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Research Article

Research Paper on Formulation and Evaluation of Herbal Massage Oil

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ABSTRACT

In recent years, there has been a growing interest in natural, plant-based products for wellness, especially in the field of massage oils. This project focuses on creating and evaluating a herbal massage oil that combines the benefits of Hibiscus extract, Peppermint oil, Camphor, Menthol, Castor oil, and Vitamin E. These ingredients were carefully chosen for their well-known therapeutic properties, such as reducing pain, soothing muscles, and promoting relaxation. The process begins with extracting active compounds from Hibiscus petals, which are then mixed with Peppermint oil, Camphor, and Menthol. These ingredients are famous for their cooling, anti-inflammatory, and pain-relieving effects, making them ideal for a massage oil aimed at easing muscle tension. Castor oil is used as the base oil, providing excellent moisturization and helping the product spread smoothly on the skin. Finally, Vitamin E is added for its antioxidant properties, which help protect and heal the skin. To evaluate the herbal massage oil, various tests are performed to check its physical and chemical properties. This includes examining the oil's colour, consistency, viscosity, and how easily it spreads. The oil's stability is also tested by storing it in different conditions, such as varying temperatures, to see how well it holds up over time. In addition to these tests, the product's effectiveness is evaluated through both laboratory testing and user feedback. The laboratory tests focus on the oil's ability to reduce inflammation and relieve pain, while user feedback looks at how it feels on the skin, its scent, and overall satisfaction. Skin irritation tests are also done to ensure the oil is safe for use. The results show that the herbal massage oil, with its unique blend of Hibiscus, Peppermint oil, Camphor, Menthol, Castor oil, and Vitamin E, offers effective relief for muscle pain and tension. Users appreciate its cooling sensation and smooth texture, which makes the massage experience pleasant and soothing. Overall, this formulation presents a natural alternative to traditional pain-relief products, with promising potential for the wellness industry. This project highlights the benefits of using herbal ingredients and offers a safe, effective solution for those seeking relief from muscle discomfort.

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INTRODUCTION

The interest in natural and holistic approaches to health has surged in recent years, with a growing preference for herbal products over synthetic ones. This shift has led to an increasing demand for natural remedies, particularly in personal care products such as massage oils. Herbal massage oils, in particular, are valued for their therapeutic benefits and minimal side effects, making them a popular choice among individuals seeking natural solutions for muscle relief and relaxation. In this context, Ayurveda, one of the world's oldest medical systems, plays a crucial role in guiding the use of plant-based oils and herbs for healing purposes. This project aims to develop and evaluate a herbal massage oil incorporating ingredients such as *Hibiscus*, *Peppermint oil*, *Camphor*, *Menthol*, *Castor oil*, and *Vitamin E*, each of which has been selected for its specific benefits in treating muscle pain, stress, and skin health. *Ayurveda*, originating in India over 5,000 years ago, is a comprehensive system of medicine based on the balance between the mind, body, and spirit. The term *Ayurveda* comes from two Sanskrit words: *"Ayus"* (life) and *"Veda"* (knowledge), meaning "the knowledge of life." Ayurveda emphasizes the use of natural remedies—herbs, oils, minerals, and lifestyle practices—to restore balance and treat ailments. It is based on the idea that the body is composed of five elements: earth, water, fire, air, and ether, which combine to form three primary energies or *doshas*: *Vata*, *Pitta*, and *Kapha*. These doshas are responsible for the physical and mental functions of the body, and an imbalance in any of them can lead to illness.In Ayurveda, massage plays an essential role in maintaining health and wellness. Herbal oils are often used in Ayurvedic massage to nourish the skin, promote relaxation, relieve pain, and balance the doshas. These oils are formulated with specific herbs that address various health concerns, such as inflammation, muscle stiffness, and skin irritation. This project combines the ancient knowledge of Ayurveda with modern scientific principles to formulate an herbal massage oil that incorporates a blend of active ingredients known for their beneficial effects on the body. The formulation of herbal massage oils requires careful selection of ingredients based on their therapeutic properties and the desired effect. The aim is to create a product that provides relief from muscle pain, tension, and stress while also nourishing and soothing the skin. In this formulation, *Hibiscus*, *Peppermint oil*, *Camphor*, *Menthol*, *Castor oil*, and *Vitamin E* are used, each contributing unique benefits. Hibiscus has been used in traditional medicine for its anti-inflammatory, analgesic, and antioxidant properties. Rich in flavonoids and organic acids, Hibiscus helps soothe irritated muscles and promotes the regeneration of skin tissues. It is particularly useful in reducing swelling and pain, making it an ideal ingredient in massage oils aimed at easing muscle discomfort. Peppermint oil is well-known for its cooling and soothing properties. Its active compound, menthol, provides a cooling sensation that helps alleviate muscle soreness and tension. Peppermint oil also has anti-inflammatory and analgesic properties, making it highly effective for treating conditions like headaches, muscle pain, and joint inflammation. Additionally, its refreshing scent enhances the overall sensory experience during massage. Camphor is a volatile compound known for its pain-relieving and anti-inflammatory effects. It enhances blood circulation and provides a cooling sensation, helping to soothe aching muscles and joints. Camphor also has antimicrobial properties, which make it beneficial for promoting skin health and preventing infections. Menthol is a key component of peppermint oil and has its own distinct cooling and analgesic properties. It helps reduce muscle pain, alleviate headaches, and

