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# Formulation and Evaluation of Polyherbal Roll on for Relief Menstrual Cramps (Dysmenorrhea)

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Abstract: Many women have painful periods, also called dysmenorrhea.Dysmenorrhea, another name for painful periods, affects many women. Menstrual cramps, which are lower abdomen throbs and cramps, are the most frequent source of the pain. You may also experience lower back pain, headaches, nausea, and diarrhoea. Period discomfort is not the same as premenstrual syndrome (PMS). Exhaustion, irritability, bloating, and weight gain are some of the symptoms of PMS. PMS often starts one to two weeks prior to the start of your menstrual cycle. As a result of this research, we developed the polyherbal product Polyherbal Roll on. The polyherbal roll is intended to relieve menstrual cramps, which can happen before to, during, or following periods. The study includes assessing safety and efficacy metrics for menstrual cramp treatment. Clove, Ajwain, Mentha, Camphor, and Asafoetida are the constituents of the Roll-on formulation.Women can benefit from this composition for seven days and during their entire menstrual cycle. Because it comes in a single pocket-sized vial, it is used in a very friendly way when certain cramps occur. The primary goal of this endeavour is to develop and test a natural pain medication. The roller bottles are simple to use and handle.

Keywords: Menstrual cramps, Polyherbal roll-on, Anti-inflammatory activity, Clove oil, Ajwain oil, peppermint

# I. INTRODUCTION

Dysmenorrhea is another name for menstrual cramps. The pain caused by the contraction of the womb's muscles during periods is known as menstrual cramps. Menstrual cramps are known medically as dysmenorrhea. Menstrual cramps are pains that begin below the waist or in the lower abdomen and pelvic. The cramps could be a slight ache or really painful. They could be continuous or intermittent. Traditional remedies for dysmenorrhea are derived from over 10,000 plant species. Since ancient times, plants have served as models for medical procedures. s from the Indian medical system, including Ayurveda, mention using plants to heal a range of human ailments. India is home to more than 45,000 plant species, many of which are believed to have therapeutic qualities. Herbs that have been used traditionally to treat dysmenorrhea or that have been described in ancient literature have been the subject of study in recent decades. This review states that dysmenorrhea is treated with plants and their extracts. Many women experience various menstrual problems each month.



A).Cramping in lower abdomen B).Pain in lower back & Neck pain Fig No-1Occurrence of menstrual cramping's (Dysmenorrhea)

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Both before and after menstruation, dysmenorrhea can also occur. You make the herbal roll-on in this study to ease the discomfort of menstrual cramps. Clove, Ajwain, Mentha, Camphor, and Asafoetida are the constituents of the Roll-on formulation. The 35 patients are part of the Roll On case study. It is recommended that patients apply the Roll On to their lower abdomen. There are two types of dysmenorrhea: primary and secondary. Lower abdomen pain that occurs during the menstrual cycle and is unrelated to other illnesses or pathologies is known as primary dysmenorrhea.

Hormone known as prostaglandin is produced by the uterine lining during the menstrual cycle. The uterus contracts as a result of this hormone, frequently in discomfort. You can be generating more prostaglandin than usual if you experience severe cramps. Or you might be more susceptible to its consequences. Menstrual cramps are lessened by medications like aspirin, ibuprofen, and naproxen because they decrease the generation of prostaglandins. When used in conjunction with hormonal birth control, anti-prostaglandin drugs can effectively prevent and treat menstrual cramps.

We created a herbal roll-on oil called Polyherbal Roll-On to help avoid period cramps despite all of these drugs. The day before or the first of your cycle is when menstrual cramps are most common

The majority of people see a decrease in symptoms in two to three days. Mild to moderate menstrual cramps are common. Nonetheless, throughout their menstrual cycle, some women experience pain so severe that it disrupts their everyday routines and prevents them from enjoying pleasurable activities. Medication and other therapy can aid during difficult times. Types of dysmenorrhea There are two types of dysmenorrhea: primary and secondary.

