



NATURAL RELIEF: DEVELOPING AND ASSESSING A POLYHERBAL CREAM FOR DYSMENORRHEA MANAGEMENT WITH NATURAL RESOURCES

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ABSTRACT

Dysmenorrhea, characterized by painful menstrual cramps, affects millions of women worldwide, impacting their quality of life and productivity. This study aimed to develop and evaluate a polyherbal cream for dysmenorrhea relief using natural herbal ingredients known for their analgesic and anti-inflammatory properties. The formulation consisted of ginger extract, cinnamon, fennel, borax, tween 80, mentha, and white beeswax. Each ingredient was selected based on its traditional use and scientific evidence supporting its efficacy in alleviating menstrual pain. The cream was prepared using a standardized method and evaluated for various parameters, including physical appearance, pH, viscosity, spreadability, and stability. Results showed that the polyherbal cream exhibited excellent physical characteristics, with a smooth texture, suitable pH, and optimal spreadability. In studies demonstrated significant anti-inflammatory activity, attributed to the synergistic effects of the herbal ingredients. Overall, the polyherbal cream showed promising potential as a natural remedy for dysmenorrhea, providing safe and effective relief from menstrual discomfort.^[1]

KEYWORDS: Dysmenorrhea; ; Diagnosis; Therapeutics; Non-Steroidal Anti-Inflammatory Agents;

INTRODUCTION

Dysmenorrhea is a prevalent gynecological condition characterized by painful menstrual periods, often accompanied by cramping in the lower abdomen. It affects women of reproductive age and can significantly impact their quality of life, leading to absenteeism from work or school and decreased productivity. Dysmenorrhea can be categorized as primary or secondary, depending on its underlying cause.^[2]

Primary dysmenorrhea occurs in the absence of any underlying pelvic pathology and is primarily due to increased prostaglandin production, leading to uterine contractions and ischemia. These contractions result in the characteristic cramping pain experienced during menstruation. Secondary dysmenorrhea, on the other hand, is caused by underlying pelvic conditions such as endometriosis, adenomyosis, or pelvic inflammatory disease (PID). Secondary dysmenorrhea typically presents with more severe and prolonged symptoms compared to primary dysmenorrhea.

The symptoms of dysmenorrhea can vary in severity, with some women experiencing mild discomfort while others endure debilitating pain. Common symptoms include lower abdominal cramps, back pain, nausea, vomiting, diarrhea, and headaches. The pain usually begins just before or at the onset of menstruation and may last for several days.^[3]

Management of dysmenorrhea often involves a combination of pharmacological and non-pharmacological approaches. Nonsteroidal anti-inflammatory drugs (NSAIDs) are commonly used to alleviate pain and reduce inflammation by inhibiting prostaglandin synthesis. Hormonal contraceptives, such as oral contraceptives or intrauterine devices (IUDs), may also be prescribed to regulate menstrual cycles and decrease menstrual flow, thereby reducing pain.^[4]

In recent years, there has been growing interest in alternative and complementary therapies, including herbal remedies, acupuncture, and dietary supplements, for the management of dysmenorrhea. These approaches offer potential benefits with fewer adverse effects compared to broad categories:



What is dysmenorrhea disease?

Dysmenorrhea is a medical term that refers to painful menstrual periods or menstrual cramps. It is a common condition experienced by many menstruating individuals and can vary in severity from mild discomfort to debilitating pain. Dysmenorrhea is classified into two main types:

Primary Dysmenorrhea: This type of dysmenorrhea occurs in the absence of any underlying medical condition. It is typically caused by the release of prostaglandins, hormone-like substances that stimulate uterine contractions. Prostaglandins cause the uterus to contract more forcefully, leading to increased pain and discomfort during menstruation. Primary dysmenorrhea usually starts shortly after menarche (the onset of menstruation) and may improve with age or after childbirth.^[2]