provide relief from skin irritations. Menthol works synergistically with other ingredients to enhance their effects and ensure that the oil is easily absorbed into the skin. Castor oil is a rich, emollient oil known for its ability to moisturize and soften the skin. It helps improve the Spreadability of the massage oil and enhances its absorption. Castor oil also has anti-inflammatory properties, making it useful in treating muscle pain and stiffness. Its soothing qualities make it an excellent base oil for massage formulations. Vitamin E is a potent antioxidant that helps protect the skin from free radical damage and supports the healing of skin tissues. It is included in this formulation to nourish the skin, improve its elasticity, and prevent premature aging. Vitamin E also plays a role in stabilizing the oil, ensuring its longevity and effectiveness over time. Once the herbal massage oil is formulated, it undergoes a comprehensive evaluation to assess its physical, chemical, and therapeutic properties. This evaluation ensures the oil's quality, safety, and effectiveness for use in therapeutic massage. Physical and chemical properties ensure the oil's appearance, texture, viscosity, and Spreadability are tested to ensure it is easy to apply and provides a pleasant user experience. The oil's pH, stability, and color are also evaluated to ensure it remains effective and visually appealing over time. After this in stabiliy testing oil is subjected to various environmental conditions, such as temperature fluctuations and exposure to light, to assess its shelf life and stability. This ensures the oil retains its therapeutic properties and remains safe to use throughout its intended lifespan. Efficacy testing related to the oil's effectiveness is assessed through in vitro tests that measure its anti-inflammatory and analgesic effects. These tests help to confirm the oil's potential in relieving pain and reducing inflammation in muscle tissues. Additionally, user feedback is gathered to assess the sensory experience, including fragrance, texture, and overall satisfaction with the product. Skin irritation and allergy testing are performed to ensure that the oil is safe for topical application. These tests help to identify any potential adverse reactions or sensitivities in users, ensuring the product is suitable for all skin types. The formulation and evaluation of herbal massage oil containing *Hibiscus*, *Peppermint oil*, *Camphor*, *Menthol*, *Castor oil*, and *Vitamin E* represent an effort to combine the ancient wisdom of Ayurveda with modern scientific evaluation. By selecting ingredients with well-documented therapeutic properties, this product aims to provide an effective, natural solution for muscle pain, stress relief, and skin care. The project not only highlights the importance of traditional herbal knowledge but also demonstrates how these ingredients can be scientifically assessed to ensure safety, stability, and efficacy. Ultimately, this project seeks to create a high-quality, herbal-based product that promotes wellness and offers a safe alternative to conventional, synthetic massage oils.

4)Reasons for formulation of the Oil: -

Joint pain and muscle soreness are common complaints that can occur for various reasons. These conditions can range from temporary discomfort due to physical activity to more serious, chronic diseases that affect the musculoskeletal system. Understanding the causes of joint pain and muscle soreness is essential for effective management and treatment. This article explores some of the primary factors that contribute to these types of discomfort.

Overuse and Physical Activity

One of the most common causes of muscle soreness and joint pain is overuse. When muscles or joints are subjected to excessive strain, they can become damaged. This often happens after intense physical activity, particularly if the body is not

accustomed to such exertion. For example, engaging in strenuous workouts, running long distances, or lifting heavy weights can result in small tears in muscle fibers, leading to soreness. Similarly, overuse of joints can cause inflammation, leading to pain and stiffness. This discomfort is usually temporary and resolves with rest and proper recovery strategies (Bove, 2020). However, if overuse is repeated without adequate recovery, it can lead to more chronic conditions such as tendinitis or bursitis, which require specific treatment.

Arthritis

Arthritis refers to inflammation of the joints and is a leading cause of joint pain. The two most common forms of arthritis are osteoarthritis and rheumatoid arthritis. Osteoarthritis is a degenerative condition in which the protective cartilage that cushions the joints breaks down over time. As a result, bones begin to rub against each other, causing pain, swelling, and stiffness. It is most often associated with aging but can also be influenced by joint injury or overuse. On the other hand, rheumatoid arthritis is an autoimmune disorder in which the body's immune system mistakenly attacks the synovial lining of the joints, causing inflammation and damage. This condition typically affects joints symmetrically, such as those in the hands and knees, and can lead to significant joint deformities if not properly managed (Gabay, 2015). Both forms of arthritis contribute to chronic pain and discomfort in the joints, and while there is no cure, treatments like anti-inflammatory medications, physical therapy, and sometimes surgery can help manage symptoms.

Infections

Infections can also cause joint and muscle pain. Some bacterial and viral infections can trigger a condition known as reactive arthritis, where the body's immune system reacts to an infection by attacking the joints. For example, a person with a urinary tract infection or gastrointestinal infection may develop reactive arthritis, which can result in swelling, pain, and stiffness in the joints. This type of arthritis often follows an infection and can lead to muscle soreness as well (Lipsky et al., 2004). Additionally, Lyme disease, caused by a bacterial infection transmitted by ticks, can cause muscle aches and joint pain, particularly in the knees.

