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FORMULATION AND EVALUATION OF HERBAL CHOCOLATES BY USING TERMINALIA ARJUNA

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ABSTRACT

People love chocolate more than any other food, yet they detest medications. Therefore, the goal of this study was to create medicated chocolate, or chocolate that contains drugs, in order to prevent different types of disorders. The chocolate base used in this experiment is made using pharmaceutical-grade sugar, cocoa butter, cocoa powder, and icing sugar. Formulating and assessing nutrient-dense chocolate and supplements with anti-oxidant, anti-hyperlipidemic, anti-diabetic, antifungal, anti-inflammatory, and wound-healing properties was the primary goal of this study. In addition to showing satisfactory herbal drug release, drug content determination, physical stability, and pH and blooming test results, the manufactured herbal chocolate formulation was evaluated for overall look.

KEYWORDS: Herbal Chocolate, Terminalia Arjuna, hypertention, wound healing, medicinal plant.

INTRODUCTION

The main objective of this research was to create and assess a dietary chocolate that contained natural cardic tonic. Our memories are essential to our individuality; even when it comes to situations we have experienced together, no two people's memories are exactly the same. Herbal formulations are defined as a type of dosage form that includes one or more processed or dried herbs in predetermined amounts to offer targeted nutrition and are intended for use in diagnosis, treatment, or mitigation.[1] Native to Bangladesh, Terminalia arjuna is a deciduous, everlasting tree that reaches heights of 20 to 30 meters above the ground. It is a member of the family Combretaceae. It may be located close to ponds and

waterways in the Deccan, South Bihar, Madhya Pradesh, Delhi, and Uttar Pradesh. The powdered tree bark of Terminalia arjuna was used by traditional Indian doctors to treat heart diseases such as angina and "Hritshool." Recent research has extracted two novel cardenolide cardiac glycosides from Terminalia belly seeds and roots. This cardenolide's primary effect is to raise intracellular calcium and sodium levels, which in turn increases the force of cardiac intensity. The pharmacognostic standard of Terminalia arjuna bark has been studied in the current investigation.[2] The globe's earliest full health care system still in use is Vedas. Its origin dates back 5000 years, and it comes from its ancient Sanskrit roots, "ayus" (life) and "ved" (knowledge), providing a deep, all-encompassing view on a healthy existence. The oldest discipline, Ayurveda, describes the correct therapy for many diseases; nevertheless, further research is needed to confirm this information.[3] Since the beginning of time, all of the crop's components have been utilized for their medicinal benefits. T. arjuna reduces the negative effects of stress and anxiety while also supporting heart health. Glycosides, abundant amounts of flavonoids, tannins, and minerals may be found in its trunk bark. These compounds are cardiotonic, and flavonoids have been shown to have anti-inflammatory, anti-oxidant, and lipid-lowering properties; these characteristics set Terminalia arjuna apart from other commonly used medicinal herbs. Inhaling cooked bark powder with water can relieve headaches and eliminate tooth worms, while fruit juice can be used as an antacid and fruit booster.[4,5] Natural compositions consist of one or more medicinal products combined with an active ingredient, herbal preparation, or herbal substance alone. Because of the medicinal advantages of chocolate products, numerous civilizations have been using them as medicine for generations. Dark chocolate has considerably more oxidant than milk or white chocolate, which do not have the same health advantages. Flavonoids regulate hormones, reduce blood pressure, and serve as antioxidants, which contribute to many of these benefits. Chocolate basis is used to make medicated chocolate, and the medicine is then mixed into the base. The term "cocoa medication delivery system" refers to the process by which the medicine is released from the chocolate after being integrated into it. Furthermore, dark chocolate has been linked to a number of health benefits, such as a reduction in hypertension, an alteration in blood flow to the brain, the ability to repair damaged cells, an increase in glucose levels, a decreased risk of heart attacks, an increase in HDL cholesterol, and a decrease in LDL cholesterol. For these reasons, the current study focuses on the preparation and evaluation of a nutrient-dense chocolate that contains arjuna bark powder, which may also have a positive effect on recipient learning and memory without causing any negative side effects.[8-14] Made from burnt and crushed cacao seeds, chocolate can be consumed as a liquid, paste, or block. It

can also be employed as an additive for flavor in other dishes. White chocolate, milk chocolate, and dark chocolate are the three primary varieties of chocolate. Made mostly of cocoa butter, it helps with stress, mood, cognitive function, heart illness, and the energy-boosting properties of chocolate.[15] Chocolate is a versatile food that may be used to produce flavors and textures that are entirely new. Chocolate also resists the development of microorganisms and the dehydration of dependent on water active ingredients since it is an anhydrous media. Compounds including polyphenols, sterols, and saturated fat are all prevalent in chocolate.[6-7]

PLANT PROFILE

Terminalia Arjuna (Arjuna)

Botanical Name: Terminalia Arjuna (Roxb.) Wt. and Arn.

Synonym: T. Glabra W&A.

Common Name: Arjun, Arjuna.

Biological Source: The drying stem bark of the terminalia arjuna rob tree is what makes arjuna. it has a minimum of 0.02% on a dry basis arjun genin.

Geographical Source: This is a usual tree on the indian peninsula. it is widely planted in the chotta nagpur zone and cultivates beside streams.

Fig. 1: Terminalia Arjuna (Arjuna).

