



FORMULATION AND EVALUATION OF PEDIATRIC HERBAL CHOCOLATE

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Article Received on 15/04/2021

Article Revised on 04/05/2021

Article Accepted on 25/05/2021

ABSTRACT

The chocolate is most loving food of children where as the medicine is hating substance. So, objective of present study was to formulate the chocolate that contain drug i.e., medicated chocolate to prevent the disease. In children cough, viral infection is most common diseases. *Ocimum sanctum*, Tulsi is the herbal drug which having several medicinal properties, antitussive activity is one of them. Thus, we have to formulate the chocolate with aqueous extract of tulsi that gives antitussive activity. Further, prepared medicated chocolate is evaluated for general appearance, dimension, hardness, blooming test, drug content determination, physical stability etc.

KEYWORDS: Medicated Chocolate, Tulsi (*Ocimum sanctum*), Antitussive activity, Eugenol.

INTRODUCTION

Chocolate is adaptable food that can be combined to create completely different taste and texture sensations. Also, chocolate is an anhydrous medium that resist microbial growth and to hydrolysis of water-sensitive active agents. Chocolate abundantly contains compounds such as saturated fat, polyphenols, sterols, di and triterpenes, aliphatic alcohols, and methylxanthines.^[1] Phenyl ethylamine that naturally occurs in the brain and it is termed as 'the love drug' which produces the feeling of well-being and contentment. Phenyl ethylamine also present in chocolate that raises blood pressure, also blood sugar level that gives the feeling of wellness.^[2] There are five basic human taste qualities i.e., sweet, sour, bitter, salty, savory. Sweet taste is one of the most pleasurable senses. The goal of the sweet taste is to detect the highly calorific saccharides for ingestion.^[3]

Medicated chocolate is prepared by using chocolate base and the drug is incorporated into prepared chocolate base. As the drug is incorporated within the chocolate and the drug is released from the chocolate, it is called as Chocolate drug delivery system.^[4] It is a best drug delivery system specifically for children.

The aim of the present study was to prepare Pediatric Herbal Chocolate. Furthermore, to evaluate the physiochemical parameters of the prepared formulations so that they can be further standardized and used commercially.

MATERIALS AND METHODS

Materials

Ocimum sanctum (Tulsi), Chocolate Base (Amul), Sugar.

Methods

Extraction

The fresh leaves of Tulsi were collected from home garden and washed with water to remove dust. Further leaves were crushed and converted into paste with the help of distilled water by using grinding machine. Paste of Tulsi leaves boiled with distilled water for 30-45 minutes i.e., Decoction method. Here, extra care should be taken to avoid the overheating. Thereafter, extract subjected to filtration and evaporated whole water by using electric water bath so as to get crude extract. Further phytochemical analysis of aqueous extract of Tulsi was carried out by performing identification test.^[5-7]

Evaluation^[8]

1. Phytochemical analysis

2. General appearance

3. Hardness

Hardness of chocolate was measured by Monsanto Hardness Tester.

4. Blooming test

Fat Bloom - When the thin layer of fat crystals form on the surface of chocolate formulation. This will cause the chocolate to lose its gloss and a soft white layer will appear, giving the finished article an unappetizing look. Fat bloom is caused by the recrystallization of fat and/or

a migration of a filling fat to the chocolate layer. Storage at a constant temperature will delay the appearance of fat bloom.

Sugar Bloom – This is rough and irregular layer on top of chocolate formulation. This is caused by condensation (when chocolate is taken out of the refrigerator). This moisture will dissolve the sugar in the chocolate. When the water evaporates, sugar recrystallizes into rough, irregular crystals on surface. This results into unpleasant look.

Test sample of chocolate was subjected to treatment cycles contains.

30 °C for 11 hours

Shifting of temperature for 1 hour

18 °C for 11 hours

Shifting of temperature for 1 hour

Observed the test sample of chocolate whether blooming has taken place.

5. Physical stability To check the physical stability, sample of chocolate was kept in closed container for 1 month at 28°C After one month interval, Test sample of chocolate was observed for physical appearance and drug degradation.

