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Formulation And Evaluation Of Poly-Herbal Pain Relief Balm

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ABSTRACT

The most popular medications topical formulations for the treatment of pain are reviewing here, along with new research findings. Tension headaches are one symptoms of the stress of modern living. Since ancient times, there has been a storing need for cosmetics; however, these days, the emphasis is primarily on derived cosmetic items. In addition to cosmetics, skin care products are also preferred because of their convenient application. Of all dermal medication delivery treatments, pain balm formulations provide the fastest local effect. The main aim of this study was to formulate and evaluate polyherbal pain relieving balm containing essential oils of Eucalyptus, Frankincense, White Willow bark liquid extract, Menthol. The plant has been reported in the literature good anti-inflammatory, antioxidant, antibacterial, analgesic, and cooling activity. Menthol is naturally occurring cyclic terpene alcohol of plant origin, which has been used since antiquity of medicinal purpose. Its use in dermatology is ubiquitous, where it is frequently part of topical anti-pruritic, antiseptic, analgesic and cooling formulations methyl salicylate, eucalyptol, camphor, petroleum jelly, coconut oil, are used. Prepared formulation was evaluated for various parameters like color, appearance, texture, pH, viscosity, solubility, non-irritancy, wash ability, spread ability.

Keywords: Balm, Menthol, Camphor, Anti-inflammatory, Analgesic Properties, Antioxidant

INTRODUCTION

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:

1. Acute inflammation
2. Chronic inflammation

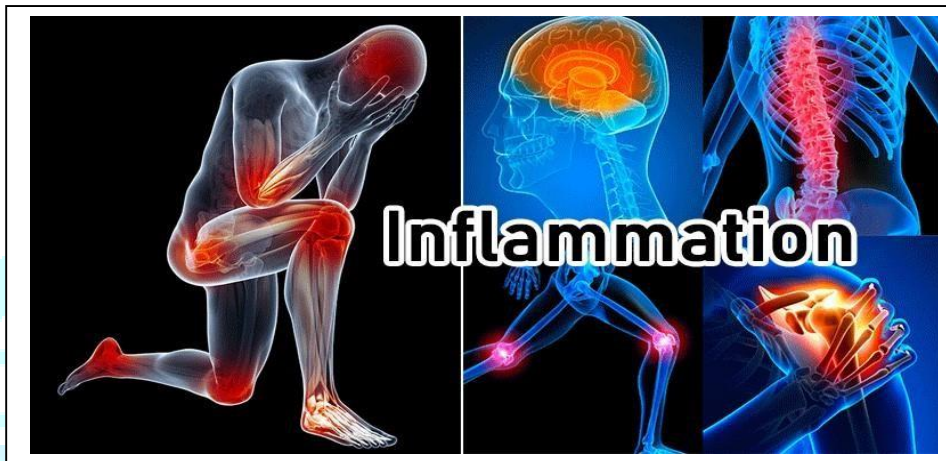


FIG No:1 Inflammation

1) 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 hours.

2) Chronic inflammation:

It is related with the infiltration of mononuclear immune cells, macrophages, monocytes, neutrophils, fibroblast activation, proliferation (angiogenesis), and fibrosis. Chronic inflammation is a gradual, long term inflammation that lasts for months or years. Chronic inflammation is a sign of other health disorders, such as rheumatoid arthritis (RA), which affects roughly 1% of the population in rich countries, and attempts at repair coexist, in varying combination

PAIN:

In the early stages, the most prevalent disease is pain. Pain is a vital nervous system function that alerts the body to possible or existing injury. Pain is an unpleasant sensation induced by severe or destructive stimuli such as stubbing a toe, burning a finger, putting alcohol on a cut, or bumping the "funny bone. "Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, described in terms of such damage". Pain pushes people to avoid dangerous circumstances, safeguard a wounded bodily part while it heals, and avoid similar experiences in the future.

Types of pain:

1. Acute Pain
2. Chronic Pain
3. Neuropathic pain
4. Nociceptive pain

HERBAL BALM

- Herbal balm is an ayurvedic formulation of powerful essential oils for quick relief from head ache, back ache, 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 skin to relieve pain and stiffness. This balm contains counter irritant chemical compounds such as methyl salicylate. Petroleum jelly is the common base for any kind of balms.
- Pain is an unpleasant feeling often caused by intense or damaging stimuli, such as stubbing a toe, burning a finger, putting alcohol on a cut and bumping the funny bone. The international association for the study of pains widely used definition states, pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage.
- Pain motivates the individual to withdrawn from damaging situations, to protect a damaged body parts while it kills and to avoid similar experiences in future. Most pain resolves promptly hence the pain stimulus is removed and the body has healed, but sometimes pain persists despite removal of stimulus and apparent healing of the body and sometimes pain arrive in the absence of any detectable stimulus, damage or disease

