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Formulation and Evaluation of Mahua - Giloy Herbal Cream for Joint Pain

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Abstract

The present study focuses on the formulation and evaluation of a herbal cream containing Mahua (*Madhuca longifolia*) and Giloy (*Tinospora cordifolia*), both of which are well-known medicinal plants in traditional Ayurvedic medicine. Mahua possesses significant anti-inflammatory, analgesic, and antioxidant properties, while Giloy is widely recognized for its immunomodulatory, anti-arthritic, and anti-inflammatory activities. The combination of these two herbs is expected to provide a synergistic effect in relieving joint pain and improving joint function.

The herbal cream was prepared using a suitable emulsification method, incorporating natural oils, waxes, and other excipients to ensure stability, spreadability, and skin compatibility. Various evaluation parameters such as physical appearance, pH, viscosity, homogeneity, spreadability, and stability studies were carried out to assess the quality of the formulation. Additionally, the therapeutic efficacy of the cream was evaluated based on its ability to reduce inflammation, pain, and stiffness.

The results demonstrated that the formulated Mahua-Giloy herbal cream exhibited good consistency, acceptable pH, excellent spreadability, and stability under different storage conditions. The presence of active phytoconstituents contributed to its significant anti-inflammatory and analgesic effects, making it effective in managing joint pain. The formulation was found to be safe for topical application, with minimal risk of irritation or adverse effects.

Introduction

Herbal formulations have been used since ancient times in traditional systems of medicine such as Ayurveda, Unani, and Siddha. Among various medicinal plants, Mahua (*Madhuca longifolia*) and Giloy (*Tinospora cordifolia*) are widely recognized for their therapeutic properties. These plants possess significant anti-inflammatory, analgesic, antioxidant, and immunomodulatory activities, making them suitable candidates for the treatment of joint pain and arthritis.

Mahua is a large tropical tree commonly found in India. Different parts of the plant, including flowers, bark, and seeds, are used for medicinal purposes. It is known for its anti-inflammatory and pain-relieving properties, which help in reducing swelling and discomfort in joints. Mahua also contains bioactive compounds such as flavonoids, saponins, and triterpenoids that contribute to its therapeutic effects.

Giloy, also known as “Amrita” or the “root of immortality,” is a climbing shrub widely used in Ayurvedic medicine. It is well known for its immunomodulatory and anti-inflammatory properties. Giloy helps in strengthening the immune system, reducing inflammation, and improving joint function. It contains important phytoconstituents such as alkaloids, glycosides, steroids, and polysaccharides, which are responsible for its medicinal activities.

The combination of Mahua and Giloy in a topical herbal cream formulation provides a synergistic effect, enhancing their individual therapeutic benefits. A herbal cream is an ideal dosage form for the treatment of joint pain as it allows direct application to the affected area, providing localized relief, improved absorption, and minimal systemic side effects.

Advantages of Herbal Cream (Mahua–Giloy Cream)

o Natural and Safe

Herbal creams are prepared using natural plant extracts such as Mahua (*Madhuca longifolia*) and Giloy (*Tinospora cordifolia*), which are generally safer compared to synthetic drugs and have minimal side effects.

o Anti-inflammatory and Analgesic Properties

Both Mahua and Giloy possess strong anti-inflammatory and pain-relieving properties, making the cream effective in reducing joint pain, swelling, and stiffness.

o Localized Action

The cream is applied directly to the affected area, providing targeted relief without affecting the whole body, thereby reducing systemic side effects.

Improved Patient Compliance

Topical creams are easy to apply, non-invasive, and convenient to use, increasing patient acceptance and compliance.

o Reduced Side Effects

Unlike oral NSAIDs, herbal creams do not cause gastrointestinal irritation, kidney damage, or cardiovascular issues when used properly.

o Moisturizing Effect

The presence of natural oils and excipients helps in moisturizing the skin and improving skin health.

o Cost-effective and Easily Available

Herbal ingredients are widely available and relatively inexpensive, making the formulation affordable.

o Synergistic Effect

The combination of Mahua and Giloy enhances therapeutic efficacy due to their combined pharmacological actions.

INGREDIENTS USED IN FORMULATION

PLANT PROFILE

MAHUA

Kingdom: Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Floral

Family: Sapotaceae

Botanical Name: *Madhuca indica*

Common Name: MahuaSource: Flowers, Seeds, Bark

Chemical Constituents: Saponins, Flavonoids, Alkaloids.

Uses: Analgesic (pain relief), Anti-inflammatory, Useful in joint pain .



