INTERNATIONAL JOURNAL OF PHARMACEUTICAL SCIENCES
[ISSN: 0975-4725; CODEN(USA): IJPS00]
Journal Homepage: https://www.ijpsjournal.com

OPEN ACCESS

Review Article

Formulation and Evalutation of Polyherbal Oil for Pain Relief

Moin Khan*

Rungta Institute of Pharmaceutical science, Kohka Kurud Bhilai, Chhattisgarh.

ARTICLE INFO

Published: 03 April. 2025
Keywords:
Pain Relief, Anti-Inflammatory, Polyherbal Oil.
DOI:
10.5281/zenodo.15132694

ABSTRACT

The focus of the current study is on developing a polyherbal oil formulation which contains a mixture of herbs having anti-inflammatory and analgesic activities known in traditional medicine. This formulation can be applied in combination with different pharmaceutical emulsions like coconut mustard and some medications such as, turmeric ginger eucalyptus oil white green oil clove ajwain amahaldi dalchini veldt grape camphor. Although there are many allopathic formulations available in the market for the treatment of swelling, they have side effects such as heartburn, stomach pain, nausea, vomiting, diarrhoea, constipation, liver damage, fluid retention, nephrotoxicity, etc. It is believed that herbal medicines are safer than allopathic medicines in the market. Nowadays the demand for herbal formulations is increasing as compared to synthetic formulations. These have better safety and have less side effects. advocates that polyherbal pain relieving oils could serve as a safe and cost effective means of managing pain in populations across the globe but further work is needed to fine tune formulations, establish the effectiveness, and enhance the acceptability and availability to patients

INTRODUCTION

A polyherbal drug is a therapeutic formulation that combines multiple medicinal plants or their extracts to achieve an effect. It relies on ancient medicines' practices, including traditional medicine systems such as Ayurveda, Traditional Chinese Medicine (TCM), and Siddha, in applying the use of herbal combinations to achieve enhanced efficacy, mild side effects, and to target multiple pathways or conditions simultaneously. The polyherbal oil manages and inhibits pain and inflammation. Polyherbal oil is the final product/solution, which is derived from the combination of medicinal oil and extracts from the plants. This oil exploits synergism between numerous herbal therapeutic constituents and that is helpful especially in patients suffering from pain in bones, joints, muscles, back including arthritis. With a great deal of diseases, the common man exploited polyherbal formulations in his attempts at keeping good health. Such practices are narrated

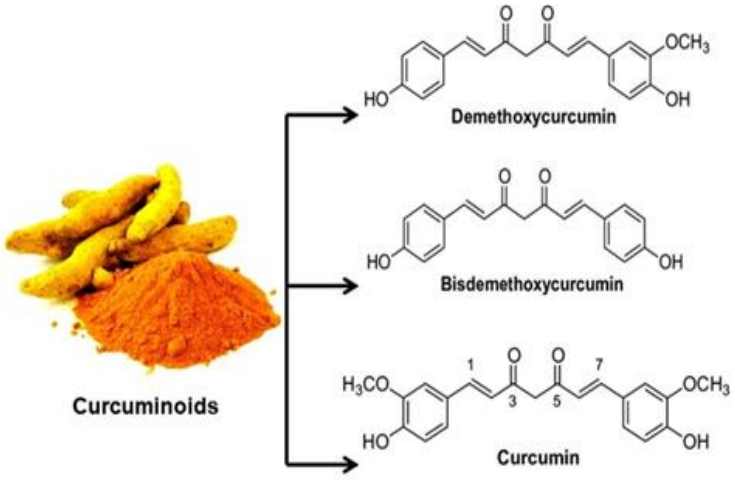
***Corresponding Author:** Moin Khan
Address: Rungta Institute of Pharmaceutical science, Kohka Kurud Bhilai, Chhattisgarh.
Email ✉: ak7651300@gmail.com
Relevant conflicts of interest/financial disclosures: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