Muscle Fatigue and Deconditioning

Muscle fatigue is another frequent cause of soreness. This occurs when muscles are overworked or not given enough time to recover after exertion. Muscle fibers can experience microscopic tears during intense exercise, leading to delayed-onset muscle soreness (DOMS). This is a common phenomenon after unaccustomed or intense physical activities such as strength training or prolonged aerobic exercises. Furthermore, muscle deconditioning due to lack of activity can also cause soreness. When muscles are not regularly used or exercised, they weaken and become more prone to injury. After returning to physical activity after a period of inactivity, individuals may experience muscle soreness due to the muscles being overstretched or strained as they regain strength (Vassilakopoulos & Roussos, 2000). Inadequate rest and improper warm-up or cool-down routines can exacerbate these issues**.**

Medication Side Effects

Some medications can also contribute to muscle soreness and joint pain as side effects. A common example is statins, which are prescribed to lower cholesterol levels. Statin-induced myopathy is a condition in which muscle pain, weakness, and tenderness occur as a side effect of the medication. While this side effect is not experienced by all

users, it can significantly affect some individuals, leading to discomfort and even difficulty in performing everyday tasks (Parker et al., 2005).

Fibromyalgia

Fibromyalgia is a chronic condition characterized by widespread musculoskeletal pain and tenderness, often in the muscles, ligaments, and tendons. Unlike other causes of muscle and joint pain, fibromyalgia is not the result of physical injury or inflammation. Instead, it is believed to be related to abnormal pain processing in the brain and nervous system. People with fibromyalgia often experience other symptoms, such as fatigue, sleep disturbances, and cognitive difficulties, in addition to joint and muscle pain (Wolfe et al., 1990). Treatment typically involves medications, physical therapy, and lifestyle modifications to manage pain and improve quality of life.

5)Literature Survey:

Herbal massage oils have gained considerable attention due to their therapeutic effects in relieving pain, improving blood circulation, and promoting skin health. The combination of natural ingredients in massage oils provides synergistic benefits, with each component contributing unique properties. This literature survey focuses on the formulation and evaluation of a herbal massage oil containing hibiscus, coconut oil, peppermint oil, menthol, Vitamin E, castor oil, and camphor.

1. Hibiscus (Hibiscus rosa-sinensis): Hibiscus has long been used in traditional medicine for its anti-inflammatory, analgesic, and antioxidant properties. It is rich in flavonoids and polyphenols that help soothe irritated skin, reduce muscle inflammation, and promote skin regeneration (Huang et al., 2015). The inclusion of hibiscus in massage oils can enhance the oil's ability to calm the skin and reduce discomfort from muscle tension.
2. Coconut Oil: Coconut oil is known for its emollient and moisturizing effects. It is rich in medium-chain fatty acids, particularly lauric acid, which exhibit antimicrobial and anti-inflammatory properties. Coconut oil is also known to improve skin barrier function and provide hydration, making it an ideal base for massage oils (Sadler et al., 2016). Its soothing properties aid in muscle relaxation and skin nourishment.
3. Peppermint Oil and Menthol: Peppermint oil is widely recognized for its cooling and analgesic effects. It contains menthol, which provides a refreshing sensation and helps alleviate muscle pain, headaches, and skin irritation (Liu et al., 2016). The menthol component activates cold receptors in the skin, promoting vasodilation and improving circulation, which can enhance the therapeutic effects of the massage.
4. Vitamin E: Vitamin E is a potent antioxidant that protects the skin from oxidative stress and promotes wound healing (Draelos, 2014). It helps maintain skin health, improves skin elasticity, and prevents premature aging. Its inclusion in herbal massage oils can enhance the rejuvenating effects on the skin and improve the overall experience.
5. Castor Oil: Castor oil is known for its ability to penetrate deep into the skin layers, enhancing tissue hydration and reducing inflammation. It contains ricinolein acid, which has been shown to have anti-inflammatory and analgesic properties (Gupta et al., 2018). Castor oil's moisturizing properties make it effective for treating dry skin and relieving muscle stiffness.
6. Camphor: Camphor has been used in traditional medicine for its analgesic, anti-inflammatory, and antispasmodic properties. It

stimulates blood circulation and provides a cooling effect, which aids in reducing pain and inflammation (Ravindran et al., 2013). Camphor's addition to massage oils enhances its muscle-relaxing and pain-relieving properties.

The global demand for herbal products has significantly increased due to growing consumer interest in natural and safe alternatives to synthetic chemicals. Herbal massage oils, which combine traditional healing with modern wellness trends, are one such category that has seen steady growth in the market. Several brands have formulated massage oils containing blends of natural ingredients like hibiscus, coconut oil, peppermint oil, menthol, Vitamin E, castor oil, and camphor, each of which brings unique therapeutic benefits to the product. This marketed survey highlights existing formulations in the market that resemble the proposed formula containing these ingredients.

