



Formulation & Evaluation Of Herbal Pain Relieving Natural Miracle Balm Derived From Moringa Oleifera

Author: Shubhangi Bramhankar*, Jitendra Shivankar Tulsidas Nimbekar

Corresponding author: Shubhangi Bramhankar

**SHRI LAXMANRAO MANKAR INSTITUTE OF PHARMACY AMGAON,
GONDIA. 441902, MAHARASHTRA, INDIA**

ABSTRACT

Modern life is stressful, and tension headaches are one result of that stress. Cosmetics have great demand since ancient time, Now a days, a focus has been shifted more towards derived cosmetic products. There has been an increasing focus on development of new routes of drug administration to provide tailored treatments for patients, without decreasing efficacy of analgesia, in proportion to the progression of the knowledge of pain mechanisms. This review presents recent findings regarding topical formulations of the most widely used drugs for pain treatment; Disclosed herein is a herbal balm composition and the method of preparing said composition. The composition comprising extracts of organically certified herbs, organic essential oils and organic beeswax, and petroleum jelly etc. The oils used in it are used as a pain killer. Not only cosmetic products, but also to the skin products due to their ease of application among all dermal drug delivery products, pain balm formulation are preferably used so as to get the faster local effect.

KEY WORDS: Herbal Balm, Anti-Inflammatory Activity, Moringa oleifera leaves oil, Eucalyptus Oil, camphor, menthol etc.

INTRODUCTION

- Herbal Balm is an Ayurvedic formulation of powerful essential oils for quick relief from headache, backache, cold and in relieving pain.
- Herbal balm composition comprising organic essential oils, organic bees wax and other desired herbal components has medicated topical preparations for application to skin of human beings.
- Balms are topical preparations for application to medicated topical preparations for application to skin to relieve pain and stiffness.

- These balm contains counter irritant chemical compounds such as methyl salicylate . Petroleum jelly is the common base for any kind of balms.

WHAT IS INFLAMMATION ?

- Inflammation is the painful redness and swelling of a portion of the body caused by an infection, injury, or illness.
- Inflammation is a normal, defensive response to tissue injury produced by physical trauma toxic chemicals, or microbiological organisms.
- It is a component of the complicated biological reaction of a body tissue to damaging stimuli such as infections, damaged cells, or allergens, and is a defensive response involving immune cells, blood vessels, and nerves.
- Inflammation can be acute or persistent. Inflammation has two types:
- **Acute inflammation, and Chronic inflammation.**

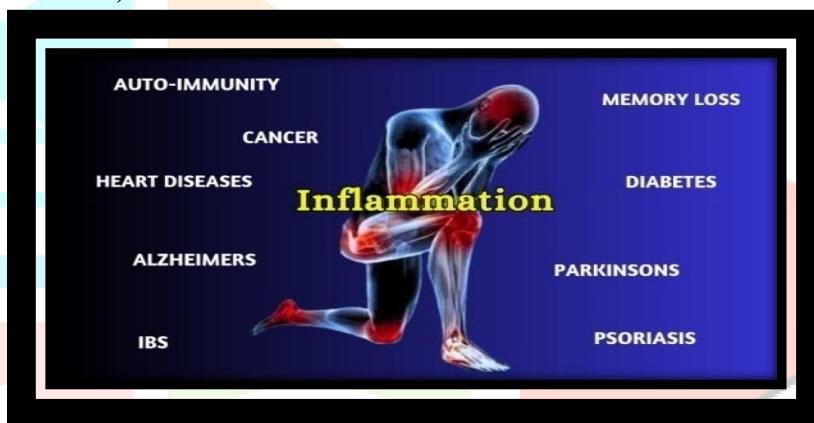


Fig No. 1 . Inflammation

Acute inflammation:

- Acute inflammation is the body's initial response to damaging stimuli, and it is characterized by accelerated flow of plasma and leukocytes from the blood into the wounded cells.
- Acute inflammation is a short-term process that usually manifests itself within a few minutes or hour.

