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Formulation and Evaluation of Herbal Pain Relief Balm

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Abstract: Zandu ultra power balm is topical ayurvedic preparation that contain varies active ingredient such as menthol, terminalia arjuna oil, vitexnegundo oil, camphor, coconut oil. There has been an increasing focusdevelopment of new routes of drug administration to providetailored treatments for patients, without decreasing efficacy, 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 longterm use. Such criteria are challenges that topical medications aim to overcome, allowing progressive delivery of active component, maintaining stable plasma levels, with a good safet profile. This review presents recent findings regarding topica formulations of the most widely used drugs for pain treatment.

Keywords: Natural Pain Relief Balm, Vitex Negundoo Oil, Terminalia Arjuna oil

I. INTRODUCTION

The common cold is the most recurrent cause of illness among adults as well as children. It is an upper respiratory tract infection caused by certain viruses and is transmitted by virusinfected droplets or by direct contact with infected secretions. The symptoms of the common cold are cough, sore throat, sneezing, and nasal congestion which presents as a runny or blocked nose. Pain is a disturbing sensation that is often caused by intense stimuli, pain during a cold usually manifests as a headache and/or backache The management of the common cold and its symptoms are frequently addressed by OTC medication such as topical medication or tablets since it is a self-limiting disease. Hence studies of consumer navigation and selection behaviours for OTC products in retail selling reveals that consumers most frequently purchase OTC medications for pain relief, allergy and cough / cold symptom. Topicalpain relief medications are available in the form of cream, ointment or gels and a majority of them contain ayurvedic components.Statistics show that ayurvedic products are gaining popularity and among the ayurvedic products about 25+% of the sale is from OTC products.

Zandu Ultra Power Balm is an ayurvedic preparation that is largely composed of Menthol (17%) and Oil of Gaultheria (25%), clove oil (5%), cajeput oil (5%), ajwain satva (0.5%), Eucalyptus globulus-oil (0.2%), Nutmeg oil (0.1%) and Capsicum annuum satva(0.02%) along with Tony Red (colour) and Quinizarine green SS (colour) as excipients. The preparation is rubbed on to the areas for relief of pain or congestion such as the head, neck, chest and back. Zandu Ultra Power Balm claims to be remedy for headaches due to cold, cold (nasal congestion) and backache due to cold. This study is undertaken to substantiate these claims.

II. REVIEW OF LITERATURE

Herbal medicine has been a cornerstone of traditional healthcare systems for centuries. In recent years, there has been a growing interest in herbal formulations for pain management due to their minimal side effects, cost-effectiveness, and wide therapeutic window.

Topical herbal balms offer localized relief from pain and inflammation through the transdermal delivery of active phytoconstituents. Studies have shown that natural ingredients such as Mentha arvensis (menthol), Eucalyptus globulus (eucalyptus oil), Capsicum annum (capsaicin), Cinnamomum camphora (camphor), and Gaultheria procumbens (wintergreen oil) possess significant analgesic and anti-inflammatory properties (Chattopadhyay et al., 2012).

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Research by Sharma et al. (2017) on polyherbal pain relief balms demonstrated improved patient outcomes in musculoskeletal pain with fewer adverse effects compared to synthetic counterparts. Similarly, Raut et al. (2019) formulated a herbal balm using essential oils and extracts such as clove, ginger, and turmeric, which showed significant pain relief in animal models.

Another study by Patel et al. (2021) emphasized the importance of excipients like beeswax and paraffin, which help maintain the semi-solid consistency of balms and aid in the sustained release of active compounds. The evaluation parameters such as spreadability, pH, viscosity, skin irritation test, and stability studies are essential to ensure product efficacy and safety.

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.

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.