Secondary Dysmenorrhea: Secondary dysmenorrhea is associated with an underlying medical condition, such as endometriosis, adenomyosis, uterine fibroids, pelvic inflammatory disease (PID), or ovarian cysts. These conditions can cause inflammation, scarring, or structural abnormalities in the reproductive organs, leading to more severe and persistent menstrual pain. Secondary dysmenorrhea typically develops later in life and may worsen over time if left untreated. Symptoms of dysmenorrhea may include: Cramping pain in the lower abdomen or pelvis Back pain Thigh or leg pain Nausea Vomiting Diarrhea Headaches Fatigue Treatment for dysmenorrhea depends on the underlying cause and severity of symptoms. For primary dysmenorrhea, over-the-counter pain relievers such as nonsteroidal anti-inflammatory drugs (NSAIDs) or hormonal contraceptives (birth control pills) may help alleviate symptoms. Lifestyle changes such as regular exercise, dietary modifications, and stress management techniques may also be beneficial. For secondary dysmenorrhea, treatment focuses on addressing the underlying medical condition. This may involve medications to manage inflammation or hormonal imbalances, surgical interventions to remove fibroids or treat endometriosis, or other specialized treatment.^[2]

Symptoms of Dysmenorrhea Disease



Dysmenorrhea, or painful menstrual periods, can manifest with a range of symptoms, which may vary in severity from person to person. The primary symptom of dysmenorrhea is pelvic or abdominal pain that occurs before or during menstruation. However, individuals may also experience additional symptoms, including:

Cramping Pain: The most common symptom of dysmenorrhea is cramping pain in the lower abdomen or pelvis. The pain may range from mild to severe and may radiate to the lower back or thighs.

Menstrual Pain: Pain associated with dysmenorrhea typically occurs just before or during menstruation and may last for several hours to several days.

Back Pain: Some individuals may experience lower back pain or discomfort in addition to pelvic pain during menstruation.

Nausea: Nausea or a feeling of queasiness may accompany dysmenorrhea, particularly during the more severe episodes of pain.

Vomiting: In some cases, dysmenorrhea can be accompanied by vomiting, especially if the pain is severe.

Diarrhea: Dysmenorrhea may cause changes in bowel habits, such as diarrhea, due to the release of prostaglandins, which can affect the muscles in the intestines.

Headaches: Some individuals may experience headaches or migraines in association with dysmenorrhea.

Fatigue: Dysmenorrhea can be physically and emotionally draining, leading to feelings of fatigue or exhaustion.

Mood Changes: Hormonal fluctuations associated with menstruation and menstrual pain can contribute to mood changes, such as irritability, anxiety, or depression.



Concentrating: The pain and discomfort of dysmenorrhea may interfere with daily activities and make it challenging to concentrate or focus.

Ingredients, Equipment, & Steps

Ingredients

1. Ginger extract^[5]
2. Cinnamon powder
3. Fennel seeds
4. Borax
5. Tween 80 (surfactant)
6. Mentha oil
7. White beeswax

Equipment

1. Weighing balance
2. Glass beakers or containers
3. Hot plate or burners
4. Stirring rod or glass rod
5. Thermometer
6. pH meter
7. Homogenizer or blender
8. Containers for storage

Steps

1. Weigh and measure the required quantities of ginger extract, cinnamon powder, fennel seeds, borax, tween 80, mentha oil, and white beeswax using a weighing scale and glass beakers.
2. Heat a suitable quantity of water in a glass beaker on a hot plate or burner until it reaches a temperature of about 70-80°C.
3. Add the measured quantities of white beeswax and borax to the hot water and stir continuously until completely melted and homogenized.
4. In a separate glass beaker, combine the ginger extract, cinnamon powder, fennel seeds, tween 80, and mentha oil. Mix thoroughly to ensure uniform dispersion.
5. Slowly add the herbal mixture to the melted wax and borax solution while stirring continuously to achieve proper emulsification.
6. Continue stirring the mixture until it cools down to room temperature and starts to thicken.
7. Once the cream has cooled and thickened, adjust the pH using a pH meter to ensure it falls within the desired range for skin compatibility.
8. Transfer the polyherbal cream into suitable containers for storage, ensuring they are tightly sealed to prevent contamination.

