



CODEN [USA]: IAJPBB

ISSN: 2349-7750

**INDO AMERICAN JOURNAL OF  
PHARMACEUTICAL SCIENCES**<http://doi.org/10.5281/zenodo.3749892>Available online at: <http://www.iajps.com>

Research Article

**FORMULATION AND EVALUATION OF HERBAL AROMA  
BASED FEMININE PAIN RELIEF ROLL ON****Pallavi B. Hangargekar<sup>1</sup>, Ramraje P. Umbare<sup>2</sup>, Amol A. Joshi<sup>3</sup>,  
Chitra B. Hangargekar<sup>4</sup>, Rubiya S. Quazi<sup>5</sup>**<sup>1</sup>Department of Pharmacy, ASPM's K. T. Patil College of Pharmacy, Osmanabad, 413501, Maharashtra, India.<sup>2</sup>Department of Pharmacology, ASPM's K. T. Patil College of Pharmacy, Osmanabad, 413501, Maharashtra, India.<sup>3</sup>Department of Pharmacognosy, ASPM's K. T. Patil College of Pharmacy, Osmanabad, 413501, Maharashtra, India.<sup>4</sup>Department of Quality Assurance, ASPM's K. T. Patil College of Pharmacy, Osmanabad, 413501, Maharashtra, India.<sup>5</sup>Department of Quality Assurance, ASPM's K. T. Patil College of Pharmacy, Osmanabad, 413501, Maharashtra, India.**Article Received:** February 2020**Accepted:** March 2020**Published:** April 2020**Abstract:**

Nowadays, use of different and complementary therapies with mainstream medicine has gained the momentum. Aromatherapy is one of the complementary therapies which use essential oils as the major therapeutic agents to treat several diseases. Premenstrual syndrome (PMS) is a collection of symptoms that many women experience during the one to 2 weeks before a menstrual period. These symptoms may be physical, psychological and emotional. Dysmenorrhea, painful menstruation, is one among the foremost common gynecologic disorders. Dysmenorrhea could also be primary, with no associated organic pathology, or secondary, with demonstrable pathology. Aromatherapy, the therapeutic use of essential oils, is usually used to reduce pain in primary dysmenorrhea. Dysmenorrhea is characterized by lower abdominal pain that happens during menstruation. The best way to use essential oil blends for primary menstrual syndrome and dysmenorrhea is roller bottles. The roller bottles are convenient to use and easy to handle. The main aim of this work is to formulate and evaluate herbal feminine pain relief roll on. The roll on consisting of essential oils blends like eucalyptus essential oil, lavender essential oil used in aromatherapy for the treatment of PMS and dysmenorrhea. The formulated roll on is evaluated by physical examination like color, aroma, absorbance into the skin. The aroma of the essential oils is checked by using the fragrance testing strips.

**Keywords:** Aromatherapy, essential oils, PMS, dysmenorrhea, roll on**Corresponding author:****Ms. Pallavi B. Hangargekar,**

Department of Pharmacy,

ASPM's K. T. Patil College of Pharmacy,

Osmanabad, 413501, Maharashtra, India.

QR code



Please cite this article in press Pallavi B. Hangargekar et al, *Formulation And Evaluation Of Herbal Aroma Based Feminine Pain Relief Roll On*, Indo Am. J. P. Sci, 2020; 07(04).