Chronic inflammation:

- Chronic inflammation is a sign of other health disorders, such as rheumatoid arthritis (RA), which affects roughly 1% of the population in affluent countries.

Mechanism of Inflammation:

NSAID

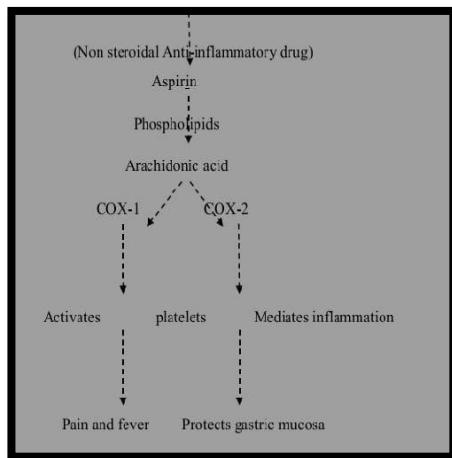


Fig No. 2 : Mechanism Of Inflammation

WHAT IS PAIN :

- Pain is a vital nervous system function that alerts the body to possible or existing injury. In the early stages, the most prevalent disease is pain.

NONVERBAL INDICATION OF PAIN

- Tense body language, Restlessness, Strained facial expressions, Sad facial expressions, Tearfulness, Increased resistance/agitation with movement, Increased breathing, Shortness of breath.

MYTHS ABOUT PAIN AND CURE FOR PAIN

- To cure pain, the condition causing your pain must be anatomically removed from your body through surgery and in most cases this simply is not feasible nor possible, nor label as a cure for pain.
- Thus the word relief is inbuilt in **the word pain balm a balm in the physical sense is defined as a semi solid preparation applied externally as a remedy or for soothing and irritation.**
- **It is also defined as any of various aromatic resinous substances contained in a preparation used for healing and soothing.**
- Pain results as a result of agitation in famed nurse at the point of injury or diseases.

Table No . 1 : Causes Of Pain

TYPES OF PAIN	CAUSES
Headache	Irritated, inflamed or damaged nerves
Foot pain	Irritated, inflamed or damaged nerves Foot pain Arthritis, a fractured or
Arthritis pain	Enough damage can result in bone grinding directly on bone
Muscle pain	Tension, stress, overuse and minor injuries
Neck pain	Poor posture
Joint pain	Injuries , infection

TYPES OF PAIN:

Pain can be broadly classified into four types

- 1) Acute Pain.
- 2) Chronic Pain.
- 3) Neuropathic Pain
- 4) Nociceptive Pain

PAIN RELIEF BALM

- Pain Relief Balm one of the emulsion / ointment that help to relieve pain and inflammation.
- It is also defined as any of various aromatic resinous substances contained in a preparation used for healing and soothing.
- Pain balm is something that is comforting and soothing
- When the pain relief balm apply on the skin the active ingredients absorb in the skin once absorbed they works through following mechanisms.

Topical application : pain relief balms applied directly to the skin over the affected area. Upon application active ingredients penetrate the skins surface targetting the underlying tissues were pain originates

Counterirritation: Cooling agents create a sensation of cold on the skin, which helps to distract from the sensation of pain known as Counter irritation.

Increased Blood flow : Increasing blood flow to the applied area Enhances circulation can help reduce inflammation and promote healing thereby alleviating pain.

Analgesic effect- : Directly targetting pain receptors in the nerves.

Anti inflammatory action : Inflammation is a common cause of pain especially in conditions like arthritis and tendonitis. Some pain relief balms contain anti- inflammatory agents such which help to reduce swelling and alleviate associated pain.[6]

PRINCIPALE OF HERBAL BALM

- Herbal balm is an ayurvedic preparation of potent essential oil for reducing pain and providing fast relief from headache, cold, and other symptoms.
- Herbal balm compassion offers medicinal topical preparation for application to skin to relieve pain and stiffness
- These product don't create inflammation at the application site or have any side effect or allergic reaction like skin irritation or skin discoloration.