PAIN RELIEF BALM

- Pain balm is something that is comforting and soothing. It is one which leads the 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. When pain relief are rubbed, on the area where the pain exists, the pressure and movement produces excess of sensory input that blocks the pain sensation.
- Menthol is a natural compound of plant origin known to produce cool sensation. Menthol is the cooling natural product and peppermint is widely used preparations for pain relief in sport injuries, arthritis and other painful conditions. Camphor is a natural product derived from the wood of the tree *Cinnamomum camphora*, has a long history of use antiseptic, analgesic, antipruritic counter irritant and rubefacient. Now a day it is importance of drug administration via the skin for therapeutic effects has increased. Camphor is highly volatile and readily absorbed through the skin. It acts as a rubefacient; (a substance which when rubbed causes redness due to dilation of blood vessels) produces a cool sensation and also acts as a mild local anesthetic.

HOW DOES THE PAIN RELIEF BALM WORK

- Pain relief balm works 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.
- Pain balms generally contains 3 components namely methyl salicylate, menthol and camphor all these are easily absorbed through the skin. A combination of these three active ingredients is useful in case of head ache and rheumatic pains. The other ingredients in the pain the pain relief balm are eucalyptus oil, frankincense oil, coconut oil, white willow bark liquid extract, petroleum jelly, geogard ECT, bees wax



FIG No: 2 Formulated product

AIM AND OBJECTIVES

AIM: formulation and evaluation of poly-herbal pain reliving balm

OBJECTIVES:

- To ease the patients' joint and muscular pain.
- To Greatly Improve Headache Patients' Experience.
- To treat common colds in comparison to other product types.
- To reduce tension and encourage rest.
- Temporarily relieves the minor aches and pains of muscles and joints associated with: arthritis. Sprains. Muscle strains.

Types of pain	Causes
Headache	Irritated, inflamed or damaged nerves
Foot pain	Arthritis, a fractured or broken bone, gout, tendinitis, plantar fasciitis

Arthritis pain	Enough damage can result in bone grinding directly on bone
Chronic pain	Ongoing cause of pain, such as arthritis or cancer
Muscle pain	Tension, stress, overuse and minor injuries
Neck pain	Poor posture

Table 1: Causes of pain

MATERIAL

1) Eucalyptus oil:



FIG No: 3 Eucalyptus oil

Scientific name: Eucalyptus globules labill

Synonym: Eucalyptus

Family: Myrtaceae

Uses:

- Relieves stuff nose.
- Eases sore muscle and joint pain.
- Clears respiratory complaints.
- Reduce stress.
- Disinfects wounds and cuts.

2) Frankincense oil



FIG No: 4 Frankincense oil

Scientific name: Boswellia sacra

Synonym: Olibanum oil

Family: Burseraceae

Uses:

- Natural pain-relieving effects.
- Helping to alleviate headaches, nerve pain.
- Enhance blood flow, reducing swelling.
- Help reduce tension and promote relaxation.
- Helps reduce inflammation.
- Beneficial for arthritis, muscle pain, joint discomfort.

3) White willow bark liquid extract:



FIG No: 5 White willow bark liquid extract

Scientific name: Salix Alba

Synonym: Crack willow, Brittle willow

Family: Salicaceae

Uses:

- Used as a natural alternative to aspirin.
- Useful in treating inflammatory conditions like arthritis.
- Help lower fevers due to its mild anti-inflammatory effects
- Natural antimicrobial and anti-inflammatory properties
- Helps in healing of minor cuts, scrapes, or abrasions.
- Help soothe irritated skin and reduce redness or swelling,

4) Menthol:



FIG No: 6 Menthol

Scientific Name: Hexahydrothymol

Synonym: Peppermint camphor

Family: Lamiaceae

Uses:

- Reduces spasm and pain caused by endoscopy.
- In migraine headache.
- To treat nausea.
- To reduce inflammation.

5) Camphor:



FIG No: 7 Camphor

Scientific Name: Cinnamomum camphora

Synonym: Alcanfor

Family: Lauraceae

Uses:

- Provide relief from cold cough, chest congestion, bronchitis and asthma.
- Improves blood circulation and help to curb muscular and joint aches.
- Powerful analgesic oil that produces a cooling sensation to numb pain and a warming sensation to increase circulation.
- Versatile anti-inflammatory and antifungal compounds that reduce pain and irritation while preventing the spread of fungal infection.

