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Formulation and Evaluation of Herbal Chocolate for Menstrual Pain

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ABSTRACT:

Chocolate is one of the most popular food types and flavors in the world, while the medicine is a odious substance. The ideal of this study is to design and fabricate chocolate. It is also called chocolate drug delivery. The global consumption of chocolate at different ages and for different purposes served as the motivation for this study. The high demand for chocolate in the request has resulted in the potential for impurity of chocolate products to meet this demand. This exploration delves into the innovative operation of herbal chocolate, an enjoyable emulsion of traditional enjoyment and holistic well-being. People love chocolate more than any other food, but they hate specifics. Therefore, the thing of this study was to develop the chocolate that contains herbal ingredients i.e. treated chocolate to relieve menstrual cramps. It is a natural remedy that possesses medicinal parcels related to the womanish reproductive system, analogous as the capability to improve lactation, prevents miscarriage, removes the infertility and controls the period. Physicochemical study was performed on herbal chocolate to determine the presence of protein, carbs, and glycoside, which signify the presence of various bimolecular factors in chocolate. Further, set-treated chocolate is estimated for general appearance, dimension, hardness, and blooming test.

KEYWORDS: Herbal Chocolate, Menstrual pain, Herbs, Chocolate formulation.

INTRODUCTION:

Herbal drugs are the oldest remedies known to humanity. Herbs have been used by all societies throughout history, but India has one of the oldest, richest and most different artistic living traditions associated with the use of medicinal shops. Natural product exploration is frequently grounded on ethno botanical information and numerous of the medicines used moment were employed in indigenous societies. One of the points of ethno pharmaceutical exploration is better understanding of the pharmacological goods of different medicinal shops traditionally used in healthcare. Shops are regarded as a promising source of new remedial agents due to their advanced structural diversity as compared to standard synthetic chemistry. Shops have operations in the development of remedial agents and act as a source of bioactive composites for possible use as medicines (1).

In clinical practice and literature, the terms" dysmenorrhea" and" menstrual pain" are occasionally used interchangeably. They represent dull, palpitating pain that feels like cramps and generally comes from the lower tummy, either before or during periods. According to some pens, there may be a kind of yearly discomfort known as" normal menstrual cramps" that is less severe than dysmenorrhea. Premenstrual



pelvic pain, with or without systemic symptoms, is appertained to as menstrual cramps occasionally known as menstrual pain pattern or metallic. Grounded on the cause, this might be distributed as primary or secondary (2).

Dysmenorrhea is distributed into two types:

1. Primary Dysmenorrhea:

It is defined as painful monthlies among ladies with normal pelvic deconstruction, constantly beginning during nonage. It is observed only in ovulatory cycles, constantly arising within 6 to 12 months after monarch with no pathology or organic base. Primary dysmenorrhea refers to menstrual pain resulting from prostaglandin situations associated with the ovulatory cycle. The cause of primary dysmenorrhea isn't well established.

2. Secondary dysmenorrhea:

It is a menstrual pain associated with underpinning pathology, and its onset might be times after monarch. Secondary dysmenorrhea is linked to medical conditions such as endometriosis, adenomyosis, fibroids (myoma) and other pelvic diseases (3, 4).

Menstrual conditions (MD) include amenorrhea, which is the absence of period; oligomenorrhea, which is the occasional circumstance of menstrual ages; hemorrhagic, which is heavy bleeding, including dragged menstrual ages or inordinate bleeding during a normal-length period; menstrual cramps which is painful cramps during period; and premenstrual pattern (PMS), which is physical and cerebral symptoms before period. Between 30 and 40 rich ladies have been reported to have PMS. Also, a frequency of 14 to 25 has been noted in women who have irregular menstrual ages. This variability includes cycles that are abnormally long or short, flow abnormally in terms of weight or lightness, or are accompanied by fresh problems such as cramping in the tummy (5).

