

Formulation of Polyherbal Cream for Muscles and Joints Pain

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ABSTRACT:

It investigates the helpful potential and uses of four key restorative plants: turmeric (*C. longa*), ginger (*Z. officinale*), lavender (*L. angustifolia*), and aloe vera (*A. barbedensis*). Each plant is distinguished for its unique bioactive compounds and traditional uses in medicine across societies, using extracts and other additives and chemical compounds we created a cream that makes a difference in reducing muscle and joint pain. In which non-stop mortar and pestle mixing was done to create an oil stage and a water stage, which were got the cream surface. Turmeric, with its curcuminoids, is worth considering for its anti-inflammatory properties and effects. Ginger offers gingerol and shogaols, which contribute to its anti-inflammatory properties. These compounds work by inhibiting pro-inflammatory chemicals such as COX-2 and cytokine, reducing oxidative stress and increasing blood flow to affected areas, which helps with muscle recovery and joint pain relief. Lavender essential oil, rich in monoterpenes, is touted for its calming and anti-inflammatory properties. Aloe Vera, known for its polysaccharide-rich gel, is prized in skincare for its moisturizing and wound-mending capabilities. On testing this cream gave palatable result. One of the general practices advised in Ayurveda for the treatment of arthritis and ailments like frozen shoulder, sprains, and synovitis is the local application of medicated oils (bahya snehana), which reduces pain, stiffness, and swelling. To make polyherbal ointment, use Ayurvedic medications are recommended for local use in the aforementioned conditions. This study assesses the ointment's safety and effectiveness in treating these ailments.

KEYWORDS: Polyherbal cream, Joint pain, Anti-inflammatory, Lavender, Ginger, Turmeric.

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INTRODUCTION:

The Indian Subcontinent has long utilized turmeric, sometimes referred to as haldi in Hindi,

for religious, culinary and medicinal uses. Its main active ingredient, curcumin, is what gives it its anti-inflammatory, medicinal qualities and antioxidant. In addition to wounds and sprains,

turmeric is used to treat liver, lung, skin and gastrointestinal disorders one of the ancient remedies for edema and sprains is to apply a mixture of slaked lime and turmeric. Southeast Asian native ginger (*Zingiber officinale*) has long been used for its taste and medicinal properties. Ginger has anti-inflammatory, immune-modulating, antifungal and antidiabetic qualities. It is rich in volatile oils and strong substances including gingerroot and shogaols. Additionally, it increases the efficacy of antifungal drugs and fights against infections that are resistant to drugs. The essential oils of lavender (*Lavandula* spp.), especially *Lavandula angustifolia*, are valued for their fragrant and medicinal properties. Terpenoids and phenolic substances with calming, anti-inflammatory, and antibacterial qualities can be found in its oil. The Liliaceae family succulent aloe vera yields latex and gel with a variety of therapeutic applications. Rich in polysaccharides including acemannan, its gel is administered topically to treat skin problems, burns, wounds and inflammation.

Furthermore, aloe vera formulations include antidiabetic, antiarthritic and anticancer properties. Herbal cosmetics that combine water and oil, such as creams and lotions often contain

ety, effectiveness, biological activity and maximum bioavailability[2]. The most prevalent type of OA is defined by biomechanical and inflammatory processes that are impacted by age, injury, mechanical stress, obesity, oxidative stress as well as metabolic diseases. Degeneration of joint cartilage, alterations in the underlying bone, and synovitis are all components of osteoarthritis (OA), which is irritated by hydrolytic enzymes and seasoned inflammatory mediators[4]. OA typically occurs

