

Formulation and Evaluation of Herbal Pain Relief Oil

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Abstract:

Herbal oil made for giving relief from pain and discomfort by using beneficiary of natural herbs available. These herbs give more relief because many people prefer traditional measure over modern for pain relief. Many "ayurvedic granthas" explain role of muscle pain. Herbal remedies have gained increasing attention as alternative therapies for pain management due to their minimal side effects and natural origin. This study focuses on the formulation and evaluation of a herbal pain relief oil using *Trachyspermum ammi*, commonly known as carom seeds or ajwain. Carom seeds are rich in thymol, a bioactive compound known for its anti-inflammatory, analgesic, and antimicrobial properties. The oil was prepared using cold infusion techniques, combining ajwain flower extract with a carrier oil such as coconut oil traditionally used for topical applications. The formulation was tested for its efficacy in reducing muscle and joint pain through evaluation methods. Results indicated a significant reduction in pain perception and inflammation, supporting the therapeutic potential of ajwain-based herbal oil. This research highlights the value of carom seeds in natural pain relief applications and supports their integration into traditional and modern medicinal practices.

Keywords: Carom seeds, , Coconut oil, *trachyspermum ammi*

Introduction:

Pain, whether acute or chronic, is one of the most common health issues affecting people of all ages. While conventional pain relief medications such as non-steroidal anti-inflammatory drugs (NSAIDs) and opioids are widely used, they often come with side effects like gastrointestinal discomfort, dependency, or long-term health risks. As a result, there is growing interest in natural and herbal alternatives that can provide effective pain relief with fewer side effects.

Herbal medicine has been used for centuries across various cultures, and many plants are known to possess potent analgesic and anti-inflammatory properties. One such medicinal herb is carom seed, scientifically known as *Trachyspermum ammi*, and commonly called ajwain. Traditionally used in Ayurvedic and Unani medicine, ajwain is known for its therapeutic benefits in treating digestive disorders, respiratory issues, and inflammatory conditions. The key active component in ajwain is thymol, which has been shown to exhibit strong anti-inflammatory, antimicrobial and pain-relieving effects. Muscle pain, or myalgia, is a common affliction that affects people across all age groups. Whether resulting from overexertion, injury, chronic conditions like fibromyalgia, or even stress, muscle pain can significantly impact one's quality of life. While conventional treatment often involves the use of synthetic analgesics and anti-inflammatory drugs, growing interest in natural and holistic health solutions has led many to explore the benefits of herbal oils as a safe and effective alternative for muscle pain relief. Herbal oils—plant-derived substances infused or extracted from medicinal herbs—have been used for centuries in traditional systems of medicine such as Ayurveda, Traditional Chinese Medicine (TCM), and Indigenous healing practices. Their therapeutic potential lies in their ability to deliver bioactive compounds directly to the affected area through topical application, often providing immediate soothing effects with fewer side effects than synthetic drugs.

Ideal properties of herbal pain relief oil:

1. Reduces pain and swelling naturally.
2. Easily absorbs into the skin.
3. Gentle and safe for all skin types.

4. Has a pleasant, soothing smell.
5. Stays fresh and effective for a long time.
6. Easy to apply and not too greasy.
7. Can give a warm or cool feeling for extra relief.

Factors affecting herbal pain relief oil:

1. Quality of carom seeds – Fresh and pure seeds give better results.
 2. Extraction method – Cold-pressed or properly infused oils retain more active compounds.
 3. Type of carrier oil – Oils like coconut oil improve absorption and effectiveness.
- Concentration of ingredients – The right balance of carom seed or ajwain flower oil ensures.

Advantages of herbal pain relief oil:

1. Provides natural relief from pain and inflammation.
 2. Has fewer side effects compared to chemical-based painkillers.
 3. Contains thymol, which fights bacteria and reduces swelling.
 4. Can be used for various pains like joint, muscle, and headaches.
 5. Safe for long-term use and suitable for all age groups.
 6. Made from easily available and affordable ingredients.
 7. Improves blood circulation when massaged.
 8. Helps relax the body and reduce stress.
 9. Free from harmful chemicals and synthetic preservatives.
- Eco-friendly and supports traditional medicine practices.

Need and objectives :

Similar to our skin, our hair needs a good balance of oils to keep it healthy and happy. According to proponents of this practice, hair oiling's main goal is to hydrate your hair and make up for any vitamins or minerals your hair may be missing after repeated washing.