PLANT PROFILE

GILOY

Kingdom:- Plantae

Division: Magnoliophyta

Class: Magnoliopsida

Order: Ranunculales

Family: Menispermaceae

Botanical Name: *Tinospora cordifolia*FIG.-2

Common Name: Giloy / Guduch

Source: Stem (mainly), Leave

Chemical Constituents: Alkaloids, Glycosides,

Diterpenoid lactones,

Uses: Anti-inflammatory, Immunomodulatory, Anti-arthritis, Pain relief in joint disorders



INGREDIENTS & COMPOSITION OF MAHUA AND GILOY HERBAL CREAM FOR JOINT PAIN



Ingredient	Quantity (gm)	Purpose
	15.00 g	Emollient, analgesic; traditionally used to reduce rheumatism
 Mahua Oil (<i>Madhuca longifolia</i>)	15.00 g	Emollient, analgesic; traditionally used to reduce rheumatism
 Giloy Extract (<i>Tinospora cordifolia</i>)	10.00 g	Anti-inflammatory; helps reduce joint swelling and modulate immunity
 Beeswax / Shea Butter	20.00 g	Base; provides cream consistency and enhances absorption
 Essential Oils (Peppermint, Eucalyptus)	5.00 g	Penetration enhancers; Peppermint provides cooling sensation and reduces pain
 Turmeric Powder, Ginger Extract	5.00 g	Anti-inflammatory herbs; Turmeric, ginger provide natural anti-inflammatory and analgesic actions
Other Ingredients	Quantity (gm)	Purpose
Camphor, Rose Oil,	q.s.	Thickening, moisturizing, stabilizing, preserving herbal cream
Stearic Acid, Glycerin,	q.s.	Thickening, moisturizing, stabilizing, preserving herbal cream
Tecyl Alcohol, Triethanolamine, Liquid Paraffin, (Preservatives)	q.s.	Thickening, moisturizing, stabilizing, preserving herbal cream

INGREDIENTS IN MAHUA AND GILOY HERBAL CREAM FOR JOINT PAIN

Ingredient	Primary Property	Primary Property	Role in Joint Pain
	Mahua Oil (<i>Madhuca longifolia</i>)	Emollient & Analgesic	Traditionally used in India to reduce rheumatism and muscle tension.
	Giloy Extract (<i>Tinospora cordifolia</i>)	Anti-inflammatory	Known as 'Amrita,' it helps reduce swelling and modulates immune response.
	Base (Wax/Butter)	Carrier	Beeswax or Shea butter to provide the 'cream' consistency and skin absorption.
	Essential Oils	Penetration Enhancer	Peppermint promotes cooling sensation and helps in deeper penetration of the herbal ingredients

TABLE.2

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PROCEDURE

1. Selection of ingredients

Common herbs used:

- Mahua (MadhucaLongifolia)
- Giloy (TinosporaCordifolia)

2. Drying and Powdering

- Wash raw herbs to remove dirt.
- Dry them under shade (to preserve active constituents).
- Grind into a fine powder using a grinder.
- Sieve to get uniform particle size.

Preparation of Extract (Decoction)

- Take required quantities of powdered herbs.
- Soak in distilled water (overnight if possible).
- Boil the mixture for 15–30 minutes.
- Cool and filter using muslin cloth or filter paper.
- Collect the clear extract.

Formulation of cream base

- Add thickening agents (e.g., stearic acid).
- Add natural herbs (mahua and giloy).
- Mix the herbal extract with the base.

Addition of Additives [10]

- Preservatives (if long storage is required; e.g., methyl paraben)
- Fragrance (essential oils like rose oil, rosemary)
- pH adjusters (Triethanolamine pH -5–6.5)

Mixing

- Stir the mixture continuously to obtain uniform consistency.
- Avoid formation of lumps.

Filtration and Filling

- Filter again to remove impurities.
- Fill into clean, dry containers.

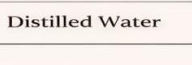
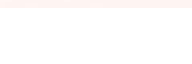
Storage

- Store in a cool, dry place.
- Use affected area in small amount.

INGREDIENTS USED

S.no	INGREDIENTS	FUNCTION	QUANTITY	USES
1.	Mahua oil	Humectant	15.Gream	Moisturizes skin and reduce inflammation
2.	Giloy extract	Primary surfactant	10 Gram	Reduce inflammation and joint pain
3.	Beeswax	Base	20 Gram	Provide structure and protective barrier
4.	Stearic acid	Thickener	5 Gram	improve consistency and stability
5.	Glycerin	Humectant	10Gram	Retains moisture and prevent dryness
6.	Camphor	Provide cooling	2 Gram	Provide cooling and pain relief
7.	Rose oil	Fragrance	1 Gram	Adds fragrance and mild smoothing effect
8.	Cetyl alcohol	Stabilizer	3Gram	Stabilizes and smoothness the cream
9.	Liquid paraffin	Moistueizer	5 ml	Hydrate and softness skin
10.	Triethanolamine	Ph adjuster	2 ml	Maintains ph and stability