1. Himalaya Herbal Massage Oil:
2. Boutique Bio Wintergreen Oil:
3. Forest Essentials' Ayurvedic Pain Relief Oil:
4. Madhav Baug Herbal Pain Relief Oil:
5. Khadi Natural Herbal Massage Oil:

Trends and Insights:

- Natural and Ayurvedic Appeal: The majority of marketed herbal massage oils position themselves as natural, Ayurvedic, or wellness products. They emphasize the use of essential oils, plant-based ingredients, and traditional healing methods. Brands like Boutique and Forest Essentials, which focus on Ayurvedic heritage, cater to consumers interested in holistic health and self-care.

- Cooling and Soothing Ingredients: Ingredients like menthol, camphor, and peppermint oil are consistently featured in formulations targeting muscle and joint pain relief due to their cooling, analgesic, and anti-inflammatory effects. The combination of these ingredients with moisturizing oils like coconut oil and castor oil is a common theme in massage oils, making the proposed formula competitive.

- Lack of Hibiscus: Despite hibiscus being widely known for its skin benefits, it is not commonly found in mass-market massage oils. However, its inclusion in niche, premium products can serve as a differentiator, offering additional benefits like antioxidant properties and skin rejuvenation.

7) Scope:

The scope of the herbal massage oil formulation containing coconut oil, castor oil, peppermint oil, camphor, menthol, hibiscus, and Vitamin E is to create a versatile product that offers multiple therapeutic benefits for muscle pain relief, improved blood circulation, and enhanced skin health. The growing demand for natural and safe alternatives to synthetic chemical-based products makes this formulation a timely solution. The oil aims to address common concerns such as joint pain, muscle stiffness, dry skin, and inflammation, providing consumers with a holistic, soothing treatment. This product also targets the wellness and self-care market, focusing on customers looking for natural remedies and effective pain management solutions**.**

Objectives:

1. **Pain Relief and Muscle Relaxation:** To combine menthol, camphor, and peppermint oil to offer effective analgesic and anti-inflammatory properties, helping to relieve muscle pain, soreness, and stiffness.

2. **Skin Nourishment and Healing:** To use coconut oil, castor oil, and hibiscus to hydrate,

nourish, and rejuvenate the skin, improving elasticity and reducing dryness.

3. **Antioxidant and Skin Protection:** To include Vitamin E, which provides antioxidant protection, reduces oxidative damage, and supports skin repair.

4. **Natural and Safe:** To formulate a non-toxic, natural massage oil that aligns with consumer demand for herbal, eco-friendly, and effective health products.

5. **Market Differentiation:** To develop a unique product with a blend of ingredients not commonly found in mass-market oils, offering a competitive edge.

8) Plant and excipient profile

1)Hibiscus Rosasinensis

Synonyms: -

1. Hibiscus chinensis L. – This is an older synonym, used in early botanical references for the same species.
2. Hibiscus rosa-sinensis var. rubra – Refers to a variety of Hibiscus rosa-sinensis with red flowers.
3. Hibiscus rosa-sinensis var. alba – A variety with white flowers.
4. Malvaviscus – A genus used for some hibiscus species in the past.
5. Hibiscus syriacus L. – Sometimes incorrectly referred to as a synonym for other hibiscus species, but it is a distinct species, commonly known as the "Rose of Sharon."

Biological Sources: - Dried leaves of hibiscus Rosa sinensis

Family: - Malvaceae.

Chemical Constituents:- The preliminary phytochemical analysis showed that Hibiscus rosasinensis contained tannins, anthraquinones, quinines, phenols, flavonoids, alkaloids,terpenoid, saponins, cardiac glycosides, protein, free amino acids, carbohydrates, reducing supars, mucilage, essential oils and steroids. Hibiscus rosa-sinensis contained cyclopropanoids, methyl sterculate, and methyl-2-hydroxy sterculate.

Pharmacological Activity: -

It is rich in vitamin C, the deficiency of which is known to cause hair loss. The flower stimulates hair regrowth from dormant follicles and bald patches. Hibiscus acts like an astringent and reduces the oil secretion by the sebaceous glands. With its antimicrobial properties, hibiscus also curbs the growth of dandruff-causing fungus on the scalp and prevents the recurrence of dandruff.

Uses:

- Nourishes and thickens hair.
- Stimulate blood circulation.

Leaves were also used as abortifacient and to stimulate expulsion of placenta after childbirth. Flower was used for liver disorders; high blood pressure young leaves and flowers were used in headache.

2) Coconut Oil

Coconut oil so the fatty oil that is derived from either raw or dried coconut. The use of coconut oil for Hai has a long history in hair and beauty therapy Using coconut oil on scalp has shown great results even in faster hair growth Coconut oil for hair is often regarded as the best hair oil that reduces protein loss and maintains hair health Coconut oil also provide better nourishment to scalp and skin in order prevent dryness and dandruff problems.