Review Of Literature

1. **P . Geetha Devi, S. Yamuna*, Sk. Nourin1, K. Naveen2, Sk. Salma3, D. swathi4 , K. Gayathri5, P. subrahmanyam6** This review presents recent findings regarding topical formulations of the most widely used drugs for pain treatment, ; Disclosed herein is a herbal balm composition and the method of preparing said composition.[1]
2. **1Miss. Telange- Patil P.V.,2Miss. Bendgude P.D.,3Miss. Chavan M.R.,4Miss.Jadhav S.T., Assistant Professor,2Stuent,3Student, 4Student., 1Pharmaceutics Department , 1College of Pharmacy Paniv, Solapur, Maharashtra ,INDIA.** Modern life is stressful, and tension headaches are one result of that stress. Cosmetics have great demand since ancient time, Now a days, a focus has been shifted more towards derived cosmetic products.
3. **Pratiksha Salunke, Shital Markad, Komal Magar, Department of pharmaceutical Quality assurance Vidya Niketan College of Pharmacy, Lakhewadi,Indapur. 413103.Maharashtra, Indian .** In line with the advancement of our understanding of pain mechanisms, there has been a growing emphasis on the creation of novel drug delivery systems that can offer patients individualized treatments without compromising the effectiveness of analgesics,
4. **Ms. Geetanjali. N. Badak Mr. Sushant Suresh Kumbhar Rajgad Dyanpeeth's College of Pharmacy, Bhor** This review presents recent findings regarding topical formulations of the most widely used drugs for pain treatment, ; Disclosed here in is a herbal balm composition and the method of preparing said composition.

ADVANTAGES AND DISADVANTAGES

ADVANTAGES OF HERBAL BALM

1. Avoidance of first pass metabolism.
2. Convenient and easy to apply.
3. Ability to deliver drug more selectively to a specific site.
4. Improving physiological and pharmacological response.
5. Improving patient compliance.

DISADVANTAGES OF HERBAL BALM

1. Skin irritation of contact dermatitis may occur due to the drug and / or excipients.
2. Poor permeability of some drug through the skin.
3. Possibility of allergic reaction.
4. Can be used only for drugs which require very small plasma concentration for action.
5. Drugs of larger particle size not easy to absorb through the skin. [6]

AIM

- Formulation and Evaluation of herbal pain relieving balm.
- Aim of the study was planned to evaluate the clinical efficacy and safety (short – and long term) of herbal pain balm in the management of headache , cold , joint pain etc .

OBJECTIVE

- To ease the patients' joint and muscular pain.
- To Greatly Improve Headache Patients' Experience.
- To treat common colds in comparison to other product types.

IDEAL PROPERTIES

- Pain relief**
 - Herbal balms can relieve pain and stiffness
 - They can help with headaches, backaches, and other pains
- Anti-inflammatory**
 - Some herbal balms have anti-inflammatory properties
- Antimicrobial**
 - Herbal balms can have antimicrobial properties
 - They can inhibit the growth of common pathogens like *Staphylococcus aureus* and *Escherichia coli*
- Antiviral**
 - Some herbal balms have antiviral properties
 - For example, lemon balm has antiviral properties that may help with severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) and human immunodeficiency virus (HIV)
- Other properties**
 - Herbal balms can have antioxidant properties
 - They can be used to treat muscle spasms, numb tissues, and kill bacteria
 - They can be used to relieve tension, stress, and minor injuries[8]

The pain relief balm pharmacological effect on the body

Pain relief balm work on the principle of counter irritant instead of actually relieving the pain they work on the principle of suppressing the pain by causing irritation on the point where the pain relief balm is applied.

