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Formulation and Evaluation of Herbal Roll On to Reduce Dysmenorrhra

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Abstract: *Menstrual cramps, which are a throbbing , cramping pain in your lower abdomen. You may produce other symptoms, inclusive of decrease lower back pain, nausea, diarrhea, and headaches.PMS causes many different symptoms , including weight gain, bloating, irritability, and fatigue.PMS regularly begins offevolved one to 2 weeks earlier than your length begins offevolved. Dysmenorrhea is a form of menstrual pain caused by uterine contractions due to both an increased production of prostaglandins and the release of the endometrial layers during menstruation. The examine consists of the assessment of efficacy and protection parameters withinside the control of menstruation cramps. Our study includes total about 10 patients. The sufferers are cautioned to use the Roll On over the decrease abdomen. This formulation can be beneficial to the feminine during their 7 days and all over the period cycle.*

Keywords: Menstrual cramps

I. INTRODUCTION

1.1 DYSMENORRHEA

Menstruation or period, is normal vaginal bleeding that happens as part of a women's monthly cycle. Many ladies have painful periods, additionally known as dysmenorrhea. The ache is most usually menstrual cramps, which might be throbbing, cramping ache for your decrease abdomen. Dysmenorrhea also called menstrual cramps is the pain caused by the womb muscle contraction during the periods. Dysmenorrhea is also occurred during pre-menstruation and post menstruation. The term dysmenorrhea refers to painful menstruation.

Dysmenorrhea is a cramp labor like ache withinside the decrease stomach that radiates to top stomach, waist and thighs and is occasionally observed with the aid of using systemic signs and symptoms like nausea, vomiting, diarrhea ,headache and dizziness. In dealing with Dysmenorrhea, medications such as prostaglandin synthesis inhibitors, non-steroidal anti-inflammatory drugs and contraception pills are used irregularly because of fear of their side effects. Therefore, it appears essential to discover a new and less difficult remedy for dysmenorrheal.

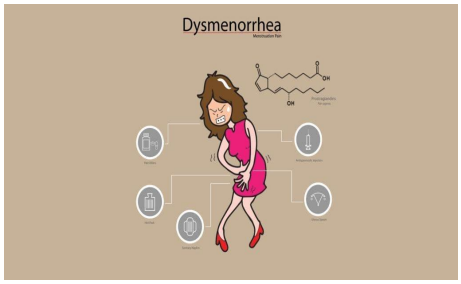

FIG.1-OCCURRENCE OF DYSMENORRHEA FIG.2DYSMENORRHEA

1.2 TYPES OF DYSMENORRHEA

There are two types of dysmenorrhea : primary and secondary

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1.2.1 PRIMARY DYSMENORRHEA

Primary dysmenorrhea is the cramping ache that takes place earlier than or throughout a period.Prostaglandins reason the muscle tissue and blood vessels of the uterus to contract.

Primary dysmenorrhea is the most common kind of period pain.These chemical substances make the muscle tissue of your uterus tighten and relax, and this reasons the cramps.

1.2.2 SECONDARY DYSMENORRHEA:

Secondary dysmenorrhea often starts later in life. It is caused by conditions that affect uterus or other reproductive organs, such as Endometriosis and Uterine Fibroids . The kind of pain often gets worse over time. It might also additionally start earlier than your length begins offevolved and keep after your length ends .

Secondary dysmenorrhea is caused by a disorder in the reproductive organs. The pain tends to get worse over time and it often lasts longer than longer than normal menstrual cramps.

Some of the conditions that can cause secondary dysmenorrhea include the following: o Endometriosis

o Fibroids

o Adenomyosis

1.3.HERBAL OLL ON:

A Roll-on is a type of liquid prepartion packed in a container with an applicator consisting of a revolving ball at the top of the dispenser.It conatins a mixture of volatile oils such as clove oil, camphor oil, thyme oil, menthol etc.These oils are commonly used to deal with stress, relieve pain, migraine, anti-inflammatory, deal with anxiety, relieve sinus tensions, etc.This topical ache reliever containing all-herbal components reasons a pleasant sensation beneficial to counteract the ache.Medictions which includes aspirin, ibuprofen and naproxen lessen prostaglandin manufacturing and accordingly lessen menstrual cramps.The mixture of hormonal delivery manage with anti-prostaglandin remedy may be very powerful in each stopping and treating menstrual cramps.Inspite of all these medications we prepare a herbal roll on oil for prevention of menstrual cramps which we named 5 Days Feminine Herbal Roll On.

