

CATHARANTHUS ROSEUS (SADABAHAR) LEAF CHOCOLATE

LAKHVINDER KAUR¹, GURJEET KAUR CHAWLA²

¹Assistant Professor, Nutrition and Dietetics, Faculty of Applied Science Manav Rachna International University, Faridabad, India

²Associate Professor, DSW, Faculty of Applied Science Manav Rachna International University, Faridabad, India

ABSTRACT-Diabetes becomes a real problem of public health in developing countries, where its prevalence is increasing steadily. Diabetes mellitus can be found in almost every population in the world. Since the Ayurvedic practice started in India, plants are being used in the cure of diseases. Catharanthus Roseus (sadabahar) being rich in alkaloids, are used in the treatment of various diseases like blood pressure, asthma, constipation, cancer and menstrual problems and majorly in diabetes. Therefore, this study was undertaken to formulate sugar free chocolates with the incorporation of C. Roseus (Sadabahar) leaves powder with hypoglycemic property. Cocoa solids as a rich source of flavonoids and alkaloids helps to reduce insulin resistance. Recently there has been a shift in a trend from synthetic to herbal medicine. Subsequently, with this background in mind, this study was embarking on the study of hypoglycemic effect of Catharanthus roseus fresh leaves in Diabetes Mellitus. Most of the people do not know Catharanthus roseus nutritional quality, health benefits, and how to use and what to use. They are not utilized to its full potential. So, the basic aim of this study is to create awareness about Catharanthus roseus leaves among the population. Therefore, the present study was undertaken to develop chocolate for diabetics by incorporating Catharanthus roseus dried leaves powder and evaluate their acceptability and phytochemical content.

1. INTRODUCTION

All over the world, Diabetes mellitus is increasing. India presently has the largest number of people with Diabetes mellitus [1]. Though many new oral hypoglycaemia agents are now available, there is a great difficulty in choosing the right medication for longer period either due to side effects or due to the lack of response. Herbal drugs are

wildly used in many parts of the world to cure various diseases. Nowadays the usage of natural products has increased and plant extracts are screened for new drug inventions [2-4]. Growing demand for herbal medicines is due to their effectiveness, minimal side effects and economical aspects. The plant Catharanthus roseus is popularly known as periwinkle in India.

The medicinal properties of this plant have been described in the Ayurveda [5]. From centuries it has been cultivated as an ornamental throughout the tropics and occasionally in the subtropics. Catharanthus Roseus grows throughout India and is found as an escape in waste places and sandy tracts. More than 130 different compounds have been reported including about 100 monoterpenoid indole alkaloids [6]. There are about two common cultivars of C. roseus which is named on the basis of their flower colour that is the Pink flowered "Rosea" and the White flowers "Alba". It is an evergreen sub shrub or herbaceous plant growing up to 1 m tall. The leaves are oval to oblong, 2.5-9 cm long and 1-3.5cm broad, glossy green, hairless, with a pale midrib and a short petiole 1-1.8 cm long; they are arranged in opposite pairs.[8] C. Roseus contains a virtual cornucopia of useful alkaloids that are used in the treatment of various diseases like diabetes, blood pressure, asthma, constipation, and cancer and menstrual problems etc. The leaves of C. roseus possess the properties of carbohydrate, flavonoid, and saponin. Most potentially active chemical constituents of Catharanthus roseus are alkaloids.

The alkaloids like Vinblastin, Vindesine, Vindeline etc. are mainly present in aerial parts of this plant whereas Ajmalicine, vineamine, Raubasine, Reserpine, catharanthine are present in roots and leaf. Rosindin a pigment found in the flower of C. Roseus. These alkaloids shows various properties related to health of the individuals. Apart from this the stems and leaves of C. roseus have enormous amount of phyto chemical constituents majorly phenols and flavonoids.[9]

Dark chocolates are good source of antioxidants and contains high amount of flavanols. The types of flavonoids found in chocolate are flavanols. The concentration of flavanols in any chocolate depends on both the flavanol content of the cacao plant and the procedures used for transforming the cocoa into chocolate. The regulation of nitric oxide (NO) production by the flavanols present in dark chocolate could explain its effects on insulin sensitivity. [10] Daily dark chocolate consumption of 20 grams per day helps to increase the sensitivity to insulin. This is important for blood glucose control. Dark chocolate helps blood vessels healthy and circulation unimpaired to protect against type II diabetes. The presence of flavonoids in dark chocolate

helps to reduce insulin resistance by helping cells to function normally and regain the ability to use body's insulin efficiently and won't cause huge spikes in blood sugar levels.^[11]

In the present study leaf powder was incorporated in sugar free dark chocolate compound along with the stevia to check its sensory acceptability and phytochemical content.

2. Material and Method

2.1. Sample Description:

Catharanthus roseus fresh leaves were collected from the main campus of Manav Rachna International University Faridabad. The leaves were washed thoroughly with tap water followed by sterilized distilled water for the removal of dust and sand particles. 10gm of catharanthus roseus leaf powder was used along with stevia drop.

2.2. Panel Selection and Training:

Food product development and its acceptability appraisal through organoleptic evaluation was carried out by trained as well as untrained panelists comprising 10 each from the department of Manav Rachna International University, Faridabad. For the Selection of Trained Panellists the screening of 25 subjects were done out of which 10 panelists were selected on the basis of Sensitivity threshold test. The test was conducted by using 4 dilutions of sweet, salt, bitter and sour sensations. The members were asked to taste the solution and give the description of taste accordingly and 10 panelists were selected on the basis of sensitivity threshold test.

2.3. Outcome Measures.

The panelists performed organoleptic appraisal by Hedonic test as well as Composite Score card to assess the overall product preference. Evaluation of appearance, taste, color, texture ,aroma, mouthfeel and overall acceptability was measured.

