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Research Article

Formulation And Evolution of Anti-Hemorrhoidal Cream by Using Ricinus Communis Linn and Cinnamomus Camphora

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ABSTRACT

Hemorrhoidal disease (piles) remains a common proctologic condition characterized by pain, itching, bleeding and swelling of anal cushions. Conventional therapies may be associated with recurrence, side-effects or invasiveness, prompting increasing interest in herbal topical formulations with multifunctional therapeutic actions. The present study aimed (a) to formulate a topical cream using herbal ingredients — specifically castor oil derived from *Ricinus communis* Linn and camphor from *Cinnamomum camphora* — intended for the treatment of hemorrhoids; (b) to evaluate its anti-hemorrhoidal activity; (c) to assess its wound-healing potential; and (d) to determine its anti-inflammatory effects. Cream formulations were prepared by incorporating standardized extracts of *R. communis* seed oil and *C. camphora* camphor into a suitable emulsion base and then evaluated for physicochemical parameters (appearance, pH, viscosity, spreadability, stability). In vitro and in vivo assays were undertaken: anti-hemorrhoidal action was assessed via bleeder-shrinking and vascular-tone models, wound-healing efficacy was evaluated on excisional wound models in rodents, and anti-inflammatory activity was measured by carrageenan-induced paw oedema in rats. The optimized formulation exhibited acceptable organoleptic and physicochemical properties, remained stable under accelerated conditions, and demonstrated significant reduction in hemorrhoidal swelling, enhanced wound-closure rate compared to control, and substantial inhibition of inflammatory markers (such as edema-volume and histopathological scores). These findings indicate that the developed herbal cream may represent a promising topical therapeutic for hemorrhoids by virtue of combined anti-hemorrhoidal, wound-healing and anti-inflammatory activities. Further clinical studies are warranted to validate safety and efficacy in human subjects.

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INTRODUCTION

Hemorrhoids, commonly known as piles, are one of the most prevalent anorectal disorders, characterized by the abnormal enlargement and inflammation of the venous plexus in the anal canal. They can cause symptoms such as pain, bleeding, itching, swelling, and discomfort, which can severely affect a patient's quality of life. Although various synthetic medications and surgical interventions are available for the management of hemorrhoids, they are often associated with side effects, recurrence, and high costs. Therefore, there is a growing demand for herbal and natural remedies that are safer, more economical, and provide multi-target therapeutic benefits. Herbal medicines have long been used in traditional systems of medicine such as Ayurveda and Unani for the treatment of hemorrhoidal conditions. Among these, *Ricinus communis* Linn (Castor plant) and *Cinnamomum camphora* (Camphor tree) are well-known for their potent pharmacological properties. *Ricinus communis* seed oil possesses anti-inflammatory, wound-healing, and antimicrobial activities, which help in reducing inflammation and promoting tissue regeneration. *Cinnamomum camphora* contains camphor, which is widely used for its analgesic, cooling, and soothing effects; it also enhances local circulation and provides relief from pain and irritation.

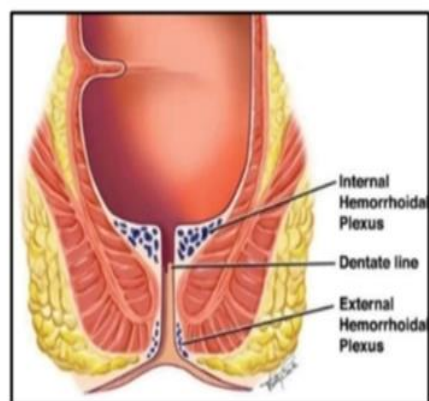
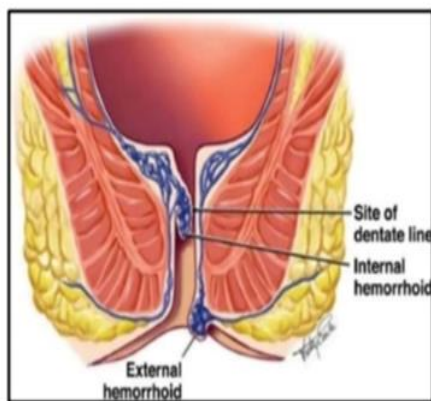
The combination of these two herbal ingredients in a topical formulation is expected to offer synergistic effects for the management of hemorrhoids through multiple mechanisms — reducing inflammation, alleviating pain,