6) Coconut oil:



FIG No: 8 Coconut oil

Scientific name: Cocos nucifera

Synonym: Cocos nucifera oil, Copra oil

Family: Arecaceae

Uses:

- Used as natural moisturizer for dry skin.
- Helps soothe sunburn and irritation.

- Used for muscle pain, arthritis, and inflammation relief.
- Reduce inflammation and prevent gum disease
- Its antimicrobial properties may help balance gut bacteria
- Give cooling effect and reduces inflammation

7) Beeswax:

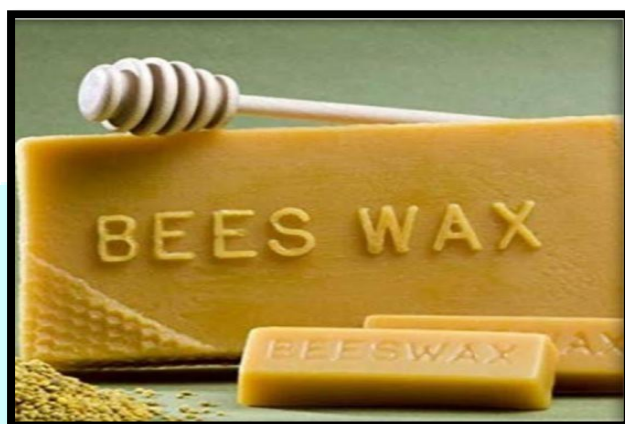


FIG No: 9 Beeswax

Scientific Name: Ceraalba

Synonym: Yellow wax

Family: Apidea

Uses

- Used as antibacterial, antifungal.
- It has anti-inflammatory and anti-allergic properties.
- It mainly use as an emulsifying agents, stiffener and gentle skin adhesive.
- Relieves stress and promotes relaxation

MATERIALS AND METHOD

MATERIAL:

Following plant materials and excipients are used to formulate this balm

SR.NO	INGREDIENTS	QUANTITY			PROPERTIES
		F1	F2	F3	
1	Eucalyptus oil	1.5ml	2.0ml	2.0ml	Anti-Inflammatory Anti-bacterial
2	Frankincense oil	1.0ml	1.0ml	1.0ml	Analgesic Anti-Inflammatory
3	White Willow bark oil	1.5ml	1.5ml	1.5ml	Anti-Inflammatory
4	Geogard ETC	0.5ml	0.5ml	0.5ml	Preservative

5	Camphor	1.5gm	1.5gm	1.5gm	Antiseptic
6	Menthol crystal	2.5gm	3.0gm	5.0gm	Counter irritant
7	Coconut oil	5.0ml	5.0ml	4.0ml	Lubricant Anti-Bacterial
8	Methyl Salicylate	1.0ml	1.0ml	1.5ml	Analgesic Skin absorbent
9	Petroleum jelly	11gm	10.5gm	10gm	Moisturizer
10	Beeswax	4.5gm	4.0gm	3gm	Base

Table No: 2 MATERIAL

METHOD:**Extraction of essential oil**

Hydro Distillation Method by using Clevenger apparatus.



FIG No: 10 Extraction of essential oi

Procedure:

- Leaves of eucalyptus were collected and dried in sun light.
- Leaf & stems were separated.
- Then cut into small pieces.
- Then weight around 100gm of eucalyptus leaves.
- Then transfer into 500ml RBF.
- Then 250ml distilled water was added into RBF.
- Set the assembly of Clevenger apparatus as seen in fig:
- Then boiled the water at 80-90°C for 60-90min
- The oil was collected in Clevenger tube at upper side because its density was lower than water. (Mention in fig:12)
- Eucalyptus essential oil was collected from Clevenger apparatus

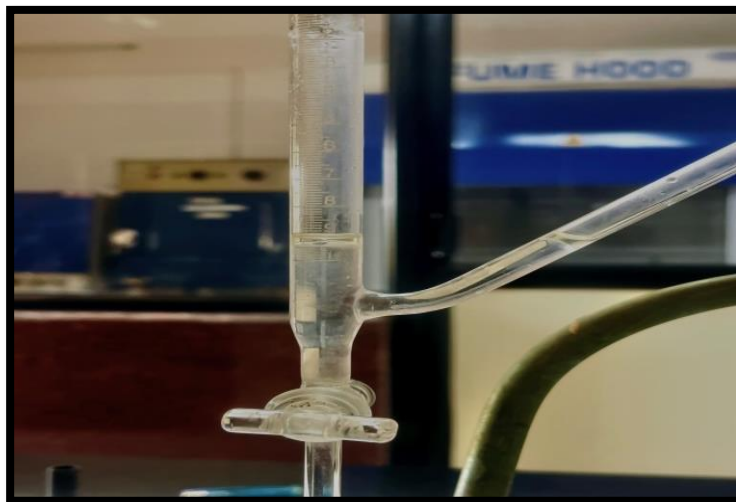


FIG No: 11 Collection of oil

Method of preparation Herbal balm:

- The essential botanical components for making an herbal pain-relief balm were carefully weighed using a digital balance.
- Initially, prepare the balm base by weighing accurately beeswax, petroleum jelly, coconut oil which is to be place in evaporating dish on water bath.
- Heat gently over low heat, string occasionally until fully melted.
- Remove from heat and quickly add menthol crystal and camphor, stirring continuously until dissolved.
- Then stir in methyl Salicylate and white willow bark oil to melted base.
- Let the mixture cool slightly.
- Mix the eucalyptus essential oil, frankincense essential oil, and Geogard ETC preservative.
- Stir well to ensure even distribution.
- Pure the balm into a clean container.
- Let it cool at room temperature until solidified.

EVALUATION PARAMETER

Following evaluation test were performed to ensure superiority of prepared Herbal balm.

1) Washability:

Formulation was applied on the skin and then ease and extent of washing with water were checked manually

2) pH:

pH of 1% aqueous solution of the formulation was measured by using pH meter at constant temperature.

3) Viscosity:

Viscosity of balm was determined using brook filled viscometer at 25 °C with a spindle speed of the viscometer rotated that 12rpm.

4) Spreadability:

The Spreadability was determined by placing sample between two glass slides which was compressed to uniform thickness by applying definite time period. The time required to separate the two slides was measured as Spreadability less time taken for separation of two slides shown better Spreadability calculated by formula,

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

S= Spreadability

M= Weight applied to slides

L= Length of slide

T= Time taken to separate the slide

5) Solubility:

Soluble in boiling water and ether, insoluble in alcohol

6) Phase separation:

The prepared balm was transfer in a suitable wide mouth container. Set aside for storage, the oil phase and aqueous phase separation were visualizing after 24hrs.

7) Non-irritancy:

Prepared formulations were applied to the skin of human being and observed the effect.

8) Antimicrobial test: balm is not required to be sterile, but they must be properly preserved to prevent microbial contamination. Microbial growth can occur in products like balm. Therefore, it is crucial that the syrup remains free from microbial contamination to ensure its safety and efficacy. In this context, microbial activity and antimicrobial testing were performed specifically for S. aureus and E. coli to assess the balm's effectiveness against these pathogens.

RESULT

Organoleptic evaluation

Sr.No.	Organoleptic characters	Herbal balm
1.	Category	Pain balm
2.	Color	Translucent White
3.	Odor	Strong Aromatic
4.	Appearance	Smooth
5.	State	Semisolid

Table No: 3 Result

Physical evaluation:

Sr.No.	Parameters	Result		
		F1	F2	F3
1.	PH	5.92	6.14	5.76
2.	Spreadability	3.4 g.cm/sec	2.4 g.cm/sec	4.1 g.cm/sec
3.	Phase separation	No	No	No
4.	Viscosity	45632 cps	53876 cps	32561 cps
5.	Irritation	No	No	No
6	Solubility	In boiling water, ether	In boiling water, ether	In boiling water, ether
7	Washbility	Easily washable	Easily washable	Easily washable
8	Antimicrobial test	-	-	Pass

Table No: 4 Result

DISCUSSION

Pain relief balms achieve progressive delivery of active components while maintaining stable plasma levels and ensuring a good safety profile through various formulations. Topical medications address the challenges of selecting analgesic drugs with high bioavailability for long-term use, ensuring a tailored treatment approach for chronic pain. Additionally, sustained release pharmaceutical formulations utilize water-miscible and hygroscopic network-forming materials to disperse active ingredients effectively, enhancing the sustained release mechanism for pain management. Furthermore, specific analgesic balms are formulated with a combination of natural ingredients that synergistically provide strong pain relief effects, allowing for prolonged pain relief and healing benefits. These formulations may also include components like capsaicin and menthol to enhance pain relief and anti-inflammatory properties.

CONCLUSION

Adverse side effects are produced when allopathic medications are taken often to treat acne vulgaris. Herbal remedies are now regarded as secure as the demand for synthetic and herbal formulations is rising on the international market. 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.

Herbal balm was prepared by using Hot Melt Processing Technique and was found to be Without particles transparent components which are used in formulation are having good Compatibility without any significant changes. The Eucalyptus oil have relieving pain Property, A White Willow bark extracts used to relieve Arthritic pain, cures high fever and this herbal balm show good physical properties. Based on the study research it can be Concluded that herbal components can be effectively formulated as in the form of balm by Using Hot melt Processing Technique which having excellent pain-relieving property.

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