One of the finest delivery styles for patient compliance is oral. Chocolate is a largely advanced and adaptable food that may be combined to produce completely distinct tastes and textures. The anhydrous nature of chocolate makes it resistant to the growth of microorganisms as well as the hydrolysis of active constituents that are water sensitive. In numerous ways, using chocolate as a delivery system for active composites makes sense. Children and individualizes of all periods find chocolate to be one of the dainty, most respectable, and favorite foods (6).

The term "CHOCOLATE" finds its roots in the word 'coca.' The history of chocolates dates to 400 announcements. It's drafted from the seeds of the coca factory known as 'Theobroma cacao.' These seeds boast a rich attention of antioxidants and essential minerals. Chocolate is created through a series of way including seed riding, turmoil, and colorful physicochemical processes, eventually yielding cocoa greasepaint and cocoa adulation, depending on the specific medication and birth ways employed. Chocolate is abundant in phytocompounds similar as phenyl ethane, flavonoids, methylxanthines, aliphatic alcohols, sterols, and more. Phenylethylamine, known as the 'love medicine', occurs naturally in the brain and is produced when individualities witness love. Pea, a type of amphetamine present in the brain, acts as a natural goad. It aids in hormone product, fosters passions of sanguinary and pleasure, and elevates dopamine situations along with other neuroreceptors (7).

Photochemistry of Herbs used in Formulation:

- CHOCOLATE:
- Botanical Name: Theorem cocoa



- Formula: C7H8N4O2
- Antonyms: Cocoa tree, Cacao tree
- Structure:



Morphological Characteristics:

- Factory Theobroma cacao is a small evergreen tree that generally grows to a height of 4–8 measures (13–26 bases).
- Leaves: The tree has broad, lustrous green leaves that are oblong and arranged alternatively on the branches.
- **Flowers:** It produces small, delicate flowers directly on the box and aged branches. These flowers are white to pinkish in color and have a characteristic odor.
- **Roots:** The roots of the cacao tree are shallow and wide spreading, helping to anchor the tree in the soil and absorb nutrients and water.

Chemical ingredients:

- **Flavonoids:** Cacao sap contain a variety of flavonoids including Catching, Epicatechins Procyonids, and Anthocyanidins.
- **Theobromine:** This is a bitter alkaloid that is responsible for important of the goad goods in chocolate.
- **Caffeine:** Though present in lower quantities compared to theobromine, caffeine contributes to the stimulating parcels of chocolate.
- **Polyphenols:** These composites act as antioxidants and are set up in cornucopia in dark chocolate.
- Adipose Acids: Cocoa butter, uprooted from cocoa sap, contains a blend of adipose acids similar as stearic acid, Oleic acid, palmitic acid.
- **Phenylethylamine:** It is known as the "love drug," PEA is a conflation that is said to increase heartstrings of pleasure and well- being.
- Anandamide: It's called the "bliss patch" anandamide is a neurotransmitter set up naturally in cacao that can promote heartstrings of happiness and relaxation (8).

1) Dark Chocolate:



Fig 1: Dark Compound.



Ideal Features of chocolate for menstrual cramps:

Characteristics of dark chocolate that could make it an effective option for easing menstrual discomfort

- **1.** It should be drafted with a refined flavor.
- 2. It must be of superior quality.
- **3.** Its texture ought to be entirely satiny.
- 4. It should present an authentic appearance.
- 5. It ought to dissolve easily in the hand or mouth.

Pharmacological Benefits:

- **1. Pain relief:** The flavonoids and anandamide set up in dark chocolate can help in lessening pain and inflammation.
- **2.** Muscle relaxation: The magnesium in dark chocolate can grease the relaxation of uterine muscles and palliate cramping.
- **3. Mood enhancement:** Phenylethylamine and anandamide can help in minimizing stress and anxiety linked to menstrual cramps.
- **4. Anti-inflammatory goods:** The flavonoids and copper in dark chocolate can work to dwindle inflammation and pain.

