



DEVELOPMENT AND ACCEPTABILITY OF READY MIX POWDERS INCORPORATED WITH JAMUN SEED (*SYZYGIUM CUMINI*) POWDER FOR DIABETIC PATIENTS

Harine Sargunam J and Janapriya S*

Department of Nutrition and Dietetics, Jamal Mohamed College, Thiruchirappalli – 20

ARTICLE INFO

Article History:

Received 5th December, 2017

Received in revised form 8th

January, 2018 Accepted 19th February, 2018

Published online 28th March, 2018

Key words:

Diabetes mellitus, Jamun seeds, Incorporation, Organoleptic evaluation, Dhal adai mix powder.

ABSTRACT

Diabetes mellitus is a major public health problem in both developed and developing countries. It is one of the leading causes of disability and mortality in the world, especially in India. Managing diabetes to delay its complications is a challenge. There are many therapeutic options available for the management of diabetes, which include oral hypoglycemic drugs and insulin therapy. Jamun seed (*Syzygium cumini*) is one of the widely used medicinal plants in the treatment of various diseases in particular diabetes. Jamun seeds contain a glycoside, named Jamboline which helps in the maintenance of glucose levels as in the normal limits. Jamun seed powder is good sources of vitamin -C and vitamin -B complex (B1, B2, B3 and B6) as well as dietary fibre, potassium, iron and they are low in fat and cholesterol. Different types of Dhal adai mix powder with varying proportions of Jamun seed powder (2 %, 4 % and 6 %) were developed along with a control. The organoleptic evaluation of the Dhal adai mix powder was carried out using 9 - Point Hedonic Scale. The data obtained was analyzed statistically. The Colour of products showed significant positive changes at $p \leq 0.05$. Organoleptic evaluation of prepared Dhal adai mix powders revealed that sample T2 (4 %) Incorporation scored highest in texture and aroma (6.7 ± 0.34) color (7.2 ± 1.128), taste (7.4 ± 2.03) and overall acceptability (7.1 ± 0.32).

Copyright©2018 Harine Sargunam J and Janapriya S*. This is an open access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

INTRODUCTION

Diabetes mellitus is a major public health problem in both developed and developing countries. It is one of the leading causes of disability and mortality in the world, especially in India. According to World Health Organization (August, 2011), 346 million people are suffering with diabetes worldwide and in 2004, 3.4 million patients died with this disease. Diabetes mellitus is a metabolic disorder characterized by high blood sugar (glucose) levels that result from defects in insulin secretion, or action, or both.^[1] Hyperglycemia in Diabetes mellitus leads to vascular complications, which is the major cause of morbidity and mortality in diabetic patients.^[2] Managing diabetes to delay its complications is a challenge.^[3] There are many therapeutic options available for the management of diabetes, which include oral hypoglycemic drugs and insulin therapy.^[4]

The plant drugs are considered to be less toxic and free from side effects than synthetic drugs. The *Syzygium cumini* (jamun) is a large evergreen tree, grown widely in the indagangetic plains and also in the Cauvery delta of Tamilnadu.^[5] Jamun seeds contain a glycoside, named *Jamboline* which helps in the maintenance of glucose levels as in the normal limits.^[6]

Ayurvedic text suggests that 1-3 g of jamun seed powder per day is an average dose for the treatment of diabetes.^[7] Jamun seed powder is good sources of vitamin -C and vitamin -B complex (B1, B2, B3 and B6) as well as dietary fibre, potassium, iron and they are low in fat and cholesterol.^[8] Traditional medical healers in Madagascar use seeds of jambolan to debilitate the complications in diabetes. The widespread therapeutic use of *Syzygium cumini* in traditional medicine warrants chemical analysis to elucidate the role of the active principles in different plant parts especially seed. The phytochemicals like malieic acid, oxalic acid, gallic acid, tannins, cynidin glycoside, oleanolic acid, flavonoids, essential oils, betulinic acid, friedelin have been reported for antianaemic, gingivitis, anti-diarrhoeal, antipyretic, antibacterial, antineoplastic, anti-inflammatory, hypoglycemic, gastroprotective and hypolipidamic properties.^[9]