FIG. 3- HERBAL ROLL ON

II. AIM

To prepare 5 days Herbal Feminine Roll –On by using selected herbs to reduce Dysmenorrhea.

2.1.OBJECTIVES:

The main aim for the preparation of a herbal roll-on is for “reduction of dysmenorrhea”.

It plays a vital role in the control and reduction of any sort of pain during the menstrual cycle.

The main motto of this herbal roll-on is to reduce the frequency of the menstrual cramps which occurs during the menstruation period on every month. Because of the dysmenorrhea, females get a bad impact on their schedule of that time.

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Therefore, we introduced "5 days herbal feminine roll-on" so every women can free comfortable in their schedule.

III. MATERIALS

Collection of herbs for roll on to reduce dysmenorrhea: The extraction system of oils turned into executed in our lab vicinity only. These herbs were collected and weighed properly. After weighing the solid form was converted into powdered form and then it was placed for extraction procedure in order to extract respective oil from its crude form and Then the extracted oils have been used for the method of five days of natural female roll on directly to lessen dysmenorrhea.

3.1.CLOVE OIL:

FIG 4-CLOVE OIL FROM CLOVE

Synonyms –
Eugenol ,Clove bud oil .
Biological Source –
It is an essential oil extracted from the dried flower buds of clove plant ,i.eSyzygiumaromaticum. Family- Myrtaceae
Chemical constituents-
The main active compound in clove oil is eugenol (70-90), a phenolic compound that contributes to its characteristics aroma and flavor.Also contains smaller amounts of eugenyl acetate and β-caryophyllene.
Uses-
May have antioxidant and anti-inflammatory properties.
Cloves have long been considered a home remedy in India for toothaches, joint pains, indigestion, asthma, cough, skin disorders, headache, etc.

3.2.MENTHOL OIL-

FIG 5-MENTHA HERB AND OIL (MENTHOL)

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Synonyms –
Menthol , Pappermint oil
Biological Source –
The primary biological source of menthol is the Mentha genus, particularly Menthapiperita (peppermint) and Menthacanadensis (cornmint).Family –Lamiaceae
Chemical constituents-
It is primarily composed of the monoterpenoid menthol, along with other compounds like menthone and menthyl acetate.
Peppermint oil also contains other components like limonene, 1,8-cineole, beta pinene, and beta-caryophyllene.
Uses-
It possesses antimicrobial, antioxidant, and anti-inflammatory properties.
The essential oil of peppermint has also demonstrated antiviral, antifungal, insecticidal, and insect-repellent properties.

3.3.AJWAIN (THYMOL)-

FIG 6-AJWAIN HERB AND THYMOL (AJWAIN OIL)

Synonyms –
Ajowan oil ,Trachyspermumammi seed oil ,Carom seed oil
Biological Source –
The essential oil is extracted from the seeds of the Trachyspermumammi plant, commonly known as ajwain or carom.
Family- Apiaceae
Chemical constituents –
The essential oil contains compounds like thymol, gamma-terpinene, and p-cymene.
Uses –
Ajwain oil has a long history of use in traditional medicine and Ayurveda, known for its digestive, antimicrobial, and pain-relieving properties.
Ajwain seeds possess antiseptic, stimulant, carminative, diuretic, anesthetic, antimicrobial, antiviral, nematicidal, antiulcer, antihypertensive, antitussive, bronchodilatory, antiplatelet and hepatoprotective as well as antihyperlipidemic effects.

3.4.CAMPHOR OIL-

FIG 7-CAMPHOR AND CAMPHOR OIL

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Synonyms –
Camphorated oil , Camphor liniment
Biological Source –
Camphor oil is extracted from the wood of camphor trees, known scientifically as Cinnamomumcamphora, and it has a strong aroma.It also can be synthesized from turpentine.
Chemical constituents –
Camphor oil contains various compounds, including camphor, a terpene, and other essential oil components.
Uses –
Camphor oil is popular in aromatherapy, as it helps relieve respiratory congestion.
Essential oils may help treat Trusted Source headaches, including migraine headaches.
It found that the essential oil could suppress pain-signalling pathways and weaken neurogenic inflammation.