Benefits for Menstrual Pain Relief:

- **1.** Alleviates menstrual cramps: The combination of flavonoids, magnesium, and anandamide in dark chocolate can help lessen menstrual cramps.
- 2. Mitigates bloating and bone receptivity: The flavonoids and magnesium in dark chocolate can help in reducing bloating and bone humaneness.
- **3.** Enhances mood: The presence of phenyl ethylamine and anandamide in dark chocolate can help boost mood and lessen stress and anxiety.
- **4.** Encourages relaxation: The magnesium and flavonoids in dark chocolate can promote relaxation and ease muscle pressure (9).

2) WHITE CHOCOLATE:



Fig 2: White Compound.

It is a confectionary product made of sugar milk solids, cocoa butter, lecithin, and vanilla where the patches of sugar and milk solids are covered by a nonstop adipose phase (substantially cocoa butter). Milk solids generally correspond to whole milk powder, and in some formulations, skimmed milk powder, whey



powder, and lactose can be used. To be named "white chocolate", white chocolate must include whole milk powder and cocoa butter in its composition, thus it doesn't contain cocoa products other than cocoa butter. Thus, white chocolate lacks precious factors such as polyphenols, minerals, and fibers. Therefore, the functionality of white chocolate is veritably low compared to dark and milk chocolate, and functional food development studies associated with white chocolate are veritably limited (10).

3) CINNAMON:



Fig 3: Cinnamon Powder

A flavoring agent of herbal chocolate with potential health benefit like anti-inflammatory agent. Scientific reports showed that CE affected as antioxidant lead to euro defensive, hepatic protective, cardio defensive, and Castro defensive and anti-inflammatory properties. And anticancer exertion, as well as in tissue form. Bark a principal part of cinnamon contains, CD, CE, and cinnamon alcohol, thus used to fight the hyperglycemia damage (11.

- Botanical Name: Cinnamon serum
- Antonyms: Ceylon Cinnamon: Cinnamon zeylanicum
- Cassia Cinnamon: Cinnamon aromaticum
- Formula: C9H8O
- Structure:



Morphological Characteristics:

- **Ceylon Cinnamon:** Thin, papery bark with a mild flavor.
- Cassia Cinnamon: Thicker, rougher bark with a stronger, gamy taste.
- Leaves: Pleasant, opposite or alternate.



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• **Flowers:** Small and invisible, clustered (12).

Chemical Ingredients:

Different types of cinnamon are composed mainly of different factors, most specially CD, CA, and cinnamate, and different important oils. These oils indicated like splint oil painting of zeylanicum cinnamon and bark oil were distinguished with eugenol. CA oil painting, was set up in, cinnamon cassia, its usedintreatment, antifungal factors to stop food loses, and cosmetics. Leaf oil painting of longepetiolatum cinnamon abundantly contain Camphor emulsion. Camphor is used topically to diminish pain and treats infections (11).

USES:

- 1. Cinnamon is a coagulant and prevents bleeding
- 2. Cinnamon also increases the blood rotation in the uterus and advances tissue regeneration
- 3. Antimicrobial
- 4. Antifungal
- 5. Antioxidant
- 6. Cinnamon has been used as an anti-inflammatory (13).

4) CARDAMOM:



Fig 4: Cardamom Powder.

An additional fresh flavoring agent to herbal chocolate.

- Botanical name: Electric cardamom
- Antonyms: Cardamom, Elaichi
- **Formula:** C16H14O4
- Structure:





Morphological Characteristics:

- **Plant:** Imperishable herb with long, reed-like stems.
- Leaves: Large, shaft-shaped, and arranged alternatively.
- Flowers: Small, unheroic-green with Violets, borne on along the panicle.
- Fruit: Small, green to pale yellow capsules containing pleasant seeds (14, 15).