in classical texts like Charaka Samhita and Sushruta Samhita in the context of numerous formulations.Traditional herbal medicine has witnessed widespread recognition of its therapeutic properties, with modern scientific research substantiating its effectiveness and use. Identification of bioactive components is achieved through methods such as HPLC and GC-MS. Pain is an unpleasant sensory and emotional experience, most often caused by actual or threatened damage- It serves as a protective utility, informing the body that there is some type of injury or disease. There are two main types of pain: acute pain, which is relatively temporary and can be related to a particular injury or ailment, and chronic pain, which endures for a more prolonged period of time, and there usually is no identified causation. Pain varies in intensity, duration and character, and management necessitates both physical as well as psychological interventions to Chronic pain, arthritis, neuropathic pain, fibromyalgia and other pain-related conditions are the most prevalent diseases worldwide. In turn, these conditions often impact quality of life, productivity and psychological health. Even when newer drugs to treat such pain come on to the market, there are still great major issues when it comes to pain management such as reliance, abuse, and side effects of the same medication in different patients. Traditional natural remedies attract low rates of addiction and low relative risk of generalised negative impact. An increase in access to healthcare for the people who are unable to access the traditional form of healthcare through the use of effective natural therapies.

Selection of Herb for Poly Herbal Oil

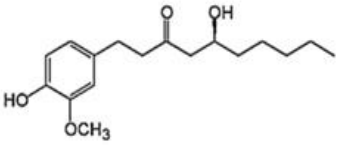
Several herbs are known for their analgesic, anti-inflammatory, and muscle-relaxant properties:

- **Turmeric** (Curcuma longa): Contains curcumin, a potent anti-inflammatory and analgesic compound effective in reducing muscle and joint pain.

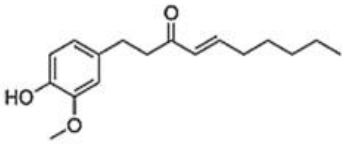


- **Ginger** (Zingiber officinale): Rich in gingerols and shogaols, it alleviates pain and reduces inflammation

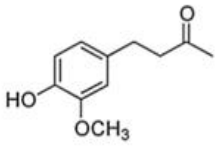
Ginger (*Zingiber officinale*) rhizome



6-Gingerol (Pungent compound in fresh ginger)

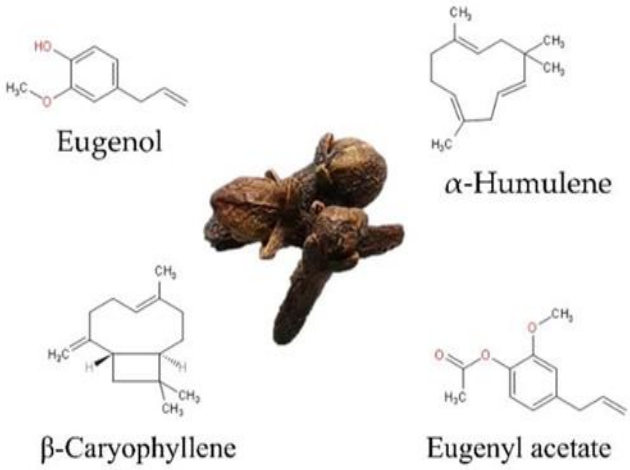


Shogaol (Pungent constituent of ginger produced on drying or cooking)

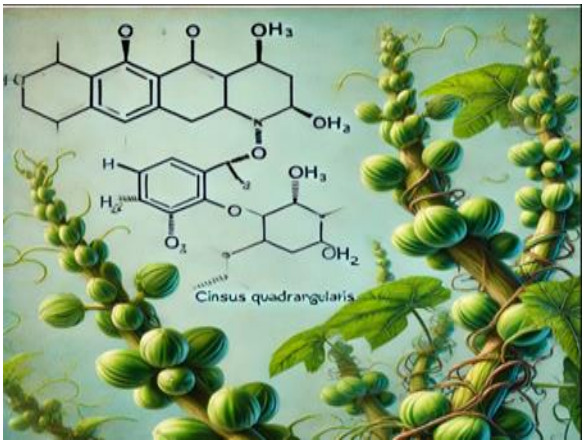


Zingerone (Pungent constituent of ginger produced on drying or cooking)