TABLE OF CHEMICALS USED IN MAHUA AND GILOY HERBAL CREAM

Ingredient	Use/Function	
	Stearic Acid	Acts as an emulsifying agent and thickener; helps in forming stable cream and improves texture
	Glycerin	Humectant; retains moisture, keeps skin hydrated, and improves smoothness
	Rose Oil	Provides fragrance; has mild anti-inflammatory and soothing properties
	Camphor	Acts as a counter-irritant; provides cooling sensation and relieves joint pain
	Beeswax	Works as a base; gives consistency and enhances skin protection
	Cetyl Alcohol	Stabilizer and emollient; improves texture and absorption of cream
	Liquid Paraffin	Moisturizer; forms protective layer and prevents dryness
	Triethanolamine	pH adjuster; helps in emulsification and stabilizing the formulation
	Preservatives (Methylparaben/ Propylparaben)	Prevent microbial growth and increase shelf life
		Solvent; used as a base for preparing cream

FORMULATION PROCEDURE

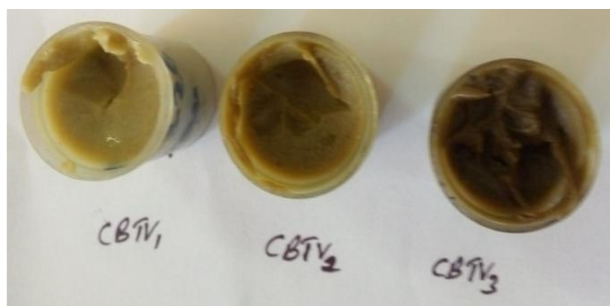
Formulation Procedure (Fusion Method)

- Weigh all the required ingredients accurately
- Prepare the oil phase by taking stearic acid, cetyl alcohol, beeswax, and liquid paraffin in a beaker
- Heat the oil phase at 70–75°C until completely melted
- Prepare the aqueous phase by taking distilled water, glycerin, and triethanolamine in another beaker
- Add preservative (methyl paraben) to the aqueous phase
- Heat the aqueous phase to the same temperature (70–75°C)
- Slowly add the aqueous phase into the oil phase with continuous stirring
- Continue stirring until a uniform emulsion is formed
- Add Mahua extract/oil and Giloy extract gradually with continuous mixing
- Stir continuously until a smooth and homogeneous cream is obtained
- Allow the cream to cool at room temperature
- Transfer the prepared cream into clean, dry, and airtight containers
- Label and store in a cool, dry place.

EVALUATION PARAMETER

1. Visual assessment

The cream was evaluated for colour odour, appearance and texture show a good formation.



2.pH determination

The Ph was measure using a digital Ph meter found between 5.5- 6.5, suitable for skin application.



3.Spreadability Test

Spreadability was checked using the glass slide method. the cream spread easily showing good application properties.



4.Skin irritation test

The cream was applied on the sin and observed for irritation or redness .no irritation was found safe for use.



5.Viscosity test

Viscosity was determined using a Brookfield viscometer. the cream shows appropriate viscosity for smooth application.

6.Stability teat

The cream was stored at different temperature and observed over time with no change in colour, odor, or consistency.

RESULT AND DISCUSSION

1. Organoleptic Evaluation

<u>Parameter</u>	<u>observation</u>	<u>discussion</u>
Colour	light brown to creamish	presence of herbs
Odour	pleasant herbal odour	acceptability
Texture	smooth and homogeneous un	good formulation
Appearance	no phase separation, uniform	good stability

2.Physiochemical parameter

<u>Parameter</u>	<u>Result</u>	<u>Discussion</u>
pH	5.5-6.5	Suitable for skin
Spreadability	Good	Better Absorption
Viscosity	Moderate	Good consistency

3. Rheological properties

Parameter	Observation	Discussion
Flow behaviour	non-Newtonian	easy spreading
Consistency	Smooth and stable	uniformly

Discussion

- The formulation and evaluation of herbal cream Were Successfully performed.
- The parameter like PH, viscosity, skin irritation test has been performed

Conclusion

In conclusion, the formulation and evaluation of Mahua and Giloy herbal cream highlight the increasing significance of herbal and natural therapies in the management of joint pain and inflammatory conditions. The present study demonstrates that plant-based ingredients such as Mahua (*Madhuca longifolia*) and Giloy (*Tinospora cordifolia*) can be effectively incorporated into a topical cream formulation to provide therapeutic benefits with minimal side effects compared to synthetic drugs.

The formulation process ensured the appropriate selection and combination of herbal extracts along with suitable excipients to obtain a stable and effective cream. The prepared formulation exhibited desirable characteristics such as smooth texture, good spreadability, homogeneity, and acceptable pH, making it suitable for topical application on the skin.

The evaluation parameters, including physical appearance, pH, viscosity, spreadability, washability, and stability studies, confirmed that the formulated herbal cream meets standard quality requirements. Furthermore, the presence of bioactive constituents in Mahua and Giloy contributes to significant anti-inflammatory and analgesic effects, which are beneficial in relieving joint pain, stiffness, and swelling.

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