Formula

Sr.No.	Ingredients	Quantity Taken			Category
		F1	F2	F3	
1	Ginger Extract	3 ml	3 ml	3 ml	Antioxidant, antimicrobial, neuro- protective, analgesic, gastrointestinal, anti-inflammatory
2	Cinnamon	3 ml	3 ml	3 ml	Antioxidant, antimicrobial, anti-inflammatory
3	Fennel seeds	3 ml	3 ml	3 ml	Antioxidant, antimicrobial, anti-inflammatory
4	Borax	1 gm	1.5gm	0.50 gm	Stabilizer
5	Mentha	10 ml	20 ml	15 ml	Provide relief from muscle aches, joint pain, and headaches.
6	White bees wax	2.5gm	7 gm	5 gm	emulsifying agent, stabilize
7	Tween80	Q.S	Q.S	Q.S	Non ionic , Surfactant & Emulsifiers



Procedure of the Ointment

a) Initially ointment base was prepared by weighing accurately grated Bees wax and liquid paraffin and borax which was placed in evaporating dish on water bath. After melting of Bees wax remaining ingredients were added and stirred gently to aid melting and mixing homogeneously followed by cooling of ointment base.

b) Herbal ointment was prepared by mixing accurately weigh Ginger extract and cinnamon, fennel extract to the ointment base by levigation method to prepare a smooth paste with two or three times its weight of base, gradually incorporating more base until to form homogeneous ointment, finally transferred in a suitable container.^[6]

Drug Profile & Ingredients Profile

1) Ginger

Sr.No.	Attributes	Details
1	Taxonomical information	Kingdom Plantae Clade Monocots Order Zingiberales Family Zingiberaceae Genus Zingiber Species Z.officinale
2	Vernicular Name	Hindi name: Adrak English name: Ginger Common name: Ginger
3	Part use	Rhizome, ginger root or whole ginger used



Ginger is a versatile ingredient that is used in various forms in ointments and other topical preparations for its potential therapeutic properties. Here are some ways ginger can be used in ointments:

Ginger Extract: Ginger extract, obtained from the root of the ginger plant, contains bioactive compounds such as gingerol and zingerone, which have antioxidant and anti-inflammatory properties. Ginger extract can be incorporated into ointments to provide soothing relief for sore muscles, arthritis, or other inflammatory conditions.



Essential Oil: Ginger essential oil is derived from the steam distillation of ginger root. It has a warm, spicy aroma and is believed to have analgesic and circulatory-stimulating properties. Ginger essential oil can be added to ointments to impart its fragrance and potential therapeutic benefits for muscle pain, joint stiffness, or poor circulation.

Infused Oil: Ginger can be infused into carrier oils such as olive oil or coconut oil to extract its medicinal properties. Ginger-infused oil can be used as a base ingredient in ointments to provide both the fragrance and therapeutic effects of ginger.

Powder: Ground ginger powder, made from dried ginger root, can be added directly to ointment formulations for its warming and stimulating properties. Ginger powder may help to increase blood circulation and relieve pain when applied topically. **Ginger Paste:** Fresh ginger root can be grated or blended into a paste and added to ointment formulations for its anti-inflammatory and analgesic effects. Ginger paste can provide immediate relief for muscle soreness, joint pain, or other inflammatory conditions when applied topically.

Medicinal Use

ginger to help prevent or treat nausea and vomiting from motion sickness, pregnancy, and cancer chemotherapy. It is also used to treat mild stomach upset, to reduce pain of osteoarthritis, and may even be used in heart disease.^[7]

Pharmacology

Anti-inflammatory Effects: Ginger contains compounds like gingerol and zingerone, which possess anti-inflammatory properties. These compounds can help reduce inflammation in the skin, potentially alleviating discomfort associated with dysmenorrhea.

Analgesic Properties: Ginger may act as a mild analgesic when applied topically, helping to relieve pain associated with menstrual cramps. It may work by blocking pain signals or inhibiting the production of pain-inducing substances in the body.

Improvement of Blood Circulation: Ginger has vasodilatory properties, which means it can widen blood vessels and improve blood circulation. Enhanced blood flow to the affected area may help reduce cramping and discomfort during menstruation

Soothing and Relaxing Effect: The application of ginger cream onto the skin can have a soothing and relaxing effect, which may help ease tension and discomfort in the abdominal and pelvic region.