Chemical Ingredients:

Dried fruit of cardamom contains steam volatile oil, fixed (fatty) oil painting, colors, proteins, cellulose, pentosans, sugars, starch, silica, calcium oxalate and minerals. The major element of the seed is starch (up to 50 percent), while in the fruit cocoon it is crude fiber (up to 31 percent). Unexpected oil painting is the most functionally important element of cardamom. The unpredictable oil painting content of seeds varies from 6.5 to 10.5 for the two types of cardamom (Malabar and Mysore) grown in India. In juvenile capsules, attained in small amounts in all crops (and further particularly in the last crop), the unpredictable oil painting, 10 protein, 1–10 fixed oil painting and up to 50 bounce. The aroma and flavor of cardamom are attained from the essential canvases which is composed of substantially α - terpinyl acetate(20 – 55) and 1,8-cineole(20 – 60) which are responsible for specific flavor to the cardamom (16).

Uses:

- 1. Traditional use for digestive and respiratory affections.
- 2. Cardamom has been incorporated into numerous drugs due to its effectiveness in treating digestive and respiratory problems. It also exhibits antimicrobial exertion
- 3. Due to similar parcels, adding this to herbal chocolate gives, not only flavor but also aids in controlling airborne complaint (15).

5) SHATAVARI:



Fig 5: Shatavari Powder.

- Botanical Name: Asparagus racehorses
- Family: Lauraceae
- Formula: C51H86O23
- Structure:

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Morphological Characteristics:

- **Roots:** The roots are finger-suchlike and clustered. The roots are the spherical, fleshy tuberous, straight or slightly twisted, tapering towards the base and swollen in the middle, brown to color, wrinkle on upper face.
- Taste: Bitter
- Odor: Odorless
- Leaves: Liner green and needle like.

Uses:

- 1. It works well for premenstrual pattern and menstrual cramps.
- 2. It is regarded as a womanish alcohol in Ayurveda.
- 3. Also, it is used to treat night blindness, renal issues, throat complaints, anticancer, anti-inflammatory, blood cleaner, galactogogue, tangy, antidiarhoeal, antidysentiric, laxative, and antitubercular diseases (17, 18).

6) CHANDRASUR:



Fig 6: Chandrasur Powder.

It is a periodic herb grows formerly in a time, medicinal factory, which is equally distributed in India, United States and Europe and extensively cultivated in hot temperature climates throughout the world for colorful culinary and medicinal uses. Garden cress seeds generally referred to the "Aliv" in Marathi, "Halim" and "chandrasur" in Hindi and "Asali" in Malayalam.



- Synonym: Aliv
- Botanical name: Lepidus sativa
- Family: Brasiccaceae
- Formula: C6H10OS2

Structure:



Morphological Characteristics:

- Seeds: Small, refocused, round-shaped, triangular at one end, smooth, about 3–4 mm long, and 1–2 mm broad, sanguine brown.
- Flowers: White having long racemes with broad and ob ovate capsules.

Chemical Ingredients:

Sativa seeds correspond of carbohydrates, protein, lipids, and fiber. Sativum seeds also contain mucilaginous substances. The presence of multitudinous factors has been reported in L. sativa seeds including alkaloids, phenolic compounds, anthraquinones, and cardiac glycosides, flavonoids, tannins, Benoit, dihydroxybenzoic, Gallic, chlorogenic, 4- hydroxycoumaric, vanilla, and salicylic acids, pyrogallol, catching, caffeine, isoleucine as well as different imitable alkaloids. **Uses:**

- 1. Garden cress seeds helps to maintain the hormonal terrain to start the menstrual cycle and to maintain the menstrual cycle or menstrual ages yearly.
- 2. Garden cress seeds are generally known by the largely nutritive value that is salutary for the nursing mother. It helps in nursing mother for the continue inflow and product of the Breast milk containing the high tenor of protein and iron (19, 20).

KNOLATION METHOD.		
SR.NO.	INGREDIENTS	F1
1.	Dark Compound	12 g
2.	White Compound	6.8 g
3.	Cinnamon Powder	0.1 g
4.	Cardamom Powder	0.4 g
5.	Shatavari Powder	0.2 g
6.	Chandrasur	0.5 g
7.	Milk	10 ml

Material and Method: FORMULATION METHOD

& Equipments:

a. Double boiler or microwave-safe bowl.