Chemical Constituent

A little over fifteen percent of arjuna contains hydrolyzable tannins. moreover, it contains arjunolicacid, arjunicacid, arjungenin, and striterpenoid saponin. in addition, it contains arjunicacid, ellagicacid, and bita sitosterol. arjunine and rjunetine are the crystallisable compounds that have been reported. the flavonoids found in arjuna wood include arjunetin,

arjunolone, and arjunone. arjuna's additional ingredients include sugar, coloring, magnesium, aluminum, and calcium salts.

MATERIAL AND METHODS

MATERIAL

Table No. 1: List of ingredients.

Sr. No	Ingredient
1	Arjuna Bark Powder
2.	Cocoa Powder
3.	Cocoa Butter
4.	Honey
5.	Sugar
6.	Vanilla

METHODS

Extraction of Herbal Drug (Arjuna)

Cold processing was used to accomplish the extraction. Initially, the ground plant material for arjuna bark powder had been soaked in a 70:30 alcohol and water combination for 24 hours in a round-bottom flask (RBF) with periodic shaking. The solvents were filtered after a 24-hour period, and powdered arjuna bark extracts were subsequently extracted.

Preparation of Chocolate Formulation

Every component was precisely weighed. Sugar and cocoa powder were combined well in a single beaker. After melting cocoa butter in a different beaker, the warm butter was added to a powder mixture and well stirred to get a fine consistency. Next, honey was included and combined to act as an emulsifier. Lastly, the prepared chocolate above received the precisely calculated addition of the medicinal herb extract. Then, before the mixture was put into molds, vanilla was added as a flavoring ingredient. After that, the produced chocolate with the herbal medication extract was put into molds and allowed to set overnight in the freezer.

Formulation Table For Composition Of Chocolate

Table No. 2: Formulation for composition of chocolate.

Contents	F1	F2	F3
Cocoa butter	2.9gm	2.9gm	2.9gm
Sugar	3.5gm	3.5gm	3.5gm
Honey	0.05gm	0.05gm	0.05gm
Vanilla	0.05gm	0.05gm	0.05gm
Drug extract	60mg	80gm	100mg

Fig. 2: Chocolate Formulatiion.

Evaluation of Chocolate

A number of quality assurance processes, such as as visual evaluation and physiochemical and reconditioning testing for performance, were carried out to assess the manufactured formulation's purity.

a) General Appearance

- Colour
- Odour
- Taste
- Texture

b) pH

A digital pH tester equipped with an electrode made from glass was used to measure the pH of the mixture created after dissolving 2 grams of prepared chocolate in 100 milliliters of the buffering phosphate solution.

c) Blooming Test

Fat Bloom: When the thin layer of fat precious stone design appears on the chocolate plan's exterior layer. This will cause the chocolate to become less shimmery and reveal a thin layer of white, giving the finished product an unappetizing appearance. Fat re-crystallization or maybe a filling fat moving to the chocolate layer is what causes fat bloom. A constant temperature and capacity will delay the emergence of fat sprouts.

Sugar Bloom: The covering on top of the chocolate mixture is uneven and scratchy. When

chocolate is taken out of the a fridge, condensation occurs, which is the reason of this. The chocolate's sugar will melt due to the moisture in it. Sugar re-crystallizes into uneven, angular crystals on its outermost layer when the water evaporates. This produces an ugly appearance.

d) Stability: Over a month, durability tests of the prepared composition were conducted at 25/75 (°C/RH) and 2-8°C. The chocolate was packaged in aluminum foil paper, and the resulting formulation's stability was assessed by evaluating the organoleptic qualities of color, odor, taste, mouthfeel, and appearance.

Phytochemical Screening of Chocolate Formulation

Table No. 3: Phyto Chemical Test.

Phytoconstitute	Chocolate formulation	Arjuna
Fats	+	-
Carbohydrate	+	+
Alkaloids	+	+
Protein	+	+

RESULT AND DISCUSSION

a) General Appearance

Table No. 4: Characterization of medicated chocolate General appearance.

Parameters	Colour	Odour	Taste	Mouth feel	Appearance
F1	Brown	Chocolaty	Sweet, good after taste	Smooth & Pleasant	Glossy
F2	Brown	Chocolaty	Semi Sweet	Smooth & Pleasant	Glossy
F3	Brown	Chocolaty	Slightly bitter	Smooth & Pleasant	Glossy

b) pH Chocolate Formulation

Table No. 5: PH Chocolate Formulation.

Formulation code	F1	F2	F3
pH	6.8	6.9	7.1

c) Blooming Test

Table No. 6: Blooming test parameter for Arjuna.

Bloming Test	Result
Fat bloom	No
Sugar bloom	No

d) Stability Test

Table No. 7: Stability Parameters.

Parameters	Colour, Odour, Taste, Mouth feel.
Storage condition	3-10 °c
Storage condition	32°c
After the one month	No change
At the time of preparation	Brown, chocolaty, slightly bitter, smooth, glossy
After	No change

CONCLUSION

Arjuna chocolates were prepared successfully and yielded satisfying results. The drug release of f1 chocolate excellent is achieved. For a month, all of the recipes remained consistent, and the chocolate's acceptability and flavor were influenced by the amount of sugar it contained. The active ingredients of arjuna powder, such as flavonoids, glycosides, and alkaloids, are present in herbal extracts that were properly formulated into chocolate formulations. Chocolate's organoleptic qualities are excellent for masking the unpleasant flavors associated with some active agents and giving compositions of active agents a smooth and creamy texture. As a result, the chocolate composition offers an enjoyable way to take medications orally.

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