promoting wound healing, and enhancing tissue repair. Formulating them into a cream base ensures easy application, better skin penetration, and patient compliance. The present study focuses on the formulation and evaluation of an anti-hemorrhoidal herbal cream using extracts of *Ricinus communis* Linn and *Cinnamomum camphora*. The prepared formulation was assessed for its physicochemical characteristics, stability, and pharmacological activities such as anti-hemorrhoidal, wound-healing, and anti-inflammatory properties. This study aims to develop an effective, safe, and natural topical preparation that could serve as an alternative to conventional hemorrhoidal treatments. Creams are considered an important part of cosmetic product as topical preparations from time immemorial due to their ease of application to the skin and also their removal. From cosmetic purposes, pharmaceutical creams have a variety of applications such as cleansing, beautifying, altering appearance, moisturizing etc

■ Hemorrhoids:

Hemorrhoids, emerods, or piles are swelling and inflammation of veins in the rectum and anus. The anatomical term "hemorrhoids" technically refers to "Cushions of tissue filled with blood vessels at the junction of the rectum and the anus. Hemorrhoids or piles are a common ailment among adults. More than half of men and women aged 50 years and older will develop hemorrhoid symptoms during their lifetime. Hemorrhoids are rare in children but now days several reports state the occurrence of hemorrhoids in children, and in elderly people.





SYMPTOMS OF HEMORRHOIDS

You get hemorrhoids when blood vessels in your bottom become swollen and inflamed. They can develop either inside or outside your anus (the canal where poop comes out).



PAIN

You may feel pain or burning, especially when you're sitting or pooping.



ITCHING

You could notice itching or irritation around your anus.



LUMPS

Some people see or feel one or more hard, tender lumps in the anal area.



BLEEDING

You might see bright red blood in your poop, on your toilet paper, or in the toilet bowl after you go. This is often the only symptom of internal hemorrhoids.

▪ Causes:-

1. Irregular bowel habits

2. Lack of exercise

3. Nutritional factor (a low-fiber diet)

4. Increased intra-abdominal pressure (prolonged straining, an intra-abdominal mass)

5. genetics, absence of valves within the hemorrhoidal veins,

▪ Classification of Arsha (Piles):-

There are different opinions of Acharya regarding the classification of Arsha:

a) On the basis of the origin

1. Sahaja

2. Janmottarakalaja

b) On the basis of the character of bleeding

Ardra (Sravi)- Bleeding piles due to vitiation of Rakta and Pitta Dosha.

Shushka- Non bleeding piles due to vitiation of Vata and Kapha Dosha.

c) On the basis of the predominance of Dosha:

1. Vataj 2. Pittaj

3. Kaphaj 4. Raktaj

5. Sannipataj 6. Sahaj

▪ Plant Profile:

▪ Ricinus communis:-



The Ricinus communis (castor plant) is a widely used and potent medicinal plant among thousands of herbal plants which are commonly used in the treatment of various diseases. The large family Euphorbiaceae contains nearly about 300 genera and 7,500 species. Generally, they are the flowering plants. Amongst all, the Ricinus communis or castor plant has high traditional and medicinal value for maintain the disease-free healthy life.