Objectives

In view of the above mentioned facts, the objectives of our research are

- To analyze the nutritional potential of Jamun seed (*Syzygium cumini*) powder incorporated Dhal adai mix powder.
- To examine the changes in the Dhal adai mix powder sensory characteristics and

*Corresponding author: **Janapriya S**

Department of Nutrition and Dietetics, Jamal Mohamed College, Thiruchirappalli – 20

- To check the acceptability of Dhal adai mix powder prepared from the Jamun seed (*Syzygium cumini*) powder, which are usually discarded.

METHODOLOGY

Different types of Dhal adai mix powder with varying proportions of Jamun seed powder (2 g, 4 g and 6 g) were developed along with a control. The organoleptic evaluation of the Dhal adai mix powder was carried out using 9 - Point Hedonic Scale. Sensory attributes of various products formed by incorporating varied levels of Jamun seed powders was assessed by a panel of twenty judges. The data obtained was analyzed statistically using SPSS 19.

Treatments

- T1 – Dhal adai mix prepared using 2 g of jamun seed powder
- T2 - Dhal adai mix prepared using 4 g of jamun seed powder
- T3 - Dhal adai mix prepared using 6 g of jamun seed powder

The different treatments of Jamun seed powder dhal adai mix powders were prepared and were put forward for the organoleptic evaluation for identifying the best acceptable product.

Recipe development

75 g of Parboiled rice + 5 g Bengal gram dhal + 5 g Black gram dhal +
5 g Green gram dhal + 5 g Red gram dhal + 2.5 g Red chilli

Sundry all the ingredients

Grind it to coarse powder

Add Asafoetida & salt to it and mix well

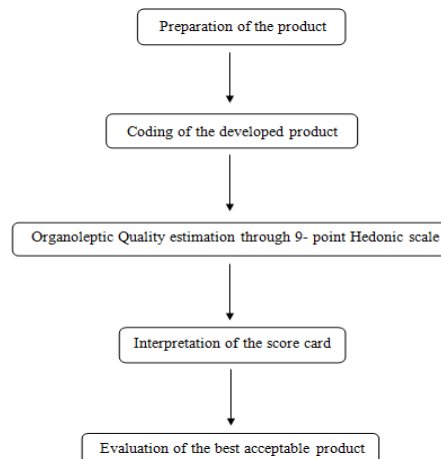
Finally add Jamun seed powder according to the

level of incorporation (2 g, 4 g and 6 g)

Store it in air tight container



Sample A – 2 %, Sample B – 4 %, Sample C – 6 %



RESULTS AND DISCUSSION

The incidence of diabetes mellitus is increasing all over the world and is becoming a problem of significant importance in the affluent societies. Oral hypoglycemic drugs have been frequently used for controlling non-insulin dependent diabetes mellitus but allopathic medicines have side effects. Medicinal plants and herbs are of great importance to the health of individuals and communities. Despite the existence of herbal medicines over many centuries, only relatively small number of plant species has been studied for their application. However, in the recent past, an increasing research evidence is getting accumulated, which clearly indicate the positive role of traditional medicinal plant in the prevention or control of some metabolic disorders like diabetes, heart diseases and certain types of cancers. ^[10] One of the great advantages of this medicinal plant is that these are easily available and have no side effects. ^[11]

Jamun is a huge evergreen tree that is well known in Ind-o-Pak. It is scientifically named as *Eugenia jambolana* or *Syzygium cumini* that belongs to family Myrtaceae. Jambul, java plum, Indian blackberry and black plum are common names of jamun. India is a leading producer of jamun. Worldwide, total production of jamun is 13.5 million tones out of which India contributes about 15.4%. ^[12]