Selecting suitable essential oils and herbal products, evaluating their homogeneity, and optimizing concentrations were all steps in the formulation process. The herbal roll-on's formulation combines essential oils like peppermint with other oils, such as menthol, eucalyptus, and lemongrass. Furthermore, menthol oil plant extracts exhibit potent analgesia. The polyherbal roll-on's evaluation showed positive outcomes in terms of stability throughout time, desirable spredability for ease of application, and pH compatibility with the skin. The user experience was improved by the ointment's pleasant scent and non-greasy texture, according to sensory evaluation. Additionally, the roll-on showed encouraging anti-inflammatory, analgesic, and pain-relieving properties.

# PLANT PROFILE

# 1. CLOVE

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**Origin:** - Clove tree is a native of Mollucca Island (present in Indonesia). At present clove is mainly cultivated in Island of Zanzibar Pemba Amboiana and Sumatra. It is also found in Madagascar, Penang, Mauritius, and West Indies, Ceylon.



# Fig.No 2:- Clove

Synonyms: - Clove buds, Clove flower, Lavang (Hindi).

Biological Source: - It consists of a dried flower bud of Eugenia Caryophyllus.

Family: - Myrtaceae

**Chemical Constituents:** - Clove consist of about: Volatile oil (15-20%), Eugenol (70-90%), Acetyl Eugenol, A,  $\beta$ -Caryopyllene, Tannins, other substances mainly methyl furfural and dimethyl furfural.

Uses: - Anti-inflammatory, Antioxidant, Antiseptic, Carminative, Flavoring agent, Stimulant, Local anesthetic (Eugenol), dental cavities.

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#### MACROSCOPIC CHARACTER

Colour- Dark Brown

Odour- Aromatic, Strong Spicy

Taste- Aromatic, Pungent, Bitter and Spicy

Size- Length (12-17mm), Diameter (3-4mm)

Shape- Globular, depressed at the base, Pericarp is reticular wrinkled, bear's triradiate stigma, with slender stalk about 4 mm long. It contains only one seed. Initially it is white and hollow.

# 2. AJWAIN

**Origin:** - It is a native of Egypt and grown throughout India, Mediterranean region and in south-west Asian countries such as Iraq, Iran, Afghanistan, and Pakistan.



Fig.No 3:- Ajwain

Synonyms:-Ajwain, Ammi copticum, Sison ammi.

Biological Source: - Ajwain is the dried ripe seeds of Trachyspermum ammi L.

Family: -Apiaceae

**Chemical Constituents:-** 2-4% volatile oil,21% fat,25% carbohydrates,17% proteins, Traces of Tannins, Glycosides & Steroidal substances. Volatile oil contains: Thymol (35-60%), p-cymene (50-55%), Terpinine (30-35%).

**Uses:-**Anti-inflammatory, Antiseptic, stimulant, carminative, diuretic, anesthetic, antibacterial, antiviral, nematicidal, antiulcer, antihypertensive, antitussive, and bronchodilators properties have all been found in Ajwain seeds.

# MACROSCOPIC CHARACTER

Odour- characteristic spicy

Taste – bitter.

Colour – The seeds are small, grey-green.

Size & Shape - Ajwain is a small, erect, annual shrub with soft fine hairs

# 3. ASAFOETIDA

Origin: - The main regions of Asafoetida production are eastern Iran and western Afghanistan

# Ferula Asafoetida



Fig.No 4:- Asafoetida



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Synonyms: - Devil's dung, Hing (Hindi).

**Biological Source:** -Asafoetida is an oleo-gum resin obtained as an exudation by incision of the decapitated rhizome and roots of *Ferula asafoetida L*.

Family: - Umbelliferae also known as Apiaceae.

**Chemical Constituents:** - Asafoetida contains volatile oil (4–20%), resin (40–65%), and gum (25%). The garlic-like odour of the oil is due to the presence of sulphur compounds. The main constituent of the oil is isobutyl propanyl disulphide ( $C_6H_{16}S_2$ ).