□ **Botanical Name-** Ricinus communis

□ **Kingdom-**Plantae

□ **Division-**Mangnoiiophyta

□ **Genus-** Ricinus

□ **Species-** communis

□ **Family -**Euphorbiace

Phytochemical constituents:

The Preliminary Phytochemical study of R. communis is the R. communis revealed the presence of steroids, saponins, alkaloids, flavonoids, and glycosides. The dried leaves of R. communis showed the presence of alkaloids, reclining(0.55%) and N-demethylricinine flavones

glycosides, and glycosides. showed the presence of two demethylricinine (0.016%), and six O- β -D-xylopyranoside, glucopyranoside, kaempferol-3-O-kaempferol-3-O- β -D-glucopyranoside, quercetin quercetin-3-O- β -D-xylopyranoside, quercetin-3-O- β -D-glucopyranoside, kaempferol O- β -rutoside and quercetin-3-O- β -glucopyranoside, kaempferol-3-rutoside. monoterpenoids (1, 8-cineole, camphor and α The cineole, camphor and α -pinene) and a gallic acid, quercetin, gentisic ellagic acid are the major phenolic acetic acid. The seeds contain 45% of fixed oil, of ricinoleic, isoricinoleic, stearic and d also lipases and a crystalline alkaloid, sesquiterpenoid (β -caryophyllene), gallic acid, quercetin, gentisic acid, rutin, epicatechin and ellagic acid are the major phenolic compounds isolated from leaves. Indole-3-acetic acid has been

extracted from the roots. The seeds contain 45% of which consist glycosides of ricinoleic, isoricinoleic, stearic and dihydroxystearic acids and also lipases and a ricinine¹. The GLC study of castor oil showed the presence form of palmitic (1.2%), stearic (0.7%), arachidic (0.3 hexadecenoic (0.2%), oleic (3.2%), linoleic (3.4 ricinoleic (89.4%) and dihydroxy stearic acid.

The GLC study of castor oil showed the presence

- 1) Ester
- 2) Arachidic (0.3%)
- 3) Linoleic (3.4%) 4) Linolenic (0.2%)

Cinnamomum camphor:



Cinnamomum camphora) is a white, crystalline substance with a strong odor and pungent taste, derived from the wood of camphor laurel (Cinnamomum camphora) and other related trees of laurel family. Camphor tree is native to China, India, Mongolia, Japan and Taiwan and a variety of this fragrant evergreen tree is grown in Southern United States; especially in Florida. Camphor is obtained through steam distillation, purification and sublimation of wood, twigs and bark of the tree.

Applications:



1. Camphor is a natural product with many applications in traditional and modern medicines.
2. Traditionally, camphor has been used as a cold remedy for the relief of chest congestion and the treatment of inflammation related diseases such as rheumatism, sprains, bronchitis, asthma and muscle pain.
3. Camphor is usually prepared as a balm, oil or cream to relieve the pain and inflammation in joints and muscles.

4. Camphor oil (20% camphor in cotton seed oil), when applied on the skin produces the feeling of coolness which is related to the stimulation of nerve endings sensitive to cold.

Objective:

- a. To formulate a topical cream using herbal ingredients intended for the treatment Of

hemorrhoids (piles). To determine anti-hemorrhoidal activity.

- b. To determine wound healing.

- c. To determine the Anti-Inflammatory.

MATERIALS AND METHOD:

Sr no.	EQUIPMENTS	CHEMICAL
1)	Conical flask	Cetyl Alcohol
2)	Measuring cylinders	Liquid Paraffin
3)	Beaker	Glycerine
4)	Bunsen burner	Triethanolamine
5)	Test tubes	Methylparaben
6)	Water bath	Cinnamomum camphor
7)	Mortar and pestle	Beeswax

Method:

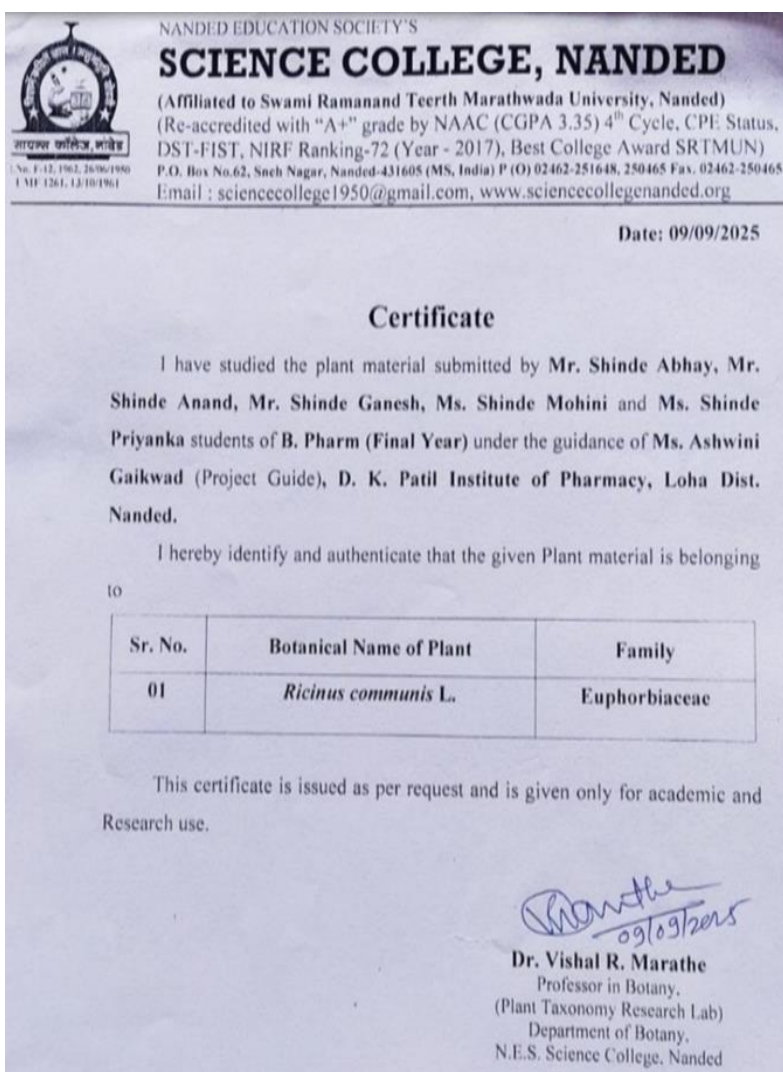
Collection, Identification and Authentication of plant Material:

Collection of plant material:

Dried fruits of Ricinus communis and Cinnamomum Camphora will be collected from local area of Loha Nanded they will be dried under shade drying.

Authentication of plant material:

The seeds of castor were collected from local area and were authenticated by Dr. Vishal R. Marathe, Associate professor and Head of Botany, Science college, Nanded. Authentication of plant Ricinus communis linn was done. Collection, authentication, Identification Processing and storage had done according to standard procedure for the plant.



Processing of crude drug:

Shade dried seeds will be used for extraction

□ Preformulation study:

- Solubility
- Ash value
- Density
- Specific gravity
- Organoleptic properties
- Bolling point

a. Solubility : it is the maximum amount of solute that can be dissolve in given amount of solvent.

b. Ash value: measure of the inorganic residue left after a substance is completely in cinerated.

Ash content (%) = (weight of ash residue)/(weight of original sample) x100

c. Density: It is the ratio of mass and volume.

Density= Mass/volume

d. Specific gravity: It is the ratio of a substance density to the density of a reference substance.

e. Organoleptic properties: the sensory attributes of a substance such as colour, odour, test, texture and appearance that are pre-received and evaluated by the human senses.

f. Bolling point: the specific temperature at which a liquids vapor pressure equal the surrounding atmospheric pressure.

