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Research Article

Formulation and Evaluation of Herbal Arthritis Oil for Joint Pain Relief Using Akarkara (Anacyclus Pyrethrum)

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ABSTRACT

Rheumatoid arthritis (RA) is a long-term autoimmune disorder that primarily affects joints. It typically results in warm, swollen, and painful joints.it affect large population osteoar-thritis and (OA) and rheumatoid arthritis (RA) are two major form of arthritis. Traditional medicinal systems have long advocated the use of natural oils for pain relief. Herbal remedies have long been used to treat arthritis and joint pain because they have an-algesic and anti-inflammatory properties. Akarkara is commonly used in these composi-tions due to its warming and penetrating qualities. This review focuses on the development of a herbal arthritis oil using Akarkara and specific excipients such as clove, camphor, pep-permint, and garlic, and highlights the effectiveness of these substances in reducing joint pain. The study looks at how these formulations were developed, looks at the scientific ba-sis for using them, and offers clinical evidence to support their use.

INTRODUCTION

The debilitating condition known as arthritis, which results in joint pain, swelling, and stiffness, affects millions of people globally. Common types that commonly affect mobility and quality of life are osteoarthritis, gout, and rheumatoid arthritis. As the world's population ages, there is increasing interest in less invasive, natural arthritis therapies. Ancient medical systems like Ayurveda have long employed herbal oils, particularly those made from Akarkara, to cure arthritis. When paired with strong herbal ingredients like clove, camphor, peppermint, and garlic, Akarkara (Anacyclus Pyrethrum) effectively relieves joint discomfort. This review examines the use of these excipients in the formulation of arthritis oils based on

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Akarkara (Anacyclus Pyrethrum) and discusses their respective and combined effects on pain relief and inflammation reduction. The combinatorial word "arthritis" was created by fusing Greek and Latin. "Arthron" means "joint" in Greek and "specifies inflammation" in Latin. As a result, arthritis is typically thought of as a condition brought on by inflamed joints. It is not a single disease per se; rather, it is a group of medical issues from which 300,000 children in the US alone suffer. If appropriate treatment is not given in a timely manner, the disease may render a person permanently disabled. Worldwide, it causes significant financial hardship due to lost wages and rising prescription costs. There are currently a number of therapy options available just to manage the illness; nevertheless, a quick solution has not yet been discovered. It's important to grasp the workings of a bone joint in order to properly comprehend the condition.

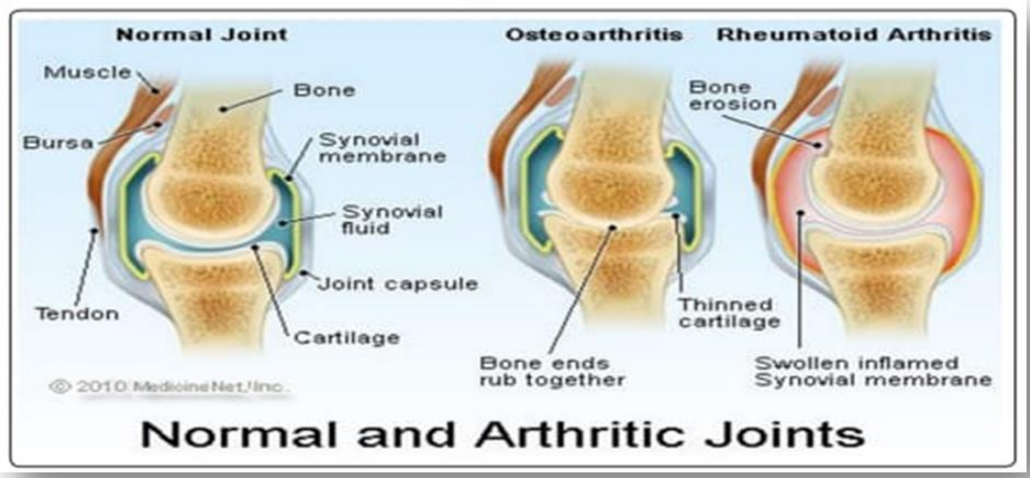
Arthritis is most common in the following areas of the body :

-Hand

-Feet

-Knees

-Hips



Akarkara (Anacyclus Pyrethrum)

Scientific Modern Science view Akarkara may be useful in managing arthritis. Akarkara is rich in antioxidants and is useful in improving blood circulation. As a result of this, it helps manage pain and inflammation in arthritis. Ayurvedic View Akarkara is useful to manage pain in arthritis. According to Ayurveda, arthritis occurs due to an aggravation of Vata dosha. It causes pain, swelling and joint immobility. Akarkara has Vata balancing property and gives relief from the symptoms of arthritis-like pain and swelling in the joint

Composition of Akarkara (Anacyclus Pyrethrum):

Akarkara (Anacyclus Pyrethrum) is an ayurvedic herb that contains alkaloids, tannins, triterpenes, flavonoids, sterols and other compounds. The root of plantcontains pyrethrin ester, and N-alkylamides (pellitorine).