3.5.ASAFOETIDA OIL (HING) :

FIG 8– HING AND ITS OIL

Synonyms –
Hing oil , Devils dung oil
Biological Source –
Asafoetida oil, also known as "hing" oil, is derived from the oleo-gum resin of several species of the Ferula plant, particularly Ferula asafetida. Family - Umbelliferae.
Chemical constituents –
Resin (40-64%): Contains asaresinotannols A and B, ferulic acid, and umbelliferone.
Gum (25%):
Volatile Oil (10-17%): Rich in organosulfur compounds, including: o 2-butyl-propenyl-disulfide o Diallyl sulfide o Diallyl disulfide (also found in garlic) o Dimethyl trisulfide (responsible for the odor of cooked onions)
Uses-
It's used to relieve stomachaches, flatulence, and menstrual cramps.
Asafoetida has been historically used as antispasmodic, aromatic, carminative, digestive, expectorant, laxative, sedative, nervine, and analgesic agent.

IV.FORMULATION TABLE

Sr no	Ingrediens	F1	F2	F3	F4	Properties
1	Camphor oil	2.2	1.8	1.68	2.04	Anti-inflammatory, Analgesic, preservative
2	Menthol oil	2	1.6	2.75	1.94	Analgesic and Antispasmodic effects
3	Clove oil	1.9	2.90	1.48	2.12	Anti-inflammatory and Analgesic
4	Thymol oil	2.14	2.5	2.80	1.9	Antispasmodic
5	Asafoetida oil	1.76	1.2	1.29	2	Antispasmodic and pain relieving

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V. METHOD OF PREPARATION

5.1. EXTRACTIONS:

5.1.1.Clove Oil Extraction –

1.Preparation: Grind the clove buds: The clove buds are first dried and ground into a fine powder. Prepare the thimble: The ground clove powder is then placed into a thimble-shaped filter paper. Choose the solvent: Select an appropriate solvent, such as isopropyl alcohol OR Eethanol. Assemble the Soxhlet apparatus: The thimble is loaded into the main chamber of the Soxhlet extractor, and the extraction solvent is placed in a distillation flask. Place the flask on a heating element: The flask is placed on a heating element. Place the Soxhlet extractor atop the flask: The Soxhlet extractor is placed atop the flask.

2. Extraction Process:

Heating and Condensation: The solvent in the flask is heated, and the vapors rise through the pipe, condense, and drop into the extractor.

Continuous Extraction: As the solvent drips into the thimble, it extracts the clove oil from the plant material.

Reflux and Siphon: The solvent, now saturated with the oil, is then siphoned back to the distillation flask, initiating another cycle of extraction.

Repeat Cycles: This process is repeated continuously until the extraction is complete.

3. Collection and Purification: Collect the Extract: After the extraction, the solvent containing the clove oil is collected in a flask. Solvent Removal: The solvent is then evaporated, leaving behind the clove oil.Purification: The crude clove oil can be further purified through techniques like vacuum distillation to remove any remaining solvent and impurities

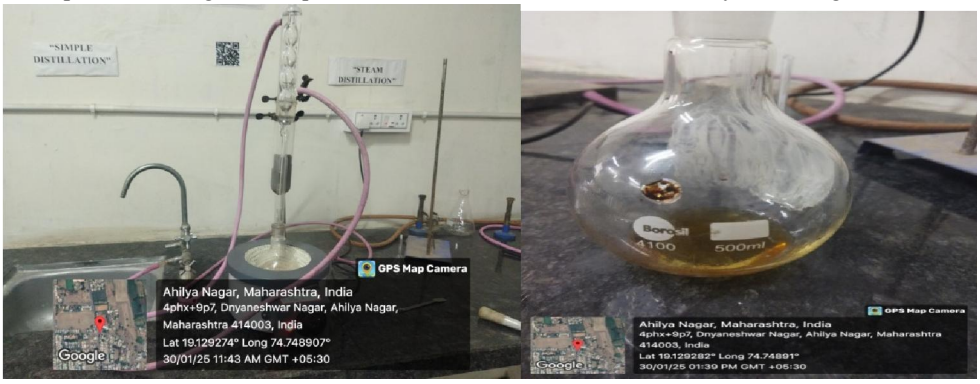

Fig 9: Extraction of clove oil by soxhlet apparatus

5.1.2.Ajwain Oil Extraction

1. Preparation of Sample:Take the Ajwain seeds and grind them coarsely (do not make a fine powder; coarser particles allow better solvent flow and extraction efficiency).

2. Set UpSoxhlet Apparatus: Place the ground Ajwain seeds into the thimble and position it inside the Soxhlet extractor.

3. Add Solvent :Fill the round bottom flask with your selected solvent (e.g., ethanol if you want a food-grade extract or hexane for industrial extraction). Usually, you need around 250–500 mL of solvent, depending on the scale of your setup.