Objectives:

1. The primary goal of this study is to prepare and evaluate herbal hair oil made from fresh components of various plants.
2. The prepared hair oil contains various herbal plants that have been utilized for hair growth. These plants include Neem, hibiscus, Aloe vera, curry leaves Coconut oil, and Tulsi.
3. All the herbs are showing anti-hair fall properties, anti-dandruff properties and anti fungal activity
4. Herbal hair oil is more popular and is used to treat a variety of hair problems.
5. The treatment is determined by the nature of the hair issue, if the causes of changes in hair growth density, size, and growth cycle are recognized, the most successful therapy approach is to address the initial illness mechanism.
6. The hair oil should be remains stable for longer periods of time.

Plan of work -

The plan of work is having following points,

1. Sampling

2.Data Collection

3.Tools of Analysis

Sampling: The sampling includes List of Ingredients used for the preparation of the Herbal hair oil. In that collection of raw materials, weighing, cleaning, separation was done. The sampling was done according to the procedure for the formulation and evaluation of herbal hair oil. Some of the ingredients available in the local market as ready to use in format. Some of the ingredients taken from the home as well as available in the college.

Data Collection: For the formulation we need to collect data for that. So the data

collection was done from the various International Journals, Books, Internet, Articles. The data collection includes the Abstract, Introduction, Keywords. Taxonomical Classification. Sampling. Uses of ingredients, Procedure for formulation, Evaluation parameters. Literature review, Ideal Properties of Herbal hair oil, etc.

Tools of Analysis: Tools of analysis includes all the evaluation parameters such as sensitivity test, pH, Acid value, Physical appearance, Skin sensitivity, Nature of Hair after wash, etc. For the analysis we arrange two volunteers (project partners)

Ingredient used for formulation

A)GREEN KAPOOR (Bhimsen Kapoor) -

Bhimseni Kapoor, more commonly known as Bhimseni camphor, is a natural Ayurvedic preparation taken from the indigenous tree *Cinnamomum camphora*. For thousands of years, this herb has stood the test of time in holistic healing practices and is now popularly gaining acceptance as a natural medicine for numerous health benefits. Bhimseni Kapoor in this fast life wants natural solutions to problems; thus, goes the case for Bhimseni Kapoor. It is something which proves out to be a very potent and versatile tool for every household. Here lie 5 major benefits of Bhimseni Kapoor about which the place is still referring to elaborate why it is best for health.

2. Anti-inflammatory and Painkiller Capacities

Yet another good benefit of Bhimseni Camphor is anti-inflammatory with analgesic effects. Whether you're or your loved ones have arthritic pains, or your body gets painful muscles, Bhimseni Camphor can prove to be a relief for you.

The active ingredient in Bhimseni Kapoor is an increase in the blood flow toward the affected part which reduces inflammation and deadens pain receptors. Bhimseni Kapoor applied regularly; it can provide immense relief in body aches in whichever form, be it topical or through inhalation.

How to use Bhimseni Camphor for Pain Relief:

Bhimseni Kapoor mixed coconut oil applied on sore muscles or joints.

Prepare a warm massage with Bhimseni Kapoor oil to treat the specific pain areas.



Fig-1 GREEN KAPOOR (BHIMSEN KAPOOR)

Plant part used-Cinnamomum camphora tree wood and bark

Biological name - green kapoor, desi kapoor, pacha kapoor

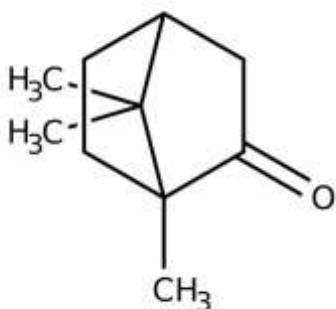
Biological source -Bhimsemi Kapoor is derived from the bark and wood of the Cinnamomum camphora tree, also known as the camphor tree.

Family- Lauraceae

Chemical constituent- Kapoor, or natural camphor, primarily contains the terpene D-camphor (also known as 1,7,7-trimethylbicycloheptan-2-one). It's a bicyclic monoterpene ketone with the Other constituents include limonene, α -pinene, β -myrcene, and camphene.

Chemical formula - $C_{10}H_{16}O$

Structure -



uses:-

1. Pain Relief:

Bhimsen Kapoor (a high-quality form of camphor) acts as a natural analgesic, helping relieve muscle pain, stiffness, and soreness.

2. Anti-inflammatory Action:

It reduces inflammation in muscles and joints, which is useful for conditions like arthritis, sprains, and strains.

3. Improves Blood Circulation:

When massaged into the skin, it creates a warming effect that helps improve blood flow, aiding in faster muscle recovery.