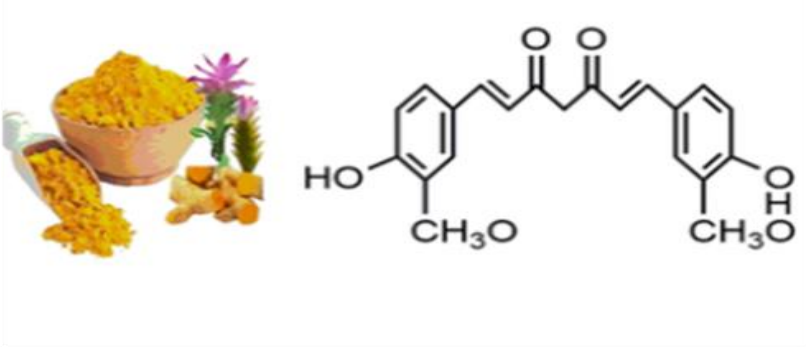
- **Clove** (Syzygium aromaticum): Contains eugenol, a natural pain reliever with anti-inflammatory properties.



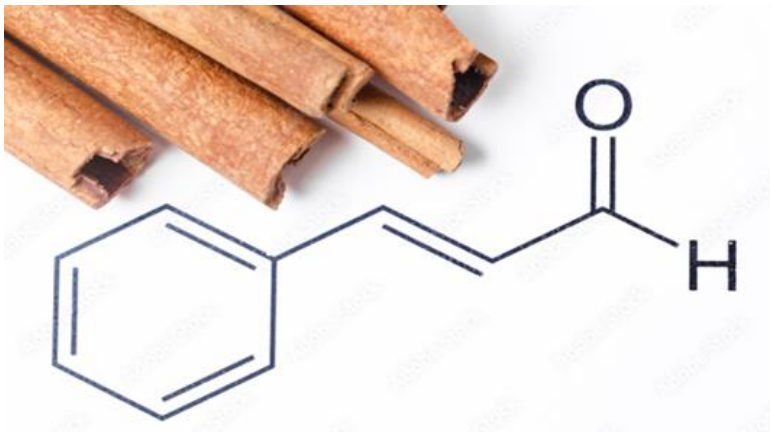
- **Veldt Grape** (Cissus cornifolia) is a medicinal plant with anti-inflammatory, analgesic, and antioxidant properties, traditionally used to relieve joint pain, muscle soreness, inflammation, and promote wound healing.



- **Amahaldi** (Curcuma amada), also known as mango ginger, is a rhizome with anti-inflammatory, antimicrobial, and antioxidant properties, used in traditional medicine for treating skin issues, digestive disorders, and inflammation.



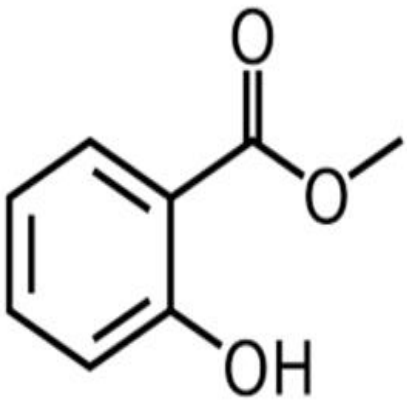
- **Dalchini** (Cinnamomum verum), or cinnamon, is a spice with potent antioxidant, anti-inflammatory, and antimicrobial properties. It is widely used in traditional medicine to treat pain, digestive issues, and respiratory conditions.



Essential Herbal Oil

Eucalyptus oil, rich in eucalyptol, is a natural remedy with anti-inflammatory, analgesic, and antispasmodic properties. It relieves joint pain, muscle soreness, and respiratory discomfort, offering a cooling, soothing effect.Wintergreen oil, containing methyl salicylate, is a potent natural analgesic and anti-inflammatory. It soothes muscle pain, joint stiffness, and cramps while providing a cooling effect, making it ideal for pain relief formulations.

Wintergreen oil, containing methyl salicylate, is a potent natural analgesic and anti-inflammatory. It soothes muscle pain, joint stiffness, and cramps while providing a cooling effect, making it ideal for pain relief formulations.