6. Drug content determination

Drug content of medicated chocolate was determined by Thin Layer Chromatography. Here, control was taken as aqueous Tulsi extract and test as melted chocolate sample. TLC plates were prepared by using silica G and plates were activated for ½ Hr. Spotting was carried out on both plates i.e., control and test plate by using capillary. Run both the plates in mobile phase i.e., Toluene: Ethyl acetate: Water having ratio 7:3:2. After running of both plates air drying of plates was carried out. Further, visualization of both plates was carried out by using iodine chamber. By comparing the RF value of both the plates i.e., control and test, Drug content in Medicated chocolate was determined.^[9]

RESULT AND DISCUSSION

Method of preparation of Medicated Chocolate^[1]

Water bath was set in such a way that water become hot having temperature about 50°C. Then chocolate base was melted in porcelain dish till it become free flowing. On another side, sugar syrup was prepared by taking sugar in appropriate quantity with distilled water in beaker on water bath. Then add prepared sugar syrup in required quantity into melted chocolate base. After above step, appropriate quantity of drug extract i.e., crude extract of Tulsi 250mg was added to it and stirred continuously. Then whole mass of chocolate base was poured in a silicon chocolate mould and refrigerated till it become solid form approximate 3-6Hrs.



Figure 1: Preparation of Medicated Chocolate.

Table 1: Formulation Table.

Sr. No.	Ingredients	Quantity Taken	
		Batch I	Batch II
1	Chocolate base	5gm	5gm
2	Sugar	2gm	5gm
3	Tulsi Extract	250mg	250mg
4	Water	q.s.	q.s.

Phytochemical analysis^[10]

To 2-3 ml of aqueous extract, add a few drops of following reagents.

Table 3: Phytochemical screening.

Sr. No.	Test	Observation
1	5%Fecl3 solution	Deep blue black colour
2	Lead acetate solution	Precipitate formation
3	Bromine water	Decolouration of bromine water
4	Dilute Iodine solution	Transient red colour

General appearance

Colour - Dark Brown
 Odour - Chocolate with no brunt, no smoky smell
 Taste - Slight sweet
 Texture - Smooth and even

Dimension

It was measured by Vernier's calipers.

Batch I - Height : 8.97 ±0.12

Diameter : 31.05 ±0.03

Batch II -Height : 8.47 ±0.049

Diameter : 31.13 ±0.021

Hardness

Batch I - 0.2 Kg/cm²

Batch II - 0.3 Kg/cm²

Blooming test

Table 4: Blooming Test.

Test	Batch I	Batch II
Fat bloom	No	No
Sugar bloom	No	No



Figure 2: Batch I - No Sugar Bloom.



Figure 3: Batch II - Sugar Bloom.

Physical stability



Figure 4: Batch I- Stability after one month.



Figure 5: Batch II- Excessive sugar causes unstability of chocolate during manufacturing.

Physical appearance

- Colour - Dark Brown
- Odour - Chocolate with no brunt, no smoky smell
- Taste - Slight sweet
- Texture - Smooth and even

Drug content determination

Figure 6: Control.



Figure 7: Test.

Observation

- 1) Distance travelled by solvent of control - 4cm.
- 2) Distance travelled by solute of control - 0.9cm.
- 3) Distance travelled by solvent of test - 4.3cm.
- 4) Distance travelled by solute of test - 1cm.

Formula

RF value = Distance travelled by solute ÷ Distance travelled by solvent

Calculation

- 1) RF value = Distance travelled by solute of control ÷ Distance travelled by solvent of control
= 0.9 ÷ 4
= 0.22
- 2) RF value = Distance travelled by solute of test ÷ Distance travelled by solvent of test
= 1 ÷ 4.3
= 0.23

By comparing RF value of both i.e., control and test approximately nearby. So, we can determine drug content.

CONCLUSION

In the present study, development of Pediatric Herbal Chocolate having antitussive activity was carried out. Aqueous extract of Tulsi leaves was prepared and phytochemical analysis was carried out to check the presence of desired compounds that shows the acceptable results. By using prepared extract medicated chocolate prepared and evaluated for general appearance, dimension, hardness, blooming test, drug content determination and physical stability. From above study, we concluded that the chocolate provides smooth and creamy texture to the formulation and are good for

masking the unpleasant taste associated with some drugs. Also, good oral drug delivery system to gives therapeutic effect.

Conflict of interest

The authors declare no conflict of interest, financial or otherwise.

Source of funding

None.

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