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Formulation and Evaluation of Polyherbal Roll on to Reduce Dysmenorrhea

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Abstract: Periods, also known as menstruation, are regular episodes of vaginal bleeding that occur during a woman's monthly cycle. Dysmenorrhea, another name for painful periods, affects a lot of women. During the menstrual cycle, lower abdomen pain is a characteristic of dysmenorrhea. Other symptoms that you can have include headaches, nausea, diarrhea, mood swings, lower back and leg pain, and headaches.

This work's primary goal is to develop and assess a herbal pain reliever. The purpose of the herbal roll is to provide relief from menstrual cramps, which can occur before, during, or after the menstrual cycle. Volatile oils found in herbal roll-ons are used to cure a variety of symptoms, including headaches, joint discomfort, lower back pain, and so on. The roller bottles are simple to handle and convenient to use.

A blend of volatile oils, including asafoetida, thymol, camphor, and clove oil, are present in this herbal roll-on.

Keywords: Herbal Roll on, Dysmenorrhoea, cramps, Menstrual cycle.

I. INTRODUCTION

Dysmenorrhea, commonly known as menstrual cramps, is a pain that results from the contraction of the womb's muscles during a woman's period. Menstruation is the regular, monthly cycle-related vaginal bleeding that occurs in women. Both before and after the menstrual cycle, dysmenorrhea can occur.

In this study, we make a herbal roll-on to help ease the discomfort associated with menstrual cramps. An A particular kind of liquid preparation known as roll-on is packaged in a revolving ball-shaped dispenser applicator. Roll-on bottles, sometimes referred to as roller bottles, are containers that hold volatile oils that are used to treat a variety of symptoms, including headaches, neck aches, lower back pain, and joint pain. The components of the Roll-on mixture are asafoetida oil, clove, thyme, mint, and camphor. Pain-relieving formulations are made with these oils, which are present in leaves, petals, stems, seeds, barks, roots, and other plant materials. Several extraction techniques, including steam distillation, cold pressing, hydro-distillation, solvent extraction, and the use of a Clevenger device, can be used to manufacture these oils.

A. Cramping in lower abdomen B. Pain in lower back C. Neck pain

Fig.6 Signs and symptoms of dysmenorrhea

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II. AIM & OBJECTIVE

AIM:
To prepare Polyherbal roll-on by using selected herbs to reduce Dysmenorrhea.

OBJECTIVE:
The main aim for the preparation of a polyherbal roll-on is for "reduction of dysmenorrhea". It plays a vital role in the control and reduction of any pain during the menstrual cycle. The main motto of this polyherbal 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 an bad impact on their schedule of that time. Therefore we introduced "Poly herbal roll-on" so every women can free comfortable in their schedule.

III. MATERIALS & METHOD

Collection of herbs for roll on to reduce dysmenorrheal:
Collection of seeds, leaves and flower of different herbs were done from different surroundings in accordance to extract oils from different collected herb for the formulation of herbal roll on to reduce dysmenorrhea. These herbs were collected from the areas like from the laboratories of our college and from our native places. The extraction procedure of oils was done in our lab area only.

The plants were selected on the basis of their potency of anti-microbial activity, anti-inflammatory activity, pain-reliever, anti-viral and etc. The herbs which we preferred for our herbal roll-on were – Camphor, mentha (mint), clove, thyme (ajwain) and asafoetida (hing).

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 were used for the formulation of roll on to reduce dysmenorrhea.

CLOVE:
Cloves (Eugenia caryophyllus) are the aromatic dried flower buds of a tree in the family Myrtaceae. For millennia, people have been aware of clove's therapeutic benefits. It works well as a home cure to treat a variety of illnesses. Cloves exhibit a number of qualities, including anti-inflammatory, myalgia, antioxidant, and antibacterial effects.

Fig.1.2: clove powder from clove

EXTRACTION OF CLOVE OIL USING CLEVENGER APPARATUS:
Procedure: 60g of cloves in a round-bottom flask connected to the Clevenger device, along with enough water to boil at 80° to 90°C. The apparatus's graduated collecting tube held the condensed water vapor and active ingredient after they were condensed by the condenser. Next, use a separating funnel to isolate the eugenol. After adding some ether, sodium chloride was saturated with the volatile distillate. The funnel then separated the hydro layer from the ether layer. The ether layer was further heated in a water bath at 60°C to recover the ether and make everything concentrated after being dehydrated by anhydrous sodium sulfate. The 1.6 ml of clove oil was weighed.

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Fig.1.3: Extraction of clove oil from clove using Clevenger apparatus

We were able to extract the clove oil with this extraction process. The oil mixture gathered in the Clevenger apparatus's collecting chamber is then gradually removed into the beaker after the heat is turned off.

After that, the mixture of oil is put into a funnel designed to separate it into its crude form using various solvents. Different layers formed in the separating funnel based on many characteristics, including density, vapour pressure, solubility, surface tension, viscosity, and so forth.

The layers seen in the separating funnel:

Fig.1.4: oil in separating funnel

MENTHA :

A genus of plants in the Lamiaceae family, or mint family, is called Mentha arvensis. Mentha has antibacterial, anti-inflammatory, analgesic, and pain-relieving qualities. It also helps to lessen menstrual cramps.