Alkyl Amides	Give the herb a pungent taste and stimulate saliva production.
Anacyclin	Give the herb aphrodisiac properties
Pyrethrins	A natural insecticide with insect -repellent properties
Sesquiterpene Lactones	Give the herb anti-inflammatory properties and -bitter taste
Insulin	Found in root
Sesamin	Found in root
Hydrocarolin	Found in root

Chemical Constituents: -

Phytochemicals like alkaloids, coumarins, flavonoids, and tannins are present in the Anacyclus pyrethrum variety. The root extract contains free fatty acids, sterols, and unsaturated amides. Pellitorine, anacyclin, phenylethylamine, inulin, polyacetylene amides, and Sesamin. Phytochemical screening of Akarkara shows the presence of carbohydrates, proteins and amino acids.

Synonyms of Akarkara-Anacyclus pyrethrum .

Biological Source -Akarkara (Anacyclus pyrethrum) is a flowering plant in the daisy family Asteraceae. It is a small, perennial herb that is native to Mediterranean Europe and parts of North Africa. It is also found in India, Pakistan, and other parts of Europe.

Scientific classification :

Kingdom	Plantae
Division	Spermatophyte
Class	Dicotyledons
Order	Asterales
Family	Asteraceae
Genus	Anacylus
Species	Pyrethrum
Botanical name	AnacylusPyrethrum

Ideal Properties

- Good abrasive effect
- Non-irritant and non-toxic
- Impart no stain in tooth
- Keep the mouth fresh and clean
- Prolong effect
- Cheap and easily available



Synergic Interactions of Akarkara in Herbal Arthritis Oil

INTEREACTION	PRIMARY ACTION	SYNERGESTIC EFFECT
Clove + Akarkara	Analgesic, warming effect	Enhances the pain-relieving property of Akarkara by amplifying its nerve-stimulating and analgesic effects
Peppermint + Akarkara	Cooling, anti-inflammatory	Balances the counter-irritant action of Akarkara by providing a cooling effect, preventing excessive irritation.
Garlic + Akarkara	Anti-arthritic, anti-inflammatory	Boosts anti-inflammatory effects, enhances ab-sorption, and supports deep penetration of active compounds
Camphor + Akarkara	Stimulates circulation, reduces stiffness	Works together to increase blood flow, relieve stiffness, and improve the warming effect of the oil.

Clove (Syzygium aromaticum)

Synonyms: -Eugenia cariophylata Mechanism: Eugenol inhibits pro-inflammatory enzymes like COX-2, reducing pain and swelling .inhibition of prostaglandin synthesis through both cyclooxygenase and lipoxygenase pathways Synergistic Effect: When combined with Akarkara, clove oil enhances the warming sensation and analgesic effects, providing deeper penetration into the affected joint tissues.

Uses :-

• Relieves muscular pain.

• Promotes faster healing.

• Reduce irritability.



Camphor (Cinnamomum camphora)

Mechanism: Camphor stimulates nerve endings, creating a numbing effect that reduces pain perception. It stimulates and desensitizes sensory nerves by activating heat-sensitive TRP vanilloid subtype 1 (TRPV1) and TRPV3 receptors. Synergistic Effect: The formulation is appropriate for both acute and chronic pain management since the combination of Akarkara and camphor helps to balance the warming and cooling effects.