Pharmacological action: -

By penetrating the hair the coconut oil can reduce the amiunt of water absorbed into your hair.This helps in limiting the daily hair loss.Cocnut oil gas anti-inflammatory properties and it can also increase the production of the collagen,the chief structural protein in skin and other tissues.

Uses: -

1. Helps in longer hair growth.
2. Prevents dandruff.
3. Helps in treating split ends.
4. Prevents hair damage from heat.
5. Effective treatment for lice-infested hair.
6. Lowers muscle soreness**.**

3) Castor Oil: -

Castor oil is a versatile vegetable oil derived from the seeds of the Ricinus communis plant, commonly known as the castor bean plant. It has been used for centuries in various cultures for its medicinal, cosmetic, and industrial applications. The oil is highly valued for its unique chemical composition, especially its high content of ricinoleic acid, a monounsaturated fatty acid that gives castor oil many of its beneficial properties. Below is a detailed overview based on various aspects of castor oil.

Properties: -

1. Viscosity: Castor oil is thick and viscous in texture, making it an excellent lubricant.

2. Hydrophilic Nature: It has a strong affinity for water and can act as a humectant, attracting moisture.

3. Emollient: Castor oil is a good moisturizer for the skin and can help smooth and soften the skin.

4. Mildly Antimicrobial: It has natural antimicrobial properties, which can help prevent bacterial and fungal infections on the skin.

Pharmacological Actions: -

Castor oil is recognized for its various therapeutic effects, attributed mainly to its high ricinolein acid content:

1. Anti-inflammatory Properties: Ricinoleic acid has shown anti-inflammatory effects, helping to reduce pain and swelling when applied topically to joints or muscles.

2. Antimicrobial Action: Castor oil is used in the treatment of minor wounds and infections because it can inhibit bacterial and fungal growth.

3. Analgesic (Pain-relieving) Effects: Topical application of castor oil has been found to reduce pain and discomfort, especially in conditions like arthritis, by penetrating the skin and reducing inflammation.

Uses: -

Castor oil has a wide range of applications in medicine, cosmetics, and industrial products:

1. Laxative: The most common medicinal use of castor oil is as a stimulant laxative, which helps relieve constipation by promoting bowel movement.

2. Skin Care: Castor oil is used in numerous skincare products to moisturize and soften the skin, reduce wrinkles, and treat conditions like acne and eczema.

3.Hair Growth: Castor oil is widely used in hair care products to stimulate hair growth, reduce hair thinning, and improve hair texture. Its moisturizing properties also help in reducing dandruff.

4. Wound Healing: Due to its antimicrobial properties, castor oil is used in the treatment of minor cuts and abrasions to promote healing and prevent infections.

5.Joint and Muscle Pain Relief: Castor oil is used topically to reduce pain and inflammation in conditions such as arthritis, muscle sprains, and back pain.

6. Industrial Uses: Castor oil is an important raw material in industries for making biodiesel, lubricants, paints, varnishes, and even in the production of certain plastics and coatings.

4)Peppermint Oil

Peppermint oil is a widely used essential oil known for its distinctive, refreshing aroma and numerous therapeutic, cosmetic, and medicinal benefits. It is extracted primarily from the leaves and stems of the Mentha × piperita plant, a hybrid of water mint (*Mentha aquatica*) and spearmint (*Mentha spicata*). Peppermint oil is rich in menthol and menthone, which are responsible for its cooling effect and many of its medicinal properties.

Source of Extraction:

Plant Name: *Mentha* × *piperita* (Peppermint)

- **Part of the Plant Used:** Primarily the leaves and stems of the peppermint plant**.**
- **Extraction Method:** Peppermint oil is obtained through steam distillation of the fresh or dried leaves and flowering tops of the plant. This process helps extract the volatile oils, particularly menthol and menthone, which contribute to its medicinal and aromatic properties.

Properties of Peppermint Oil:

Peppermint oil has several distinctive properties that make it highly sought after in the fields of aromatherapy, cosmetics, and medicinal treatments:

1. Cooling Effect:
2. Aromatic and Refreshing:
3. Antioxidant:
4. Antibacterial and Antiviral:

3. Pharmacological Actions of Peppermint Oil:

1. Analgesic (Pain-relieving) Effect:
2. Antispasmodic Effect:
3. Digestive Aid
4. Decongestant (Respiratory Relief)

Uses:

1. Relieves Digestive Issues:
2. Headache Relief:
3. Soothing Muscles and Joints:
4. Improves Respiratory Health:
5. Antimicrobial Action:
6. Aromatherapy

5) Camphor

1. Source of Extraction:

- Plant Name: Cinnamomum camphora (Camphor tree)
- Part of the Plant Used: The wood and bark of the camphor tree are the primary sources for camphor extraction.
- Extraction Method: Camphor is extracted through steam distillation from the wood of the camphor tree. After the extraction, the essential oil is refined and sometimes crystallized into solid camphor, which can be used in various applications. Synthetic camphor is also produced, but natural camphor from the tree remains the most potent.

