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Research Paper

Formulation Of Herbal Aniti Arthritis Oil Using Zingiber Officinale and Boswellia Serrata

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ABSTRACT

Rheumatoid arthritis is a chronic inflammatory stiffness. The present study focuses on the formulation and evaluation of a herbal anti-arthritic oil containing Zingiber officinale (Ginger) and Boswellia serrata. Both herbs possess significant anti-inflammatory and analgesic properties that help reduce joint inflammation and pain. 2. The formulated herbal oil was evaluated for its of physicochemical properties and stability. The results suggest that the herbal oil may serve as a safe, effective, and natural alternative for the management of arthritis with fewer side effects compared to conventional therapies

INTRODUCTION

1.1 HERBAL DRUG

An herb is a plant or plant part used for its therapeutic properties, flavor or scent. Herbal drugs are type of dietary supplements, hence they are marketed as different dosage forms like tablets, capsules, powders, in the form of tea bags, solid extracts and sometimes as fresh or dried plants. People use herbal drugs to maintain or improve their general health. [1]

1.2 RHEUMATOID ARTHRITIS

Rheumatoid Arthritis is an autoimmune inflammatory disorder, affecting synovial joints, damage articular cartilage also causes bone erosion and deformity. NSAIDs are the first line drugs and afford symptomatic relief in pain, swelling, morning stiffness, immobility, but they do not arrest the disease process.

Drug therapy is targeted to ameliorate pain, joint stiffness, articular cartilage damage, hone erosions, and also to preserve joint function Treatment usually begins with medications to reduce pain and inflammation in mild to moderate cases of arthritis Drugs such analgesics, non-steroidal anti-inflammatory drugs with some

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immunosuppressant drug of choice in relieving pain, inflammation and stiffness of joints.

These treatments have various side effects like gi disturbance, poor immunity, hepatic and nephrotoxicity. Herbal based treatment have good tolerability, safety and effectiveness than above conventional treatment, Herbal drugs are gaining popularity in the treatment of chronic disease like jaundice, vitiligo, rheumatoid arthritis, asthma etc. Ginger (extract of Gingiber officinale) act as a potent anti-inflammatory 6-Gingerols, gingerdiol, gingerdione, shogaol and paradol are the active principles of ginger extract. Studies revealed that 6-gingerol shows in-vivo anti-inflammatory properties after intra peritoneal or topical administration. [2]

Till it is believed that cause of rheumatoid arthritis is unknown, but it is supposed to be triggered by the combination of genetic susceptibility and exposure to environmental factors. A critical role for T cells in the pathogenesis of RA is suggested by the strong association between RA and certain human leukocyte antigen (III.A) haplotypes. Recent data suggest that the destruction of rheumatoid joints is initiated by complexcell-cell interaction between antigen presenting cells and CD4+T cells. However, it is thought that these cell-cell interaction result in the activation of

Macrophages and induction of the inflammatory process, culminating in degradation and resorption of cartilage and bone. The drugs commonly in use for the treatment of arthritis include NSAIDS (eg Ibuprofen and naproxen) and glucocorticoids (eg-cortisone and prednisone) to

Suppress the symptoms, while. Disease-modifying antirheumatic drugs (DMARDs) such as anti-tumour necrosis factor (TNF)-a therapy (eg-etanercept, infliximab and adalinumab), anti-CD20 therapy (eg-rituximab) and abatacept are often required. To inhibit or halt the underlying immune process, [3]

1.3 Advantages of Herbal Anti-Arthritic Oil

1. Natural and plant-based formulation.
2. Effective anti-inflammatory action.
3. rovides pain relief and reduces joint stiffness.
4. Direct action at the site of inflammation.
5. Improves blood circulation around affected joints.
6. Suitable for long-term use. [4]

1.4 Disadvantages of Herbal Anti-Arthritic Oil

1. Lack of standardization may lead to variable therapeutic effects.
2. Herbal oils generally have a slower onset of action.
3. Some users may experience allergic reactions or skin irritation.
4. Herbal oils may undergo oxidation and degradation during storage.
5. Strong odor and greasy texture may reduce . [5]