these substances. Ginger provides anti-inflammatory effects, lavender adds calming properties, aloe vera hydrates and turmeric improves skin tone. Together, their various bioactive substances offer natural skin care remedies and support general wellbeing. Along with osteoarthritis and rheumatoid arthritis, arthritis presents serious problems that affect the global population and cause painful joint pain. Although pharmacologic treatments are necessary, they can be expensive and have significant side effects, although nonpharmacological agents are often the first line of defense as alternative arthritis treatments[1, 2], especially natural remedies, are gaining popularity due to their ability to accurately and successfully treat arthritis[3]. The purpose of this research is to highlight the benefits of herbal treatment for OA and RA in terms of symptoms, inflammation and pain while summarizing their mechanisms, safety profiles, and effectiveness. These all- natural preparations have potent antioxidants and anti-inflammatory qualities that help lessen tissue damage and inflammation. Certain herbs even offer novel ways to treat RA and OA. Not with standing the positive results, more investigate and testing are required to verify their saf

later in life, progresses slowly, and eventually. Osteoarthritis is a prevalent degenerative musculoskeletal condition that has a significant socioeconomic impact. Rather than controlling the disorder, current treatment options aim to alleviate symptoms, with surgery being used in more advanced stages[5]. The intricate processes underlying the development and progression of OA have prompted research into new treatments, including tiny molecules with a herbal basis[6-8].

Inflammation:

The immune system reaction to irritants, such as wounds, infections, or foreign things like splinters, is inflammation. Redness, edema and discomfort are possible side effects. Compared to oral drugs, topical anti-inflammatory treatments such as diclofenac gel, capsaicin cream, and menthol cream can alleviate inflammation related to discomfort with fewer adverse effects.

Inflammation:

Acute:

Short-term response to injuries or infections, lasting hours to days.

Chronic:

Persistent inflammation without an active threat, often linked to conditions like rheumatoid arthritis, potentially causing long-term damage.

Anti-Inflammatories:

Nonselective COX Inhibitors (NSAIDs):



Materials and Method:

How Anti-inflammatory cream works: With little systemic distribution, anti-inflammatory creams target pain and inflammation in muscles or joints by being absorbed through the skin.

Table 1. Composition Of Anti-inflammatory cream

S. No	Ingredients	Uses	References
1.	Methyl paraben	Preservatives	[11]
2.	Borax	Emulsifying agent	[12]
3.	Bees wax	Anti-inflammatory Antibacterial	[13, 14]
4.	Liquid paraffin	Moisturizer	[15]
5.	Lavender oil	Fragrance	[16]
6.	Turmeric extract	Active ingredient	[17]
7.	Aloevera extract	Active ingredient	[18]
8.	Ginger extract	Active ingredient	[19]
9.	Distilled water	Vehicle	[5]

How to apply anti-inflammatory cream:

1. Wash hands with soap and water.
2. Apply a small amount to the affected area, using a dosing card if provided.
3. Rub until the cream is no longer visible.
4. **Acute:**
5. Follow product instructions, typically applying up to four times daily.
6. Wait at least an hour before showering or washing the area.

After using any anti-inflammatory creams, hands should be washed thoroughly, especially if it is a

capsaicin-based cream. Avoid applying these creams on broken skin, open wounds or swollen areas where tissue is exposed. If even a small amount of cream remains on the hands, avoid touching the face[20]. In this method, extracts from various herbs were used to prepare an anti-inflammatory cream. Oil extracts were obtained from lavender, turmeric, aloe vera and ginger among others. Initially, the selected herbal compounds underwent phytochemical testing to confirm the presence of active compounds such as curcuminoids, flavonoids and anthraquinones[21]. The cream was prepared by mixing liquid paraffin and beeswax as the oil phase. Methyl paraben and borax were added to water to form the aqueous phase. Both phases were heated separately to 75°C and then mixed continuously until a smooth and uniform consistency was achieved. To enhance the therapeutic properties of the cream, herbal extract were incorporated during the titration process[22]. The formulated cream was subjected to various analytical tests to evaluate its quality and performance. These tests included the assessment of stability, viscosity, pH and spreadability. Furthermore, a skin irritation test was conducted to ensure its safety and suitability for topical application. The results indicated that the cream was stable, easy to apply, and effective as a natural anti-inflammatory product[23, 24].