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 Amrutdhara, Cinnamon oil, clove oil 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, bees wax. Although these pain relief balms have a special pharmacological effect in relieving pain, it is actually the amount of pressure applied and the movement that plays a significant role. Role of the balm includes a local anesthetic effect and finally provides a comfortable stage. These products do not have any side effect or allergic reactions such as irritation or darkening of the skin or cause inflammation on the point of application. Hence the consumer develops a liking for the chosen product. Petroleum jelly or petrolatum is the semi solid mixture of hydrocarbons and has become house hold preparation for various medical purposes. Petrolatum has associated with some of negative effects due to improper use including lipid pneumonia when inhaled from the nose. Petrolatum is not a material from renewable sources and not biodegradable

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which may be a cause of concern for environmental pollution etc these balms comprise cold balm, lip balm, body balm and foot balm etc.

How to apply?

- 1. Clean the Area: Wash and dry the skin where you'll apply the balm.
- 2. Use a Small Amount: Gently rub a little balm on the affected area until it's absorbed.
- 3. Repeat as Needed: Apply 2-3 times a day for the best results.

Provides instant and long-lasting relief from



Headache



Back Ache



Cold



Body Ache

Zandu Balm Core benefit: Pain Relief Basic Product: Pain relief of body muscle and joint. Expected product: Fast pain relief Augmented product: Easy to use Product Extension: Zandu Gel Baim Junior, Zandu Balen Uitra Power, Zandu Gel, Zandu spray, Zanda roll on

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III. MATERIAL AND METHODOLOGY

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.

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 :

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%), pcimene (7.7%), apinene (7.3%), and a-limonene (6.9%).

Uses: 1.Augments Skin and Hair

Relieves pain and imflammation

To Treat Rheumatoid Arthritis

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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

nTritriacontane, nhentriacontanol, nhentricontane, n-pentatricontane, n- nonacosane, β sitosterol, phydroxybenzoic acid and 5-oxyisophthalic acid, 3, 4- dihydroxybenzoic acid [30-32], artemetin [33], 3 β -acetoxyolean12- en-27-oic acid, 5 β hydro-

8,11,13abietatrien 6α -ol, $2\alpha,3\alpha$ -dihydroxyoleana- 5,12-dien-28-oicacid,

 2β , 3α diacetoxyoleana-5, 12-dien-28-oicacid and 2α , 3β diacetoxy-18-hydroxyoleana-5, 12 dien-28-oic acid [34, 35], vitedoin A, vitedoamine A, vitedoin B.

Benefits Of Negundo oil: 1.Infections 3.Antioxidan 2.Pain 4.Arthritimetic



Other ingredients:

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.

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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

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: Topical analgesic Muscle relaxant 3.contraceptive Antiseptic Anti- inflammatory Cough suppressant

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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 Hymenptera. 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 :

In preparation of ointments, plasters and polishes.

Also used in the manufacturing of candles, moulds in dental and electronic industries, cosmetics, lipsticks. Is an ingredient of paraffin ointment



IV. METHODOLOGY

Take one container in that weigh and add 5gm of petroleum jelly, place the container in a hot plate and boil it In the dissolved petroleum jelly solution weigh and add 10 gm of bees wax, stir it and boil until the bees wax added completely dissolve in the petroleum jelly.

After that, weigh and add 10 gm of menthol crystals to the above solution and boil it until the menthol completely dissolved.

Weight 10 ml of coconut oil, stir the solution and boil the solution.

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





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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 |

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.

PHASE SEPARATION: The prepared balm was transferred in a suitable wide mouth container. Set aside for storage, the oil phase and aqueous phase separation were visualising after 24h.

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.

SPREDABILITY: 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 quartersized 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. A 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. a person can use a cool compress or petroleum jelly to relieve the skin if needed.

ACCELERATED STABILITY STUDIES:

Accelerated stability testing of prepared herbal balm formulation was at room temperature studied for one week, at 50° C \pm 1°C for 3 months. The herbal balm formulation were kept both at room and elevated temperature and observed on 0th, 15th, 20th, 30th, 40th, 50th, 60th, 70th, 80th and 90th day for the following parameters

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PHYSICAL PARAMETERS OF HERBAL PAIN 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 |

V. RESULTS AND 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.

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 |



VI. 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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