2. Properties of Camphor

1. Aromatic:
2. Volatile:
3. Cooling Sensation:
4. Flammable:

Pharmacological Actions of Camphor:

1. Analgesic (Pain-relieving) Effect:
2. Anti-inflammatory Effect:
3. Antimicrobial Properties:
4. Respiratory Stimulant:

Uses:

- Topical Analgesic:
- Respiratory Relief:
- Antiseptic and Antifungal:
- Insect Repellent:
- Aromatherapy:
- Industrial manufacturing of liquors, fragrances, etc.

6) Menthol

Menthol is an organic compound derived primarily from the mint plant, particularly *Mentha arvensis* (field mint) and *Mentha piperita* (peppermint). It has a characteristic cool, refreshing taste and aroma, which has led to its widespread use in various consumer products such as food, pharmaceuticals, cosmetics, and personal care items.

Source of Extraction

Mint Leaves: The primary source of menthol is from the essential oils of mint plants, particularly *Mentha arvensis* (Japanese mint) and *Mentha piperita* (peppermint). The leaves of these plants contain menthol in significant quantities.

Synthesis: Menthol can also be synthesized chemically from piperitone, a compound derived from the essential oils of certain mint species.

Properties of Menthol

- Cooling Sensation:
- Aromatic:
- Solubility:
- Volatility:

Pharmacological Actions of Menthol

- Analgesic Effect:
- Anti-inflammatory:
- Antiseptic Properties:
- Bronchodilator Effect:

Uses of Menthol

- Pharmaceuticals:
- Cosmetics and Personal Care:
- Food and Beverages:
- Tobacco Industry:
- Aromatherapy:
- Insect Repellents:

7) Vitamin E

Source of Vitamin E

Vitamin E is a fat-soluble vitamin that exists in various forms, with alpha-tocopherol being the most biologically active form in humans. Vitamin E is primarily obtained from vegetable oils, including sunflower, wheat germ, and safflower oils. It can also be found in nuts, seeds, green leafy vegetables, and fortified cereals. Additionally, vitamin E is present in whole grains, avocados, and some fish (like salmon).

Properties of Vitamin E

- Antioxidant Property:
- Anti-inflammatory Effects:
- Fat Solubility:
- Anticoagulant (Blood-Thinning) Activity:

Pharmacological Actions

- Cardioprotective Action:
- Neuroprotective Effects:
- Immune Modulation:
- Skin Health:

Uses

- Prevention of Cardiovascular Diseases:
- Skin Care:
- Treatment of Vitamin E Deficiency:
- Anti-Aging Supplement:
- Support for Eye Health:
- Protection Against Cancer:

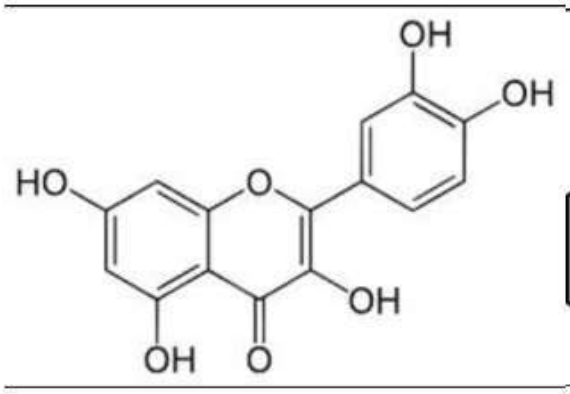
9) Extraction Procedure of Hibiscus Rosa-Sinensis

1. Hibiscus Rosa-sinensis flowers are collected from the house garden.
2. Then they are selected according to our needs.
3. After this process the flowers are kept in sunlight for 48-72 hours for drying.
4. Then these dried flowers are grinded in a mixer grinder and passed through the sieve of the size 80 for better powder formation and filtration from foreign particles.
5. Then this powder is boiled in coconut oil at 110°C for about 40 minutes in order to get better extraction of components.
6. Then this oil is cooled and filtered from filter paper and stored in containers at room temperature.

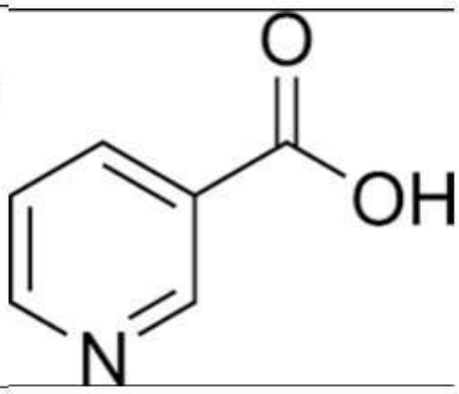
Phytochemical Constituents Reported on part of plant: -

Sr. No.	Plant Part	Constituents Reported
1.	Flowers	Thiamine, Riboflavin, Niacinamide, Ascorbic Acid, Apigenidin (Tric Acid), Fructose, Glucose, Oxalic Acid, Pelargonidin, Quercetin.
2.	Leaves	Alkaloids, Glycosides, Reducing Sugars, Fat Materials, Resin, Sterols, Fatty Acids, Fatty Alcohol, Hydrocarbons.
3.	Stem	Teraxeryl Acetate, Sitosterol, Cyclic Acid, Sterculic Acid.
4.	Roots	Glycosides, Tannins, Photosterol Fats, Proteins, Fats, Amino Acids, Nayonoids, Saponin Gum and Mucilage.