**INTRODUCTION:****Aromatherapy:**

Aromatherapy is the use of essential oils from plants to boost the mind, body and spirit. The term aromatherapy is derived from the word aroma, which means fragrance or smell and therapy which means treatment. This therapy is a natural way of healing a person's mind, body and soul. Aromatherapy has established itself for the treatment of varied arrays of complications and conditions. The essential oils have obtained their importance in therapeutic, cosmetic, aromatic, fragrant and spiritual uses. This therapy uses different essential oils, as the main therapeutic agents, which are said to be highly concentrated substances extracted from flowers, leaves, stalks, fruits and roots, and also distilled from resins. Essential oils are a mix of saturated and unsaturated hydrocarbons, alcohol, aldehydes, esters, ethers, ketones, oxides phenols and terpenes, which can produce characteristic odors. They are colorless pleasant-smelling liquids with high refractive index. These oils are so potent and concentrated that they work on pressure points and rejuvenate. There are various methods by which they're administered in small quantity like inhalation, massage or simple applications on the skin surface and infrequently, they're taken internally. Inhalation and the external application of those oils for the treatment of mental and physical balance are the very basics of aromatherapy. The therapy of these oils is known to relieve the stress, rejuvenate. Olfactory nerves from nose to the brain are the site of action for these essential oils.



**Fig.1 Aromatherapy**

**Classification of aromatherapy:****1) Cosmetic aromatherapy**

This therapy uses specific essential oils for skin, body, face and hair cosmetic products. These oils are used for their various effects as cleansing, moisturizing, drying and toning. A healthy and glowing skin can be gained by use of essential oils in facial cosmetic products. On a personal extent, cosmetic aromatherapy of full-body or foot bath will be a simple and an effective way to have an experience. Similarly, use of appropriate essential oil will give a rejuvenating and revitalizing experience.

**2) Massage aromatherapy**

The use of oils like grape seed, almond, or jojoba oil in pure vegetable oil during massage has been shown to have revitalizing and wonderful effects. This is also known as healing touch of massage therapy.

**3) Medical aromatherapy**

In modern aromatherapy, different essential oils have been used by the founder Rene-Maurice Gatte fosse, to massage patients during surgery, thus utilizing the medical aromatherapy knowledge of the effect of essential oils on promoting and treating clinically diagnosed medical ailments.

**4) Olfactory aromatherapy**

In olfactory aromatherapy, there is the inhalation of essential oils, where simple inhalation has resulted in enhanced emotional wellness, calmness, relaxation or rejuvenation of the human body. Essential oils are complemented to medical treatment and can never be taken as a replacement for it.

**4) Psycho-aromatherapy**

The different essential oils are used in psycho aromatherapy to obtain certain states of moods and emotions, giving the pleasure of relaxation, invigoration or a pleasant memory. In this therapy the inhalation of the oils is direct though the infusion in the room of a patient. Psycho-aromatherapy deal with the study and effects of aroma be it natural or synthetic.

**ESSENTIAL OILS**

An essential oil is a concentrated hydrophobic liquid containing volatile compounds which are obtained from different plant parts. Essential oils are also called as volatile oils, ethereal oils, or simply as the oil of the plant from which they were extracted.

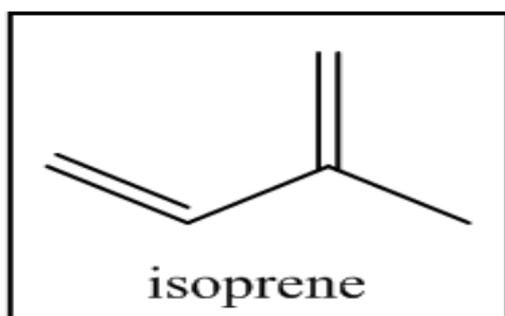


**Fig.2 Essential oils**

An essential oil is "essential" as it contains the "essence of" the plant's fragrance the characteristic fragrance of the plant from which it is derived. The essential oils typically evaporate completely without leaving a stain or residue. Essential oils are generally extracted by steam distillation. Other processes like expression, solvent extraction, absolute oil extraction, resin tapping, wax embedding, and cold pressing are also used. Essential oils are used in perfumes, cosmetics, soaps and other cosmetic products, for flavoring food and drink, and for adding scents to incense and household cleaning products.

#### CHEMICAL COMPOSITION OF ESSENTIAL OILS

Most constituents of essential oil belong to the large group of terpenes. Terpenes usually refer to hydrocarbon molecules consisting of isoprene (2-methylbuta-1, 3-diene). The isoprene unit, which can build upon it in various ways, is a five-carbon molecule.



