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Formulation And Evaluation Of Herbal Cardamom Suppositories

Mayuri Balaram Bhoir [1], Prajkta Nivrutti Dongare[2], Shinde Monali B[3]

[1]VIDYA NIKETAN INSTITUTE OF PHARMACY AND RESEARCH CENTER, Bota, India

[2]VIDYA NIKETAN INSTITUTE OF PHARMACY AND RESEARCH CENTER, Bota, India

[3]VIDYA NIKETAN INSTITUTE OF PHARMACY AND RESEARCH CENTER Bota, India

Abstract

The development and testing of herbal cardamom suppositories revealed that cardamom possesses relaxing and maybe anti-inflammatory properties that make it suitable for vaginal use. Acceptable physical attributes, including consistent shape, smooth texture, sufficient weight, and suitable melting time, were displayed by the manufactured suppositories. Effective medication release and biocompatibility were guaranteed by the use of natural bases like glycerin or cocoa butter. Overall, the study shows that herbal cardamom suppositories are a safe and natural therapeutic option that shows promise for treating issues like local irritation or white discharge. The active component of the herbal suppositories successfully produced in this study was cardamom extract. The suppositories' smooth texture, consistent weight, appropriate melting point, and pH that was adequate for vaginal administration were among their acceptable physical attributes. The presence of active ingredients was verified by phytochemical screening.

Keywords: Herbal medicines, Herbal suppositories, cardamom

Introduction

Herbal suppositories are solid dose forms with systemic or localized effects that are meant to be administered rectal. Cardamom (Elettaria cardamomum) is a possible option for suppository formulation due to its anti-inflammatory, antibacterial, and digestive qualities. Known as the "queen of spices," cardamom (Elettaria cardamomum) has long been prized in traditional medical systems for its many medicinal uses. Cardamom is currently being investigated in new delivery methods, such as suppositories, despite its widespread use as a spice in food and in oral preparations. The scientific foundation, historical background, and justification for creating herbal cardamom suppositories are all covered in this introduction.[1,2]

Recent studies on guggul and flaxseed suppositories demonstrate how the increased interest in herbal therapy has sparked research into suppositories with plant-derived active ingredients. These formulations combine the dependable delivery of the suppository technique with the advantages of traditional herbs. Suppositories are solid medication dosage forms that are meant to be inserted into bodily cavities such as the urethra, vagina, or rectum. The active substance is released when they melt or dissolve at body temperature. Because of its natural nature, reduced side effects, and patient acceptability, herbal suppositories are becoming more and more popular.[3]

Elettaria cardamomum seeds are used to make cardamom, a spice that has long been used to heal infections, nausea, and indigestion. Because of its natural source, less negative effects, and medicinal advantages, herbal formulations are becoming more and more popular. Cardamom (Elettaria cardamomum) is a popular herbal ingredient because of its antibacterial, anti-inflammatory, and antioxidant qualities. A unique way to deliver cardamom's medicinal properties is by incorporating it into pharmaceutical forms like suppositories, particularly for localized diseases like inflammation, infections, or hemorrhoids. A solid dose form called a suppository is meant to be inserted into bodily orifices, where it will melt, dissolve, or soften to provide either local or systemic effects. The formulation of herbal cardamom suppository combines the natural medicinal benefits of cardamom with the advantages of the suppository route, such as bypassing first-pass metabolism and offering targeted treatment.[3,4]

The development method entails choosing appropriate bases (such as glycerinated gelatine and cocoa butter) and making sure that the cardamom extracts in the formulation are stable and compatible. This novel strategy seeks to improve herbal treatments' efficacy while offering a dosage form that is convenient for patients. The usage of herbal medications has significantly increased in recent years because of its wide range of therapeutic uses, safety record, and natural nature. For the treatment of many illnesses, especially those that need long-term care, herbal formulations are becoming more and more popular than synthetic medications. Cardamom (Elettaria cardamomum) is a notable medicinal plant because of its well-established antibacterial, anti-inflammatory, antioxidant, and gastroprotective properties.[5,6]

Carefully choosing the base, maximizing the concentration of cardamom extract, and assessing the suppositories' physicochemical characteristics—such as their melting time, disintegration, and drug release profile—are all part of the formulation process. In order to support the expanding field of pharmaceuticals

based on natural products, this study attempts to create a herbal suppository that is stable, efficient, and patient-friendly. Because suppositories enable the active ingredients to operate directly at the site of infection, improving absorption and accelerating therapeutic activity, they are perfect for vaginal administration. The formulation includes selecting suitable bases, such as polyethylene glycol or cocoa butter, adding the cardamom extract, and making sure the product is stable and acceptable to patients.[7,8,9]

In order to provide a safe, natural, and efficient therapeutic option for women's health, this study is to create and assess a herbal cardamom suppository that is especially intended for the management and treatment of white discharge.