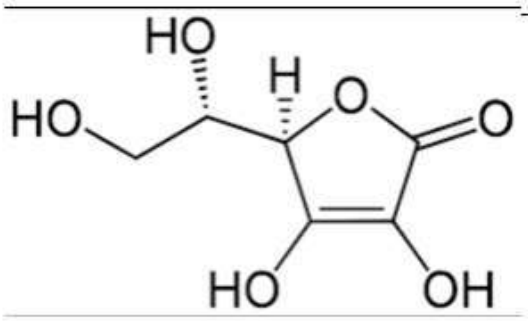
Structure of active ingredient found in Hibiscus Rosa-Sinensis: -



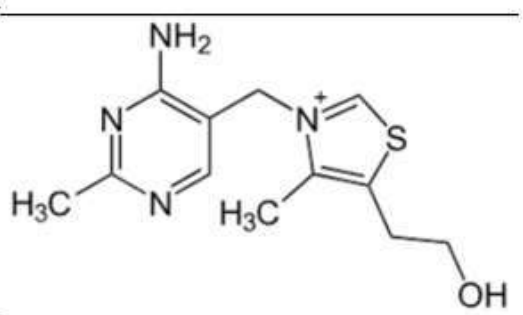
Quercetin



Niacin



Ascorbic Acid



Thiamine

10) Method Of Preparation: -

The present work was aimed to prepare and evaluate the herbal massage oil containing ingredients like Hibiscus, Vitamin E, Coconut Oil, Castor Oil, Peppermint Oil, Camphor and Menthol. All these ingredients have their characteristics of providing nourishment to hair and also reduce muscle soreness and providing cooling effect.

List of ingredients and their uses: -

1.Hibiscus Rosa-sinensis: -

Uses: - Promote hair growth and provide nourishment to hairs.

2.Coconut Oil: -

Uses: - Vehicle for other ingredients and prevents skin irritation.

3. Castor Oil: -

Uses: - Hair growth, moisturizes skin, Reduce muscle soreness and wound healing properties.

4. Peppermint Oil: -

Uses: - Antimicrobial Action, Relives Headache and Reduces muscle soreness and soothes it.

5. Camphor: -

Uses: - Analgesic, Respiratory Relief, Antiseptic and Antifungal.

6. Menthol: -

Uses: - Muscle Pain, Headache, Itching and Cooling effect.

7.Vitamin E: -

Uses: - Provides moisturization to skin, Anti-aging effect, Protect from UV rays and Anti-Cancer activity.

Table No.2 Ingredients Used in Formulation with Their Quantity: -

Sr. No.	Common Name	Scientific Name	Family	Quantity Taken
1.	Hibiscus	Hibiscus Rosa-sinensis	Malvaceae	20 gm
2.	Coconut Oil	Cocos Nucifera	Arecaceae	100 ml
3.	Castor Oil	Ricinus Communis L.	Euphoebiaceae	25 ml
4.	Peppermint Oil	Mentha Piperita	Lamiaceae	15 ml
5.	Camphor	Cinnamomum Camphor	Lauraceae	10 gm
6.	Menthol	Mentha Arvensis	Lamiaceae	10 gm
7.	Vitamin E	Tocopherol	—	2 ml

11) Procedure: -

Different ingredients used in formulation are presented in table number 2.
1. Firstly, the Petals of Hibiscus flowers are dried in Sun for 1-2 days until it loses its moisture.

2. After this blend them in a blender and pass through a Sieve with 80 number mesh until get the fine powder.

3. Then heat the oil at 100 °C and add this powder to it until the powder loses colour and oil gets the colour and keep it to cool.

4. After this filter the oil from filter paper.

5. Then mix all the remaining ingredients one by one in given quantity and given order: -

a) Castor Oil
b) Peppermint Oil
c) Camphor
d) Menthol
e) Vitamin E

6. Stir it for better distribution in overall oil and keep it aside for 24-48 hours for complete dissolution of added ingredients.

12) Evaluation Parameter: -

The prepared oil is subjected to physical and biological evaluation.

1. Physical Evaluation: -

Physical evaluation includes the specific gravity, viscosity and ph.

a) Specific Gravity :-

Take the specific Gravity bottle, rinse it with distilled water and dry it in the oven for 15 min.

cool, close it with cap and weigh it (a) Now fill the same specific gravity bottle with the sample and close it with cap and again it weighs (b). Determine the weight of sample per millilitre by subtracting the weight (a-b).

Viscosity: -

Viscosity was determined by Ostwald's Viscometer.

pH: -

pH was determined by the pH meter.

2. Biological Evaluation: -

Biological Evaluation includes the sensitivity and skin irritation test.

Sensitivity Test: -

The prepared oil was applied on 1 cm^2 area of skin of hand and exposed to sunlight for 4-5 minutes.

Skin Irritation Test: -

The prepared oil was applied on another side of hand and keep in observation for 4-6 hours.