2.4 Phytochemical Evaluation:

Phyto chemical analysis of chocolate was carried out for total phenolic content as well as total flavonoid was analysed .

2.5. Statistical Analysis.

The data were subjected to statistical analysis using Statistical Package for Social Sciences (SPSS) .Mean ± SD was used to obtain the differences in organoleptic scores, within different levels of incorporation of Catharanthus

roseus leaves in developed chocolate .The result showed non significance $p < 0.05$.

3. Results

3.1. Organoleptic Evaluation. Sugar free chocolate incorporated with Catharanthus roseus (Sadabahar) leaf powder was found to be organoleptically satisfactory.

Table 1. SENSORY EVALUATION OF THE PRODUCT BY TRAINED PANELIST.

All values are found to be Nonsignificant.

ATTRIBUTE	Mean Score
APPEARANCE	17.1±2.84
TEXTURE	8.6±1.07
COLOUR	8.7±1.05
TASTE	17±2.05
AROMA	7.5±1.64
MOUTH FEEL	8.00±1.24
OVERALLACCEPTABILITY	17.80±1.31

Table 1 depicts the composite mean score of chocolate.

The overall mean score of the developed chocolate revealed that the attributes i.e. appearance, texture, colour, taste, aroma and mouthfeel were acceptable but showed non significant. Its overall acceptability was 17.80±1.31 by the trained panelists through composite scoring.

Therefore non significant difference was found in scores for organoleptic characteristics of developed sugar free leaf chocolate.

Table 2 SENSORY EVALUATION UNTRAINED PANELIST

ATTRIBUTE	Mean Score
APPEARANCE	8.3±0.67
TEXTURE	8.0±0.66
COLOUR	8.0±0.81
TASTE	8.0±0.66
AROMA	6.90±1.19
MOUTH FEEL	7.90±0.73
OVERALL ACCEPTABILITY	8.10±0.56

All values were found to be nonsignificant.

Table 2 The overall mean score of chocolate revealed that the attributes ie appearance, texture, colour, taste, aroma, mouthfeel were acceptable but showed non significant result .Its overall acceptability was 8.10 ± 0.56 by the untrained panelists by Hedonic score rating. So, non significant difference was found in scores for organoleptic characteristics of developed sugar free leaf chocolate.

3.2. Phytochemical Evaluation:

Phyto chemical analysis of chocolate was carried out for total phenolic content as well as total flavonoid was analysed .

PHYTO CHEMICAL ANALYSIS OF CHOCOLATE

Table 3. TOTAL PHENOLIC CONTENT

SAMPLE	mg/100gm
Leaf chocolate	4.5

The table 3 shows the amount of total phenolic content present in chocolate that was 4.5mg/100gm.

Table 4. TOTAL FLAVONOID CONTENT

SAMPLE	mg/100gm
Leaf chocolate	138

The table 4 revealed that the amount of total flavonoids content present in Leaf chocolate was 138mg/100gm .

4 .SUMMARY AND CONCLUSION

The present study was conducted to develop Catharanthus Roseus (Sadabahar) leaves incorporated sugar free chocolates. The purpose of the study was to determine its overall acceptability and to access its phyto chemical analysis.

The medicinal properties of this plant have been described in the Ayurveda. More than 400 kinds of alkaloids at different parts of the plant. These alkaloids help in curing different diseases eg. hypertension, constipation, ulcerative problems etc. Majorly it helps in controlling the blood sugar level among the diabetic patients.

As a result it showed that the developed chocolate was highly acceptable with high nutritional value and antioxidant properties.

Therefore it can be easily incorporated into one's daily diet regime. Diabetic population can easily consume this product as a part of their diet. It holds a great promise for future research for the formulation of potent anti diabetic products for the present plant.

BIBLIOGRAPHY

1. Shaw J. E., De Courten M. P., Zimma P. Z.,Diabetes in new Millennium, The Endocrinology & Diabetic Research Foundation of University of Sydney. 1999, 1-9.
2. Shridhar G. R., Psycho social and cultural issues in diabetic mellitus, Current Science. 2002,83- 91.
3. Alberti KG, Zimmet PZ. New diagnostic Criteria and Classification of diabetesagain. Diabetes Med.1998; 15:535
4. Valiathan MS. Healing plants. Curr Sci. 1998; 75:112-6.
5. Pereira DM, Faria J, Valentao P, Sottomayor M, Andrade PB .Exploiting Catharanthus roseus roots: source of antioxidants. Journal of Food Chemistry 2010 ;6:235-242.
6. Muralidharan L. Beneficial effects of Aegle marmelos leaves on blood glucose levels and body weight changes in alloxaninduced diabetic rats. 2014; 2 (4):46-49.
7. Bailey LJ, Day C. Traditional plant medicine as treatment for diabetes. Diab Care. 1989; 12: 553-564.
8. Don G. Catharanthus roseus. In: Ross IA, editor. Medicinal Plants of the World. Totowa: Human Press; 1999. pp. 109-18.
9. Gurib-Fakim A, Brendler T. Medicinal and aromatic plants of Indian Ocean Islands. 2004: 568
10. Miller KB, Hurst WJ, Payne MJ, Stuart DA, Apgar J, Sweigart DS, Ou B. Impact of Alkalization on the Antioxidant and Flavanol Content of Commercial Cocoa Powders. Journal of Agricultural and Food Chemistry 2008; 56(18):8527.
11. Haritha K, Kalyani L ,Lakshmana Rao A. Health Benefits of Dark Chocolate Journal of Advanced Drug Delivery 2014; 1(4); 184-195