2. DRUG AND EXCIPIENTS PROFILE

1.Zingiber Officinale (Ginger)

Figure No 2.1 : Ginger Rhizome and Ginger Powder

Synonyms: Zingiber, Adrak, Sonth (dried ginger)
Biological Source: It consists of dried rhizomes of Zingiber officinale.
Family: Zingiberaceae
Geographical Source: Mainly cultivated in India (Kerala, Karnataka, Maharashtra), China Jamaica, Nigeria.
Uses : Anti-inflammatory, Analgesic.

2.Boswellia Serrata

Figure No 2.2: Boswellia Serrata and Boswellia Serrata Powder

Synonyms: Indian Frankincense, Salai Guggul, Salai, Shallaki (Ayurvedic name)
Biological Source: Boswellia serrata consists of the dried oleo-gum-resin obtained by incision of the bark of Boswellia serrata.
Family: Burseraceae
Geographical Source: Boswellia serrata is mainly found in the dry hilly regions of India, particularly in the states of Madhya Pradesh, Rajasthan.
Uses: Anti-inflammator **,**Analgesi**.**

3.Turmeric

Figure No 2.3: Turmeric Rhizome and Turmeric powder

Synonyms: Haldi, Haridra, Curcuma
Biological Source: Turmeric is the dried rhizome of Curcuma longa Linn., belonging to the family Zingiberaceae.
Geographical Source: It is mainly cultivated in India, China, Malaysia, and other tropical countries.
Chemical Constituents: Curcumin, turmerone, zingiberene, volatile oil, resin, and starch.
Uses: Anti-inflammatory agent, Relieves joint pain and swelling.

3. METHODOLOGY

Sr.No	INGREDIENTS	FAMILY	USES	COLLECTION
1	Zingiber Officinale(Ginger)	Zingiberaceae	Anti-inflammatory , Analgesic, Antioxidant, Improve blood circulation.	Collected from market
2	Boswellia Serrata	Burseraceae	Anti-inflammatory,Analgesic, Antioxidant, Improves joint mobility.	Collected from market
3	Turmeric	Zingiberaceae	Relieves joint pain, Reduce swelling and redness, Improves joint mobility.	Collected from market
4	Sesame Oil	Pedaliaceae	Acts as a carrier base oil, Enhances skin penetration of active constituents.	Collected from market
5	Peppermint Oil	Labiatae	Provides a cooling sensation to affected joints, Reduces muscle soreness.	Collected from market
6	Vitamin E Oil	Tocopherol	Increase shelf life of formulation .	Collected from market

4.FORMULATION TABLE

SR.No	INGREDIENTS	F1	F2	F3
1	Zingiber Officinale (Ginger)	5g	7g	10g
2	Boswellia serrata	5g	7g	10g
3	Turmeric Oil	2ml	3ml	5ml
4	Sesame Oil	86ml	81ml	74ml
5	Vitamin E	0.05ml	0.05ml	0.05ml
6	Peppermint Oil	0.05ml	0.05ml	0.05ml

5. METHOD OF PREPARATION

Step 1: Collection and Preparation of Raw Materials

- Collect dried Ginger (Zingiber officinale), Boswellia serratą resin, and Turmeric (Curcuma longa).
- Clean all crude drugs to remove dust and impurities.

Figure No 5.1 Collection and Preparation of Raw Materials

- Dry them completely if moisture is present.
- Grind ginger and Boswellia into coarse powder for better extraction.

Step 2: Weighing of Ingredients (as per formulation F1-F5)

- Weigh required quantity of:
- Ginger (5-15 g depending on formulation)
- Boswellia serrata (5-15 g)
- Measure turmeric extract/oil and other additives accurately.

