

Formulation and Evaluation of Antidiabetic Chocolate by using Guava Leaves and Mulberry Fruits

Mr.Ghughe Jagannath Ramprasad¹, Miss. Kale Vidya Raosaheb²

¹Student of Yashodeep Institute of Pharmacy, ¹B. pharmacy

²Assistant Professor, Yashodeep Institute of Pharmacy Aurangabad, Maharashtra, India

Abstract

The chocolate is product which love every age person to eat but due to health issues like obesity, high blood pressure, coronary artery disease, diabetes etc. doctor restrict patient to take chocolate. So, objective of present research was to formulate the medicated chocolate keeping note of health issues to prevent the Diabetes and make patient convenient to eat chocolate. Psidium Guajava is synonyms Guava leaves have high levels of antioxidants and vitamins which also helps to lower blood sugar levels. Chocolate formulation contained Guava leaves powder, dark chocolate, cocoa butter, coffee, stevia sugar and evaluated parameters are general appearance, dimension, hardness, blooming test, drug content determination, physical stability etc.

Keyword: Anti Diabetes, Chocolate, Guava leaves, Mulberry Fruits

1. INTRODUCTION

Diabetes is a chronic disease which caused by a metabolic disorder characterized by fast increase of blood sugar level (high blood glucose). There are different types of diabetes that are Type 1, Type 2 and Gestational Diabetes. Type 1 diabetes is an autoimmune disease, Type 2 diabetes occurs when body becomes resistant to insulin, and sugar builds up in blood and Gestational diabetes is high blood sugar during pregnancy. Insulin-blocking hormones produced by the placenta cause this type of diabetes. Guava leaves (*Psidium Guajava*) belongs to family Myrtaceae chemical contain carotenoids, polyphenols, Vit. C, linoleic acid. It is used for inflammation, diabetes, hypertension, pain relief, fever, diarrhea, ulcer rheumatism. Dark chocolate is powerful source of antioxidants which contain 70% or high cocoa, helps balance blood glucose, improve blood flow and blood pressure, reduce heart disease, improve brain function. It also reduce risk of diabetes for long term. Mulberry fruits (White Mulberry) belongs family Moraceae chemical containing linoleic acid and palmitic acid it also helps in control blood sugar levels, improve blood circulation and promotes liver health. Guava leaves, Dark chocolate and Mulberry fruits are more effectively use as antidiabetic so chocolate is formulated which diabetic patient can convenient and happy to eat.

2. AIM AND OBJECTIVE

Aim- Formulation and Evaluation of Antidiabetic Chocolate by using Guava Leaves and Mulberry Fruits.

Objective-

1. To formulate antidiabetic chocolate for all age person who suffers from the diabetic disease.
2. To control blood sugar levels and also reduce risk of diabetes for long term.
3. To overcome intake of medicated drug to get antidiabetic activity.

3. MATERIALS

Materials: Gauva leaves powder, Cocca butter, Dark chocolate, coffee, stevia sugar, Distilled water.

Equipments: Measuring cylinder, Beaker, Mortar pestle, Conical flask, Funnel, Chocolate mould, Petri dish

Instruments: Refrigerator, water bath, sieves, grinder

4. METHODS

Preparation of Chocolate

1. Collect leaves of Gauva and wash it with water to remove dirt
2. Dried it naturally for 4-5 days
3. Reduce size into powder form by using grinder
4. Pass Gauva powder through sieves
5. Take Dark chocolate and Cocca butter melt it on water bath then add Gauva powder and other ingredients and mix well.
6. Transfer mixture into chocolate mould and and freez it 8 to 10 hours

Table.1 Formulation Table

Sr no	Ingredients	Quantity given	Quantity Tekan	use
1	Guava Leaves powder	100gm	10 gm	Antidiabetic
2	Dark chocolate	1000 gm	100gm	Antidiabetic
3	Stevia	250	2.5 gm	Sweeting Agent
4	Coffee	10gm	1gm	Flavoring Agent
5	Butter	50gm	5gm	Shine