PLANT MATERIAL AND EQUIPMENTS

All the natural material used in the present study i.e. Moringa leaves , Menthol castor oil , Bees wax , Camphor , Eucalyptus oil , coconut oil, etc.

PLANT MATERIAL :

1 . **Moringa oleifera :**

Moringa oleifera is a plant native to the Indian subcontinent that has become naturalized in tropical and subtropical regions around the world and is a fast growing, drought-resistant tree also known as the drumstick tree, horseradish tree, and ben oil tree or benzoline tree that can be eaten and is extremely safe .

In common language it's also known as "sahajan" . Moringa is world's most useful trees which is used for various purpose such as food medicine and in industries

Medicinal Properties And Uses Of Moringa Olifera

1. Anti-inflammatory: MORINGA OLEIFERA exhibits anti-inflammatory properties, making it useful in the treatment of conditions such as arthritis and joint pain.

2. Antioxidant: The plant is rich in antioxidants, which help neutralize harmful free radicals in the body, reducing the risk of chronic diseases and supporting overall health.

3. Cures digestive disorders

4. Useful in cold and cough

5. Treat headache

OBJECTIVES

- To formulate Moringa leaves powder.
- To analyze the physio-chemical properties and nutritional analysis of Moringa leaves powder by using standard methods.
- To develop value-added products of Moringa leaves powder and their sensory evaluation.[11]

PLANT PROFILE :

- **Botanical Name** : Moringa oleifera
- **Synonyms** : Drumstick tree , ben oil tree ,regional name like “malunggay” and
- **Order** : Brassicales
- **Family** : Moringaceae
- **Genus** : Moringa
- **Species** : Oleifera
- **Family** : Moringaceae



Methodology:

- Formulation Of Moringa Oleifera Leaves Powder :

DRYING OF LEAVES :

- **Collection:**

The leaves were collected from the university campus (**Garden Of Shri Laxmanrao Mankar Institute Of Pharmacy Amgaon**)

- **Sorting:**

Fresh, green undamaged leaves were collected to produce the best quality powder.

- **Cleaning and washing :**

The stalk of the leaves was cut from the main branches and were washed 3-4 times with plenty of water to remove all the adhering dust, and dirt particles.

- **Blanching and Drying :**

Moringa oleifera leaves were immersed in boiling water at 100 °C for 5 minutes and then it was immersed in cold water for 2 minutes. Blanched leaves were dried in neat and clean dust free dark shadow place at temperature ranged from 25-30 °C. The leaves were completely dried in 24-38 hours. Dried them till leaves became brittle and crushed easily.

- **Grinding of leaves:**

Dried leaves were ground into fine powder

- **Storage:**

Moringa oleifera leaves powder were stored in airtight containers protected from humidity, heat, and light to avoid the growth of molds at room temperature.

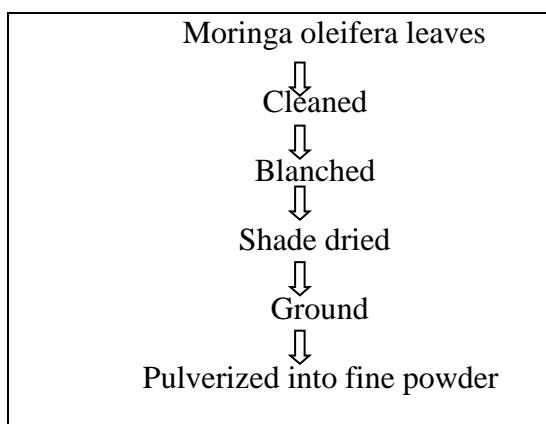


FIG. 4 : Flow diagram of formulation of Moringa oleifera leaves powder

Extract preparation

1g of dry powder of leaves of the moringa were dissolved in 25 ml of solvent (water) , boil it for specific period of time then cooled and strained the solution



Phytochemical screening

Phytochemical screening was carried out on the plant extract . Analysis was done to detect Various chemical constituents by performing tests for alkaloids glucosides, flavonoids, proteins, Carbohydrates, and Tannins .Results of the tests shows presence of alkaloids, glycosides, flavonoids, Tannins and phenolic contents