Materials and methodology

2.1 Materials and equipment's

White bees wax, cocoa butter, glycerine, and sesame oil was used. Suppositories were prepared by using appropriate moulds. For the extraction of cardamom Soxhlet extraction method was used.

2.2 Methodology

2.2.1 Preparation of herbal suppositories

For the preparation of suppositories fusion mold method was used. Cardamom extract was prepared by using the Soxhlet extraction method. Three batches were prepared as per following formulation table. Cocoa butter melted and white beeswax together over gentle heat. Added sesame oil and glycerine slowly while stirring. Added Cardamom Extract also and slowly stirring. Mixed thoroughly until uniform. Poured into clean suppository molds. Cooled at room temperature or refrigerate until fully solid. Demolded carefully and store in a cool, dry place.[10,11]

SR. NO	INGREDIENT	F1	F2	F3
1	White bees wax	0.15	0.21	**0.09**
2	Cocoa butter	2.4	2.25	**2.55**
3	Glycerin	0.06	0.09	**0.03**
4	Sesame oil	0.24	0.3	**0.18**
5	Cardamom Extract	0.15	0.15	**0.15**

Table: Formulation table/composition of Herbal suppositories

2.2.2 Evaluation of Herbal Suppositories

2.2.2.1 Weight variation

Evaluation was carried out for weight variation.

2.2.2.2 Appearance and shape

Suppositories have been checked for smooth, uniform appearance without cracks or air bubbles, and the shape should be appropriate for the intended route of administration.

2.2.2.3 Melting range

The melting point should be close to body temperature to facilitate drug release.

2.2.2.4 Disintegration and Dissolution

Tests measure the time it takes for suppositories to disintegrate and the rate at which the active ingredient dissolves in a suitable medium.

2.2.2.5 Drug Content Uniformity

Random samples are tested to ensure consistent drug content across all suppositories.

2.2.2.6 Hardness/Breaking Strength

Tests determine the suppository's resistance to breakage.

2.2.2.7 Stability

Long-term storage tests assess changes in appearance, melting range, drug content, and dissolution over time, helping determine shelf life.

2.2.2.8 Softening Time

Determines the time it takes for the suppository to soften under defined conditions.

2.2.2.9 Visual Examination

Assesses overall appearance, colour, and any defects.

2.2.2.10 Liquefaction Time/Temperature

Measures the time and temperature required for the suppository to melt or become soft.

2.2.2.11 Physical Appearance

Uniformity in shape, colour, and texture.

2.2.2.12 pH Measurement:

pH was determined by using pH meter.[13,14,15]

Result and Discussion

Herbal suppositories from cardamom extract were prepared and evaluated for the physio-chemical evaluation, results found are as follow,

3.1 pH Measurements

FORMULATION	F1	F2	F3
pH	3.9	4.2	3.5

Table 8.1 pH Measurements

3.2 Physical Evaluation Test:

FORMULATION	Appearance	Colour	Odour	Shape	Texture
F1	Smooth, Uniform	Light Yellow	Pleasant or Neutral	Bullet	Smooth
F2	Smooth, Uniform	Light Yellow	Pleasant or Neutral	Bullet	Smooth
F3	Smooth, Uniform	Light Yellow	Pleasant or Neutral	Bullet	Smooth

Table 8.2 Physical Evaluation Test

3.3 Chemical Test:

CHEMICAL TEST	OBSERVATION	CONCLUSION
Liberman Reaction	Green or bluish green colour	+
Liberman – Burchard Test	Blue or green	–
Hesse's Reaction	Reddish colour	–
Borntrager Test	Pink or red colour	–
Killer – Killani Test	Blue or green colour	–
Legals Test	Pink colour developed	–

Table 8.2 Chemical Test

Conclusion

Herbal cardamom suppositories were developed and tested, and the results showed that cardamom has calming and maybe anti-inflammatory qualities that are good for vaginal usage. The prepared suppositories showed acceptable physical characteristics such as uniform shape, smooth texture, proper weight, and appropriate melting time. The use of natural bases like cocoa butter or glycerin ensured biocompatibility and effective drug release. Overall, the study supports that herbal cardamom suppositories are a promising alternative for managing conditions like white discharge or local inflammation, offering a safe and natural treatment option.

Cardamom extract was used as the active ingredient in the herbal suppositories that were effectively created in this investigation. The suppositories exhibited acceptable physical characteristics, including smooth texture, uniform weight, suitable melting point, and pH compatible with vaginal administration. Phytochemical screening confirmed the presence of active constituents.

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