13) Calculations: -

1. **Parameter First: - Determination of Density of Oil.**

- W1 - Weight of Gravity Bottle without stopper - 20.14 gm
- W2 - Weight of Gravity Bottle + Wt. Of Water - 55.59 gm
- W3 - Weight of Gravity Bottle + Wt. Of Oil - 49.80 gm

Formula for Density of Oil =

$$\frac{W3–W1}{W2 – W1}$$

$$\frac{49.80 – 20.14}{55.59 – 20.14}$$

$$= 0.836 \text{ g/ml}$$

Density Of Oil (p2) = 0.836 g/ml

Density Of Water at R.T. (pl) = 0.997 g/ml (Standard Value)

1. **Parameter Second – Determination of Viscosity of Oil By Ostwald's Viscometer –**

Viscosity Of Liquid =

$$n2 = \frac{p2t2}{p1t1} \times n1$$

Where,

- *P_1 = Density of Water*
- *P_2 = Density of Oil*
- *N_1 = Viscosity of Water*
- *N_2 = Viscosity of Oil*
- *T_1 = Time of Flow of Water from Point a to B*
- *T_2 = Time of Flow of Oil from Point a to B*

Distilled Water	28.46 Sec	30.12 Sec	T_1 = 29.29 Sec
Massage Oil	123.20 Sec	125.22 Sec	T_2 = 124.21 Sec

N_1 = 0.8937 cp.

$$N_2 = \frac{0.836 \times 124.21}{0.997 \times 29.29} \times 0.8937$$

= 3.1595 cp.

Density Of Oil (p^2) = 0.836 g/ml
Viscosity Of Oil (N_2) = 3.1595 cp

Parameter Third – pH

The pH of the oil was determined by the pH Meter and it was found to be 6.85. This pH indicates the Oil is slightly Neutral to Acidic in Nature.

2. Parameter Fourth – Skin Irritation Test

- No skin irritation.

3. Parameter Fifth – Skin Sensitivity Test

No skin irritation.

14) Result And Discussion: -

The Herbal Massage Oil is prepared with herbs which mentioned in above table. Herbs that are used in the oil are having following activity.

- Anti-Dandruff
- Stimulates Hair Growth
- Nourishes scalp
- Muscle relaxant

This all activity is done to provide relaxation after massaging with this oil and this oil also reduces muscle soreness while nourishing scalp along with hair roots. The various parameters like pH, Specific Gravity, Colour, Odour, Viscosity evaluated in below table.

Table No.3- Parameters And Inferences

Sr. No.	Parameter	Inference
1.	Colour	Transparent Brownish Red
2.	Odour	Minty
3.	pH	6.85
4.	Viscosity	3.1595 cp.
5.	Density	0.836 g/ml
6.	Grittiness	Smooth
7.	Skin Irritation	No Irritation

15) CONCLUSION –

The current study successfully involved the formulation and evaluation of a herbal massage oil containing a synergistic blend of hibiscus, coconut oil, peppermint oil, castor oil, camphor, menthol, and vitamin E capsules. Each component was carefully selected based on traditional usage, scientific literature, and its therapeutic potential in promoting skin health, relieving muscle pain, and enhancing overall relaxation. Hibiscus is known for its antioxidant properties, rich in flavonoids and anthocyanins, which help combat oxidative stress and promote skin elasticity. Coconut oil, a well-known emollient, acts as an excellent base due to its moisturizing, antimicrobial, and skin-softening effects. Peppermint oil and menthol contribute to the formulation's cooling and soothing action, making it effective in relieving muscular tension and fatigue. Castor oil supports skin hydration and has anti-inflammatory benefits, while camphor enhances blood flow and offers mild analgesic effects. Vitamin E capsules were included for their antioxidant and skin-repairing properties, further enhancing the oil's cosmetic and therapeutic value. The formulation process involved the careful blending of ingredients under controlled conditions to ensure homogeneity and stability. Evaluation parameters such as appearance, colour, Odor, pH, viscosity, Spreadability, and stability were assessed, and the results indicated that the oil met acceptable standards for topical application. The massage oil showed no signs of phase separation or degradation over a 30-day observation period, confirming its physical and chemical stability. Additionally, a sensory evaluation conducted among volunteers indicated positive feedback in terms of ease of application, skin feel, aroma, and overall effectiveness in providing relaxation and relief from minor body aches. The non-greasy texture and pleasant fragrance further add to its user acceptability. This formulation highlights the potential of herbal-based products in the field of cosmeceuticals and alternative medicine. The integration of traditional herbal knowledge with modern pharmaceutical formulation techniques offers a safer, natural, and cost-effective solution compared to many commercially available synthetic products that may have adverse effects with long-term use. In conclusion, the formulated herbal massage oil not only meets therapeutic and cosmetic expectations but also aligns with the growing consumer demand for natural wellness products. It serves as a viable candidate for further pharmacological studies, including antimicrobial and anti-inflammatory testing, as well as clinical trials to validate its efficacy on a larger scale. With appropriate regulatory approvals and standardization, this herbal oil holds strong potential for commercial production and use in therapeutic massage practices.

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