**Fig.3 Isoprene unit**

#### MEDICINAL AND PHAMACOLOGICAL USES OF ESSENTIAL OILS:

Essential oils are the natural products used as raw materials in fields like perfumes, cosmetics, aromatherapy, psychotherapy, spices and nutrition, insecticides. Aromatherapy is the therapeutic use of essential oils or volatile oils to cure or mitigate or prevent diseases, infection and indisposition by means of inhalation. Inhalation of essential oils has

a significant role in controlling the central nervous system.

#### PRE-MENSTRUAL SYNDROME (PMS):

Premenstrual syndrome (PMS) has a wide variety of signs and symptoms, including mood swings, tender breasts, food cravings, fatigue, irritability and depression.



**Fig.4 PMS symptoms**

#### Symptoms

The list of signs and symptoms for premenstrual syndrome is long, but most women only experience a few of these problems.

- Emotional and behavioral signs and symptoms
- Tension or anxiety
- Depressed mood
- Crying spells
- Mood swings and irritability or anger



**Fig.5 Mood swings**

- Appetite changes and food cravings
- Trouble falling asleep (insomnia)
- Social withdrawal
- Poor concentration
- Physical signs and symptoms
- Joint or muscle pain
- Headache
- Fatigue
- Weight gain related to fluid retention
- Abdominal bloating
- Breast tenderness
- Acne flare-ups
- Constipation or diarrhea
- Alcohol intolerance

### Causes

Exactly what causes PMS is unknown, but several factors may contribute to the condition:

Cyclic changes in hormones. Signs and symptoms of PMS change with hormonal fluctuations and disappear with pregnancy and menopause. Chemical changes in the brain. Fluctuations of serotonin, a brain chemical (neurotransmitter) that's thought to play an important role in mood states, could trigger PMS symptoms. Insufficient amounts of serotonin may contribute to premenstrual depression, also on fatigue, food cravings and sleep problems. Depression. Some women with severe PMS have undiagnosed depression, though depression alone doesn't cause all of the symptoms.

### DYSMENORRHEA:

Dysmenorrhea is the medical term used for pain with menstruation. There are two types of dysmenorrhea as "primary" and "secondary". Primary dysmenorrhea is the common menstrual cramp that occurs frequently and come back and is not due to other diseases. Pain usually begins 1 or 2 days before, and is felt in the lower abdomen, back, or thighs. Pain can range from mild to severe, can typically last 12 to 72 hours, and can be accompanied by nausea-and-vomiting, fatigue, and even diarrhea. Common menstrual cramps usually become less painful as a woman ages and may stop entirely if the woman has a baby. Secondary dysmenorrhea is pain that is caused by a disorder in

the woman's reproductive organs, such as endometriosis, adenomyosis, uterine fibroids, or infection. Pain from secondary dysmenorrhea usually begins earlier in the menstrual cycle and lasts longer than common menstrual cramps. The pain is not typically accompanied by nausea, vomiting, fatigue, or diarrhea.

### Causes of dysmenorrhea (pain of menstrual cramps)

Menstrual cramps are caused by contractions (tightening) in the uterus by a chemical called prostaglandin. The uterus, contracts throughout a woman's menstrual cycle. During menstruation, the uterus contracts more strongly. If the uterus contracts too strongly, it can affect the nearby blood vessels, there by cutting off the supply of oxygen to the muscle tissue of the uterus. Pain results when part of the muscle loses its supply of oxygen.

### Causes of secondary dysmenorrhea

Menstrual pain from secondary dysmenorrhea is caused by a disease in the woman's reproductive organs. Conditions that can cause secondary dysmenorrhea include:

**Endometriosis** - A condition in which the tissue lining the uterus (the endometrium) is found outside of the uterus.

**Adenomyosis** – A condition where the lining of the uterus grows into the muscle of the uterus.

**Pelvic inflammatory disease** - An infection caused by bacteria that starts in the uterus and can spread to other reproductive organs.