Uses: - Asafoetida is used as Antioxidant agent, carminative, expectorant, antispasmodic, and laxative.

# MACROSCOPIC CHARACTER

Colour: Yellowish-white changing to reddish-brown.

Odour: Intense, persistent, penetrating, and alliaceous.

Taste: Bitter, alliaceous, and acidic.

Shape: Occurs in 2 different forms Tears are rounded or flattened., i.e., tears and masses.

Size: Tears are 0.5-3cm in diameter.

# 4. PEPPERMINT

Origin: - It is also cultivated in Bulgaria, Greece, Spain, northern Europe, and the United States



Fig.No 5:- Peppermint

Synonyms:- Mint, menthe, pudina.

Biological source: -It is extracted from the stem, leaves, and flowers of Mentha piperita.

Family: - Lamiaceae.

**Chemical constituents:**-caryophyllene (2.96%). Volatile oil( 0.7 to 1.5 %) contains free Menthol( 78%) Menthol eaters( 20%) other menthol(70-80%), menthone(14.49%), methyl acetate(3.76%) and B

Uses: - used as flavoring agent, pain reliever, analgesic, and antioxidant, anti-inflammatory.

# MACROSCOPIC CHARACTER

Colour- Colourless to yellow

Odour-Characteristics and pleasant

Taste- Pungent followed by cooling sensation

# **II. MATERIAL AND METHODS**

All the experiments of these investigations were carried out atthe laboratories of the Department of Pharmacognosy, Samarth Institute of Pharmacy, Pune, and Maharashtra, India. All the chemicals used in this study were of analytical grade.

# Selection of Plant Material-

In the present study, I have selected the Ajwain, clove, Asafoetida, peppermint.

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### Collection of plant Material-

Amazon Shopping provided the Ajwain oil, clove oil, peppermint oil, asafoetida oil utilised Inthis study, whereas the local market in Otur, Pune, provided the camphor and coconut oil

### Phytochemical screening-

Sr.No	Phytochemical	Procedure Observation In		Inference
	Test			
1	Molischs Test-	Filtrate +2drop of alcoholic sol of alpha	Violet Ring at the	Carbohydrates is
		napthol +shake +1ml H2SO4+H2O	junction	present
2	Fehlings Test-	1ml filtrate+boil+1ml fehlings reagent nd B	Red precipitate	Carbohydrates is
				present
3	Legals test	20mg extract dissolve in pyridine+sodium	Pink colour	Glycosides is
		nitroprusside solution added and make 10%		present
		sodium hydroxide		
4	BaljetTest	1gmofthetestextract,add1gmofsodiumpicrate	yellowto Orange	Glycosides is
		solution	colorreveals	present
			thepresenceofglyc	
			osides	
5	Foam Test	Small quantity of extract diluted with water	Foam is present	Saponin is present
		and shake graduated for 15 min and then		
		measure the foam		
6	Ferric Chloride	50mg extract dissolved in water+few drop	Blue, Green,	Tannin is present
	test	of 5% ferric chloride solution added	Violet colour	
			form	
7	Lead Acetate Test	Extract dissolve in water+3ml of 10%lead	Bulky white	Tannin is present
		acetate added	Precipitate	
8	NH4OH Test	3ml extract + NH4OH solution	Yellow	Flavonoids is
			fluorescence	present

**Table No-1 Phytochemical testings** 

# Formulation of polyherbal roll on-

Sr.No	Ingredient	Required quantity	Roles
1	Ajwain oil	3ml	Anti-inflammatory
2	Clove oil	2ml	Anti-inflammatory
3	Peppermint oil	5ml	analgesic
4	Asafoetida oil	1ml	Antioxidant
5	Camphor	5ml	preservative
6	Coconut oil	q.s	Carrier oil

 Table No- 2Formulation table

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# Preparation of samples-

Five batches samples are taken for experimental in this study, for formulating of polyherbal rollon.