4. Decongestant and Relaxant:

Its strong aroma has a soothing effect on the nervous system, which can help in relaxing the muscles and relieving stress.

5. Antiseptic Properties:

Camphor has mild antiseptic properties, which helps keep the skin clean and reduces the risk of infection in case of minor injuries or cuts.

B)Ajwain caraway (ajwain phool) -

Ajwain's small, oval, seed-like fruits are pale brown schizocarps, which resemble the seeds of other plants in the family Apiaceae such as caraway, cumin and fennel. They have a bitter and pungent taste, with a flavor similar to anise. Ajwain is commonly used in cooking and has various medicinal properties. Its anti-inflammatory and analgesic (pain-relieving) properties are attributed to compounds like thymol, which may help reduce inflammation and pain.

Muscle Relaxant:

Some studies suggest that ajwain may have muscle-relaxant effects, potentially helping to alleviate muscle spasms and tension.

Massage:

A mixture of crushed ajwain seeds and coconut oil can be used for massage to relieve muscle pain and inflammation.



fig-2 AJWAIN CARAWAY (AJWAIN PHOOL)

Biological name - *trachyspermum ammi*

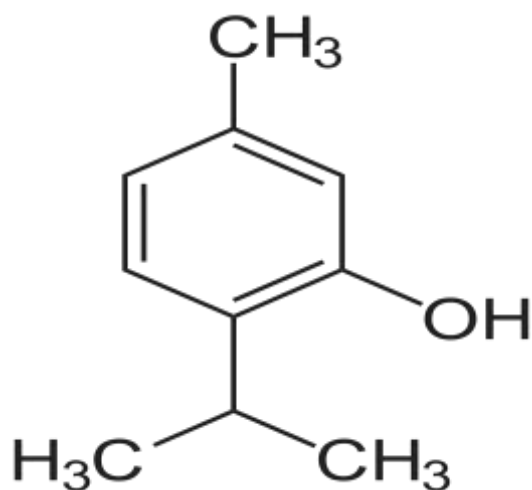
Biological source -the biological source of ajwain is the dried fruits of the plant *Trachyspermum ammi*.

Family- Apiaceae or Umbelliferae

Chemical constituent-thymol being the major component in its essential oil. Other key compounds include oleic acid, linoleic acid, γ -terpinene.

Formula - thymol $C_{10}H_{14}O$

Structure -



uses:-

1. Anti-inflammatory Properties:

Ajwain's anti-inflammatory effects can help reduce swelling and pain associated with muscle inflammation or injuries.

2. Analgesic Effects:

The seed's analgesic properties can help numb the pain and provide temporary relief.

3. Muscle Relaxation:

Ajwain may help relax muscles and reduce muscle spasms.

4. Traditional Use:

In some cultures, ajwain is applied topically or ingested to relieve muscle pain and stiffness.

C) *Mentha arvensis* (asmantara) -

Asmantara, which often refers to menthol crystals, is known for its cooling and analgesic properties, making it useful for muscle pain relief. Menthol is a counterirritant that can distract from deeper pain by creating a temporary feeling of coolness on the skin. When applied topically, menthol crystals create a cooling sensation that can numb pain and provide temporary relief from muscle soreness. In some cases, menthol can help improve circulation to the affected area, which can also contribute to pain relief.



Fig-3 *Mentha arvensis* (asmantara)

Plant part used- leaves and stems

Biological name -corn mint ,*Mentha arvensis*

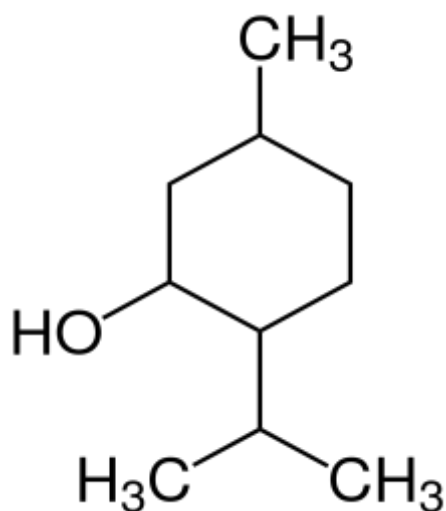
Biological source -primarily derived from the leaves and stems of the mint plant, specifically the peppermint plant and other related species like spearmint .Menthol is a key component.

Family- Lamiaceae.

Chemical constituent- The primary chemical constituent of asmantara, also known as menthol crystals, is menthol. Menthol is a cyclic alcohol found naturally in the leaves of *Mentha arvensis* .

