

Traditional Polyherbal Topical Oil For Musculoskeletal Leg Pain: An Ethnopharmacological Case Report

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ABSTRACT

Musculoskeletal pain is a prevalent clinical condition that significantly affects mobility, daily activities, and quality of life. Leg muscle pain is among the most common musculoskeletal complaints encountered in clinical practice. Long-term use of conventional analgesics, particularly non-steroidal anti-inflammatory drugs (NSAIDs), is frequently associated with adverse effects, prompting increased interest in complementary and alternative therapeutic approaches. Traditional plant-based polyherbal topical oils are widely utilized in rural communities and traditional medicine systems in India for the management of muscular pain, inflammation, and stiffness. Documentation of such ethnopharmacological practices is important for preserving traditional knowledge and facilitating future pharmacological investigations. The present case report documents the traditional use, observed efficacy, and safety of a polyherbal topical oil formulation containing *Urtica dioica*, *Allium ursinum* (wild garlic), and *Cordyceps militaris*. Observational findings from repeated personal use in musculoskeletal pain conditions were supported by a review of published pharmacological literature. The oil was applied topically twice daily for one week and demonstrated noticeable subjective reduction in pain intensity, muscle stiffness, and fatigue, along with improved comfort during walking and standing. No adverse reactions or skin irritation were observed during the treatment period. Published studies support the anti-inflammatory, analgesic, antioxidant, and immunomodulatory properties of all three ingredients, suggesting mechanistic plausibility through inhibition of cyclooxygenase (COX) and lipoxygenase (LOX) pathways, suppression of inflammatory mediators, and reduction of oxidative stress. The convergence of ethnopharmacological knowledge, scientific evidence, and observational findings suggests that this traditional polyherbal oil may represent a safe and effective complementary therapy for musculoskeletal pain. Nevertheless, larger controlled clinical studies are necessary to validate its efficacy, safety, and therapeutic mechanisms.

Keywords: Ethnopharmacology, topical analgesic, polyherbal oil, traditional medicine, musculoskeletal pain, herbal medicine.

INTRODUCTION

Musculoskeletal pain is one of the leading causes of disability worldwide and significantly impairs mobility, physical function, work productivity, and overall quality of life. Chronic musculoskeletal pain is defined as pain originating from muscles, bones, joints, ligaments, or connective tissues that persists or recurs for more than three months and is often associated with functional disability and emotional distress.¹ Conditions such as lower back pain, myalgia, muscle fatigue, and soft tissue inflammation affect millions of individuals across all age groups.²

Pain involving the lower limbs commonly results from prolonged standing, excessive physical activity,

aging, sports-related injuries, muscular overuse, and inflammatory disorders. Conventional treatment approaches, including analgesics and non-steroidal anti-inflammatory drugs (NSAIDs), mainly provide symptomatic relief but are frequently associated with gastrointestinal, renal, and cardiovascular adverse effects when used long term. Consequently, increasing attention has been directed toward complementary and alternative medicine approaches, particularly medicinal plant-based therapies, for the management of musculoskeletal disorders.³

Medicinal plants contain a wide variety of bioactive compounds possessing anti-inflammatory, analgesic, antioxidant, and circulation-enhancing properties.

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Polyherbal formulations, which combine multiple medicinal plant ingredients, are traditionally believed to produce synergistic therapeutic effects and are widely used in Ayurvedic and folk medicine systems for relieving pain, inflammation, muscular stiffness, and fatigue.⁴

One such medicinal plant is *Urtica dioica* (stinging nettle), which contains flavonoids, phenolic acids, lignans, and polysaccharides with documented anti-inflammatory and analgesic activities. Experimental and clinical studies have demonstrated that nettle extracts may inhibit pro-inflammatory cytokines and reduce pain associated with osteoarthritis and inflammatory conditions.⁵⁻⁷

Another promising natural therapeutic source is *Cordyceps militaris*, a medicinal mushroom traditionally used in Asian medicine. It contains cordycepin (3-deoxyadenosine), polysaccharides, and several bioactive metabolites exhibiting anti-inflammatory, antioxidant, and immunomodulatory properties. Experimental studies suggest that cordycepin suppresses inflammatory mediators and oxidative stress, both of which play important roles in chronic pain and tissue injury.⁸⁻¹⁰

Allium ursinum (wild garlic or ramsons) is rich in sulphur-containing compounds such as allicin and ajoene, which possess antioxidant, antimicrobial, anti-inflammatory, and vasodilatory properties. These compounds may improve local blood circulation, reduce inflammation, and support tissue repair.¹¹⁻¹³

Considering the complementary pharmacological activities of these natural ingredients, their combination in a topical oil formulation may provide synergistic analgesic and anti-inflammatory effects through multiple mechanisms, including suppression of inflammatory mediators, antioxidant protection, enhanced circulation, and tissue regeneration.