Extraction of plant material : -

☐ Selection of solvent :- The water is used as solvent for the extraction

Decoction method:

This technique is utilized for the extraction of those substances (obtained from crude drug) that are soluble in water and are thermostable. The crude drug is boiled in water for about 15 minutes then cooled, filtered and adequate quantity of water is added to it to make the required volume

Ash value:

The traditional approach to determining ash values in pharmacognosy involves the incineration of plant material, followed by the quantification of the residual ash. This process typically takes place in a muffle furnace, where the plant material is subjected to high temperatures until all organic matter is burnt off, leaving behind inorganic minerals and salts. The total ash content is then measured, providing an estimate of the total mineral content of the plant.

b. Phytochemical qualitative test:

The confirmatory qualitative phytochemical screening of plant extracts was performed to identify the main classes of compounds (tannins, saponins, flavonoids, alkaloids, phenols, glycosides, steroids, and terpenoids) present in the extracts following standard protocols.



☐ Steroid and terpenoids test:

☐ Libermann burchard'

s test: The castor oil is added with acetic anhydride then add few drops of H_2SO_4

☐ Salkowskis'

s test : In castor oil add chloroform and few drops of H_2SO_4

☐ Carbohydrate test :

☐ Fehling'

s test : the felings reagent add in castor oil.

☐ Flavonoids test :

☐ Alkaline reagent test: In castor oil add KOH

☐ Lead acetate test: The lead acetate add in castor oil.

☐ Glycosides test :

☐ Keller killiani test: The extract of castor oil add with H_2SO_4 and $FeCl_3$

☐ Alkaloids test :

□ Dragendorff

s test : In castor oil add dragendroff reagent and methanolic extract.

□ Mayer test : In castor oil add mayers reagent.

□ Phenol test :

□ Phenolic test : The phthallic anhydride, concentrated H₂SO₄ and

dilute sodium hydroxide

Formulation table:

Sr. No	Ingredients	Quantity given (50gm)
1	Ricinus communis	5g
2	Streric acid	5.4gm
3	Liquid Paraffine	2.0ml
4	Triethanolamine	0.75gm
5	Glycerine	2.5ml
6	Water	36.85ml
7	Besswax	3gm
8	Cinnamon camphora	3gm
9	Methyl Paraben	0.5gm
10	Cetyl alcohol	2ml

Formulation of anti- hemorrihoidal cream :

Sr. No	Ingredientgs	Category
1	Ricinus communis Seed	Anti- Inflammatory
2	Stearic acid	Emulsifier
3	Cetyl Alcohol	Thickening agent
4	Liquid Paraffin	Moisturizing agent
5	Glycerin	Hydration
6	Triethanolamine	Neutralizing agent
7	Methylparaben	Preservatives
8	Cinnamomum Camphor	Wound Healing

□ Procedure:

□ Preparation of Oil Phase: Take a beaker in which add in beeswax , castor oil, liquid paraffin then heat this mix at 75°C. the beeswax is fully melted.

□ Preparation of aqueous phase: Take another beaker prepare aqueous phase by adding steric acid cetyl alcohol, cinamomum camphora., triethanolamine , water heat the solution for few minutes completely dissolve the mixture required in water.

□ Addition of Aqueous Phase to Oil Phase: The aqueous phase was poured in oil phase slowly by continuous stirring at 75°C. Methyl paraben and

Glycerin were added into the mixture. The mixture was allowed to cool to room temperature by continuous stirring. Then the cream was evaluated for various physical parameters.



Batches formulation table:

Sr. No	Ingredients	Quantity given	B1	B2	B3	B4
1	Ricinus communis	5g	2gm	2gm	2gm	2gm
2	Steric acid	5.4gm	2.16gm	2.16gm	2.16gm	2.16gm
3	Liquid Paraffine	2.0ml	0.8ml	0.8ml	0.8ml	0.8ml
4	Triethanolamine	0.75gm	0.6gm	0.6gm	0.6gm	0.6gm
5	Glycerine	2.5ml	1ml	1ml	1ml	1ml
6	Water	36.85ml	12.00ml	12.74ml	12.75ml	12.75ml
7	Beeswax					
8	Cinnamon camphora	3gm	1.2gm	1.2gm	1.2gm	1.2gm
9	Methyl Paraben	0.5gm	0.005gm	0.005gm	0.005gm	0.005gm
10	Cetyl alcohol	2ml	0.2gm	0.2gm	0.2gm	0.2gm

Cream Formulation

Evaluation of Anti- hemorrhoidal cream:

1) Organoleptic property : In which we can observe the colour, odour of the cream.

