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Formulation And Evaluation Of Herbal Antitussive Chocolate

Vaishnavi Navanath Karande¹, Kale Sahil Tanhaji², Pawar Tanuja V³

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

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

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

Abstract

Chocolate has more affection towards children, so this development focuses towards the conversion of chocolate into herbal chocolate to serve therapeutic effect. The formulation of herbal chocolate by using arjuna bark powder was prepared and evaluated under this study. Four different batches of formulation from Arjunna bark, Tulsi, Cardamom, and cinnamon were prepared. Cocoa butter was used as a vehicle in the formulation while honey used as a cough relief. Evaluation was done for the organoleptic properties, pH, moisture content, presence of different metabolites, blooming test, and physical stability. Organoleptic evaluation was found to be as expected for all four batches. Moisture content measured on loss on drying method was less than 2% for all four batches. pH was around 6 to 7 for all four batches. Due to use of herbal ingredients, chemical analysis test was found to be positive for all four formulations. The study's findings indicate promising developments for the creation of herbal chocolate. However, additional research will be necessary for this medicine to be marketed and to increase patient compliance.

Keywords: Herbal Chocolate, Antitussive, Arjunna bark, Tulsi, honey

Introduction

Ayurveda, Siddha, and Unani are three traditional Indian medical systems, developed between 2500 and 500 BC. Ayurveda emphasizes treating man and his illness, with food as the primary source for maintaining nutritional needs. However, modernization has led to the abandonment of ancient approaches, causing a discrepancy in nutritional intake, causing normal living to be abnormal. Dark chocolate, rich in cocoa solids, cocoa butter, and sugar, offers potential health benefits due to its complex composition. Cocoa solids contain flavanols, antioxidants that improve blood flow, reduce blood pressure, and enhance cognitive function. Cocoa butter, high in saturated fat, contains stearic acid, neutralizing cholesterol levels. Other minerals like iron, magnesium, and potassium contribute to health benefits. However, the benefits are most pronounced in dark chocolate with high cocoa content and limited added sugars[1,2,3].

The global demand for functional foods and nutraceuticals is growing due to increased consumer awareness of the link between diet and health. People seek benefits beyond basic nutrition to improve well-being, prevent chronic diseases, and enhance physical and mental performance. The availability of information, especially online, has enabled consumers to research ingredients and products, leading to a more informed consumer base. Manufacturers are investing in research to create evidence-based functional foods and nutraceuticals, catering to specific health needs and preferences, fueling market expansion. Chocolate, known for its rich flavor and creamy texture, can effectively deliver herbal components due to its fat content, particularly dark chocolate. This increases the bioavailability of fat-soluble herbal extracts and makes them more palatable, potentially improving health outcomes. The combination of chocolate's antioxidant properties with herbal ingredients presents a synergistic advantage, making it a promising area for further research and development in functional foods[4,5].

Herbal chocolate, a blend of dark chocolate and beneficial herbs, can enhance well-being by improving cardiovascular health and cognitive function. Infused herbs like ashwagandha, ginseng, and lavender can also promote stress reduction, sleep improvement, and energy levels. However, the efficacy and safety of herbal chocolate depend on the quality of ingredients and dosage accuracy. Consumers should choose reputable manufacturers with strict quality control standards. Legal requirements are crucial in the herbal chocolate sector, including food safety regulations, ingredient labeling, and dietary supplement or functional food regulations. Businesses must verify claims and conduct thorough investigations and testing to ensure legal compliance. Long-term success in this market relies on ingredient transparency and ethical sourcing, which are increasingly important for customer trust and brand reputation. Exaggerating health claims may lead to legal issues. The growing herbal chocolate industry faces challenges such as sourcing ethically harvested herbs, ensuring consistent potency and standardization of herbal extracts, and navigating unclear regulatory frameworks. Balancing the bitter or earthy flavors of herbs with the sweetness of chocolate is crucial for appeal to a broad consumer base. Overcoming these challenges requires research, innovation, and transparent communication to unlock the full potential of herbal chocolate, ensuring its sustainable growth and wider acceptance[6,7,8].

In this study, The herbal chocolate formulation that was created and assessed for this study yielded encouraging results regarding its possible antitussive qualities. The herbal chocolate was made using cinnamon, cardamom, Tulsi, and arjuna bark. The formulation employed cocoa butter as a carrier. Physical stability, blooming test, pH, moisture content, presence of various metabolites, and organoleptic characteristics were all evaluated. The study's findings indicate promising developments for the creation of herbal chocolate. However, more research will be necessary for this product to be sold and for patient compliance.