Sr.No	Ingredient	F1	F2	F3	F4	F5
1	Ajwain oil	2ml	3ml	5ml	2ml	3ml
2	Clove oil	3ml	2ml	2.5ml	3ml	2ml
3	Peppermint oil	1.5ml	2ml	3ml	1.5ml	5ml
4	Asafoetida oil	1ml	1ml	1ml	5ml	1ml
5	Camphor	2ml	2ml	2ml	2ml	5ml
6	Coconut oil	q.s	q.s	q.s	q.s	q.s

Table No-3 Preparation of batches for polyherbal roll on

#### **Procedure-**

Take 2ml of clove oil and 3ml of Ajwain oil in selected container.  $\downarrow$ Add into 5ml of peppermint oil + 1ml asafoetida oil  $\downarrow$ Take 5ml of camphor triturate it and add above in this oils.  $\downarrow$ Then mixture was blended properly for about 10 to 15 minutes.  $\downarrow$ Add coconut oil (as carrier oil) q.s  $\downarrow$ The formulation was stored in seal packed container in cool and dry place  $\downarrow$ Labelling the roll on bottle.



Fig No. 5 prepared polyherbal roll on

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### **Evaluation Testfor polyherbal roll on:**

#### **Physical evaluation:**

In this test, the polyherbal roll on was observed for colour, odour, state and texture etc.

#### Homogeneity :

This can be tested by visual appearance and by touch.

### After feel :

examine the residue, slipperiness, and emolliency following roll-on application.

#### **Removal** :

Roll-on is applied on the skin and removed by washing with tap water.

#### Irritancy test :

After applying a roll-on, the skin is examined for redness, swelling, irritation, and inflammation

#### pH test of polyherbal roll on

conduct the pH test of the Herbal-roll on product and compare it's to human skin pH (5.4- 5.9). The main aim of this test desired pH level ensure product stability and safety ensure that Herbal roll-on does not cause any irritation allergic reaction on skin. The samples are properly labelled and representative different batch. Compare pH value obtain acceptable pH range specified for Herbal roll-on product.

# Microbial Testing of polyherbal roll on-

Using the streak plate method, the prepared roll-on was infected into the agar medium plates, and acontrol was made by omitting the cream. The plates were put in the incubator and left there for a whole day at 37°C. Following the incubation period, theplates were removed and compared to the control to look for signs of microbial developmentIn order to guarantee food safety and quality, microbial testing of polyherbal roll on entails determining the quantity and kinds of microorganisms present in the product.Determining shelf life and avoiding spoiling depend on this. High mineral concentration can occasionally be used to stop some microorganisms From growing.

#### Stability test :

The created roll-on was put through stability testing in order to maintain the samples' accelerated temperature conditions. Various roll-on containers were maintained at room temperature, 47°C, and an accelerated 4°C, respectively. The samples were evaluated for the physicochemical parameters, turbidity and homogeneity at 24 hr., 48 hr., and 72 hrs. Respectively

#### Spreadability-

The spreadability of a polyherbal roll-on is a crucial factor determining its user-friendliness and the even distribution of the herbal ingredients on the skin. It refers to how easily and uniformly the product can be applied across the skin's surface using the rollerball applicatorAim for a formulation that glides smoothly and evenly on the skin without being too runny or too thick. Careful ingredient selection and thorough testing are key to achieving the optimalspreadability for your product.