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- b. Chocolate Moulds.
- c. Whisk or Spatula.
- Procedure:
- Sample A : Double Boiler
- 1. Chop the chocolate into small, even pieces.
- 2. Set up a double boiler: Fill a saucepan with an inch of water and bring it to a simmer. Place a heatproof bowl on top (make sure it doesn't touch the water).
- 3. Add chocolate to the bowl:
- For dark chocolate: Stir gently until melted and smooth.
- For white chocolate: Stir constantly on low heat—white chocolate burns easily.
- 4. **Remove from heat** once fully melted.



Fig : Sample A

- > Sample B : Preparation of Semisolid Chandrasur Milk Mixture
- Ingredients: Milk – 6 ml

Chandrasur powder -0.2 g

• Weighing balance

Beaker or small container Measuring cylinder or pipette Stove or heating plate Stirring rod

- Procedure:
- 1. Weighing and Measuring:
- Accurately weigh 0.2 grams of Chandrasur powder using a digital balance.
- Measure 6 ml of milk using a pipette or measuring cylinder.
- 2. Boiling the Milk:
- Transfer the 6 ml of milk into a clean beaker.
- Heat the milk to 100°C and maintain it at boiling for 2 minutes.



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3. Adding Chandrasur Powder:

- After 2 minutes of boiling, reduce the heat.
- Gradually add the 0.2 g of Chandrasur powder into the hot milk.
- Stir continuously to ensure uniform mixing.
- 4. Heating the Mixture:
- Continue heating the mixture on low flame for 5 more minutes.
- Stir occasionally to avoid sticking and burning.
- 5. Formation of Semisolid Mass:
- Observe the mixture as it thickens and forms a semisolid, sticky mass.
- Once the consistency is semisolid and the milk is absorbed, remove from heat.
- 6. Cooling and Storage:
- Allow the mixture to cool at room temperature.
- Use immediately or store in an airtight container if required.



Fig: Sample B

Method 3:

- Ingredients:
- Milk -4 ml
- Cardamom powder as required
- Cinnamon powder as required
- Shatavari powder as required

Procedure:

- 1. Boiling the Milk:
- Take 4 ml of milk in a small saucepan.
- Boil it at 100°C for 2 minutes.
- 2. Adding Cardamom:
- After boiling, add a pinch of cardamom powder to the hot milk.
- Shake well and mix properly to ensure even distribution.

3. Adding Cinnamon:

- Add a pinch of cinnamon powder to the above mixture.
- Stir thoroughly to mix all the ingredients evenly.



- 4. Adding Shatavari:
- Finally, add the required amount of shatavari powder.
- Shake or stir the mixture well until the powder is fully dissolved.
- 5. Final Mixing:
- Ensure the mixture is uniform and smooth.

Sample D Preparation Procedure



Fig: Sample C

- Materials:
- Sample B
- Sample C
- Complex A (small amount)
- Clean mold
- Freezer
- Packaging materials
- Procedure:
- 1. Mixing:
- Combine Sample E and Sample C thoroughly.
- Add a small amount of Complex A to the mixture and mix until uniform.
- This mixture is now referred to as *Sample D*.



Fig: Sample D



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2. Mold Preparation:

- Take a *clean mold* and ensure it is dry and free of contaminants.
- Spread a thin layer of Sample A evenly across the base of the mold.

3. Filling the Mold:

- Pour or spread the *Sample D* mixture into the mold over the layer of Sample A.
- Level the surface gently.

4. Top Coating:

• Coat the top of the filled mold with the *remaining amount of Sample A* to seal and finish the surface.



Fig: Chocolate Final Product

5. Freezing:

• Place the mold in a freezer and freeze at the required temperature (specify temperature and duration if known).