4. Begin Extraction: Heat the flask gently using a heating mantle or water bath. As the solvent vaporizes, it condenses in the condenser and drips onto the sample in the thimble. The solvent extracts the oils and drains back into the boiling flask. This cycle repeats several times over 4–6 hours (sometimes longer for exhaustive extraction).

5. Collect the Extract: After sufficient cycles, turn off the heat and allow the apparatus to cool. Carefully separate the solvent extract from the solid residue. 6. Remove the Solvent: To isolate the oil, you need to evaporate the solvent. Use a rotary evaporator if available (or simple evaporation in an open beaker with low heat if not). You will be left with Ajwain oil, typically a yellowish or light brown liquid rich in thymol and other active compounds.

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Fig10: Extraction of Thymol by soxhlet apparatus

5.1.3.Menthol Oil Extraction:

1. Preparation of Plant Material: Dry the peppermint leaves thoroughly. Grind them into a rough powder the use of a mortar and pestle. The increased surface area improves extraction efficiency.

2. Loading the Soxhlet Apparatus: Place the powdered leaves in a thimble made of filter paper or cellulose. Insert the thimble into the extraction chamber of the Soxhlet apparatus.

3. Choosing the Solvent: Fill the round-bottom flask with a suitable solvent. Ethanol is often used because it effectively dissolves menthol and is relatively safe. Attach the flask to the Soxhlet extractor.

4. Start the Extraction: Assemble the Soxhlet extractor, including the condenser on top. Heat the solvent gently using a heating mantle. The solvent will vaporize, rise into the condenser, and drip into the extraction chamber containing the plant material. Once the chamber fills, it siphons back into the flask, carrying dissolved compounds (like menthol) with it. This cycle repeats multiple times (typically 6–24 hours), ensuring efficient extraction.

5. Solvent Recovery: After sufficient cycles, stop heating and allow the apparatus to cool. Recover the solvent-menthol mixture from the flask. 6. Solvent Evaporation: Use a rotary evaporator or simple distillation setup to evaporate the solvent, leaving behind menthol oil (or an extract rich in menthol). 7. Optional – Menthol Crystallization: You can cool the concentrated extract to encourage menthol to crystallize, then filter and collect the crystals if pure menthol is your target.

Fig11: Extraction of menthol by soxhlet apparatus

5.1.4. Asafoetida oil extraction :

1. Preparation: Crush or powder the asafoetida gum resin to increase the surface area for extraction.

2. Loading the Soxhlet: Place the powdered asafoetida into a filter paper thimble or directly into the Soxhlet extractor if it allows.

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3. Choosing the Solvent: Select a solvent suitable for extracting essential oils or oleoresins. For volatile oils, hexane or petroleum ether is commonly used.

4. Assembly: Assemble the Soxhlet apparatus:Round-bottom flask with solvent at the bottom. Soxhlet extractor in the middle containing the resin.Condenser at the top to cool vapor and drip back solvent.

5. Extraction: Heat the solvent gently in the round-bottom flask. The solvent vaporizes, travels up, condenses, and drips onto the resin. The solvent collects in the Soxhlet chamber, extracting the oil. When full, it siphons back into the flask. Continue the cycle for several hours (6–8 hours is common, but depends on sample size and solvent efficiency).

6. Solvent Removal: Once the extraction is complete, evaporate the solvent to collect the asafoetida extract.Use a rotary evaporator or gentle heating (taking care not to degrade the oil).

7. Oil Collection:The result is a concentrated extract, which may contain essential oil and other resinous components.

Fig12 : Extraction of asafoetida oil by soxhlet apparatus

5.2.PROCEDURE:

Add 1.02 ml of camphor oil in selected container.

↓

Then add 0.97 ml of menthol oil, 1.06 ml of clove oil and 0.95 ml of thymol oil into it. And at last 1 ml of asafoetida oil.

↓

The mixture was blended properly for about 10 to 15 minutes.

↓

The formulation was stored in seal packed container in cool and dry place.