**Cervical stenosis:** The opening of uterus narrows

**Fibroids (benign tumors)** - Growths on the inner wall of the uterus.

### Signs and symptoms of dysmenorrhea



A. Cramping in lower abdomen

B. Pain in lower back

C. Neck pain

Fig.6 Signs and symptoms of dysmenorrhea

### TRADITIONAL REMEDIES FOR PERIOD PAIN:

Many home remedies can help relieve menstrual cramps, like heat, exercise and other included below

#### HEAT:

Placing a hot water bottle or heating pad against the abdomen can relax the muscles and relieve cramps. Heat helps the uterine muscle to relax, which may ease cramping and discomfort. By placing a heating pad on the lower back to get rid of back pain. Another way to get relief from pain is to soak in a warm bath, which can help relax the muscles in the abdomen, back, and legs.



Fig.7 Heating pad

#### GENTLE EXERCISE:

Gentle exercise may also provide relief from menstrual cramps. Gentle stretching, going for a walk, or doing yoga may help to get relief. Exercise also releases nature's natural pain relievers called as the endorphins.



Fig.8 Exercise

#### HERBAL TEA:

Herbal teas are warm and soothing, and in some cases, the herbs themselves can be beneficial as well. Some manufacturers market specific teas, such as chamomile, dandelion, red raspberry, and fennel teas, as providing relief from menstrual cramps.



Fig.9 Herbal tea

#### MEDITATION:

Meditation reduces Stress. Stress reduction is one of the most common reasons people try. It also Controls Anxiety.



Fig.10 Meditation

#### ROLLER BOTTLES

Roll-on bottles, also called as the roller bottles, are useful for the following reasons:

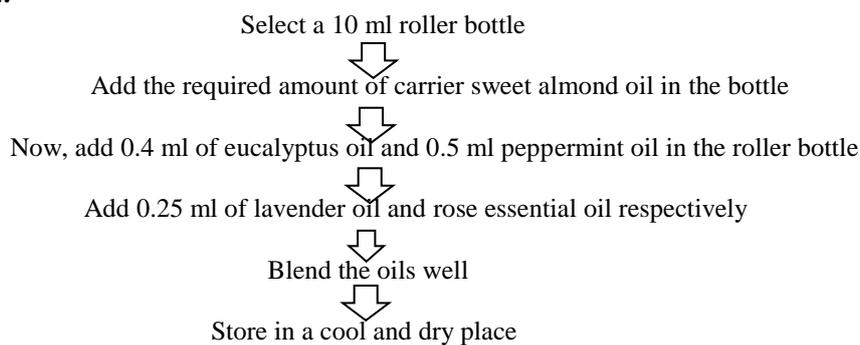
- It can be used to create blends customized as per needs.
- Essential oils blends can be pre-diluted and ready for use.
- They make it easy to apply blends without creating a mess.
- They can be conveniently carried or in a bag to use whenever need them.



Fig.11 Roller bottle

**MATERIALS AND EQUIPMENTS:****List of materials****Table 1: List of ingredients**

Sr. No.	Name of ingredients	Uses	Manufacturer
1	Eucalyptus essential oil	Anti-inflammatory	Speaking tree-eucalyptus essential oil(30 ml)100% pure, natural and undiluted
2	Peppermint essential oil	Cooling sensation	Old tree peppermint essential oil(15ml)100% pure and natural
3	Lavender essential oil	Anti-inflammatory, antidepressant, analgesic, sedative effects	Organix Mantra lavender essential oil steam distilled natural, pure and organic(15 ml)
4	Rose essential oil	Anti-anxiety	Precious aromas rose essential oil(15ml), Gurgaon
5	Sweet almond oil	Carrier oil	Roghan Badam Shirin sweet almond oil, 100% pure (25 ml), Gurgaon