Materials and methodology

2.1 Materials and equipment's

Plant powders of Tulsi, cinnamon, arjuna bark and cardamon were collected fresh from the natural source. Honey was used for cough relief and immune support. Cocoa butter was used as a vehicle for the preparation of the herbal chocolate. Melting of the cocoa butter was carried out by using heating mantle.

2.2 Methodology

2.2.1 Preparation of herbal chocolate

Powders of plants were prepared by washing, drying and followed by grinding. Plant powders were stored in an airtight container. As per the formulation weighed quantity of arjuna bark was incorporated into the melted cocoa butter along with the other excipients. Herbal chocolate was prepared by using different sizes of mould[9,10,11].

Contents	F1	F2	F3	F4
Tulsi	150mg	500mg	500mg	250mg
Cinnamon	150mg	500mg	300mg	150mg
Cardamon	150mg	500mg	150mg	75mg
Arjuna Bark	150mg	500mg	500mg	300mg
Honey	2g	2g	-	-
Flavoring agent	0.05ml	0.05ml	0.05ml	0.05ml
Cocoa Butter	3g	6g	5g	9g

Table: Formulation table/composition of Herbal chocolate

2.2.2 Physio-chemical evaluation of Herbal chocolate

2.2.2.1 Organoleptic properties

Evaluation was carried out for colour, odour, taste, mouth feel and appearance.

2.2.2.2 pH measurement

pH of the formulation was determined by using pH meter.

2.2.2.3 Moisture content

Moisture content of herbal chocolate was determined by the loss on drying method[12].

2.2.2.4 Chemical test

Herbal chocolate was tested for the carbohydrate (Fehling's test), protein (biuret test), amino acid (Ninhydrin test) as per the standard procedure.

2.2.2.5 Blooming test

Test sample of chocolate was subjected to treatment cycles at 30°C for 11 hours, followed by a temperature for 1 hour to 18 °C for 11 hours, followed by a room temperature for 1 hour. Observed the test sample of chocolate to determine whether blooming has taken place or not[13,14].

2.2.2.6 Physical stability

Physical stability of herbal chocolate was checked for 1 month at 28°C[15,16].

Result and Discussion

Herbal chocolate from arjuna bark powder was prepared and evaluated for the physio-chemical evaluation, results found are as follow,

3.1 Organoleptic properties

All four batches were subjected for estimation of organoleptic properties and results are as follow,

Parameter	F1	F2	F3	F4
Colour	Brown	Brown	Brown	Brown
Odour	Chocolaty	Chocolaty	Chocolaty	Chocolaty
Taste	Sweet	Sweet	Sweet	Sweet
Mouth Feel	Smooth & Pleasant	Smooth & Pleasant	Smooth & Pleasant	Smooth & Pleasant
Appearance	Glossy	Glossy	Glossy	Glossy

Table: Organoleptic properties of Herbal chocolate formulation

3.2 pH measurement

pH of all four batches was calculated and found to be as follow,

	F1	F2	F3	F4
pH	6	6	7	6

Table: pH of Herbal chocolate formulation

3.3 Moisture content

Moisture content estimated on the basis of loss on drying was found to as follow,

	F1	F2	F3	F4
Moisture content	1.89%	1.72%	1.65%	1.73%

Table: Moisture content of Herbal chocolate formulation

3.4 Chemical test

Chemical test evaluation for all four formulation are as follow,

Test	F1	F2	F3	F4
Carbohydrate	Positive	Positive	Positive	Positive
Protein	Positive	Positive	Positive	Positive
Amino acids	Positive	Positive	Positive	Positive

Table: Chemical tests of Herbal chocolate formulation

3.5 Blooming test

Results for blooming test are as follow,

Test	F1	F2	F3	F4
Fat bloom	Positive	Positive	Positive	Positive
Sugar bloom	Positive	Positive	Positive	Positive

Table: Blooming test of Herbal chocolate formulation

3.6 Physical stability

	F1	F2	F3	F4
Physical stability	No degradation	No degradation	No degradation	No degradation

Table: Physical stability of Herbal chocolate formulation

Conclusion

The formulation of herbal chocolate was prepared and evaluated under this study which shows positive outcomes towards the potential antitussive properties. Arjunna bark, Tulsi, Cardamom, and cinnamon were used in the formulation of the herbal chocolate. Cocoa butter was used as a vehicle in the formulation. Evaluation was done for the organoleptic properties, pH, moisture content, presence of different metabolites, blooming test, and physical stability. Results of this study shows positive outcomes towards the development of herbal chocolate. Although, this product will require the further investigation in order to get marketed and also to gain patient compliance.



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