Fig.1 Dark chocolate



Fig.2 Melt and add all ingredients



Fig.3 Mix it properly



Fig. 4 Transfer melted containt into mould



Fig.5 Final product Chocolate

5. EVALUATION TEST

1. **Color:** Observe color by visualisation.
2. **Texture:** Evaluate the texture of the chocolate Checking its soft ness and brittle ness of chocolate
3. **Mouth feel:** Place chocolate in mouth and feel it.
4. **Taste of chocolate:** Taste the chocolate.
5. **Hardness:** Material testing machine TIRA test 27,025 (TIRA GmbH, Germany) equipped with a 200 N load cell was used to test the hardness of the chocolate bars according to De Clercq et al., (2017). The cylindrical probe (diameter 5 mm) moving by a speed of 2 mm/s penetrated into the chocolate bar. The penetration distance was set to 5 mm. The maximum load was defined as the hardness. The testing was performed in an air-conditioned laboratory at a temperature of $20 \pm 1^\circ\text{C}$. Hardness evaluation was performed immediately after production and 2, 6, 10, 18, and 26 weeks after production.

6. Blooming test:

1. **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.
2. **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
7. **Physical stability:** To check the physical stability, sample of chocolate was kept in closed container for 1 month at 28°C After 1 month interval, Test sample of chocolate was observed for physical appearance and drug degradation.
8. **Melting Point:** The residual heat of the chocolate will melt it. Do not rely on appearance alone when microwaving chocolate. The only way to know if it is fully melted is to gently stir it and use an instant-read

thermometer to check the chocolate's temperature while melting. Use a rubber spatula to stir the melting chocolate.

6. OBSERVATION

Table:2 Observation Table

Sr no	Parameter	Result
1	Color	Dark Brown color
2	Texture	Bitter with chalky texture
3	Mouth feel	Soft
4	Taste of chocolate	Sweet
5	Hardness	11.46
6	Melting point	88 F

7. RESULT AND DISCUSSION

Antidiabetic Chocolate was Formulated and Evaluated by Using Guava Leaves and Mulberry Fruits.

As per Ayurveda, there exists a huge collection of plants with antidiabetic potential. Only few of them have been scientifically proven and a lot more have yet to be explored and proved.



8. SUMMARY AND CONCLUSION

In the present study, natural active constituents in gauva leaves powder extracts manifested superior inhibition against diabetic activity than present in the commercially available antidiabetic chocolate. Therefore, these compounds were extracted and incorporated in harbal chocolate bases to prepare superior antidiabetic chocolate with less or no side effects with the low money inputs.

Although the removal is not 100%, a major number can, and maintained a good heath which is an important wealth for our daily life.