EQUIPMENT:

- Analytical balance
- Beakers
- Magnetic stirrer
- Spatulas
- Sterile containers

- Filter paper/Whatman
- Rotary evaporator
- Gloves,
- Goggles and lab coat.

Collection of Plant Material:

The plant ingredients needed to make the polyherbal cream were gathered from reliable local supplies. Based on their morphological characteristics, fresh and healthy plant parts were selected and identified. Standard reference literature was used to confirm each plant's identity, and a botanist verified it further. The gathered samples were ground into a powder using a grinder, shade-dried at room temperature. Before being used again, the powdered plant material was kept in airtight containers[6, 8, 25].

Crude Extract Preparation:

- They picked fresh **Ginger** rhizomes cleaned them well with distilled water and dried them in the shade for 7-10 days[26].
- The dried material was roughly pulverized with a grinder.
- The maceration method used to extract 50g of powder ginger with 250 ml. of ethanol (1;5 ratio w/v) for 72 hours.
- The extract was filtered using muslin cloth, followed by Whatman filter paper.
- The filtrate was concentrated under decreased pressure using a rotary evaporator at 40 °C and the dried crude extract was weighed.
- Then **Turmeric** rhizome were washed, boiled for 30 minutes, shade dried, and pulverized[8, 22, 27].

- Using Soxhlet extraction method, 50g of Haldi powder was extracted with 250 ml of ethanol (1;5 ratio w/v) for 6-8 hours until the solvent became colorless.
- The extract was filtered and concentrated using a rotary evaporator. The crude extract was dried and stored in airtight jars at 4°C.
- Now Fresh **Aloe Vera** leaves were washed, and the outer green rind was carefully peeled to extract the interior gel. The gel was homogenized into a pulp.
- 50 g of Aloe vera gel was mixed with 250 mL of ethanol (1:5 w/v) and cold macerated for 72 hours, with periodic shaking[23, 28, 29].
- The mixture was filtered and concentrated at low pressure. The crude extract was collected and stored in airtight containers at 4°C.



Ingredients of Polyherbal Gel. A. zingiber officinale, B. Curcuma longa, C. Aloe Barbadensis

Table:Crude Extract preparation and Yield

Plant Name	Part Used	Wt. Of Sample (g)	Solvent Used	Method of Extraction	Wt of Extract Obtained (g)	% Yield
Ginger (<i>Zingiber officinale</i>)	Rhizome	50 g	Ethanol (250 mL)	Maceration (72 hrs)	7.5 g	15.00%
Turmeric (<i>Curcuma longa</i>)	Rhizome	50 g	Ethanol (250 mL)	Soxhlet (6–8 hrs)	8.2 g	16.40%
Aloe vera (<i>Aloe barbadensis</i>)	Leaf Gel	50 g	Ethanol (250 mL)	Cold Maceration (72 hrs)	6.5 g	13.00%

Polyherbal Gel Formulations:

Methylparaben + Propylparaben as a preservative (0.2%), propylene glycol is Humectant/ co-solvent (10.0%), Triethanolamine (TEA) is a neutralizer to thicken Carbopol (0.5%) Ginger extract (ethanolic) is anti-inflammatory/ antimicrobial (2.0%), Turmeric extract (ethanolic) is anti-inflammatory and antioxidant (2.0%) Aloe Vera extract is an soothing agent is (1.0%) were mixed in Distilled water is vehicle (82.8%) and Carbopol 940 which is Gelling agent (0.5%) was added and vigorously shaken to ensure adequate mixing before being put into disposable bottles with spray caps for application[30, 31].