**EXPERIMENTAL WORK PROCEDURE:****FORMULA****Table 2: Formulation of pain relief roll on (10 ml)**

Sr. No.	Ingredients	Quantity Taken
1.	Eucalyptus oil	0.4 ml 8 drops
2.	Peppermint oil	0.5ml 10 drops
3.	Lavender oil	0.25ml 5 drops
4.	Rose Essential oil	0.25ml 5 drops
5.	Sweet almond oil	8.6ml

**Fig.12 Roller bottle with formulation**

**EVALUATION TESTS:****Sensory evaluation****Colour-** Pale yellow**Odour-** Aromatic

**FRAGRANCE TESTING STRIPS:** The aroma of the essential oils and the formulation was checked by using the fragrance testing strips. Essential oil test strips are perfect for testing oil or perfume scents. The narrow end of the strip was dipped into the oil and allowed it to sit for a few seconds. Then the strip was held 3-5 inches from the nose and short whiff was taken.

The colour of the formulation is observed pale yellow visually.

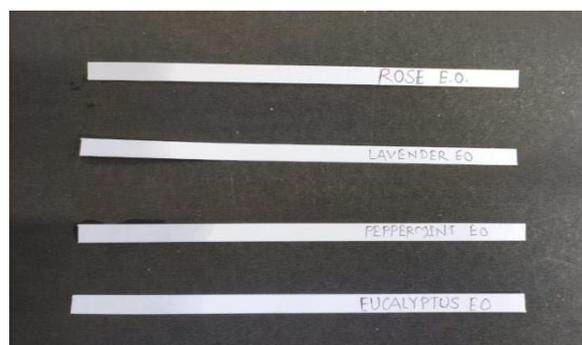
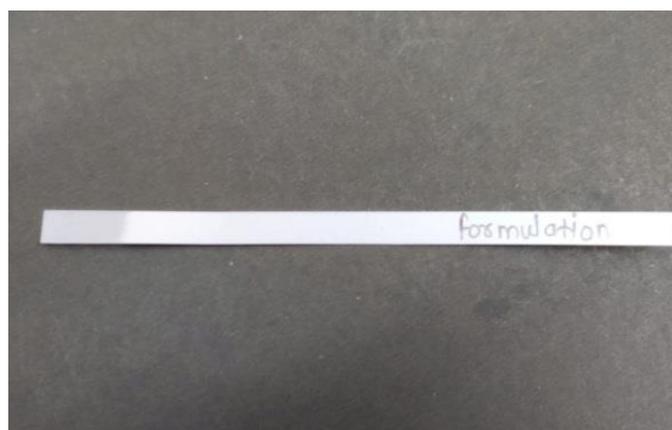
**RESULT AND DISCUSSION:**

The result of present study explains the effects of short-term effects of essential oil based herbal feminine pain relief roll on which was

formulated and evaluated. The pain relief roll-on uses a combination of Eucalyptus, Peppermint, Lavender and Rose essential oils that supposed have an uplifting effect on the user's mood. The present formula can offer immediate relief once applied on the affected region. The roll-on can be effective because of the way it deals with cramps, which provides a cooling effect followed by providing heat to the affected area. This may be the best way to handle period pain. In evaluation test different organoleptic properties were studied like color, aroma, and irritancy. The results are discussed in table no.3. The aroma of the essential oils and the formulation was checked by using the fragrance testing strips. Essential oil test strips are perfect for testing oil or perfume scents. The narrow end of the strip was dipped into the oil and allowed it to sit for a few seconds. Then the strip was hold 3-5 inches from the nose and short whiff was taken.