Jamun seeds also contains albumen, fat, glycosides, an alkaloid; jambosine, resin, ellagic acid, quercetin, gallic acid as well as elements of zinc, vanadium, chromium, sodium and potassium. β -sitosterol is present in unsaponifiable material of seed fat. However, the ellagic acid and glucoside jamboline are known as bioactive components of jamun

containing antioxidant activity and hold the capacity to convert the starch into sugar. [13]

Table 1 Nutrient content of jamun seed powder per 100g

Nutrients	Value
Energy (k.cal)	380.64
Carbohydrate (g)	84
Sugar as sucrose (g)	0.56
Protein (g)	5.53
Fat (g)	2.40
Dietary fiber (g)	1.49
Iron (mg)	1.25
Moisture Content (%)	5.89
Total Ash (%)	1.95

Nutritional evaluation

Table 2 Nutritional composition of control and the fortified Dhal adai mix powders

Product	Energy (k. Cal.)	Carbohydrate (g)	Protein (g)	Fat (g)	Fibre (g)	Iron (mg)
Control	337.24	72.22	9.8	0.97	1.16	1.79
T1	337.93	72.32	9.78	1.01	1.19	1.8
T2*	338.63	72.42	9.76	1.04	1.21	1.8
T3	339.32	72.52	9.75	1.09	1.24	1.81

*The product T2 with 4 g fortification with jamun seed powder showed highest overall acceptability as shown below. Result of nutritional evaluation showed statistically significant at $p \leq 0.05$ in all nutrient content.

Sensory evaluation

The experimental Dhal adai mix powders were organoleptically evaluated by panel of twenty members on a 9 – point Hedonic scale and marking was done on the basis of four parameters

- Texture and Aroma
- Color and Appearance
- Taste
- Overall Acceptability

Organoleptic evaluation of prepared Dhal adai mix powders revealed that sample T2 (4 %) Incorporation scored highest in texture and aroma (6.7 ± 0.34) color (7.2 ± 1.128), taste (7.4 ± 2.03) and overall acceptability (7.1 ± 0.32)

Table 3 Effects of level of incorporation of Jamun seed powder on sensory evaluation of Dhal adai mix powders

Sensory attributes	Texture and aroma	Colour and appearance	Taste	Overall acceptability
Control	7.93 ± 1.15	8.15 ± 1.06	8.10 ± 1.22	8.10 ± 1.09
T1	7.53 ± 1.05	7.65 ± 0.91	7.75 ± 0.92	7.80 ± 0.98
T2	7.65 ± 1.11	7.75 ± 1.04	7.90 ± 0.89	8.10 ± 0.94
T3	7.28 ± 1.07	7.40 ± 0.92	7.40 ± 0.97	7.50 ± 1.02

The above graph represents the mean scores by the panel members on the basis of texture and aroma of different Dhal adai mix powders. The minimum average scored is by the control Dhal adai mix powder while maximum is of T2 with an average of 7.65.

The above graph shows that the average scores for colour and appearance for T2 is 7.75 which is the maximum and the least score is for T3 (7.40). The results indicate that colour and appearance are highly affected by the concentration of Jamun seed powder.

T2 scored the maximum value in taste with an average of 7.90 followed by 7.40 for T3 as clearly revealed by the graph with response from the panelists.

The overall acceptability graph represents the acceptance on the basis of all the mentioned parameters; the maximum average score is 8.10 by the product T2. After statistical analysis it was found that there was a significant association between parameters therefore, flavor, taste, color, appearance and overall acceptability is significant (<0.05).