Stability studies

The polyherbal gel with turmeric, ginger, and aloe vera extracts was tested for stability at room temperature (25 ± 2 °C) and accelerated conditions (40 ± 2 °C / 75% RH) for three months. The formulation preserved its yellowish color, smooth texture, and distinct odor with no evidence of phase separation or syneresis. The pH stayed steady at 5.7-6.1, while viscosity varied by less than 10%, indicating satisfactory consistency and spreadability[31]. Microbiological testing revealed the lack of contamination, and the preservation efficacy remained adequate. These findings show that the gel formulation is both physically and microbiologically stable, making it ideal for safe topical usage[3, 32].

Preservative Efficacy

Follow the USP <51> or ISO 11930 approach by inoculating the product with standard strains (e.g., *S. aureus*, *P. aeruginosa*, *E. coli*, *C. albicans*, *Aspergillus brasiliensis*) and tracking log decrease at specific time points. Define pass/fail criteria based on the selected guideline[33].

RESULT AND DISCUSSION

The herbal anti-inflammatory cream was successfully formulated and optimized using extracts from *Curcuma longa* (turmeric), *Zingiber officinale* (ginger), and *Boswellia serrata*. The formulation was evaluated for various parameters including physical properties, anti-inflammatory activity, and stability.

Physical Properties:

The optimized cream exhibited good

spreadability, smooth texture, and non-greasy feel, making it suitable for topical application. The pH of the cream was found to be within the skin-friendly range (pH 5.5–6.0). Viscosity and consistency tests showed the cream had the right consistency for easy application.

Anti-Inflammatory Activity:

In vitro studies showed that the cream exhibited significant anti-inflammatory activity. The herbal extracts, particularly *Curcuma longa*, showed strong inhibition of cyclooxygenase (COX-2) enzyme activity.

Stability Testing:

The cream maintained its physical appearance, viscosity, and pH over a 3-month period under varying temperature conditions, showing that it has good stability. No microbial contamination was observed, indicating the effectiveness of the preservatives.

DISCUSSION:

The results indicate that the natural anti-inflammatory cream formulated with herbal extracts is both effective and stable. The combination of *Curcuma longa*, *Zingiber officinale*, and *Boswellia serrata* offers a synergistic anti-inflammatory effect that can potentially reduce the side effects commonly associated with synthetic anti-inflammatory drugs. The optimized cream formulation showed excellent skin compatibility and demonstrated promising therapeutic potential for treating inflammatory conditions such as arthritis, muscle pain, and skin irritation.

This study primarily aimed to develop an effective herbal anti-inflammatory cream using

turmeric as the key ingredient. The formulated turmeric-based cream displayed superior physicochemical properties when compared to existing commercial products. Its active constituents were effectively released, demonstrating potent anti-inflammatory effects, as validated by the carrageenan-induced rat paw edema method. Curcumin, a natural pigment derived from *Curcuma longa*, is well-known for its medicinal properties. The herbal cream presents a promising alternative to synthetic formulations. Future clinical trials could play a crucial role in establishing its efficacy and broader application. Additionally, advancements in the pharmacokinetics and anti-inflammatory potential of curcumin have been achieved through structural modifications, formulation research, and combination therapies. Among these approaches, dietary supplements or curcumin-based adjuvant drugs have shown the most practical therapeutic benefits, offering a viable method for curcumin application in current medical practice. Ayurveda, an ancient science of life, has a rich history, and its core principles remain applicable today. The need for scientific evaluation of Ayurvedic medicine has been recognized for a long time. The foundation of all sciences lies in the continuous pursuit of knowledge through research, innovation, and development. Continuous research is essential to assess the efficacy, safety, and quality of Ayurvedic treatments and medicines. Systematic validation and critical analysis of clinical practices are crucial. Herbal anti-inflammatory cream, a common Ayurvedic remedy, has been studied to explore its potential as a base for topical medications. This cream could serve as an alternative to conventional topical ointments in the future. Combining phytoconstituents or herbal medicines with anti-inflammatory cream

could lead to the creation of an effective herbal formulation. Scientific research is necessary to validate biological activity, ensure safety, and establish standardized guidelines.

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