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Research Article

Formulation And Evaluation Of Multi-Herbal Anti- Diabetic Cookies

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ABSTRACT

Nowadays the cookies are often used in the breakfast, snacks for controlling the Hunger is within a shorter period of time but this case is not similarly found in the diabetic patients, our formulated fortified herbal and multinutritional biscuit is most beneficial for children's, obeys and in diabetic patients as compared to the number of varieties of marketed cookies that consists of refined Flour and Maida. The aim of this formulated fortified herbal biscuit is that to control and regulate the sugar level if it is more than or less in the patients this formulation containing some of the ingredients having their sugar control properties such as Bael, Jammun seed, Guava leaves, Insulin plant, Moringa leaves, Curry leaves, Coccinia indica, Stevia leaves etc. traditionally and medicinally these herbal medicines are used for glucose lowering mechanism.

INTRODUCTION

Abnormal glucose level in the blood known as diabetes, increase in the glucose up to its normal called Hyperglycemia, whereas decrease in the glucose is called hypoglycemia [1,2]. This is not the communicable type of disease but according to the WHO it is metabolic disorder which leads to cause some of the hormonal unbalancing in humans Langerhans of pancreas responsible to

produce Glucagon by alpha cell, insulin by beta cell, somatostatin by delta cell and pancreatic polypeptide by PP cells the insulin is the polypeptide hormone which controls the blood glucose level [3,4]. Multiherbal antidiabetic cookies are combination of various herbs, fruits flour that have powerful impact on insulin secretion. The multiherb cookies contains Ashwagandha, Black gram flour, Coccinia Indica,

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Curry leaves, Guava leaves, Holy Basil, Insulin plant, Jamun seed, Moringa leaves, Liquorice, Piper batel leaves, Stevia leaves, Wheat flour, Mentha etc.

Ashwagandha (*Withania somnifera*) belonging to the family solanaceae having steroidal alkaloids used to treat cognitive health, controls lipid profile and blood glucose level. Also contains flavonoids and antioxidants.

Curry leaves (*Murraya koenigii*) belonging to family Rutaceain identified for its speciality of aroma and medicinal values along with antioxidant, anticancer, antifungal, antimicrobial and pancreatic lipase inhibitor.

Guava leaves (*Psidium guajava*) are used in traditional medicine to treat a verity of disease including diabetes stomach intestinal issues pain and wound healing this leaves showing strong antioxidant some minerals and vitamins properties.

Moringa leaves (*Moringa oleifera*) Leaves powder has several health benefits such as it is used to treat asthma diabetes HIV AIDS lowers high cholesterol levels and increase in milk production in the lactating mother.

Liquorice (*Glycyrrhiza glabra*) Liquorice help to regulate fat metabolism in the liver possess glycaemic moderating effects and supports the healthy function of kidney, liver and bladder it is rich in essential elements for hair health.

Insulin plant (*Costus igneus*) it is traditionally used medicinal which is important for the diabetes and its other medicinal values it is not reduce thye blood glucose level but also make a great impact on the blood sugar level when diabetic patients eat this leaves it also having Blood pressure control properties.

Stevia leaves rubaudiana (*Stevia rubaudiana*) it is plant of herbal sugar having numerous vales and its importance's commercially it is used in beverages and essential ingredient in the herbal antidiabetic medicine as well it consists of some flavonoids, quercetin and riboflavin moieties having antibacterial, antiviral, amtitumor and anticaries properties.

Piper batel leaves (*Piper siriboa*) It help to improve oral health, along with anti-asthmatic properties and relief from the depression cases its belonging from the family piperaceae [5-8]



a) Herbal ingredients



b) Herbal Extract

Figure 1: Herbal ingredients and their extract

Table 1: Ingredients of Multiherbal Antidiabetic Cookies

No	Ingredients	Scientific name	Part use	Quantity taken (gm)
1	Ashwagandha	Withania somnifera	Whole herb	8
2	Black gram flour	Vinga mungo	Seed	45
3	Coccinia Indica	Ivy gourd	Leaves	8
4	Curry leaves	Murraya koenigii	Leaves	10
5	Guava leaves	Psidium guajava	Leaves	5
6	Holy Basil	Ocimum tenuiflorum	Whole herb	5
7	Insulin plant	Costus igneus	Whole herb	6
8	Jamun seed	Syzygium cumini	Seed	10
9	Moringa leaves	Moringa Oleifera	Leaves	15
10	Liquorice	Glycyrrhiza glabra	Whole herb	5
11	Piper batel leaves	Piper siriboa	Leaves	5
12	Mentha	Mentha piperita	Leaves	4
13	Stevia leaves	Stevia rubaudina	Leaves	5
14	Wheat flour	Triticum aestivum	Seed	85
15	Fructooligosaccharide	Sweetener	-	5
16	Vanilla	Extract	-	10 ml
17	Butter	-	-	25
18	Milk	-	-	12 ml
19	Baking soda	-	-	1.5
20	Baking Powder	-	-	2
21	Salt	-	-	2