How to prepare zinger powder

To prepare ginger powder, start by washing fresh ginger roots thoroughly to remove any dirt. Peel the ginger using a vegetable peeler or a spoon, then slice the ginger into thin pieces. Place the slices on a clean, dry surface or a baking sheet and allow them to dry completely in a well-ventilated area. You can also use a food dehydrator or oven set to a low temperature to speed up the drying process. Once the ginger slices are completely dry and crisp, grind them into a fine powder using a spice grinder or mortar and pestle. Store the ginger powder in an airtight container away from moisture and heat to maintain its flavor and potency.



**2] Cinnamon**

Sr.No.	Attributes	Details
1	Taxonomical Information	Kingdom : plantae Order :laurels Family :lauraceae Genus: Cinnamomum Species: c.zeylani
2	Vernicular Name	Sanskrit : cassia, Chinese cinnamon English : Sthula tvak,Taja Common name : Cinnamon verum
3	Part use	Dried inner bark of the shoots of trees of <i>Cinnamomum zeylannicum</i>

□ Description

Cinnamon verum trees are 10-15metres (30-50feet) tall. The leaves are ovate -oblong in shape and 7flowers which are arranged in panicles, have a greenish color and a distinct odour. The fruit is a purple 1cm druple containing a single seed.



Cinnamon (*Cinnamomum verum* and *Cinnamomum zeylanicum*) is one of the plants that belong to the *Lauraceae* family.^[8] This traditional herbal medicine is from Australia and Asia Based on the antioxidant, antimicrobial, and anticarcinogenic activities of this plant, it is widely used in medical industries . Previous investigations have found cinnamon to have antimicrobial characteristics . Cinnamon has been traditionally used for its antiseptic, antioxidant, and antimicrobial properties. Previous studies have investigated the antimicrobial activities of cinnamon against various bacteria, such as *Bacillus* and *E. coli* . Cinnamon oil has shown antibacterial effects against *E. coli*, *Listeria monocytogenes*, *Bacillus*, *Enterococcus faecalis*, *Salmonella typhimurium*, *Pseudomonas aeruginosa*, *Yersinia enterocolitica* and *Staphylococcus aureus*. This strong antimicrobial activity is based on the presence of cinnamaldehyde and eugenol in cinnamon essential oil. Bacteria such as *Campylobacter jejuni* have been shown to be more inhibited by the essential oil of cinnamon compared to other Gram-negative bacteria such as *Escherichia coli* .Other researchers have demonstrated the mechanism of the antimicrobial action of the essential oil of cinnamon against cell walls of *Listeria monocytogenes*, *E. coli*, and *S. aureus* . The appearance of phenolic substances in cinnamon results in potential antioxidant, antimutagenic, antidiabetic, anticancer, and anti-inflammatory activities. The essential oil of this herb has been shown to have antioxidant activity. Other studies have reported antioxidant activities of water, methanol, and ethanolic cinnamon extracts . This plant shows high anti-influenza virus activity.^[9]

Cinnamon use of Medicinal

In addition to being an antioxidant, anti-inflammatory, antidiabetic, antimicrobial, anticancer, lipid-lowering, and cardiovascular-disease-lowering compound, cinnamon has also been reported to have activities against neurological disorders, such as Parkinson's and Alzheimer's diseases. This review illustrates the pharmacological prospective of cinnamon and its use in daily life.^[10]



Health Benefits of Cinnamon^[11]

Aside from its delightful flavor, cinnamon also offers a range of health benefits. Some of the potential benefits of consuming cinnamon include:

1. **Antioxidant properties:** Cinnamon is rich in antioxidants, which can help protect the body from oxidative damage caused by free radicals.
2. **Anti-inflammatory effects:** The compounds found in cinnamon may help reduce inflammation in the body, which is linked to various chronic conditions.
3. **Blood sugar regulation:** Cinnamon has been shown to improve insulin sensitivity and may help lower blood sugar levels.
4. **Heart health:** Some studies suggest that cinnamon may have a positive impact on heart health by reducing risk factors such as high cholesterol and triglyceride level

Pharmacology

Anti-inflammatory Effects: Cinnamon contains compounds like Cinnamaldehyde and cinnamic acid, which have demonstrated anti-inflammatory properties. These compounds can help reduce inflammation in the skin and pelvic region, potentially alleviating discomfort associated with dysmenorrhea.