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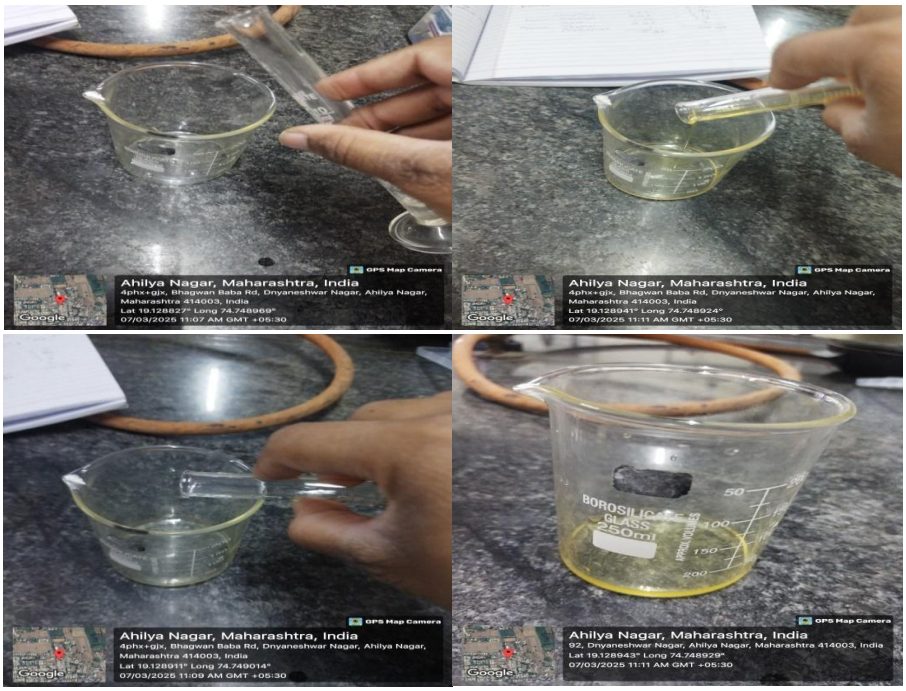

FIG13:PREPARATION OF ROLL ON

VI: EVALUATION

1. pH Test:
Equipment: pH meter or pH paper
Procedure: Measure pH at 25°C
Standard: 4.5-7.
Compare pH value obtain acceptable pH range specified for Herbal roll-on product.
Appearance Test:
Equipment: Visual inspection
Procedure: Evaluate color, clarity, homogeneity
Standard: Uniform color, clear, homogeneous
3. Organoleptic evalution-
Organoleptic evalution test standard for Herbal-roll on typically evaluating the
product sensory characteristics such as appearance, colour, odour and texture.
It also provides valuable information about sensory characteristics of product
4.Irritancy test:
Roll on is applied on the skin and checked for redness, edema, inflammation, and irritation.
5.Test for microbial growth:
The Formulated roll-on was inoculated on the agar media plates by streak Plate approach and manipulate changed into organized through with the exception of the cream.
The plates were placed into the incubator and incubated at 37°C for 24 hours.
After the incubation period, plates were taken out and checked for microbial growth by comparing them with the control.
6.Removal:
Roll-on is applied on the skin and removed by washing with tap water.

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VII. RESULT

The Herbal Feminine Roll On to Reduce Dysmenorrhea was prepared and evaluated. This roll on contains camphor oil,cloveoil,menthol oil, thymol,andasafoetida oil.

pH test-The standard PH of herbal roll on is 4.5-7.

FIG14: PH TEST

Sr no	Baches	PH Value
1	F1	5
2	F2	6
3	F3	4
4	F4	6

TABLE 1: PH TEST

Batch F3 is not in range near about skin pH.hence it is not acceptable.

Appearance test-In appearance test we determined the parameters such as color ,clarity, homogeity.

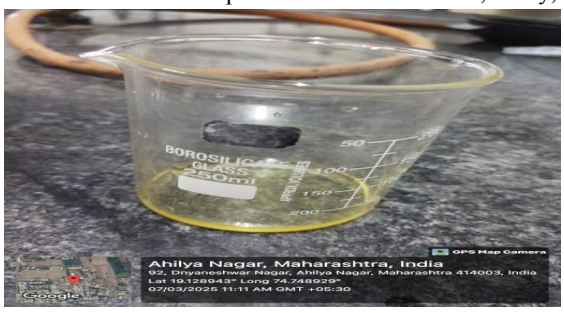

FIG 15: APPEARANCE TEST

Sr no	Baches	Color	Clarity	Homogeneity
1	F1	Yellow	Clear	homogeneous
2	F2	Yellow	Clear	homogeneous
3	F3	Yellow	Clear	homogeneous
4	F4	Pale Yellow	Clear	homogeneous

TABLE 2: APPEARANCE TEST

The homogeneity test is useful for the skin parameter. In which the oil is easily absorbed in the skin.So, the batch F4 is approved.