	Test	Result
Alkaloids	Wagners test	+
	Huggers test	+
	Dragendroffs test	-
Glycoside	Killer killanin test	+
Flavonoids	Shinoda test	+
Tannins	Ferric chloride test	+



Phytochemical screening tests

2. MENTHOL :

- **Scientific Name** : Hexahydrothymol
- **Synonyms** : Peppermint, Camphor
- **Order** : Strong Minty, Cooling
- **Botanical source** : It is the oil obtained by the distillation of *Mentha piperita* belonging **Family** Lamiaceae
- **Genus** : *Mentha Piperita*, *Mentha Longifolia*
- **Chemical Constituents** : The chief constituent of Peppermint oil is Menthol, along with other constituents like methyl acetate, isovalerate, menthone, cineol, inactive pinene,

USES

1. It is used to reduce spasm and pain caused by endoscopy
2. It is used in migraine headache.
3. It is also used to treat nausea
4. It is used to reduce inflammation. [13]



Fig 5 : Menthol Oil

3. CASTOR OIL :

- **Synonyms** : Castor Bean Oil, Castor Oil Seed,
- **Scientific Name** : *Ricinus communis*
- **Synonyms** : Ricinus Oil
- **Family** : Euphorbiaceous
- **Biological Source** : Castor oil is the fixed oil obtained by cold expression of the seed of *ricinus communis* linn.

- **Chemical Constituent :** Castor oil also contains vitamin F. 90% Of the fatty acid content is ricinoleic acid.
- **Uses :**
 - 1 . Castor oil is commonly used as the laxative .
 - 2 . Castor oil.promot the wound healing.
 - 3 . Castor oil Used in carthritis.
 - 4 . Castor oil Help to improve blood circulation



Fig : Castor oil

4. EUCALYPTUS OIL

- **Synonyms** : Lemon scented gum ,
- **Scientific Name** : Eucalyptus Globules ,
- **Kingdome** : Plantae
- **Order** : Myrtales
- **Biological Source** : Eucalyptus oil is made from the fresh leaves and branch tops of the eucalyptus plant belonging to
- **Family** : Myrtaceae
- **Sub – Family** : Myrtoideae
- **Genus** : Eucalyptus L her

Uses

- 1 . It is used to relieve stuff nose .
- 2 . It is used to redused stress .
- 3 . It is used in disinfectants wounds and cut
- 4 . It is used to relieves joint pain inflammation . [15]



Fig : Eucalyptus Oil

5 . COCONUT OIL

- **Biological Name** : Cocos nucifera
- **Kingdome** : Plantae
- **Order** : Arecales
- **Biological source** : coconut oil is the expressed from their dried solid part of endosperm of coconut , cocos nucifera L , belonging to family **Palmae** .
- **Family** : Arecaceae
- **Sub - Family** : Arecoideae
- **Genus** : Cocos L.
- **Species** : Nucifera

Chemical Constituents :Coconut oil is composed of the fatty acids, caprylic acid C -8:0 (8%), capric acid, C-10:0,(7%), lauric acid C-12:0 (49%), myristic acid C-14:0 (8%), palmitic acid C-16:0 (8%), stearic acid C-18:0 (2%), oleic acid C-18:1 (6%) and 2% of C-18:2 linoleic acid.

Uses

1 . It is used as Anti- inflammatory .