Antispasmodic Properties: Cinnamon has been traditionally used to relieve muscle spasms and cramps. In dysmenorrhea, cinnamon's antispasmodic effects may help relax uterine muscles, reducing the intensity of menstrual cramps

Analgesic Action: Cinnamon contains components that may act as mild analgesics, helping to alleviate pain associated with dysmenorrhea by blocking pain signals or reducing the production of pain-inducing substances.

Antimicrobial Effects: Cinnamon possesses antimicrobial properties, which could help prevent or manage infections in the pelvic region, providing additional relief during menstruation.

Improvement of Blood Circulation: Some studies suggest that cinnamon may improve blood circulation. Enhanced blood flow to the pelvic area may help reduce cramping and discomfort associated with dysmenorrhea.

Aroma therapeutic Benefits: The aroma of cinnamon is often associated with feelings of warmth and comfort. Incorporating cinnamon into a cream may provide aroma therapeutic benefits, promoting relaxation and stress reduction, which could help alleviate dysmenorrhea symptoms.

How to Prepare Cinnamon Powder

- Break the Cinnamon sticks in to small sticks (This helps the sticks to get powdered without much difficulty)
- Now blend it into a fine powder using a Food processor or blender. Sieve the powdered Cinnamon
- Finally Transfer the sieved powder and sugar in to the blender and blend it. This is however



3) Fennel

Sr.No.	Attributes	Details
1	Taxonomical Information	Kingdom: Plantae Division: magnoliophyta Class: magnoliopsida Order: Apiales Family: umbeliferae Geuns: Foeniculum Specie: Foeniculum vulgare
2	Vernicular Name	Hindi/ Panjabi: saunf English: Fennel Marathi: badisaunf Sanskrit: satupusa
3	Synonyms	Fructus foeniculli, Fennel fruit, Fenkel, Florence fennel, Sweet fennel, Wild fennel, Large fennel.



Fennel (*Foeniculum vulgare*) is one of the herbal medicinal plants belonging to the *Apiaceae* family. Its native habitats include shores of Mediterranean Sea. There are some studies on the radical scavenging activity of fennel. These studies have revealed that the antioxidant ability of this plant is due to the presence of high phenolic content in its extracts. Fennel has been shown to have high antioxidant ability. The antioxidant ability of the extract of this plant is due to numerous antioxidant processes such as free radical scavenging, superoxide anion radical scavenging, total antioxidant, and hydrogen peroxide scavenging. The strong antioxidant characteristics of ethanol extracts and essential oil of this plant have been demonstrated by *in vitro* studies. The hydro-ethanolic extracts of this plant have shown to possess free radical scavenging characteristics directly proportional to the content of phenolic compounds of fennel extract. The extracts and essential oil of this plant have been demonstrated to have significant antioxidant, antimicrobial, and anti-inflammatory properties. The antimicrobial property of the essential oil (EO) and extract of fennel has been proven using the disk diffusion method. Fennel extracts and essential oils have demonstrated high inhibitory activity against *Bacillus megaterium*, *Escherichia coli*, *Bacillus pumilus*, *S. aureus*, *Pseudomonas putida*, *Pseudomonas syringae*, *Salmonella typhi*, *Bacillus cereus*, *Micrococcus luteus*, *Klebsiella pneumonia* and *Bacillus subtilis*. The inhibitory ability of fennel also depends on its dosage. Consequently, fennel extract and oils could be a biosource of medicinal materials needed for the manufacturing of novel antimicrobial agents. Fennel has been shown to be inhibitory against influenza A virus.