3) Organoleptic evalution

The organoleptic parameter of the preapared herbal roll on where determined parameters such as odour and texture.

Sr no	Batches	Odour	Texture
1	F1	Pleasant	Oily ,smooth
2	F2	Pleasant	Oily ,smooth
3	F3	Pleasant	Oily ,smooth

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4	F4	Pleasant	Oily ,smooth

TABLE 3: ORGANOLEPTIC EVALUATION

4) Irritancy test

In irritanncy test we determined parameters such as Redness, irritation and burning sensation.

Sr no	Batches	Irritation	redness	Burning sensation
1	F1	Mild skin irritancy	None	None
2	F2	Skin irritancy	None	None
3	F3	Slow less irritancy and mild cooling effect	None	None
4	F4	Cooling effect	None	None

TABLE 4: IRRITANCY TEST

So from above the batch F4 is approved.

5) Test for microbial growth

Sr no	Batches	Microbial growth
1	F1	Present
2	F2	Present
3	F3	Absent
4	F4	Absent

TABLE 5:TEST FOR MICROBIAL GROWTH

So, here batch F1 and F2 should not be approved.

FIG16: TEST FOR MICROBIAL GROWTH

Removal Test

Sr no	Batches	Result
1	F1	Easily remove with water

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2	F2	Easily remove with water
3	F3	Slight residue remaining
4	F4	Easily remove with water

TABLE 6:REMOVAL TEST

In this Batch F3 is not acceptable because it did not easily removed and shows the residue after washing.

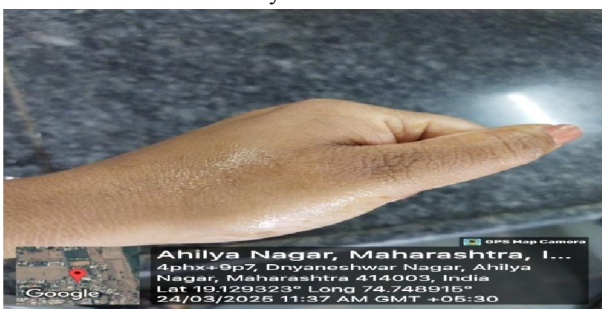

FIG 17: REMOVAL TEST

After performing all evaluation tests we have concluded that Batch F4 is optimized batch and shows results in acceptable range as shown in table no 14 given below

SR NO	EVALUATION PARAMETERS	OBSERVATION	STANDARD
1	PH test	6	4.5-7
2	Appearance test 2.1Evaluate color	Yellowish	Uniform color
	2.2clarity	clear	clear
	2.3homogeneity	homogeneous	homogeneous
3	Organoleptic evalution 3.1odour –	Pleasant	Plasant and not over powering
	3.2texture-	Oily,Smooth , easily rollable	No stickness or residue
4	Irritancy test 4.1 Redness	None	Standard grading- 0:None 1:Very slight 2:Well defined 3:Moderate 4:severe
	4.2 Itching/ Irritation	None, cooling effect	Standard grading- 0:None 1:Mild 2:Moderate 3: severe
	4.3 Burning sensation	No burning	Reported as absent or present
5	Test for microbial growth	No miocrobial growt/ Absent	Pathogens should be absent (E.coli,Salmonella,etc)
6	Removal	Easily remove with water	Easily remove with water or damp cloth

TABLE 7: RESULTS OF EVALUATION TESTS

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VIII. CONCLUSION

Five days of herbal ache alleviation for ladies Roll On is a cutting-edge, natural roll on that gives long-lasting alleviation from length cramps. The cramp relief quickly absorbs into the skin and doesn't leave any residue or oil on the body or on your clothes. Even aleven though a woman's length is a herbal a part of her life, excessive length ache does now no longer should be. Menstrual pain is typically treatable, so women don't have to just put up with it. It may be a good idea to consult a doctor if you get particularly painful periods or if the discomfort keeps getting worse over time. For outpatients with number one dysmenorrhea, aromatherapy rubdown decreased the severity of menstrual soreness and presented alleviation. The oil combination changed into to be massaged into the abdomens of the study's woman participants. Women who used the essential oils for menstruation reported less discomfort and bleeding than those who received a placebo, according to this study. This study observes significant effect on sign symptoms which showed 80% efficacy on Dysmenorrhoea. There become sizeable remedy from menstrual cramps for lengthy period which is probably because of fragrant medicated oil. Therefore it may be concluded that Herbal Feminine Roll-on can be effective and safe in management of dysmenorrhoea. The reviews from the patient are on positive.

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