Technique Use for Extraction of Herbal Oil

Cold Pressing Technique for Formulating Pain Relief Oil

Cold pressing is a non-chemical technique of extracting essential oil commonly used in manufacture of anti- pain ointments nowadays. This technique involves the physical expulsion of oil from seeds, nuts or herb at a temperature below 50°C, which assists to retain antioxidant standards, vitamins and acai fetus fundamentals. For pain relief oils, the carrier oils could include neem, eucalyptus, camphor, and ginger and are normally blended from sesame, coconut/olive oil. First, the herbs are dried and masticated so that the essential healing constituents can be extracted as fully as is possible. These materials are then added to the carrier oil and mechanically expelling the oil under high pressure thus eliminating the use of heat or solvents. Cold pressing also reduces the impact of heat on the extraction process to ensure the medicine retains strong anti-inflammatory, and a pain-relieving property necessary in combating inflammation and pain. The product that is obtained is then filtered to remove any impurities that would then make the final product to be in appropriate for skin application since it is very rich in nutrients. On this method, it is easy to maintain the genuine nature and quality of the oil, which is

good for aching joints, muscles, and arthritis while being on the safe side for skin-prone individuals. Cold pressing is suitable to environmentally healthy production and a process that increases the healing and environmentally friendly aspect of the oil.

Solvent extraction technique on the formulation of pain relief oil

Solvent extraction is widely used when synthesizing pain relief oils when using herbs and plant matters that have low oil extraction rates or when mechanically it is challenging to extract the oil. This involves the use of pulse of hot solvent such as ethanol or hexane to pull out active pharmaceutical ingredients from plants like Eucalyptus, menthol, camphor or turmeric etc. It involves drying and milling plant material to make sure that plant substance presents the highest surface to the starting material as possible. When used, the powdered material is wetted or dispersed in an appropriate solvent with bioactive compounds such as anti-inflammatory and analgesic agents dissolving in the solvent. The plant residue in this mixture is filtered or centrifuged in order to obtain the liquid phase containing the said compounds. The solvent is either evaporated or distilled under reduce pressure and the remaining extract contains therapeutic substances. The aqueous and ethanol extract is then added to the carrier oils, for example sesame oil, coconut oil or olive oil which produce the formula for pain relief. One is that solvent extraction can also be used to produce oils since it results in high yield of highly concentrated active ingredients. But it is rather delicate task to remove any solvent residues and at the same time to obtain the safe preparation for the outer application and possessing the same therapeutic effect.

Decoction technique on the formulation of pain relief oil

Decoction technique is a conventional technique of preparing polyherbal oils for the treatment of pain since it has the potentiality to isolate active phytocompounds from herbs used. To process the oil add begin by preparing a decoction. For every portion of the chosen herbs (turmeric, ashwagandha, ginger, etc.) use 16 parts of water and boil until it is reduced fourfold. It is finally necessary to filter the decoction and remove the insistence of solid particles. Then add equal amount of decoction with 4 parts of any base oils like sesame or coconut oil in a heavy bottom pan. To increase potency, mix a little of the herbal powders and incorporate them into the preparations with turmeric or camphor. Cook the mixture over low heat, while stirring occasionally until all water is driven off from the mixture and all you are left with is oil. This can be tested by the absence of crackling sound when you drop a drop of oil in water namely. The remaining sediment should be filtered out using muslin cloth, leave the oil to cool and then put the oil into sterilized bottles and keep it in a cool dark place. It could be applied in large amount and rubbed gently to the affected areas, helping to provide relief for individuals suffering from discomforting painful sensations, swollen tissues and aching muscles which makes oil an effective natural medicine for pain.

Evolution of Poly Herbal Oil

- **Physical and Chemical Evolution**

These oils are usually prepared by mixing herbal extracts, essential oils and carrier oils which comprise different bioactive ingredients. Spatial change refers to the change in color, change in viscosity, change in texture, and difference in appearance of some object over a period of time. Such properties can be affected by oxidation, exposure to light, and temperature. For instance, with evaporation of essential oils, aromatics and viscosity would change too when they are exposed

to the heat. Alternatively, if the formulation is not stable owing to absence of emulsifiers or any other stabilizing agent, it can lead to phase separation. Chemical evolution may be regarded as a consequence of the reactions between the active components and the environment or their active ingredients. Some of the important transformations are oxidation, hydrolysis and polymerization of fatty acids, terpenoids and phenolic compounds. These reactions may influence the therapeutic efficacy of the oil either positively or negatively. For example, some products of fatty acid oxidation may enhance anti-inflammatory effects while others may cause rancidity or reduced activity. Furthermore, the shelf life of the oil is also influenced by the chemical stability of its constituents such as curcuminoids, alkaloids and flavonoids. Furthermore, to achieve the desired goals, polyherbal oils indeed contain antioxidants and are packed in amber bottles which limit polyherbal oils degradation. However, during the storage bioactive compounds interactions might occur which could lead to a synergistic effect**.**

