

FORMULATION & EVALUATION OF HERBAL PAIN RELIEF BALM

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ABSTRACT:

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. While acute pain acts as an alarm, chronic pain is a syndrome requiring meticulous selection of analgesic drugs of high bioavailability for long-term use. Such criteria are challenges that topical medications aim to overcome, allowing progressive delivery of active component, maintaining stable plasma levels, with a good safety profile. 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, wherein the extract is prepared employing a super critical fluid extraction (SCFE) and where in the essential oils used herein is obtained by cold pressed method. The oils used in it is used as a pain killer.

KEYWORDS:- Natural pain relief balm, Vitex negundo oil, Eucalyptus oil.

INTRODUCTION:-

- ✓ 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. These 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- ✓ Pain motivates the individual to withdrawn from damaging situations, to protect a damaged body parts while it kills and to avoid similar experiences in future.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.

❖ MYTHS ABOUT PAIN AND CURE FOR PAIN :-

- ✓ A cure for pain doesn't exist. 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. Pain results as a result of agitated in famed nurse at the point of injury or diseases. Any pain relief product that works will more often than not be unique to reach of us as individuals. In order to achieve pain relieve and pain control.
- ✓ Pain balm is some thing 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 exits, the pressure and movement produces excess of sensory in put that blocks the pain sensation.

❖ WHAT IS PAIN? :-

- ✓ 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 Pain’s 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 withdraw from damaging situations, to protect a damaged body part while it heals, and to avoid similar experiences in the future. Most pain resolves promptly once the painful stimulus is removed and the body has healed, but sometimes pain persists despite removal of the stimulus and apparent healing of the body; and sometimes pain arises in the absence of any detectable stimulus, damage or disease.

❖ **NONVERBAL INDICATORS OF PAIN :-**

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

❖ **TYPES OF PAIN:-**

Pain is usually transitory, lasting only until the noxious stimulus is removed or the underlying damage or pathology has healed, but some painful conditions, such as rheumatoid arthritis, peripheral neuropathy, cancer and idiopathic pain, may persist for years. Psychogenic pain is pain caused, increased, or prolonged by mental, emotional, or behavioral factors. Headache, back pain, and stomach pain are sometimes diagnosed as psychogenic. Sufferers are often stigmatized, because both medical professionals and the general public tend to think that pain from a psychological source is not “real”. Pain is part of the body’s defense system, producing a reflexive retraction from the painful stimulus, and tendencies to 83 Apr ‘12/ May ‘12 protect the affected body part while it heals, and avoid that harmful situation in the future. Acute pain is usually managed with medications such as analgesics and anesthetics. Management of chronic pain, however, is much more difficult and may require the coordinated efforts of a pain management team.

- Acute Pain.
- Chronic Pain.
- Neuropathic Pain.
- Nociceptive Pain.

❖ **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. Nowadays 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, petroleum jelly, negundo oil, bees wax.

❖ MATERIAL AND METHODOLOGIES :-

➤ Coconut Oil :



Fig : Coconut Oil

- **Biological Source :** Coconut oil is the oil expressed from the dried solid part of endosperm of coconut, *Cocos nucifera* L., belonging to **Family** - Palmae.
- **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.
- **Discription :** Coconut oil or Copra oil is an edible oil extracted from the kernel or meat of mature coconuts harvested from the coconut palm (*Cocos nucifer*). It has various applications. Because of its high saturated fat content, it is slow to oxidize and thus resistant to rancidification. Coconut oil is one of nature's super foods and a truly essential nutrient in any diet or beauty regime. Coconut oil is unique when compared to other oils because it is composed predominantly of a group of fat molecules known as medium chain fatty acids.
- **Benefits of Coconut oil:** It can help ease pain. Several studies have shown that virgin coconut oil has anti-inflammatory properties, once again due to the high lauric acid levels. This makes coconut oil a good choice for relieving painful joints and muscles, especially after sport.

➤ Eucalyptus oil :



Fig : Eucalyptus oil

- **Biological Source :** Eucalyptus oil is made from the fresh leaves and branch tops of the eucalyptus plant belonging to **Family**- Myrtaceae.
- **Chemical Constituents :** The main chemical constituents are 1,8-cineole (63.1%), p-cimene (7.7%), α -pinene (7.3%), and α -limonene (6.9%).
- **Discription :** *Eucalyptus globulus* Labill. is an aromatic tree in the myrtaceae family which commonly attains a height of 150-180 feet and a diameter of height 4-7 feet. It has a straight trunk up to two-third of its total height and a well-developed crown. The central trunk and tap root are fringed with many lateral stems and roots. The tap root rarely

exceeds a length of 10 feet. The light, yellow- brown bark is deciduous.