Chemical formula - menthol $C_{10}H_{20}O$

Structure -



uses:-

1. Medicinal Uses

Mentha arvensis is extensively used in traditional medicine systems:

2.Digestive Aid: Used to relieve indigestion, bloating, and flatulence

3.Antispasmodic: Helps reduce muscle spasms, especially in the gastrointestinal tract

4.Analgesic: Menthol is known for its pain-relieving properties

5.Antiseptic: Used for minor cuts, wounds, and infections

6.Cold and Cough: Effective in relieving symptoms of cold, sinusitis, and respiratory congestion

7.Headache Relief: Menthol provides a cooling sensation and soothes tension headaches

8.Skin Disorders: Used in creams and balms for itching, burns, and insect bites

9.Muscle Relaxation:

The cooling effect of menthol can also help relax muscles and ease tension.

10.Distracton from Pain:

The initial cooling sensation can help distract from the pain signals being sent to the brain, providing temporary relief.

D) Coconut oil -

Coconut oil may offer some benefits for muscle pain due to its analgesic and anti-inflammatory properties, potentially helping to relieve muscle cramps and ease pain in joints. It can be used topically for massage or applied directly to affected areas. Additionally, some studies suggest that coconut oil may have antimicrobial and antioxidant properties that could indirectly support muscle health and recovery. Massaging the affected area can improve blood circulation and reduce pain and swelling. Coconut oil's anti-inflammatory properties may help reduce inflammation associated with muscle pain and injury.

Some research suggests that virgin coconut oil can help reduce inflammatory markers in the skin, which may also apply to muscles.



fig-4 COCONUT OIL

Plant part used-.coconut palm

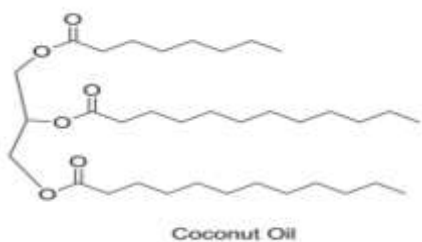
Biological name -cocos nucifera,

Biological source -Coconut oil is derived from the meat of the coconut, which is also known as the kernel or endosperm. This white, fleshy part of the coconut is extracted and processed to yield the oil.

Family-Arecaceae (palm)

Chemical constituent- Coconut oil's primary chemical components are saturated fatty acids, particularly lauric acid, which makes up about 50% of the oil.

Chemical formula -C₃₃H₆₂O₆



Structure -

uses:-

1. Massage:

Applying coconut oil to sore muscles and massaging it in can help soothe and relax them, particularly after physical activity.

2. Heat:

Warming the coconut oil before applying it can enhance its pain-relieving effects by increasing blood flow and reducing inflammation.

3. Combination with essential oils:

Coconut oil can be mixed with essential oils known for their muscle pain relief properties.

4. Application to specific areas:

Coconut oil can be used on areas like the feet, knees, and back to relieve pain and reduce inflammation.

5. Anti-inflammatory properties:

Coconut oil contains fatty acids, especially lauric acid, which may have anti-inflammatory effects.

6. Improved blood circulation:

Massaging with coconut oil can help improve blood circulation, which can also contribute to pain relief.

Table 1- **Purposes of Ingredients**

Sr no.	Ingredients	Purpose
1	Green Kapoor	Pain relief
2	Caraway	Anti inflammatory effect
3	Mentha	Cooling sensation
4	Coconut oil	Quick absorption