Peppermint (Mentha piperita)

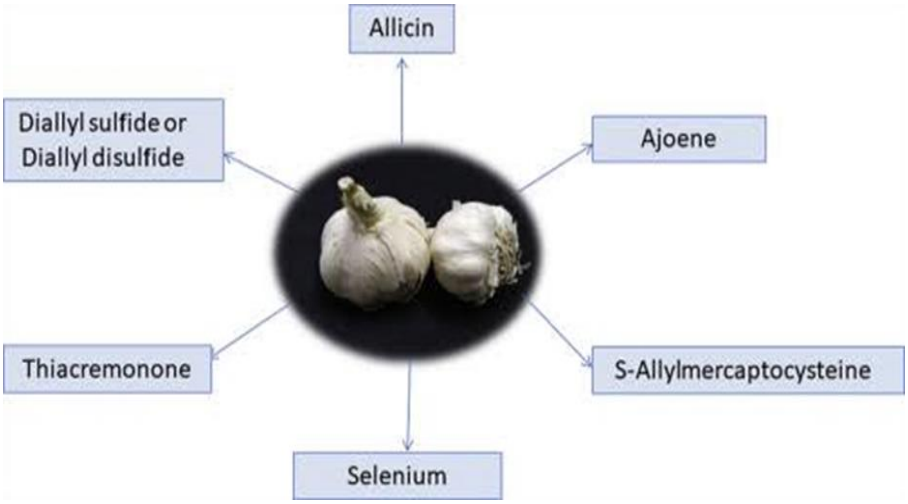
Mechanism: Menthol activates cold-sensitive receptors, producing a cooling sensation that helps in pain relief. Peppermint oil may help relieve joint pain because it has analgesic and anesthetic properties, and its menthol content can create a cooling effect that numbs pain Synergistic Effect:

Because peppermint oil instantly cools down after Akarkara does, it balances out the warming effect of Akarkara and improves the formulation's effectiveness for joint discomfort.



Garlic (Allium sativum)

Mechanism: Garlic suppresses inflammatory cytokines like TNF-α and IL-6, which are associated with arthritis pain. Garlic may help with joint pain because it has anti-inflammatory properties and can reduce the effects of pro-inflammatory cytokines Synergistic Effect: Garlic strengthens the anti-inflammatory qualities of Akarkara, which offers both temporary and long-term pain relief.



- **MATERIALS AND METHODS**

(A) Materials Used

Base Oil: Coconut oil (40 mL)

Herbal Ingredients:

- Akarkara powder – 9 g
- Clove – 1.5 g
- Peppermint oil – 0.8 mL
- Garlic extract – 2g
- Camphor – 0.8 g

(B) Method of Preparation

1. Oil Extraction:

Weigh 10 g of Akarkara powder and mix it with 40 mL of coconut oil in a round- bottom flask (RBF).

Heat at 60°C for 2 hours using a hot plate while stirring continuously.

2.Addition of Active Ingredients:

After cooling, add clove powder (2 g), garlic extract (1 mL), and camphor (1 g).Stir well until camphor dissolves completely.

3. Final Formulation:

Add 0.5 mL of peppermint oil for its cooling effect.

Filter the oil and store it in an amber glass bottle.

Ingredients Table for 40 mL Herbal Arthritis Oil

Ingredients	Quantity	Purpose
Coconut Oil	40ml	Base oil, carrier for herbal actives
Akarkara Powder	9g	Analgesic, anti-inflamm atory, stimulates circulation
Clove	1.5g	Pain relief, antiseptic, enhances warming effect
Peppermint Oil	0.8ml	Cooling, anti-inflammatory, relieves muscle tension
Garlic	2g	Anti-inflamm atory, improves absorption
Camphor	0.8g	Stimulates circulation, reduces stiffness
Water	160ml	Enhances Herbal Infusion

Evaluation of formulated Akarkara joint pain oil

A. Organoleptic Evaluation :-

Color –Yellowish

Odor –Aromatic

Appearance – Clear ad slightly thick

B. Physicochemical Parameters :-

PH - The PH of herbal arthritis oil is determine by using PH meter is obtain 5.3, which is within the acceptable range for topical formulations, ensuring safety and minimal skin irritation.

Spreadability - Spreadability of herbal arthritis oil is determine using glass slide obtain 1.3 indicating moderate spreadability, which is desirable for massage oil formulations.

Viscosity - The viscosity of the herbal arthritis oil was assessed through its spreadability test, revealing a diameter of 1.3 cm, indicating a moderate viscosityThis ensures easy application and good absorption without being too runny.

C. Stability Studies :-

Thermal Stability- Thermal stability determine using storing herbal arthritis oil 24 hour at 40-50°C No phase separation or degradation was observed, indicating good thermal stability.

Odor stability-No significant change in odor was observed over time, Confirming the formulation's odor stability under normal storage conditions.

D. Skin Irritation study (patch test on human skin) :-

A patch test was conducted by applying a small quantity of oil on the hand. After observation, no signs of allergy, redness, or irritation were found, confirming the formulation is non-irritant and safe for external application.

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