- **Uses :**
 1. Augments Skin and Hair
 2. Relieves pain and inflammation
 3. To Treat Rheumatoid Arthritis

➤ **Vitex Negundo oil :**



Fig : Vitex Negundo oil

- **Biological Source :** Vitex Negundo oil is obtained from Negundo Chastetree belonging to **Family** - Verbenaceae.
- **Chemical Constituents :** Negundo oil have chemical constituents such as n-Tritriacontane, n-hentriacontanol, nhentricontane, n-pentatricontane, n- nonacosane, β -sitosterol, phydroxybenzoic acid and 5-oxyisophthalic acid, 3, 4- dihydroxybenzoic acid [30-32], artemetin [33], 3 β -acetoxyolean-12- en-27-oic acid, 5 β -hydro-8,11,13- abietatrien6 α -ol, 2 α ,3 α -dihydroxyoleana- 5,12-dien-28-oicacid, 2 β ,3 α -diacetoxyoleana-5,12-dien-28-oicacid and 2 α ,3 β diacetoxy-18-hydroxyoleana-5,12-dien-28-oic acid [34,35], vitedoin A, vitedoamine A, vitedoin B.
- **Discription :** Vitex negundo Linn is a woody, erect and large aromatic deciduous shrub which grows to small tree of height 2-5 m with quadrangular branches. The leaves are penta foliate and the leaflets are arranged palmately and terminal leaflets are long (4-10 cm) acute with petiolate(1-1.3 long), lanceolate, hairy beneath and both the ends are pointed. The flowers are numerous which are bluish purple in colour and in branched in tomentose cymes and the fruits are round, succulent and black on ripening with four seeds.
- **Benefits Of Negundo oil :**

1.Infections	3.Antioxidant
2.Pain	4.Arthritis

❖ **Other Ingredients :**

➤ **Sodium Benzoate :**



Fig : Sodium Benzoate

- Sodium benzoate powder is accepted as a preservative by some of the worlds toughest natural product certification. Using sodium benzoate in shampoo and conditioner as a preservative is a safe and effective technique to protect against bacteria and mold forming the bottles.
- Type of ingredient - preservative
- Main benefits - sodium benzoate is also an effective product stabilizer commonly used in pain.

➤ **Menthol :**



Fig : Menthol

- Menthol is an organic compound, more specifically a monoterpenoid, made synthetically or obtained from the oils of corn mint, peppermint, or other mints. It is a waxy, clear or white crystalline substance, and melts slightly.
- Benefits : As a topical agent, it acts as a counter-irritant by imparting a cooling effect and by initially stimulating nociceptors and then desensitizing them.

➤ **Camphor :**



Fig : Camphor

- Camphor is derived from the wood of camphor laurel and other related trees of laurel family. Camphor is bicyclic mono terpenoid. It is a white crystalline substance with strong odor and pungent tast. It is a waxy flammable substance obtained from steam distillation, purification and sublimation of wood, twings and bark of the tree.
- Uses;

1. Topical analgesic	4. Antiseptic
2. Muscle relaxant	5. Anti- inflammatory
3. Contraceptive	6. Cough suppressant

➤ **Bees Wax :****Fig : Bees Wax**

- Bees wax obtained from the honey comb of the bees *Apis mellifera* and other species of *apis* belonging to the family *Apidae*. Order *Hymenoptera*. It is also known as yellow wax, *cera alba*. It is yellow to yellowish – brown in colour. Insoluble in water and soluble in alcohol, ether, chloroform, carbon etc.
- Uses :
 1. In preparation of ointments, plasters and polishes.
 2. Also used in the manufacturing of candles, moulds in dental and electronic industries, cosmetics, lip sticks.
 3. Is an ingredient of paraffin ointment.

❖ **PREPARATION FORMULA OF HERBAL PAIN RELIEF BALM :**

S.NO.	INGREDIENTS	QUANTITY	MEDICINAL USES
1	Coconut oil	10ml	Solvent
2	Eucalyptus oil	10ml	Pain reliever
3	Vitex negundo oil	10ml	Relieves arthritic pain
4	Petroleum jelly	5gm	Relieves dry skin, healing
5	Menthol	10gm	Counter irritant
6	Camphor	10gm	Relives cough
7	Sodium benzoate	5gm	Preservative
8	Bees wax	10gm	Base
9	Methyl Salicylate	10ml	Analgesic, skin absorbent

TABLE. Materials used in Formulation of Herbal Pain Relief Balm❖ **METHODOLOGY :-**

- Take one container in that weigh and add 5gm 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 5gm of bees wax, stir it and boil until the bees wax added completely dissolve in the petroleum jelly.
- After that, weigh and add 5gm of menthol crystals to the above solution and boil it until the menthol completely dissolved.
- Weigh 10ml of vitex negundo oil, stir the solution and boil the solution.
- Weigh 10ml of eucalyptus oil, stir the solution and boil the solution.
- Weigh 5gm 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.