2 . It is used as skin conditio

3 . It is used in heal wounds ^[16]



Fig:coconut oil

6 . BEES WAX :

- **Scientific Name** : Ceraalba
- **Synonym** : Whight wax , yellow wax
- **Colour** : Yellow to yellow-brown
- **Order** : Hymenptera
- **Tast** : Pungent

**7 . CAMPHOR**

- **Scientific Name** : Cinnamomum camphor
- **Synonym** : Gum Camphor , Japan Camphor , Alcanfor
- **Tast** : Pungent
- **Biological Source** : Camphor is a solid ketone, obtained from the volatile oil of Cinnamomum. Camphor's biological source is the wood of the camphor laurel tree, Cinnamomum camphora.
- **Chemical Constituents** : Camphor is bicyclic mono terpenoid . Camphor oil contains camphor, cineole, pinene, camphene, phellandrene, limonene, and diterpenes. Camphor is entirely a monoterpenic ketone. Its basic carbon framework is related to bofineol .

Uses:

1. It is used as Antiseptic
2. It is used as Muscle relaxant
3. It is used as Anti- inflammatory

**8 . METHYL SALICYLATE**

- **Formula** : C₈H₈O₃
- **Odor** : Liquid having the characteristic odor of wintergreen.
- **Taste** : Liquid having the characteristic taste of wintergreen.
- **Biological source** : Methyl Salicylate is found in many plants , particularly wintergreens.
- **Density** : 1.174
- **Solubility** : Less than 1 mg\ml at 66 F

- Slightly soluble in water, soluble in most organic solvent

9 . Sodium Benzoate :

- **Types of ingredient** : Preservative
- **Chemical Formula** : C7H5NaO2
- **Appearance** : White, odorless, crystalline powder or granules
- **Solubility** : Highly soluble in water
- **Main benefits** : sodium benzoate is also an effective product stabilizer commonly used in pain.

EQUPMENTS

Sr.No.	Equipments
1	Beaker
	Magnetic stirrer
3	Mortar and pestle
4	Digital ph
5	Viscometer
6	Weighing balance
7	Hot plate
8	Container for filling and storage
9	Filter paper
10	Butter paper
11	Funnel
12	Stand
13	Thermometer
14	Slide
15	Spatula

Preparing / Extracting Oil From Leaves Of Moringa Oleifera :

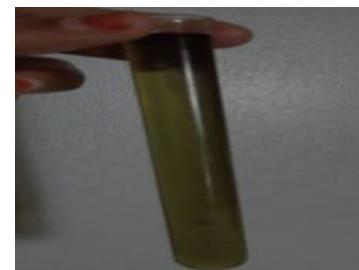
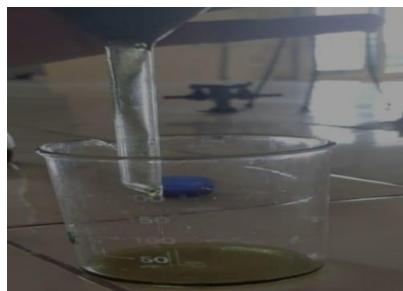
Sr. NO.	INGREDIENTS	QUANTITY
1	MORINGA LEAVES POWDER	10 gm
2	COCONUNT OIL	10 lm
3	CASTOR OIL	10 ml

1 . Collect fresh Moringa Leaves .

2 . Washroom the leaves the initially by tap water and then rinsed with distilled water

3 . Get the leaves as dry as you can, but if there's a little water left it will evaporate.

4 . Put leaves powder in a heat resistant container/glass/pan



c. Moringa leaves oil

A . Preparing Moringa oil

5. Add Castor oil/Coconut oil to cover them wholly (here castor oil is used which is odourless or not having strong smell to extract Leaves oil as it has properties like use in arthritis pain, antioxidants, moisturize skin, relieve joint pain)

6..Leave Pan uncovered & raised temperature of oil until mixture just barely begins to bubble .

7 . Having the potential uncovered allows the moisture in the fresh herbs to evaporate off.