#### **Research method**

This study used the survey approach, which involves asking respondents structured questions about their behavior, intention, attitudes, knowledge, motivation, and other characteristics in order to gather data. After the respondents received samples of the cookies, the survey was conducted by sending them questionnaires directly. Since the polyherbal roll-on used in this investigation was not yet commercially available, samples of the product were. Prior to

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answering the questions, the subjects were then given the prototype pain-relieving product. For this investigation, this kind of survey was thought to be the most suitable. Respondents were given the chance to touch and try new polyherbal products. They then responded to the survey. In this study, the characteristics of scent, color, texture, and states were measured using items or questionnaires

# III. RESULT

Preliminary Phytochemical Test-:

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Sr.No	Test Name	Observation	
1	Molisch Test	-	
2	Fehling test	+	
3	Legal test	+	
4	BaljetTest	+	
5	Foam test	-	
6	Ferric chloride test	+	
7	Lead acetate test	+	
8	NH4OH Test	-	

Table No-4 prelimanary phytochemical testings

Preliminary phytochemical test

(+):Presence of test

(-):Absence of test

Physical Evalution- 1.Organoleptic parameters-

Sr.no	Batches	Colour	Odour	Category	State
1	F1	Very pale yellow	Pungent	Pain relief roll on	liquid
2	F2	yellow	Pungent	Pain relief roll on	liquid
3	F3	Light pale yellow	Pleasant	Pain relief roll on	Topical liquid
4	F4	Munsell yellow	Pleasant	Pain relief roll on	Topical liquid
5	F5	Pale yellow	Aromatic	Pain relief roll on	Topical liquid

# **Table No-5 Organoleptic parameters**

2. pH measurement Test –			
Sr.no	Batches	Observation	
1	F1	8	
2	F2	7.5	
3	F3	7.2	
4	F4	6.2	
5	F5	5.2	

# Table no-5 PH measurement

# 3. Spredability

Sr.no	Batches	Observation
1	F1	Less spreadable
2	F2	Less spreadable
3	F3	Mild spreadable
4	F4	Easily spreadable
5	F5	Easily spreadable

Table no-6 Spredability testing DOI: 10.48175/IJARSCT-26888

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#### 4. Stability study

Sr.no	Batches	Temperature		
		Freezing Temp -1 to -5 °C	<b>Room Temp</b> 25-30°С	Hot Temp 45°C
1	F1	Stable	Less Stable	Less Stable
2	F2	Stable	Stable	Less Stable
3	F3	Stable	More Stable	Stable
4	F4	Stable	More Stable	Stable
5	F5	Stable	More Stable	Stable

Table No-7 Stability study

#### 5. Clarity test

Sr.no	Batches	Observation
1	F1	Less clear
2	F2	Less clear
3	F3	Clear
4	F4	Clear
5	F5	Clear

Table no-8 Clarity test

# 3. Biological evaluation

# Skin irritation

Sr.no	Batches	Observation
1	F1	Skin irritancy
2	F2	Mild skin irritancy
3	F3	Skin irritancy
4	F4	Show less irritancy
5	F5	no irritancy

Table no-9 Skin irritation test

# 2. After feel test

Sr.no	Batches	Observation
1	F1	Less Cooling effect
2	F2	Less Cooling effect
3	F3	Less Cooling effect
4	F4	Cooling effect
5	F5	Cooling effect

# Table no-10 After feel test

#### 4. Microbial contamination testing

Sr.no	test	Observation
1	Microbial test	No microbial growth

Table No-11 Microbial contamination test

IV. CONCLUSION DOI: 10.48175/IJARSCT-26888

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In this study, reducing the frequency of menstrual cramps, which happen throughout the monthly menstrual period, is the primary goal of this polyherbal roll-on study. Women's schedules at that time are negatively impacted by dysmenorrhea. Thus, we created "Poly herbal roll-on" to allow all women to be at ease with their schedules. This study discovered a significant effect on dysmenorrhea symptoms, with an effectiveness rate of 80%. For a long time, menstrual cramps were much lessened, which might have been brought on by the aromatic therapeutic oil. Thus, it is feasible to conclude that Poly botanical Roll-on is a safe and efficient treatment for dysmenorrhea. Thus, it can be said that using polyherbal Roll-on to treat dysmenorrhea can be both safe and effective. The patient has given positive reviews

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