- **PhytoChemical Evolution**

The polyherbal oil for pain management has undergone cytochemical advancements, which are explained as the alterations occurring at the biochemical level particularly at the cellular level due to the presence of the active phytoconstituents during the processes of formulation, storage and use. The said oils possess a mixture of various bioactive substances including but not limited to; alkaloids, flavonoids, terpenoids, tannins and essential oils that are reported to possess myriad of therapeutic activities including but not limited to anti-inflammatory, analgesic and antioxidant activities. The formulation of the oil and more so the extraction of the herbal ingredients and combining them to produce the herbal oil makes it really complicated at the chemical level. The therapeutic effects of particular chemical compounds have statistically suggested that they may provide some synergistic or adjunctive response. For example, it has been shown that terpenes and phenolic compounds added together are able to increase anti-inflammation by certain cellular pathways such as COX-2 and NF-kB. When environmental factors such as light, heat, and oxygen are introduced, cytochemical modifications start to take place. Essential oils and unsaturated fatty acids can result in oxidative degradation, which can either exacerbate or lessen the oil's biological effectiveness in various forms of phytochemicals. For instance, the activity of terpenes' receptors may change when they degrade, which could change how well the terpenes relieve pain. When applied topically, the oil penetrates the skin intercalating with nociceptors, prostaglandins and free radicals. Flavonoids and other phenolic acids targeting oxygen species may help to maintain oxidative balance across cell membranes, which is thought to bolster skin health.

- **Pharmcological Evolution**

The safety evolution of pain relief oil involves ensuring its non-toxicity and minimizing adverse reactions during formulation, storage, and application. This process integrates the careful selection of ingredients, stability testing, and compliance with safety standards to safeguard user health.

Formulation Phase: Safety begins with the choice of non-toxic, biocompatible herbal ingredients and carrier oils. Ingredients are screened for known allergens or irritants, and their concentrations

Storage Phase: Environmental factors such as heat, light, and oxygen can degrade components,

forming potentially harmful substances. For example, the oxidation of essential oils may lead to skin-sensitizing compounds.

Application Phase: Patch testing is recommended to identify individual sensitivities before widespread application. Safety evolves further through real-world use, where adverse reactions such as redness, itching, or rashes are monitored.

- **Safety Evolution**

Relatively to safety, one should pay heed to this factor – non toxicity of the substance being used as well as other aspects that can be encountered during preparation, storage and application of the pain relief oil. This explains the step-by-step method on how one can choose the right amount of various components, stabilizers, and compliance to the Safety Standard to prevent harm to the consumers. Formulation Phase: Safety start with the decision to use only toxic as well as biodegradable plant products and carrier oils. They are assessed with various food items for potential allergens or reactive compounds as well as the exposure to other conditions such as heat and light in order to prevent the creation of unsafe products due to the interaction of the components and the changes of their physical states. For example, the degradation of oils which are full of nutrients may have harmful skin irritation products due to oxidation. Application Phase: According to the authors, the patch test has to be performed before the actual large scale application of the test product in order to identify people who might react on the side effect. Safety gradually spreads into applications in which adverse reactions like irritation of the skin, redness, and itching, or even rashes are noted and checked out.

Some body pain diseases

1. **Osteoarthritis:** Osteoarthritis (OA) is one of the most common diseases that affect the joints and is particularly known as a wear-and-tear joint disease. With cartilage degradation, bones eventually get contact with each other causing pain, inflammation, swelling, stiffness and reduced flexibility and functionality of the affected part. Osteoarthritis, sometimes referred to as OA, can affect weight-bearing joints in the lower limbs and such in the upper limb as well. Such a person might have osteoarthritis without knowing the precise cause or what it entails such as the impact to the joint or some other changes in the body that cause the joint to be hurt in old age or even a repetitive action in relation to the activity in which the joint is being subjected to. It covers topics such as obesity, the presence of a family history of this disease, previous joint damage, or excessive use.