Name of Equipment's Used: Electronic weighing balance (FHOENIX, Mumbai), Electronic oven (Agaro-21, Aloxin Mumbai).

Method:

Herbal material was selected and air dried according to the specificity and make a powder of this all material, side by side the black gram flour and wheat flour is roasted and mixing it well with all dry ingredients are sieve them by using 200 mesh after that butter and milk is added to make dough and rolled it properly in that fructooligosaccharide as a sweetener due to its Glycaemic index-1 along with Vanilla, basil,

mentha used as flavouring agent then make a damp mass for shifting into the mould for appropriate in shape and allow to bake in the Agaro-21 oven the cookies usually baked at the temperature 175°C for 20 min. After cooled it and them pack [9].

RESULTS:

Moisture content:

Detection of amount of water in the sample is called moisture content. 6- cookies are prepared from which 1 is taken out for calculating initial weight, and after air-drying of this same cookie the final weight is calculated [10,11].



Mass of prepared cookies with wet ingredients -
Mass of dried cookies

Initial weight - 5 gm
Final weight – 0.995

Mass of dish – 3

Formula:

$$\begin{aligned}\text{Moisture content} &= \frac{\text{Mass of water in sample} - \text{Mass of dried sample}}{\text{Mass of dried sample}} \times 100 \\ &= \frac{(5 - 0.995)}{5.3} \times 100 \\ &= 400.5 / 5.3 \\ &= 75.5\end{aligned}$$

$$\text{Ash value} = \frac{\text{weight of empty dish} - \text{weight of dish with ash}}{\text{weight of sample}} \times 100$$



The Moisture content was found to be 75.5.

Ash value:

Ash value is important for detecting purity and quantity of total amount of the minerals and thier concentration in formulated samples [12].

Weight of empty dish - 34.22

Weight of dish with ash - 32.20

Weight of sample - 34.22

$$= \frac{(32.20 - 30.25)}{34.22} \times 100$$

$$= 1.95 / 0.0569 \times 100$$

$$= 5.690$$

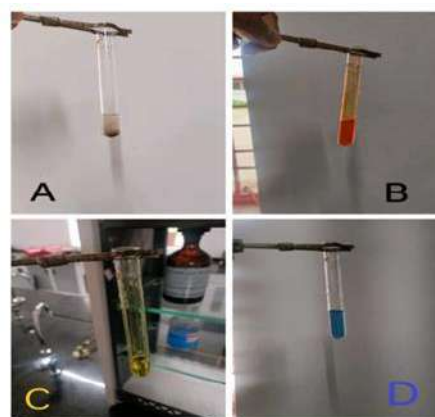
Total Ash value of Biscuit is = 5.690 it is not more than 10%. D

Table 2: Evaluation of Formulation [13,14]

No.	Physical Paramaters	Observation / Herbal dhoop
1	Color	Yellowish Brown / Golden yellow
2	Odour	Vanilla
3	Taste	Sweet
4	Weight	5 g
5	Width	6.2
6	Thickness	0.9



Formulated Cookies



Chemical test of Formulation

- A. Molischs test
- B. Dragendorff's test
- C. Lead subacetate test
- D. Biuret test

Figure 2: Evaluation of Formulation

Identification Test:

A. 2gm of the sample is taken in the clean and dry test tube in that 1-2 ml of Molisch's reagent is

added the violet colouration produce which indicates presence of carbohydrate.

B. 2gm of the sample is taken in the clean and dry test tube in that 1-2 ml of Dragendorff's reagent is added the orange or red colouration is produce which indicates presence of alkaloids in the sample.

C. 2gm of the sample is taken in the clean and dry test tube in that 1-2 ml of Lead acetate reagent is added the yellow colouration produce which indicates presence of Flavonoids.

D. 2gm of the sample is taken in the clean and dry test tube in that 1-2 ml of Biuret reagent is added the violet/purple colouration produce which indicates presence of Protein [15-18].

