diffusion cell, 2gm of ointment was kept in donor compartment. The entire surface of cellophane membrane was in contact with the receptor compartment containing 25ml of phosphate buffer pH 7.4 The receptor compartment was continuously stirred (100rpm) using the magnetic stirrer .The temperature was maintained 37c .The study was carried out for 2 hrs and the sample was withdrawn at 15 minute time interval and same volume was replaced with free phosphate buffer. The content of seed extract withdrawn and sample was measured after suitable dilution.

LOD

LOD was determined by placing the formulation in petri-dish on water bath and dried for 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. Moringa oleifera ointment formulations were applied on the skin and then ease extend of washing with water was checked. Washability was checked by keeping applied skin area under the tap water for about 10 min^[7].

Non Irritancy Test

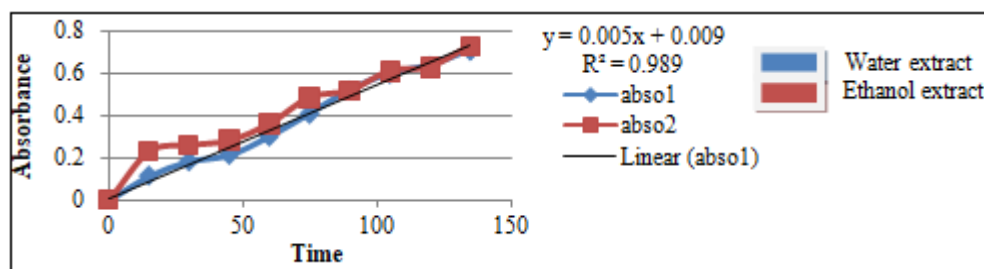
Herbal ointment prepared was applied on the skin of human being and observed for effect.

Stability Study

Moringa oleifera ointment formulations were evaluated for their stability at an ambient condition of pressure and temperature for two weeks. Formulations were observed for phase separation and particle agglomeration^[8]

3. Result and Conclusion**Table 2:** Observation and Result

S.No	Test	Observation	Result
		F1 (Water Extraction)	F2(Ethanol Extraction)
1	Color	Green	Faint Brown
2	Appearance	Semi Solid	Semi Solid
3	Consistency	Semi Solid	Semi Solid
4	Wash ability	Good	Good
5	Spradility	15.75	26
6	pH	5.5	6.5

**Graph 1:** Percentage drug release**4. Conclusion**

Natural remedies are more acceptable in the belief that they are safer with fewer side effects than synthetic ones herbal formulation have growing demand in the world market . it is very good attempt to establish the herbal ointment and liniment containing ethanolic extract of moringa oleifera seed powder. This study revolves that the developed single herble formulation table 4 was comparatively better than table 3.

Diffusion Study**Table 3:** Water Extract

Time	Absorbance
15min	0.114
30min	0.183
45min	0.214
60min	0.302
75min	0.41
90min	0.522
105min	0.602
120min	0.64
135min	0.712

Table 4: Ethanol Extract

Time	Absorbance
15min	0.232
30min	0.262
45min	0.284
60min	0.362
75min	0.488
90min	0.52
105min	0.612
120min	0.632
135min	0.732

Percentage Drug Release of Water Extract and Ehanolic Extract of Seed Moringa Olifera**References**

- [1] Farnsworth NR. Screening Plants for New Medicines. Biodiversity. Part II. 2nd ed. Washington: National Academy Press; 1989.
- [2] Lee Y. Chinese medicine externally used for curing bronchial asthma and its preparation. J Pharm Tech 2012; 12:32-7.
- [3] Mishra SP, Singh,P and Singh, S.(2011).Nutritional and medicinal value of Moringa oleifera leaves: Potential and Prospects. Forestry Bulletin, 11(1):46-58.
- [4] Mahesh S, Paschapur P, Patil MB, Ravi K, Sachin D. Evaluation of anti-inflammatory activity of Ethanolic

- extract of *Borassus flabellifer* L. male flowers in experimental animals. J Med Plants Res 2009; 3:49-4.
- [5] Burd A, Huang L. Carbohydrates and cutaneous wound healing. Carbo. Chem. 2008; 17:253-27.
- [6] Rajasree PH, Vishwanad V. Formulation and evaluation of antiseptic polyherbal ointment. Int J Pharm Life Sci. 2012; 3(10), 2021-2031.
- [7] Aukunuru J, Bonepally C. Preparation, characterization and optimization of ibuprofen ointment intended for topical and systemic delivery. Trop J Pharm Res. 2007; 6(4), 855-860.
- [8] Rajalakshmi G, Damodharan N. Formulation and evaluation of clotrimazole and ichthammol ointment. Int J Pharm Bio Sciences. 2010; 1(4):P7-P15.