REFERENCES

1. Yogesh S. Kolekar , Sajid A.Mulani, Firoj A.Tamboli, Harinath N. More , And Ashish A. Misal Formulation and evaluation of Pediatric herbal chocolate by European journal of biomedical and pharmaceutical , science .Vol 8 Issue 6,2021
2. Pallavi D. Pawar , Akshada A. Bakliwal. Swati G. Talele .Dr.Anil G. Jhadhav Research form Formulation and evaluation of herbal chocolate as nervine tonic by journal of pharmaceutical science and research , Vol 11 (2019)
3. Poojashree Verma , Urvashi Sharma, Niharika Gokhale And Mahavir Chhajed Research form Formulation and evaluation of herbal chocolate in the treatment of hormonal I'm balance by International journal of pharmacy & life science , Vol 11 Issue 8 Aug 2020
4. Rohini R. Devare , Shivani A. Chaudhary , Prajikta S. Dewang , Varsha B. Patil, Amrita M. Patil Research form Chocolate Formulation as drug delivery system for Pediatric by Indian journal of Drugs Vol 7 (2019)
5. Shivani A. Chaudhari, Rohini R. Devare, Prajakta S. Dewang, Varsha B Patil Amruta M. Patil, Dr. Sunil P. Pawar Research form chocolate formulation as drug delivery system by Indian journal of drugs . Vol 6 (2018)
6. Sharma Mayank , Dinesh Kumar ,Research form Chocolate Formulation as drugs delivery system for Pediatric. Vol 23 (2012)
7. Geoff Talbot, Prediction of hardness of chocolate and compounds coating ,unsilvers research Colworth.
8. Pandey, G.& Madhuri, S.(2010) Pharmacological activities of Ocimum Sntum (Tulsi):A rewiew .Int J pharm Sci Rew Res ,5(1)
9. Konar, N. Toker, O. S. Oba , S., & Sagdic, O(2016) . Improving functionality of chocolate A rewiew on Probiotics ,prebiotic and synbiotics characteristics . Trend in food science &Technology .
10. Reddy Sunil, K .Maunika ,A. Venkatesham. Design and fabrication of medicat knowed chocolate formulation by chocolate drug delivery system .Int J Curr pharm Res,(2017) 9 (5)
11. Barbara Oliveira, Kaja Falkenhain and Jonathan P Little Sugar-Free Dark Chocolate Consumption Results in Lower Blood Glucose in Adults Roger Philip Aidooa,b, *, Frederic Depyperea , Emmanuel Ohene Afoakwab and Koen Dewettinckawith Diabetes. volume 15 (2022)
12. CH-HUING TSAI1, WAN-CHEN CHIU1 , NAE-CHERNG YANG2 , CHUNG-MEI OUYANG3 & YUE-HORNG YEN A novel green tea meal replacement formula for weight loss among obese individuals: a randomized controlled clinical trial volume 21(2009)
13. Gourab Chatterjee1, Sumita Das1, Rahel Suchintita Das2, Amit Baran Das Development of green tea infused chocolate yoghurt and evaluation of its nutritive value and storage stability Volume 20 (2018)
14. Roger Philip Aidooa,b, Frederic Depyperea , Emmanuel Ohene Afoakwab and Koen Dewettincka Industrial manufacture of sugarfree chocolates Applicability of alternative sweeteners and carbohydrate polymers as raw materials in product development volume 13 (2013)
15. Gourab Chatterjee1 , Sumita Das1 , Rahel Suchintita Das2 , Amit Baran Das Development of green tea infused chocolate yoghurt and evaluation of its nutritive value and storage stability volume 20 (2018)
16. Dr. Akashamrut M Patel, Jafarali K Momin and Kedar S Damle Development of sugar-free Kajukatli:

A traditional Indian sweet voloume 9 (2021)

17. Najva Tayefe Ashrafie – Mohammad Hossain Azizi – Aghdas Taslimi – Mehrdad Mohammadi – Tirang R. Neyestani – Mohammad Amin Mohammadifa Development of Reduced-Fat And Reduced-Energy Dark Chocolate Using Collagen Hydrolysate As Cocoa Butter Replacement Agent voloume 53 (2014)
18. Paradorn Ngamdee*, Sureechay Jamkrajang and Siriwan Yankin Development and Study on Physical and Sensory Properties of Dark Chocolates Fortified with Anthocyanin from Broken Riceberry Rice voloume 14(2020)
19. Syed Raza Shaha , Richard Alweisb , Najla Issa Najimc , Amin Muhammad Dharanid , Muhammad Ahmed Jangdad , Maira Shahidd , Ahmed Nabeel Kazie and Syed Arbab Shahf Use of dark chocolate for diabetic patients: a review of the literature and current evidence voloume 7 (2017)
20. Sabu M Chacko¹, Priya T Thambi¹, Ramadasan Kuttan² , Ikuo Nishigak Beneficial effects of green tea: A literature review. Voloume 10 (2010)