Table 3: Physiochemical Parameters

No.	Physiochemical Parameters	Standard	F-1	F-2
1	Carbohydrates content	78.57	72.20	71.54
2	Protein content	2.6	2.4	2.4
3	Fat content	15.5	13.5	13.8
6	Alcohol extraction	6.5	5.2	5
7	Water extraction	6.10	6.2	6.1
8	Alkaloid	5.05	2.1	2.1
9	Flavonoids	05	04	4.1

CONCLUSION:

The present study of this Nutraceutical biscuit shows antidiabetic property and this formulated biscuit and their valuable data shows the Carbohydrates proteins fats and some essentials of ingredients which are traditionally known for their antioxidant and antidiabetic property This formulated biscuit has the highest acceptance in order to regulate the actual role in the diabetic patient Here the stevia is a sweetener having more than 250 sweetness as compared to natural sugar.

REFERENCE

1. Pathak K, Khan S, Sen S, et al. Formulation of Polyherbal Antidiabetic Cookies. *J Chem Pharm Res*, 2018; 10(2): 91-97.
2. Pratley RE. The early treatment of type 2 diabetes. *Am J Med*, 2013; 126: S2-S9.
3. Das C, Dash S, Sahoo DC, et al. Evaluation of methanolic bark extract of *Tecoma stans* linn, for wound healing in albino rats. *Int J Pharmacy Technol*, 2010; 2: 735-742.
4. Ewenighi C, Dimkpa U, Onyeausi J, et al. Responses to glycemic control therapy according to age, gender, level of adiposity, and duration of diabetes in type 2 diabetic patients. *Ultas Med J*, 2015; 1(2): 26-30.
5. Tappy L, Gugolz E, Wursch P, et al. Effects of Breakfast Cereals Containing Various Amounts of β -Glucan Fibers on Plasma Glucose and Insulin Responses in NIDDM Subjects. *Diabetes Care*, 1996; 19: 83-84.
6. Pearson D. *The Chemical Analysis of Food*. Edinburgh, UK: T&A Cost. Ltd, 1970. pp. 4-13.
7. Aberg, G, Edman, G, Rossner, S. Perceived hunger, palatability, and adherence: A comparison of high- and low-fat diets. *Obes Res Clin Pract*. 2008. 2:71- 142.
8. James, M., Lattimer and Mark D. H. "Effects of Dietary Fiber and Its Components on Metabolic Health" (2010). *Nutrient*, 2: 1266-1289.
9. Kumari, P., Sharma, P. S. and Srivastava M. M. "Bio-powder. Removal and recovery of arsenic from aqueous system" (2006), *Int. J. Miner. Proc.* 78:131-139.
10. Caceres, A., Saravia, A. S., Rizzo, L, Zabala, E. D, Leon and Nave, F. "Pharmacologic properties of *Moringa oleifera*: screening for antispasmodic, anti-inflammatory and diuretic activity (1992). *J. of Ethnophar.* 36(3): 233-237



11. Marugandan, S., K Srinivasan, S. K. Tandon and H. A Hasan. "Anti-inflammatory and analgesic activity of some medicinal J. Med. Aromat. Plant. Sci. 22:56-58. plants" (2001).
12. Ples, M. And Howell H., Comparative Effects of Moringa Oleifera Lam. Tea on Normal and Hyperglycemic Patients. Dietary fiber, University of California, Berkeley Bancroft [Way Berkeley, CA 9472
13. Jenkins, D.J.A, Wolever, T.M.S., Leeds, A.R., Gassull, M.A. and Haisman, P.J.B. "Dietary fibres, fibre analogues and glucose tolerance: importance of viscosity" (1978). *Brit.Med. J.* 1:1392-94.
14. Holt, S, Heading, R.C, Carter, D.C., Prescott, L. F. and Tothill, available E-health Int. J at http://www.researchmoringa.com/uploads/2e/Health_International_Blood_Sugar.pdf
15. Kulkarni, S.D. Roasted soybean in cookies. Influence on product quality (1997). *J. Food Sci. Technol.* 34: 503-505.
16. Akubor, P. "Functional properties and performance of cowpea/ plantain/ wheat flour blends in biscuits" (2003),
17. "Effect of gel fiber on gastric emptying and absorption glucose and paracetamol" (1979). *Lancet* 1:636-39.Springer.
18. ADA (American Dietetic Association). Position of the American American Dietetic Association:"Health implications of dietary fiber (2008),*J. Am. Diet Assoc.*108:1716-31.

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