2) State of anti-hemorrhoidal cream : in which we can simply observe the physical state of cream (solid , liquid, semi-solid).

3) Irritancy test: The formulation B1, B2 and B3, B4 shows no redness, edema, Inflammation and irritation during irritancy studies. These formulations are safe to use for skin.

4) Homogeneity: All formulations produce uniform distribution of extracts in cream. This was confirmed by visual appearance and by touch .

5) Appearance: When formulation were kept for long time, it found that no change in colour of cream .

6) Type of smear: After application of cream, the type of smear formed on the skin were non greasy

7) pH test: The pH meter was calibrated using a standard buffer solution. About 1g of cream was weighed and dissolved in 10ml of distilled water and its pH was measured.

8) Spread ability:

The sample was applied between two glass slides and was compressed to uniform thickness by placing 100gm weight for 5min. weight was added to the pan. The time required to separate the two glass slides. i.e. the time in which the upper glass slide moved over the lower slide was taken as measure of spread ability.

It was calculated using formula: $S = m \cdot L / T$ here,

S – Spread ability

m – weight tied to upper glass slide

L – Length moved on glass slide

T – Time taken the determination were carried out in triplicate and the averages of three readings were recorded

9) Wash ability: This test is carried out by simple washing the applied cream with water.

Observation: -

Test	Procedure	Observation	Inference
1. Steroids & Terpenoids			
a. Libermann – Berchards test	Castor oil+ acetic anhydride+H ₂ SO ₄	Colour change green blue	Steroid present
b. Salkowskis test	castor oil+ chloroform + H ₂ SO ₄	Reddish brown colour	Terpenoids present
7. Carbohydrates			
7.2 Felhing's test:	Frehlings reagent + Castor oil	Reducing sugar	Carbohydrates present
8. Flavanoids			
a. Alkaline reagent test	Castor oil+ KOH	Dark yellow colour	Flavonoids present
b. Lead acetate test	Castor oil+ KOH	Precipitate	Flavonoids present
9. Glycosides			
9.2 Keller -killani test	Extrat + H ₂ SO ₄ + FeCl ₃	Change colour deep blue to green	Glycosides present
10. Alkaloids test			
10.2 Dragandragen dorff's test	Dragandragen dorff's reagent + castor oil+	Orange red PPT	Alkaloids present
10.3 Mayers test:	methanolic extract Mayers reagents + castor oil	Cream or greenish ppt	Alkaloids present
11. Phenol test	Phatalic unhydried + con. H ₂ SO ₄ + Dil. NaoH	Pink colour	Phenol present

Table no 09: qualitative test

Observation table for physical evaluation:

□ Organoleptic character:

Sr.no	Appearance	Description
1	Colour	Pale yellow to colorless
2	Oduor	Faint or nutty
3	Taste	Bland and Acrid

Solubility:

Water – Partially insoluble

Dilute HCL – Insoluble

Concentrated HCL – Soluble

NaoH – Simple dissolve

Nitric acid – largely insoluble

□ Ash value:

Ash value of resinus communis its = 25%

□ Density:

Density of Ricinus communis = 0.97gm/ml

□ Specific gravity:

Specific gravity = 0.99

□ Boling point:

Boiling point= 313.c

CONCLUSION:

The Present study on Ricinus communis linn and Cinnamomum camphora might be reveals its promising for Formulation and Evaluation of Anti-Hemorrhoidal Cream.

RESULT:

Studies shown it promotes wound healing reduce inflammation and minimizes infection recurrence and control wound creating. it's well tolerated with minimal side effects, making it a promising alternative to synthetic treatments for skin infection.

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