❖ EVALUATION OF PREPARED HERBAL FORMULATION:-

- ✓ **PHYSICAL PARAMETERS :** Clarity and colour was checked by naked eyes against white background, the odour was smelled.

- ✓ **pH :** The PH of the prepared formulation was determined

by using digital PH meter by dipping the glass electrode completely

in to the gel system to cover the electrode. The measurement was carried

out in triplicate and the average of the three readings was recorded



Fig: Digital pH Meter

- ✓ **VISCOSITY :** Viscosity of balm was determined using brook filled viscometer (S-62,model LVDV-E)at 25°C with a spindle speed of the viscometer rotated at 12rpm.



Fig : Brook filled viscometer

- ✓ **SPREADABILITY :** Two sets of glass slides of standard dimensions were taken. The herbal balm formulation was placed over one of the slides. The other slides was placed on the top of the gel, such that the gel was sandwiched between the two slides in an area occupied by a distance of 7.5cm along the slides. Hundred g weight of gel was placed on the upper slides so that the gel was between the two slides was pressed uniformly to form a thin layer. The weight was removed and the excess of gel adhering to the slides was scrapped off. The two slides in position were fixed to a stand with out slightest disturbance and in such a way that only upper slides to slip off freely by the force of weight tied on it. A20 g weight was tied to the upper slide carefully. The time taken for the upper slide to travel the distance of 7.5 cm and separated away from the lower slide under the influence of the weighed was noted. The experiment was repeated for three times and the mean time was taken for

calculation.

- ✓ **PATCH TEST :** Apply the product to a small patch of skin where a person is unlikely to accidentally wash or rub it away. Good areas may included the inside of the arm or bend of the elbow. Apply the product to a quarter-sized patch of skin. A person should apply the product as thickly as they would when using it regularly. Leave the product on the patch of skin for as long as it would normally be on the skin. If a person is testing a product that they would usually wash off, such as a cleanser, they should keep the patch on for 5min or long as the instructions advice. Repeat the patch test twice a day for between 7-10 days. Reaction may not happen immediately, so it is important to continue applying the product for this length of time. If a persons skin react to the product, they should wash it off as soon as possible and stop using it.
- ✓ **ACCELERATED STABILITY STUDIES:** Accelerated stability testing of prepared herbal balm formulation was at room temperature studied for one week, at $50^{\circ}\text{C} \pm 1^{\circ}\text{C}$ for 3 months. The herbal balm formulation were kept both at room and elevated temperature and observed on 0 th , 15th , 20th , 30th , 40 th , 50th , 60th , 70th , 80th and 90th day for the following parameters.

❖ RESULT & DISCUSSION :

The physicochemical parameters of the prepared balm were determined parameters such as colour, odour, appearance and PH were tested. The formulations exhibited good in appearance characteristic as well as PH was found in the range 7.0 which is the desired PH of the skin.

TABLE : PHYSICAL PARAMETERS OF HERBAL PAIN RELIEF BALM:

S.NO	ORGANOLEPTIC CHARACTERS	HERBAL BALM	MARKETED BALM
1	Formulation	Pain balm	Pain balm
2	Colour	Light Yellow	white
3	Odour	Fragrant	Fragrant
4	Appearance	Good	Smooth
5	State	Semi solid	Semi solid

TABLE : EVALUATION RESULT OF HERBAL PAIN RELIEF BALM:

S.NO.	PARAMETERS	RESULTS
1	PH	6.27
2	Spreadability	7.4g. cm/sec
3	Phase separation	No phase separation

4	Viscosity	37352cps
5	Patch test	Non allergenic



❖ SUMMARY:

- ✓ A herbal pain relief balm is typically made by infusing various herbs and essential oils known for their analgesic properties into a base such as beeswax or coconut oil.
- ✓ Herbal ingredients work together to provide relief from 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:

- ✓ Herbal balm was prepared by using Hot Processing Technique and were found to be without particles transparent components which are used in formulation are having good compatibility without any significant changes.
- ✓ The Eucalyptus leaves extracts have relieving pain property, vitex negundo leaves extracts used to relieve Arthritic pain, cures high fever and alleviates menstrual cramps.
- ✓ The prepared formulation showing good physical characteristics. Further evaluated by various evaluation parameters such as PH, Extrudability, Spreadability, Viscosity, Patch test and gives good result.
- ✓ 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 Processing Technique which having excellent pain-relieving property.

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