Step 3: Fomentation / Heat Infusion Process

- Take required quantity of sesame oil (base oil) in a clean stainless steel beaker.
- Add weighed ginger powder + Boswellia serrata powder into the oil.
- Heat the mixture on a water bath (indirect heating method) at 60-70°C.
- Maintain gentle stirring for 1-2 hours to ensure proper extraction of active compounds.
- This step allows transfer of active phytoconstituents into oil base.

Figure No 5.2. Infusion process.

Step 4: Filtration

- After heating, allow the mixture to cool slightly.
- Filter using Whatman filter paper to remove solid
- residues.
- Collect clear herbal infused oil.

Figure 5.3.Filtration Process

Step 5: Addition of Other Ingredients

- To the filtered oil, add:
- Turmeric oil/extract (Curcuma longa)
- Vitamin E oil (antioxidant)
- Peppermint oil (cooling and analgesic effect)
- Mix thoroughly to ensure uniform distribution.

Step 6: Storage And Packaging

- Transfer the prepared oil into the amber colour glass bottles.
- Label properly with:
- Name of formulation
- Batch number (F1-F5)
- Date of preparation
- Store in a cool, dry place away from sunlight.

Figure 5.4(a)Storage

Figure 5.4(b)

Packaging and labelling

1,Organoleptic Evaluation Test

5. RESULT

Parameter	F1	F2	F3
Appearance	Clear oily liquid	Clear oily liquid	Slightly turbid oily liquid
Colour	Yellowish-brown	Yellowish-brown	Pale yellow
Odour	Characteristic herbal, camphoraceous	Herbal, camphoraceous	Strong herbal, camphoraceous
Touch Sensation	Mild warming effect	Mild warming effect	Moderate warming effect

All three batches of anti-arthritic oil showed consistent organoleptic properties in terms of appearance, color, odor, texture, consistency, homogeneity, and warming sensation. Minor variations in turbidity and odor intensity were observed but remained within acceptable limits, indicating good batch uniformity and formulation consistency.

2.Skin Irritancy Test

Parameters	F1	F2	F3
Itching	Absent	Absent	Absent
Swelling	Absent	Absent	Absent
Observation	Non Irritant	Non Irritant	Non Irritant

All formulations (F1-F3) of anti-arthritic oil showed no itching or swelling on topical application, indicating that the preparations are non-irritant and safe for skin use.

3.Spreadability Test

Parameter	F1	F2	F3
Spradability Test	Poor	Good	Best

All formulations (F1-F3) of anti-arthritic oil showed good spreadability on skin, indicating that the oil can be easily applied and evenly distributed over the surface, ensuring proper application and effectiveness.

4.Viscosity

Parameter	F1	F2	F3
Viscosity	1.2Pa.s	1.4Pa.s	1.6Pa.s

All formulations (F1-F3) showed an increase in viscosity from F1 to F3, indicating gradual thickening of the oil. The values remained within acceptable limits, suggesting good flow properties and suitable consistency for topical application.

5.pH Test

Parameter	F1	F2	F3
pH Test	6.2	6.3	6.4
Observation	Slightly Acidic,Suitable for skin.	Mildly Acidic.Skin friendly.	Near Natural,Safe for topical use

All formulations (F1-F3) showed pH in the range of 6.2-6.4, indicating a mildly acidic nature compatible with skin pH, confirming that the oil is non-irritant and suitable for external application.

CONCLUSION

The formulation of herbal anti-arthritic oil using Zingiber officinale (Ginger) and Boswellia serrata (Indian Frankincense) represents a promising natural approach for the management of arthritis and associated inflammatory conditions. Both herbal ingredients possess well-documented anti-inflammatory, analgesic, and antioxidant properties that help reduce joint pain, swelling, stiffness, and improve mobility.

The developed oil formulation provides localized drug delivery directly to the affected joints, enhancing therapeutic efficacy while minimizing systemic side effects commonly associated with conventional anti-arthritic drugs. Ginger constituents such as gingerols and shogaols contribute to pain relief and inflammation control,

whereas boswellic acids from Boswellia serrata inhibit inflammatory mediators responsible for joint degeneration and discomfort.

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