2. **Rheumatoid arthritis:** Rheumatoid arthritis(RA) is an autoimmune disease which involves the inflammatory action of the immune cells in the synovial tissues, leading to their activation in the affected joints. This causes pains, swellings and inflammation in the wrists, knees, hands, and feet. If left untreated, RA causes loss of joints and can lead to joint deformation and damage in the form of RA. It is supposed to be understood that the cause of RA is not well understood and is probably due to some genetic factor of this condition. Most patients report discomfort due to stiff necks in the morning, fatigue, headache, increased body weight and swelling of the limbs. This manifestation is similar to the conditions such as rheumatic fever where RA can affect both the sides of the body and produce similar effects, also affecting tissues

in the body like those in the gastrointestinal and skin areas.

3. **Back pain:** Back pain is a commonly occurring health issue that hampers people of different ages, impacting their ability to go about their activities and, more importantly, their overall well-being. It refers to an ache or pain in the upper, middle, or lower section of the back, at times sharp, sometimes dull or even numb, which can come and go, or worse, linger on for many weeks or months. Back pain may be acute. Causes of back pain vary greatly. It can be due to bad posture, muscle strain, or overuse from heavy lifting or prolonged sitting. Injuries, such as sprains or fractures, are another common cause. Structural problems like herniated discs, spinal stenosis, or scoliosis can also contribute to back pain. Additionally, medical conditions like osteoporosis, arthritis, or infections may lead to chronic discomfort. Symptoms usually involve stiffness, pain that is localized and sharp or reduced range of motion. Pain can sometimes radiate into the legs, a phenomenon referred to as sciatica. Treatment is usually based on the cause and severity of pain. For milder instances, rest, over-the-counter medication, and physical therapy would usually suffice. On the other hand, more critical cases would necessitate medical care such as injections, surgical interventions, or alternative treatments, for example, acupuncture. To prevent it, individuals can ensure proper posture, lead active lifestyles, and avoid strain to the back. It is important to consult a healthcare professional to diagnose the cause and develop an appropriate treatment plan to manage back pain effectively.

4. **Muscle sprain:** A sprain is a common injury, which is caused by overstretching or tearing of the ligament, a tissue connecting bones to stabilize joints. A sprain is often mistaken for a strain, which is a condition involving muscles or tendons. The injury usually occurs from a sudden movement, overexertion, or trauma such as twisting or falling. Sprains most often occur in joints like the ankle, wrist, or knee. The severity of a sprain varies and is classified as one of three grades: minor (Grade I); some stretching of the ligament, with little tearing and only mild discomfort, mild pain, and full range of motion; moderate sprain (Grade II) where the ligament gets partially torn, leading to swelling, bruising, and limited mobility; a complete ligament tear; the severe sprain would lead to significant pain and swelling with joint instability. Common symptoms of a muscle sprain include pain, swelling, bruising, stiffness, and difficulty using the affected joint. In severe cases, there may be a feeling of a popping at the time of injury. Treatment usually follows the RICE protocol: Rest, Ice, Compression, and Elevation. The patient can use over-the-counter pain relievers to manage the pain and inflammation. In some cases, a doctor may refer a patient to physical therapy for recovery of strength and mobility. Severe sprains are sometimes immobilized using a brace or even surgically repaired to fix the ligament. Prevention of muscle sprains is through proper warm-up prior to exercise, well-developed strength and flexibility, and appropriate footwear. Initial treatment with rehabilitation will thus ensure total recovery and possible prevention in the future.

5. **Sciatica:** Sciatica, therefore, refers to radiating pain along the nerve path of the sciatic nerve, which is said to be the longest nerve in the body. This nerve runs from the lower back, passing through the hips and buttocks, and