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Fig. 1.4: mentha herb and oil(menthol)

EXTRACTION PROCESS FOR MENTHOL:

In the HD method, 330g of ground mint leaves are placed into a 500ml flask of a Clevenger-type equipment together with 250mL of distilled water for hydro-distillation. This procedure is done at least twice and takes six hours to complete. The apparatus's graduated collecting tube held the condensed water vapour and active ingredient after they were condensed by the condenser. 50 milliliters of dichloromethane are added to a separating funnel to separate the active ingredient. By adding anhydrous calcium chloride and filtering it, the residual water is eliminated. 1.6 ml of menthol is obtained after heating.

AJWAIN:

Ajwain, also known as Trachyspermum ammi (L.) Sprague, is a herbaceous plant that is a member of the Apiaceae family. Antiseptic, stimulant, carminative, diuretic, anesthetic, antibacterial, antiviral, nematicidal, antiulcer, antihypertensive, antitussive, and bronchodilatory properties have all been found in ajwain seeds.

Fig.1.5: Ajwain herb with seeds

EXTRACTION PROCESS FOR THYMOL:

In the steam generator, add roughly 250 milliliters of water and heat it up to create steam. Place roughly 75 grams of crushed carom seeds in the flask with a circular bottom. A powerful stream of steam is directed through the round-bottom flask from the steam generator. In the flask with the circular bottom, some of the steam condenses. The volatile components of the steam travel through the condenser with the increasing amount of steam. These condensation-related components are gathered in the receiver. To avoid too much steam condensation, you can use a Bunsen burner to heat the contents of the round-bottom flask. For around thirty minutes, the steam distillation procedure is carried out.

Move the distillate to a funnel for separation, then extract three times using 20 milliliter parts of petroleum ether. In a 250 ml conical flask, combine the petroleum ether extracts and use anhydrous sodium sulphate to dry the mixture. Carefully distill the dried filtrate in a water bath to extract the solvent. The distillation flask still contains the essential oil. One and a half milliliters of essential oil was extracted.

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Fig.1.6: Thymol (Ajwain oil)

CAMPHOR :

Scientifically referred to as Cinnamomum camphora, camphor is a member of the Lauraceae family. Strong-smelling camphor oil is derived from the wood of camphor trees. Turpentine can also be used to synthesize it. Aromatherapists frequently use camphor oil because it helps clear congestion in the respiratory system. Additionally, it possesses antitussive qualities that may ease coughs in children and adults. Trusted Source headaches, particularly migraine headaches, may be treated using essential oils. Those who help create a relaxing environment might also encourage sleep. In 2019, a mouse study examined the impact of Cinnamomum camphora on migraines. It was discovered that the essential oil might lessen neurogenic inflammation and inhibit pain-signaling pathways.

Fig.1.7: Camphor and camphor oil

ASAFOETIDA (HING) :

Hingu was also known as Hing or Asafoetida. Asafoetida, also known as Ferula asafoetida, is an oleo-gum resin made from the Umbelliferae family plant Ferula vegetable stalks. Hing plants have thick, massive, pulpy roots; fruits are round, flat, reddish-brown, and full of milky fluid. The plants themselves are pale greenish yellow in color. An extract equal to that of the stems is bled from them.

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Fig 1.8 : Asafoetida and it's oil

EXTRACTION PROCESS FOR ASAFOETIDA OIL:

The Asafoetida oil is derived by using Clevenger apparatus assembly of the asafoetida tree gum and this oil can be used to increase the standards of many delicacies. The Asafoetida oil has a lot of different properties which provides the users with different kinds of benefits which includes relief from intestinal disorders, blood purifier and also a brilliant element to balance mental stress. Due to so many benefits and also available at an affordable rate, the Asafoetida oil is sold worldwide on various websites. This oil is also extracted by the method of steam distillation.

FORMULATION AND EVALUATION :

FORMULA:

Sr. No.	Ingredients	Quantity Taken (ml)
1	Camphor oil	1.02
2	Menthol	0.97
3	Clove oil	1.06
4	Thymol	0.95
5	Asafoetida oil	1.00

PROCETURE:

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.

Fig 1.9: formulation of herbal oil roll-on

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EVALUATION TESTS:

Organoleptic Evaluation : organoleptic properties involves colour, odour, and texture.
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.
Test for microbial growth : Using the streak plate method, the prepared roll-on was infected into the agar medium plates, and a control 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, the plates were removed and compared to the control to look for signs of microbial development.
pH Evaluation : The pH is determine by using digital pH meter.
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.

OBSERVATION OF ERVALUATION PARAMETERS :

Sr. No.	Evalution Parameters	Obervations
1.	Organoleptic evaluation: Colour Odour	 Pale yellow Aromatic
2.	Homogeneity	Uniform distribution
3.	After feel	Cooling effect with counter-irritant effect and reduce cramps
4.	Removal	Easily removed
5.	Irritancy test	No any irritation
6.	Test for Mic4robial growth	No microbial growth
7.	pH	6
8.	Stability	More stable at room temperater

IV. RESULT

This study found a considerable impact on the symptoms of dysmenorrhea, with an 80% effectiveness rate. Menstrual cramps were significantly relieved for an extended period of time, which may have been caused by the fragrant medicinal oil. Consequently, it is possible to draw the conclusion that Poly botanical Roll-on can safely and effectively treat dysmenorrhea.

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