Fig. After Removing the Mold



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6. Packaging:

• Once fully frozen, remove *Sample D* from the mold carefully.

• Package using suitable materials to preserve quality during storage and transport.

Evaluation Parameters:

Organoleptic Property

- Color
- Odor
- Taste
- 1. Primary Phytochemical Screening
- Test for carbohydrate
- Test for protein
- Test for saponins glycoside
- Test for amino acid
- 2. pH
- 4. Blooming Test
- Fat blooming
- Sugar blooming
- 5. Hardness
- 6. Stability
- 7. Weight variation
- 1) Organoleptic Properties:

The overall fineness, visual identity, and general appearance of chocolate expression are important.

- a. To insure customer acceptability;
- b. To maintain uniformity from lot to lot;
- c. To oversee trouble-free manufacturing. A variety of characteristics, including color, taste, mouthfeel, face texture, and odor, are measured to regulate the overall appearance of chocolate.

2) Original Phytochemical Screening:

This screening was done to see if any organic chemical factors were included in the creation of chocolate. The following organic chemical factors: carbohydrate, protein, amino acid, fats and oils, steroids, unpredictable oil painting, glycoside, flavonoids, alkaloids, tannins and phenolic substance, vitamins, gum and gum were examined to determine if they were present or absent in the formulations stated above.

2.1) Carbohydrate Test (Molichs Test/ General Test):

Take two to three milliliters of chocolate expression, add a many drops of alcohol-based alpha- author results, shake, and add cone. The violet ring at the intersection of two liquids, which is a form of sulfuric acid from the test tube's side, indicates the actuality of carbohydrates.



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Fig 7: Carbohydrate test.

2.2) Protein Assay (Burnt Test/ General Test):

Take 3 milliliters of chocolate expression, add a few drops of 1 copper sulfate result, and dilute it with 4 NaOH. The violet color indicates the presence of protein.



Fig 8: Protein Test.

2.3) Test for Saponins Glycoside (Froth Formation):

Add 2 milliliters of chocolate expression to a test tube, fill it with water, and shake roundly and stable froth formations signify the presence of glycoside saponins.



Fig 9: Saphonin Test.



2.4) Amino acid test (Ninhydrin test):

Three drops of 5% Ninhydrin were added to three milliliters of hot test solution. After adding the solution, the water was brought to a boil and cooked for ten minutes. The hues of bluish and purple indicate the presence of amino acids.



Fig 10: Amino Acid Test.

3) pH:

A digital pH meter fitted with a glass electrode was used to measure the pH of the mixture that was created after dissolving 2 grams of set chocolate in 100 milliliters of phosphate buffer result.

4) The blooming test

4.1) Fat Blooms:

A soft white coating and a loss of buff are caused by a thin layer of fat chargers raging on the top of chocolate expression, giving the final product an unpleasing appearance. The migration of a filling fat to the chocolate subcaste or the recrystallization of fats are the two main causes of fat bloom, and storing at a steady temperature will defer its onset.

4.2) Sugar Bloom:

This is the coarse, asymmetrical layer that sits on the chocolate mixture. Condensation is what happens when chocolate is removed from the refrigerator and results in sugar bloom. The chocolate's sugar will melt due to this humidity. The sugar also recrystallizes creating an uneven, rough demitasse on the face when the water ultimately evaporates. This makes chocolate appear unpleasing. Every sample passed treatment cycles that included (1) 11 hours at 30 °C, (2) 1 hour of temperature shifting, (3) 11 hours at 18 °C, and (4) 1 hour of temperature shifting. After being kept at 18 °C for 11 hours, a test chocolate expression was used to determine whether or not blooming had passed.

5) Hardness:

A particular degree of hardness is needed for a chocolate bar to break across its border. The hardness of chocolate is a good index of its strength. The hardness was measured with a Monsanto Hardness tester. The values were expressed in kg/cm2.