8 . Stirring frequently until herbs are Crisp

9 .Cool & Strain the oil from the residue

PREPARATION FORMULA OF HERBAL PAIN RELIEF BALM

Sr. NO.	INGREDIENTS	QUANTITY	MEDICINAL USES
1	Bees wax	3 gm	Bees wax
2	Petroleum jelly	3 gm	Relieves dry skin, healing
3	Eucalyptus oil	3 ml	Pain relieve , Promote relaxation
4	Peppermint oil	3 ml	Counter irritant Moisturizer
5	Camphor	3 gm	Relives cough , Antiseptic
6	Sodium benzoate	2gm	Preservative
7	Methyl salicylate	2 ml	Analgesic,skin absorbent
8	Cetyl alcohol	2gm	Viscosity enhancer

PROCEDURE

The essential components for making a herbal pain – relieving balm were carefully weighed by using a digital weighing balance machine.

- Take one container in that weigh and add 3 gm of petroleum jelly, place the container in a hot plate and boil it until all the amount of petroleum jelly completely dissolved
- In the dissolved petroleum jelly solution weigh and add 5 gm of bees wax, stir it and boil until the bees wax added completely dissolve in the petroleum jelly.
- After that, weigh and add 3 ml of peppermint oil of the above solution and boil it until the oil completely
- Add moringa leaves oil of the above solution and boil it until the oil completely
- Weigh 3 ml of eucalyptus oil, stir the solution and boil the solution.
- Weigh 2 ml of methyl salicylate of the above solution and boil it until the oil completely
- Weigh 2 gm of sodium benzoate and add it to the solution, stir it well and boil the solution, for complete dissolution of the solution.
- When all the added ingredients were completely dissolved and turns in to the liquid form then take the solution out of the hot plate and keep the herbal balm solution for cooling.
- Finally the prepared solution cools down and turns into a semi solid herbal balm.[23]

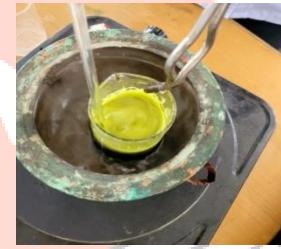
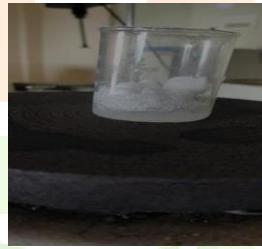


Fig : Preparation Of Pain Relife Herbal Balm



Fig : formulated pain relief herbal balm

RESULT AND DISCUSSION

The physiochemical parameter of the prepared balm were determined parameter such as colour odour appearance, texture and pH were tested.

EVALUTION PARAMETER RESULT OF HERBAL BALM

SR NO	ORGANOLEPTIC CHARECTERS	HERBAL BALM	MARKETED BALM
1	Formulation	Pain Balm	Pain Balm
2	Colour	Lime Green	White
3	Odour	Strong odour	Fragrant
4	Apperence	Pain relief stick	Pain relief stick
5	Tecture	Smooth	Smooth
6	State	Semi solid	Semi solid

EVALUTION PARAMETER RESULT OF HERBAL BALM

SR NO .	PHYSICAL CHARECTERS	Result
1	Ph	6.5
2	Spreadability	Easily Spreadable
3	Consistency	Fair , smooth
4	Viscosity	39010 cps
5	Phase separation	No phase separation
6	Solubility	Soluble in boil water
7	Patch test	Non allergenic
8	Washability	Easily washable

CONTAINER AN STORAGE

Store in well closed mouth bottle at room temperature.

CATEGORY

Intended to be used as analgesic .

DIRECTION FOR USES

To be rubbed externally.

2.Rub gently on the skin with the help of finger.

3.Do not apply on skin an cuts.

Uses:

1. Arthritis.	2. Sore muscle.	3. Leg cramps	4. Neck Pain
5. Backches.	6. Joint pain.	7. Headache [27]	

SUMMARY AND DISCUSSION

- In summary, the primary aim of the research was to develop and assess the fundamental physical parameters and stability assessment of menthol-containing pain relief products. After making the same attempt, the assessment parameter results indicated that, provided the menthol formulation in the balm, stays steady.
- A herbal pain relief balm is topically made by infusing various herbs and essential oils known for their anti inflammatory properties into a base such as bees wax .
- Herbal ingredient work together to provide relief from headache, muscle aches , joint pain , and minor injuries when applied topically .
- It's important to research and ensure proper dilution ratios and potential allergens before making or using such a balm.