This case report describes the traditional use and observed therapeutic effects of a polyherbal topical oil containing *Urtica dioica*, *Cordyceps militaris*, and *Allium ursinum* for the management of chronic leg muscle pain.

MATERIALS AND METHODS

Source of Formulation

The polyherbal oil formulation was purchased from a government-recognized herbal medicine shop in Nainital, Uttarakhand, India. According to local practitioners and vendors, the formulation was prepared using traditional knowledge practiced in rural and forest-adjacent communities, where these medicinal plants are commonly used individually or in combination for topical pain relief.

The oil was green in appearance, possessed a characteristic herbal odour, and exhibited moderate viscosity suitable for massage application.

Method of Application

Approximately 2 mL of the polyherbal oil was applied topically over the affected leg muscles twice daily, once in the morning and once before bedtime, for a duration of one week. Gentle massage was performed for approximately five minutes during each application.

No concurrent oral analgesics, anti-inflammatory medications, or physiotherapeutic interventions were used during the observation period.

RESULTS

Repeated topical application of the polyherbal oil demonstrated noticeable reduction in pain intensity within approximately 15–30 minutes after application. Improvement in muscle relaxation, walking comfort, and joint mobility was also observed. Reduction in localized muscle stiffness and muscular fatigue during daily activities was reported.

No significant skin irritation, allergic reactions, or other adverse effects were observed throughout the treatment period. After one week of continuous application, substantial improvement in leg muscle pain was observed compared with the limited relief previously experienced from conventional medications.

DISCUSSION



The observed analgesic and anti-inflammatory effects of the polyherbal oil formulation may be attributed to the combined pharmacological activities of its herbal constituents.

Urtica dioica has demonstrated significant anti-inflammatory effects through inhibition of nuclear factor-kappa B (NF- κ B) signalling and suppression of inflammatory mediators such as tumour necrosis factor-alpha (TNF- α) and interleukin-1 beta (IL-1 β). Clinical investigations have also reported reductions in pain and inflammation following topical application of nettle preparations in osteoarthritis patients.⁵⁻⁷

Cordyceps militaris contains cordycepin, which has been shown to inhibit inflammatory pathways and reduce oxidative stress. Experimental studies suggest that cordycepin suppresses inflammatory mediator production, modulates immune responses, and promotes tissue recovery.⁸⁻¹⁰

Allium ursinum contains organosulfur compounds including allicin and ajoene, which exhibit antioxidant, anti-inflammatory, antimicrobial, and vasodilatory activities. Improved local blood circulation induced by these compounds may contribute to enhanced tissue oxygenation and reduction of muscular discomfort.¹¹⁻¹³

The combination of these natural ingredients may therefore provide synergistic therapeutic benefits by targeting multiple mechanisms involved in musculoskeletal pain, including suppression of inflammatory mediators, antioxidant protection, enhancement of local circulation, and reduction of oxidative tissue damage.

However, more randomized controlled clinical trials are necessary to validate the therapeutic potential of this herbal formulation.

CONCLUSION

This case report documents the traditional use and observed therapeutic effects of a polyherbal topical oil containing *Urtica dioica*, *Cordyceps militaris*, and *Allium ursinum* for the management of chronic leg muscle pain. The formulation demonstrated significant subjective analgesic and anti-

inflammatory effects without reported adverse reactions. The documented pharmacological activities of the constituent ingredients provide scientific plausibility for the observed therapeutic benefits.

These findings highlight the importance of preserving ethnopharmacological knowledge as a foundation for future drug discovery and integrative pain management strategies. Further preclinical investigations and well-designed clinical trials are required to establish the efficacy, safety, and standardization of this traditional formulation.

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