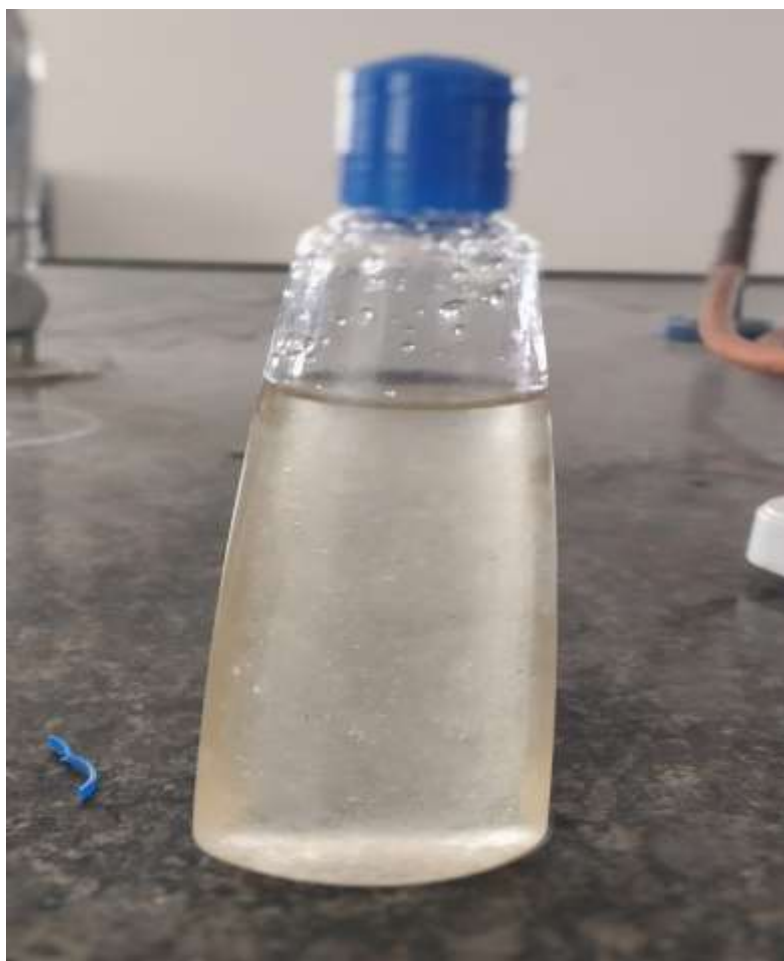


Method of formulation -

- 1) All herbs of crude drugs were weighed by weighing balance
- 2) Each ingredient was taken 20gm
- 3) The crude drugs were mixed with each other with the help of mortar and pestle
- 4) They were mixed and crushed until they formed an oil-like phase.
- 5) When they formed an oil-like phase, now adding coconut oil.
- 6) Mixing of all the ingredients well. (Coconut oil was added for effectiveness and to produce absorption)
- 7) Finally, prepared herbal oil for pain relief of muscle.
- 8) Which was transferred into a bottle.

Table-2 - Formula table

Sr no	Ingredients	Quantity (gm)
1	Green Kapoor	20
2	Caraway	20
3	Mentha	20
4	Coconut oil	20



Final product

Result -

A formulation of herbal pain relief oil, evaluated through in vitro studies, has shown potential for reducing pain and inflammation. The oil, prepared using cold infusion techniques, combines ajwain seed extract with a carrier oil like coconut oil, both traditionally used for topical applications. The results indicate a significant reduction in pain perception and inflammation, supporting its therapeutic potential. Studies have shown that herbal oils can effectively reduce pain and inflammation in animals. no side effects Herbal oils are often considered safer and gentler on the body than synthetic pain relievers.

Stability and quality of oil should remain

stable and maintain its quality during storage. The oil should be compatible with the skin and not cause irritation. The oil should provide effective pain relief for conditions like muscle pain, joint stiffness, and minor aches.

Conclusion -

Herbal muscle pain oils offer a natural and effective alternative for managing musculoskeletal discomfort. Their diverse compositions and mechanisms of action provide multifaceted benefits, including pain relief, anti-inflammation, and muscle relaxation. Clinical evidence supports their efficacy, and with proper usage, they present a safe option for many individuals. However, awareness of potential side effects and contraindications is essential to ensure optimal outcomes. Herbal muscle pain oils offer a natural and effective alternative for relieving muscle aches, stiffness, and inflammation. Formulated with plant-based ingredients such as ajwain, mentha, green camphor, and coconut oil, these remedies leverage the therapeutic properties of herbs to promote circulation, reduce pain, and support muscle recovery. With minimal side effects compared to synthetic pain relievers, herbal oils are suitable for regular use and appeal to those

seeking holistic wellness solutions. However, individual results may vary, and users should ensure there are no allergic reactions or contraindications with other treatments.

Future scope -

Ayurveda is the science and philosophy of life. Ayurveda reveals that we had a rich knowledge of the application of medicinal plants from very ancient times. Plants have played a significant role in maintaining human health and improving the quality of human life for thousands of years and have served human as well as valuable components of medicines, seasoning, beverages, cosmetics and drugs. In this study Botanical description, chemical Constituents, and Ayurvedic Properties. Increasing global demand and growing scientific interest in their efficacy and safety. The market for herbal pain relief products is experiencing significant growth, particularly in India, driven by consumer preference for natural remedies and increasing awareness of their benefits. Further research and development are expected to lead to more refined formulations, enhanced availability, and broader acceptance of herbal oils as a safe and effective pain management option. Growing Demand for Natural Remedies.

Rising Awareness of Herbal Benefits.

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