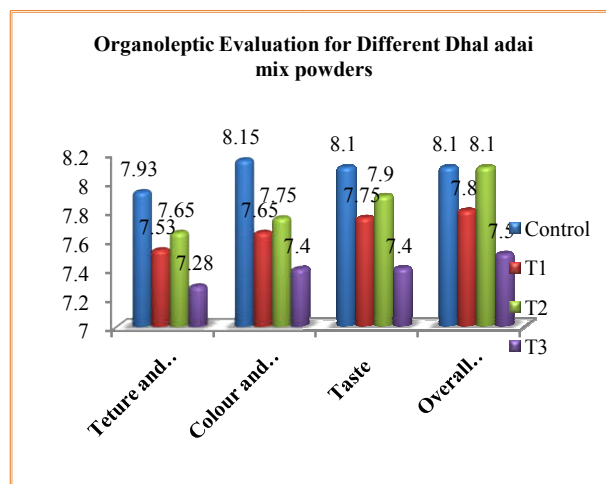


Fig 1 Mean score of organoleptic evaluation for different Dhal adai mix powders

CONCLUSION

The incorporated Dhal adai mix powders had better quality with respect to nutritive value especially Energy, Carbohydrate, Fat, Fibre and Iron content as well as organoleptic acceptability. Results of the present study clearly revealed high potential of the Dhal adai mix powders prepared by incorporating the Jamun seed powder (*Syzygium cumini*). Development of products based on these ready mix powders will increase the Nutritional value of the regular Indian diet as well as this can contribute to the reduction of blood glucose level among the diabetic patients.

References

1. Romesh Khardori, 2015. Type 2 Diabetes Mellitus, Medspace.
2. Karthic K, Kirthiram KS, Sadasivam S, Thayumanavan B., 2008. Identification of alpha amylase inhibitors from *Syzygium cumini* Linn seeds. *Indian J Exp Biol*; 46: 677-80.
3. Kasper D, Fauci A, Hauser S, Longo D, Jameson J, Loscalzo J, 2015. Harrison’s Principles of Internal Medicine. 19th ed. New York: McGraw Hill; p. 2424.
4. Sidana S, Singh VB, Meena BL, Beniwal S, Singh K, Kumar D, et al., 2017. Effect of *Syzygium cumini* (jamun) seed powder on glycemic control: A double-blind randomized controlled trial. *J Med Soc*; 31: 185-9.
5. Indira, G., Mohan Ram, M., 1992. Jamun, In: Fruits, National institute of nutrition, Indian Council of Medical Research, Hyderabad, India, 34-37.
6. Kalse SB, Swami SB, Sawant AA, Thakor NJ, 2016. Development and Quality Evaluation of Jamun Seed Powder Fortified Biscuit Using Finger Millet. *J Food Process Technology* 7: 633. Volume 7 • Issue 11 • 1000633 ISSN: 2157-7110

7. Swami SB, Nayansingh Thakur J, Patil M, Haladankar P, 2012. Jamun (*Syzygium cumini* L): A review of its food and medicinal uses. *Food Nutrition Science* 1102
8. Priyanka, A.A. Mishra, 2015. Development and quality evaluation of jamun powder fortified biscuits using natural sweeteners *International Journal of Science, Engineering and Technology-Volume 3 Issue 3*.
9. Ramya S, Neethirajan K, Jayakumararaj R. Profile of bioactive compounds in *Syzygium cumini* – A review. *J*
10. Zhang, X., 1996. Traditional medicine and (WHO) World Health Organization. *The Magazine of World Health Organization*. 49th year No.2: 4-5.
11. Mehta, K.C., 1982. Indian herbal drugs in the treatment of diabetes. *Current Medical Practice*, 26: 305-309.
12. Ali, A., T. Masud, K.S. Abbasi, A. Ali and A. Hussain. 2013. Some compositional and biochemical attributes of jamun fruit (*Syzygium cumini* L.) from Potowar region of Pakistan. *Res. Pharm.*, 3: 01-09.
13. Benherlal, P.S. and Arumughan. C, 2007. Chemical composition and *in vitro* antioxidant studies of *S. cumini* fruit. *J. Sci. Food Agric.*, 87: 2560-2569.

How to cite this article:

Harine Sargunam J and Janapriya S (2018) 'Development and Acceptability of Ready Mix Powders Incorporated with Jamun Seed (*Syzygium Cumini*) Powder for Diabetic Patients', *International Journal of Current Advanced Research*, 07(3), pp. 10792-10795. DOI: <http://dx.doi.org/10.24327/ijcar.2018.10795.1846>