CONCLUSION

- This article contains the overview of medicinal properties of moringa leaves which have been proved but are rarely used as a herbal medication. Moringa oleifera is a useful remedy for treating headache, In present investigation an attempt was made to prepare & evaluate the herbal balm formulation comprising of the oil of the leaves of moringa oleifera . From various information sources and based on the presence of phytochemical constituents it is concluded that the plant showing various medicinal pharmacological activities such as anti inflammatory activity, immunomodulatory activity, anthelmintic, Antioxidant, antimicrobial, antiparasitic and pain relieving properties.

REFERENCE

1. P. Geetha Devi, S. Yamuna , Sk. Nourin, K. Naveen, Sk. Salma, D. swathi, K. Gayathri, P. subrahmanyam. 2022. Formulation of natural miracle balm formulation by using herbal plants and evaluation on topical region 21(7):604-629.
2. 7. Joseph C. Maroon, Jeffrey W. Bost, and Adara Maroon. 2010. Natural anti-inflammatory agents for pain reliefSurgNeurolInt.1-6.
3. Almekinders LC, Gilbert JA. Healing of experimental muscle strains and the effects of nonsteroidal anti-inflammatory medication. Am J Sports Med. 1986;14:303– 8.
4. 4. Almekinders LC. Anti-inflammatory treatment of muscular injuries in sport. An update of recent studies. Sports Med. 1999;28:383–8.
5. Acebo E, Raton JA, Sautua S, Eizaguirre X, Trébol I, Pérez JL. Allergic contact dermatitis from Boswellia serrata extract in a naturopathic cream. Am J Contact Dermat. 2004;51:91– 2.

6. 1. Formulation and evaluation of herbal pain relieving balm Jagruti S Bidgar, Shivam S Bamankar, Kajal K Katkar, Samadhan K kodalkar Department of B. Pahramcy, Mandesh Institute of Pharmaceutical Science and Research Center Mhaswad, Maharashtra, India.
7. D.R. Batish, H.P. Singh, R.K. Kohli, S. Kaur. 2008. Eucalyptus essential oil as a natural pesticide. *Forest Ecology and Management*.256(12):2166-2174.
8. FatihBrahmi, MadaniKhodir, Chibane Mohamed and DuezPierre. Chemical Composition and Biological Activities of *Mentha* Species.
9. Banerjee M, Tripathi LM, Srivastava VM, Puri A, Shukla R. Modulation of inflammatory mediators by ibuprofen and curcumin treatment during chronic inflammation in rat. *Immunopharmacol Immunotoxicol*. 2003;25:213–24.
10. Banno N, Akihisa T, Yasukawa K, Tokuda H, Tabata K, Nakamura Y, et al. Antiinflammatory activities of the triterpene acids from the resin of *Boswellia carteri*. *J Ethnopharmacol*. 2006;107:249–53.
11. Bengmark S. Curcumin, an atoxic antioxidant and natural NF κ B, cyclooxygenase-2, lipoxygenase, and inducible nitric oxide synthase inhibitor: A shield against acute and chronic diseases. *JPEN J Parenter Enteral Nutr*. 2006;30:45–51.
12. Bernstein JE, Bickers DR, Dahl MV, Roshal JY. Treatment of chronic postherpetic neuralgia with topical capsaicin. A preliminary study. *J Am Acad Dermatol*. 1987;17:93–8.
13. Badria FA, El-Farahaty T, Shabana AA, Hawas SA, El-Batoty MF. Boswellia-curcumin preparation for treating knee osteoarthritis: A clinical evaluation. *Alt Complement Ther*. 2002;8:341–8. [Google Scholar]