down both legs. It usually starts on one side of the body only and occurs when the nerve is compressed, irritated, or inflamed. The common causes of sciatica include a herniated disc, bone spur, spinal stenosis (narrowing of the spinal canal), or muscle spasms that press on the sciatic nerve. Rarely, conditions like tumors or diabetes-related nerve damage can contribute to sciatica. The symptoms include sharp, burning, or shooting pain from the lower back down through the buttock and leg. Some also have numbness, tingling, or weakness of the muscles in the leg or foot that is affected. Pain is worse with prolonged sitting, sudden movements, or activity. Treatment for sciatica depends on the cause and severity of the condition. Mild cases can be treated with self-care measures such as rest, over-the-counter pain relievers, physical therapy, and stretching exercises. Applying heat or ice to the affected area may also help. More severe cases require medical interventions, such as corticosteroid injections, nerve block procedures, or surgery. Maintaining good posture, strengthening core muscles, and avoiding heavy lifting or prolonged periods of sitting prevent sciatica. Early intervention will ensure effective management of symptoms and prevention of recurrence.

REFERENCES

1. Yeom M.J., Lee H.C. and Kim G.H., Anti-arthritic effects of Ephedra sinica STAPF herbacupuncture:
2. inhibition of lipopolysaccharideinduced inflammation and adjuvant-induced polyarthritis, J. Pharmacol. Sci., 2006, 100, 41-50.
3. Gabriel S.E., The epidemiology of rheumatoid arthritis, Rheum. Dis. Clin. North. Am., 2001, 27, 269-281.
4. Asad M., Koteshwar P., Licto T. and Kamath J.D., Evaluation of analgesics and Anti-inflammatory activiyt of Sudard, a Poly-herbal formulation, Iranian J Pharmacol. Ther., 2007, 6, 71-75.
5. Scott D.L., Shipley M. and Dawson A., The clinical management of rheumatoid arthritis and osteoarthritis: Strategies for improving clinical effectiveness, Br. J. Rheumatol., 1998, 37, 546- 554. Mangesh S. Bansod et al /Int.J. PharmTech Res.2010,2(2) 1526
6. Wealth of India: A dictionary of Indian Raw materials and industrial products. (Revised), Council of Scientific and Industrial Research Publication, New Delhi, 1999.
7. Kirtikar K.R. and Basu B.D., Indian Medicinal Plants. Vol. I, 2nd ed., Oriental Enterprises, Dehradun, India, 2000.
8. Morita H., Matsumoto K., Takeya K., Itokawa H. and Iitaka Y., Structures and solid state tautomeric forms of two novel antileukemic tropoloisoquinoline alkaloids, pareirubrines A and B, from Cissampelos pareira, Chem. Pharm. Bull., 1993, 41, 1418-1422
9. C.K. Kokate, Practical Pharmacognosy ,Vallabh Prakashan ,4th edition,145-146
10. Vinod D. Rangari, Pharmacognosy and Pytochemistry, Carrier Publication, 1sted.,part II;364.
11. Dr. Pulok K Mukherjee, Quality Control of Herbal Drugs ;103-216.
12. N.M. Mahajan “Formulation, Development and Evaluation of topical drug delivery system of Diclofinac Sodium, Linseed oil and Ginger oleo-resin,64.
13. Multimer, M.N. Riffskin, C. and Hill J.A.J. Am. Pharm. Assso.,45, 212-214
14. Scientific Committee of Consumer Product” opinion on tea tree oil; Jan-Mar 2011
15. P Ravi Prakash; “Formulation, evaluation and anti-inflammatory activity of etoricoxib gel”, Department of Pharmaceutics, Luqman

College of Pharmacy, Gulbarga, Karnataka (India); Vol.3 Issue 2, April-June 2010.