**Table 3: Physicochemical parameters and observation**

Physicochemical parameters	Observation
Colour	Pale yellow
Aroma	Aromatic
Non irritancy	Non irritant
Stability	Stable (6 months)

**Fig.13** Fragrance test strips**Fig.14** Fragrance testing strips of essential oils**Fig.15** Fragrance testing strip formulation

**CONCLUSION:**

Aromatherapy is a holistic healing treatment that uses natural plant extracts to promote health and well-being. The research concludes the efficacy of aromatherapy in alleviating pain in primary dysmenorrhea and premenstrual syndrome. This roll on could become a media to use the essential oils in a safe way as well as in an effective way. By the result and discussion, the aroma based herbal feminine roll on provides an effective and safe alternative to the existing formulations used as a treatment for premenstrual syndrome and dysmenorrhea.

**CONFLICTS OF INTEREST**

The authors declare that there are no conflicts of interest.

**ACKNOWLEDGMENT:**

The authors wish to thank all the participants in this study. We sincerely thank the individuals who contributed to this work including all our colleagues, management and Principal of ASPM's K. T. Patil College of Pharmacy, Osmanabad. We would like to wish a special thanks to Anamika gore and Ujwal Havelikar.

**REFERENCES:**

1. Krishna, R. Tiwari, S. Kumar Aromatherapy- an alternative health care through essential oils J Med Aromat Plant Sci, 22 (2000), pp. 798-804
2. Ozgoli G, Goli M, Moattar F. Comparison of effects of ginger, mefenamic acid, and ibuprofen on pain in women with primary dysmenorrhea. *Journal of Alternative and Complementary Medicine*. 2009;15(2):129-132.
3. Dye J. *Aromatherapy for Women and Childbirth*. Saffron Walden, UK: Caniel Company; 1997.
4. Adorjan, B. & Buchbauer, G. (2010). Biological properties of essential oils: an updated review. *Flavour Fragr. J.*, Vol.25, pp. 407-426.
5. Hass, Nancy (September 24, 2015). "Francis Kurkdjian and Fabien Ducher, *Changing History in a Bottle*". *The New York Times (Style Magazine)*. ISSN 0362-4331. Retrieved 2015-10-26.
6. Harel Z. Dysmenorrhea in adolescents and young adults: etiology and management. *J Pediatr Adolesc Gynecol*. 2006; 19(6):363-371.
7. Dawood MY. Dysmenorrhea and prostaglandins: pharmacological and therapeutic considerations. *Drugs*. 1981; 22(1):42-56.
8. Borenstein J, Chiou CF, Dean B, Wong J, Wade S. Estimating direct and indirect costs of premenstrual syndrome. *J Occup Environ Med*. 2005; 47: 26-33.
9. W. Sayorwan, V. Siripornpanich, T. Piriyaapun yaporn, T. Hongratanaworakit, N. Kotchabhak di, N. Ruangrungsi The effects of lavender oil inhalation on emotional states, autonomic nervous system, and brain electrical activity *J Med Assoc Thai*, 95 (2012), pp. 598-606
10. Dr. C. K. Kokate, A. P. Purohit, S. B. Gokhale; *Pharmacognosy*; forty eighth edition; Nirali publication; 2013, 14.41-14.43
11. Dr. C. K. Kokate, A. P. Purohit, S. B. Gokhale; *Pharmacognosy*; forty eighth edition; Nirali publication; 2013, 14.50-14.51
12. Dr. C. K. Kokate, A. P. Purohit, S. B. Gokhale; *Pharmacognosy*; forty eighth edition; Nirali publication; 2013, 14.58-14.59
13. W. Sayorwan, N. Ruangrungsi, T. Piriyaapun yorn, T. Hongratanaworakit, N. Kotchabhakdi, V. Siripornpanich Effects of inhaled rosemary oil on subjective feelings and activities of the nervous system *Sci Pharm*, 81 (2) (2013), pp. 531-542
14. Han SH, Hur MH, Buckle J, Choi J, Lee MS. Effect of aromatherapy on symptoms of dysmenorrhea in college students: A randomized placebo-controlled clinical trial. *J Altern Complement Med*. 2006; 12: 535-41.