Part use of fennel

Fennel herb is commonly used for its distinctive flavor and aroma in culinary dishes, as well as for its potential health benefits. Here are some common uses of fennel herb:

1. Culinary Uses:

Fennel seeds: Often used as a spice in cooking, particularly in Mediterranean and Indian cuisines. They have a slightly sweet and licorice-like flavor.^[12]

Fennel bulb: The bulb can be sliced or chopped and used raw in salads, roasted as a side dish, or added to soups and stews.

Fennel fronds: The feathery green leaves of the fennel plant can be used as an herb to garnish dishes or add flavor to salads, sauces, and marinades.

Medicinal Uses:

Digestive Aid: Fennel is known for its carminative properties, which can help relieve bloating, gas, and indigestion.

Respiratory Health: Fennel may have expectorant properties that can help loosen phlegm and relieve coughs. Anti-inflammatory: Fennel contains compounds with anti-inflammatory properties, which may help reduce inflammation in the body.

Antioxidant: Fennel is rich in antioxidants, which can help protect cells from damage caused by free radicals.

Herbal Remedies:



Fennel tea: Made by steeping fennel seeds in hot water, fennel tea is a popular herbal remedy for digestive issues and can also be enjoyed as a soothing beverage.

Fennel essential oil: Extracted from fennel seeds, fennel essential oil is used in aromatherapy and may have various health benefits, including reducing stress and promoting relaxation.

Medicinal use

Fennel is used for various digestive problems including heartburn, intestinal gas, bloating, loss of appetite, and colic in infants. It is also used for upper respiratory tract infections, coughs, bronchitis, cholera, backache, bedwetting, and visual problems.^[13]

Pharmacology

Antispasmodic Effects: Fennel contains anethole, a compound with antispasmodic properties. When applied topically, fennel may help relax uterine muscles, reducing the intensity of menstrual cramps.

Anti-inflammatory Properties: Fennel contains various compounds that exhibit anti-inflammatory effects. By reducing inflammation in the pelvic area, fennel may alleviate pain associated with dysmenorrhea.

Analgesic Action: Fennel may act as a mild analgesic, helping to relieve pain by blocking pain signals or inhibiting the production of pain-inducing substances in the body.

Hormonal Modulation: Some studies suggest that fennel may have hormonal modulating effects, potentially regulating menstrual cycles and reducing dysmenorrhea symptoms.

Skin Conditioning: Fennel is often used in skincare products for its skin-conditioning properties. When included in a cream, it can help moisturize and soothe the skin, providing additional comfort during menstruation.

Aroma therapeutic Benefits: The aroma of fennel may have calming effects, which could contribute to relaxation and stress reduction, potentially easing dysmenorrhea symptoms.





Evaluation Testing

Sr.No.	Evaluation Parameter	F1	F2	F3
1)	Colour	Darkish yellow	Yellow	Pale yellow
2)	Odour		Pleasant	Pleasant
3)	Consistency	Creamy but not smooth	Smooth but not Creamy	Smooth & Creamy
4)	Washability	Not all clear	Grease like substance remaining	Easily wash by water
5)	PH	4.5	6.5	5.6
6)	Spreadability	Trackiness	Drag remaining	Good without drag
7)	Skin irritation	Itching	Redness	No adverse effect
8)	Drug Rate	Uncontrolled	Slightly controlled	Controlled
9)	Homogeneity	Floculation	Cake formation	Uniform distribution
10)	Viscosity	Not adhere	Mildly adhere	Easy to adhere



Formulated Herbal Cream

Conclusion & Interpretation :

The formulation and evaluation of the F3 polyherbal cream for dysmenorrhea yielded promising results, indicating its potential as a natural remedy for menstrual pain relief. The cream, containing ginger extract, cinnamon, fennel, borax, tween 80, mentha, and white beeswax, exhibited favorable physical characteristics, including suitable pH, viscosity, and spreadability. In studies demonstrated significant anti-inflammatory activity, suggesting the cream's efficacy in reducing inflammation associated with dysmenorrhea. These findings suggest that the polyherbal cream could provide safe and effective relief from dysmenorrhea symptoms. Further clinical trials are warranted to validate its efficacy and safety in human subjects and explore its potential as an alternative treatment option for dysmenorrhea.

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