6) Stability:

In a particular expression within a particular vessel, medicinal particulars are said to be stable if they are suitable to retain their physical, chemical, microbiological, remedial, and toxicological conditions. Stated else, a medicine's stability refers to its capability to resist deterioration. 90 of the indicated energy is generally considered as the smallest permissible energy position. Medicine declination can occur in a number of ways due to variations to its chemical, physical, and microbiological characteristics. The changes can make the product less effective as a drug or further dangerous.

7) Weight variation:

Importing was done on six chocolate recipes both collectively and inclusively. The average weight was determined by importing all the chocolate. The individual weights were compared to the average weight. The chance difference of the weight change mustn't exceed the permitted limits. The percent deviation was calculated using the following formula (21).

% Deviation: Individual weight – Average weight \times 100 Average weight

Result and Disscusion:

1.1) Organoleptic properties (Evaluation of taste, texture, and mouthfeel) Table displays the properties of prepared chocolate formulation in terms of taste, texture, and mouthfeel.

Parameters	Observations
Colour	Brown
Odour	Chocolate
Taste	Slightly bitter
Mouthfeel	Smooth and pleasant

 Table 1.1: Result of organoleptic properties

1.2) Initial phytochemical screening:

Initial phytochemical screening of the chocolate method, as displayed in the table below.

Name of test	Test group	Control group
Carbohydrate	Positive	Positive
Protein	Positive	Positive
Glycoside	Negative	Negative
Amino Acid	Positive	Negative

 Table 1.2: Result of preliminary phytochemical screening.



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Fig 11: Test Group



Fig 12: Control Group

1.3) **pH:** Using a pH meter, the PH of the chocolate formulation was determined to be pH =5.87.**1.4**) Blooming test:

Test	Result
Fat bloom	No
Sugar bloom	No

Table 1.3: Result of blooming test:

1.5) Hardness:

The Monsanto Hardness Tester was used to determine the hardness of chocolate formation. The observed results are shown in table no.1.4.

Initial reading	After breakage of chocolate	Hardness	present	in	the
		chocolate			
0	2	2kg/cm2			

 Table 1.4: Result of hardness test

1.6) Stability test:

The organoleptic characteristics of the formulation were examined at the conclusion of the month. The observed results are listed in the table.



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Parameter	Storage condition	At the time of	After the one month
		preparation	
Colour	2-8°c	Brown	No Change
Odour	2-8°c	Chocolaty	No Change
Taste	2-8°c	Slightly bitter	No Change
Mouth feel	2-8°c	Smooth	No Change

Table 1.5: Result of Stability test

Biological Activity:

1) Antifungal Activity:

Methods:Tube dilution system

Procedure: The chemical agent is incorporated into nutrient broth or agar medium and inoculated with the test microorganisms. These tubes are incubated at 30 to 35 °C for 2 to 3 days and also the results in the form of turbidity or colonies are observed. The results are recorded, and the activity of the given detergent is compared as shown in the fig.



Fig 13: Antifungal Test.

Conclusion:

This research paper concludes that, unlike chocolates laden with artificial additives, herbal chocolate presents itself as a health-promoting alternative, using constituents similar to dark chocolate, both of which are known for their antioxidant properties and contribute to wrinkle reduction. These herbal infusions not only improve flavor but also help to general well-being when eaten daily. Specially, the addition of seasoning factors such as cinnamon and cardamom imparts fresh medicinal characteristics, similar to anti-inflammatory goods. Grounded on the study's result, dark chocolate combined with herbal substances includes Cinnamon, Cardamom, Shatavari, Chandrasur may have the capability to reduce period discomfort, so it could be as alternative remedy for menstrual cramps. Physicochemical studies revealed the presence of protein, carbs, and glycoside in the chocolate. The chocolate was assessed for appearance, stability, and humidity content. Grounded on the below discussion, we assumed that the chocolates give a silky, smooth face to the details and are excellent at masking the unpleasant taste associated with the



medicines and treatments that are used in the lotion range are safe to ingest and do not carry a threat of side goods.

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