16. R. Sudeendra Bhat, J. Shankrappa, H. G. Shivakumar "Formulation and evaluation of polyherbal wound treatments" Formulation and evaluation of polyherbal wound treatments/Asian Journal of Pharmaceutical Sciences 2007, 2 (1): 11-17.
17. Jurga Bernatoniene, "Topical application of Calendula officinalis (L.): Formulation and evaluation of hydrophilic cream with antioxidant activity" Journal of Medicinal Plants Research Vol. 5(6), pp. 868-877, 18 March, 2011 Available online at http://www.academicjournals.org/JMPR, ISSN 1996-0875 ©2011 Academic Journals.
18. Marvin S. Balsam, Cosmetics Science And Technology, 2nd ed : pp.302-306
19. Chi. S.C. and Jun H.W., "Anti-inflammatory activity of Ketoprofen gel on carrageenan-induced paw edema in rats." Department of Pharmaceutics, University of Georgia, Athens 30602. J Pharm Sci.;79(11);1990 Nov;974-7
20. Wealth of India: A dictionary of Indian Raw materials and industrial products. (Revised), Council of Scientific and Industrial Research Publication, New Delhi, 1999.
21. Chokshi KS et al., To Prepare a Poly Herbal Formulation Containing Pluchea lanceolata and Vitex negundo and Evaluate its Anti-Inflammatory Activity by Topical Application. American Journal of PharmTech Research 2012. ISSN 2249-3387.Vol 2, Issue 3, 2012.
22. Buch M, Emery P. The aetiology and pathogenesis of rheumatoid arthritis. Hosp Pharm 2002; 9: 5–10.
23. Katz L, Piliero SJ. A study of adjuvant induced poly arthritis in the rat with special reference to associated immunological phenomena. Ann. New York Aca. Sci. 1969; 147: 515–36.
24. Surendra Kr Sharma and Naveen Goyal Department of Pharmaceutical Sciences, Guru Jambheshwar University of Science and Technology, Hisar, India.ISN 0976-1233.Annals of Biological Research, 2011, 2(3); 25-34.
25. William KSX , Bendito JM , Clarissa SL, Qt.al., Topical antiinflammatory action of Caryocar villosum Oil (Aubl) Pers. Journal of Applied Pharmaceutical Science 01(03);2011:62-67
26. Bansod M S, Kagathara V G, Pujari R R, Patel V B, Ardeshna H H, Therapeutic effect of a poly-herbal preparation on adjuvant induced arthritis in Wistar rats. International Journal of Pharmacy and Pharmaceutical Sciences. ISSN-0975-1-491.Vol 3, Suppl 2, 2011.
27. Ansari, A.H. (1818). Ikhtiyarat-i-Bad'i (Book of Bad'i) (in Persian). Manuscript from the collection of the Institute of Manuscripts in Baku, Azerbaijan. Code D -6/1136; copied in (1818).
28. Bamgbose, S.O.A. and Noamesi, B.K. (1981). Planta. Med., 42: 392.
29. Bentley, G.A., Newton, S.H. AND Starr, J. (1983). Studies on the antinociceptive action of aagonist drugs and their interaction with opioids mechanism. British Journal of Pharmacology, 79: 125-134.
30. Bersa, S.E., Sharma, R.M. and Gomes, A. (1996). Anti-inflammatory effect of petroleum ether extract of leaves of Litchi chinensis Gaertn (Sapindaceae). Journal of Ethnopharmacology, 54: 1-6.
31. Carlson, C. (1998). The Benefits of Flax. Herbs for Health, Sept./Oct., 63-65.
32. Chopra, R.N., Nayar, S.L. and Chopra, I.C. (1986). Glossary of Indian Medicinal Plants (Including the Supplement). Council of Scientific and Industrial Research, New Delhi.
33. Correa, C.R., Kyle, D.J., Chakravarty, S. and Calixto, J.B. (1996). Antinociceptive profile of the pseudopeptides B2 bradykinin receptor

antagonist NPC 18688 in mice. British Journal of Pharmacology, 117: 552-558.

34. Damirov, I.A., Prilipko, L.I., Shukurov, D.Z. and Kerimov, Y.B. (1988). Medicinal Plants of Azerbaijan (in Russian). 3rd ed. Baku, Azerbaijan: Maaraif.
35. Deraedt, R., Jougney, S., Delevalcee, F. and Falhout, M. (1980). Release of prostaglandin E and F in an algogenic reaction and its inhibition. European Journal of Pharmacology, 51: 17-24.
36. Duke. J. A. and Ayensu, E.S. (1985). Medicinal Plants of China Reference Publications, Inc. ISBN 0-917256-20-4. Gene, R.M., Segura, L., Adzet, T., Mann, E. and Iglesiaas, J. (1998). Heteeerotheca inuloides: Anti-inflammatory and analgesic effect. Journal of Ethnopharmacology.

HOW TO CITE: Moin Khan, Formulation and Evalutation of Polyherbal Oil for Pain Relief, Int. J. of Pharm. Sci., 2025, Vol 3, Issue 4, 430-441 https://doi.org/10.5281/zenodo.15132694