

Sensory Evaluation and Physical properties of developed value-added fortified cookies with Psyllium husk (Isabgol)

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Abstract: - Current research was done to characterize and use psyllium husk to prepare dietetic cookies. Straight grade flour was replaced by psyllium husk in various combinations at rates of 20%. With regard to the characterization of psyllium husk, the average values obtained for the physical characteristics of dietary cookies mean diameter and dispersion ratio were decreased by adding husk with thickener increased. With regard to the storage of cookies, the results show an increase in the diameter and spread ratio while the thickness shows a decreasing trend. Sensory feedback such as the colour, taste, flavour, texture and overall acceptability of psyllium husk cookies revealed significant drawbacks with addition of husk. However, @ 20% additional textures of psyllium husk cookies have been shown to be statistically consistent with expected results. In conclusion, the addition of 20% psyllium husk cookies was acceptable with respect to colour tonality and sensory response which may help meet daily dietary fiber requirements. Notably, psyllium husk-based cookies showed a gradual increase in the amount of husk in the dietary fiber content in the recipe as the amount of husk was increased. The resulting cookies may have the ability to manage lipid profiles and glucose concentrations in human subjects.

Key Words: — *Isabgol, cookies, sensory response, dietary fiber, physical properties.*

I. INTRODUCTION

Psyllium husk commonly known as "Psyllium" in English and "Isabgol" in Hindi, belonging to the family Plantaginaceae, is an annual herb with short stems 10-45cm known by different names. It is known as ashwagolam, aspaghol, bazarqutuna, blond psyllium.

Isabgol is high in fiber and acts like a sponge to cleanse the intestines and is widely cultivated in many parts of the world. (Katke, D. S. et al., 2020; Deshpande, W. H. et al., 2020). Some of the available appreciable functions whose reviews are briefly described under Uses of Isabgol – Hydrogel, Sustained Release Agent/Release Retardant, Gastroprotective Agent, Super Disintegrant, Microparticles.

A form of psyllium fiber is made of husk seeds a *Plantago ovata* plant. It is sometimes known as ispaghula. It is commonly known as an aperient.

However, research shows that taking psyllium is beneficial for many parts of the human body, including the heart and pancreas. Psyllium is a prebiotic—a substance necessary for healthy colonies of probiotics to grow in the gut. Psyllium husk is a source of natural hydrocarbons. The plants from which it is derived are known for their positive health effects, and in 2012 the Food and Drug Administration (FDA) reported a positive effect of psyllium husk soluble fiber on reducing the risk of coronary heart disease.

Psyllium husk arabinoxylans are resistant to degradation in the intestine; They have prebiotic properties, allowing an increase in desirable microorganisms in the digestive tract and a decrease in pathogenic bacteria. In addition, psyllium husk has unique gelling and good sensory properties, both of which are desirable for food ingredients. In addition, psyllium husk is a low-cost, biodegradable and eco-friendly material. Psyllium mucilage has a long history as a nutritional supplement because of its considerable amount of soluble and insoluble fiber as a pharmacologically active gel forming

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natural polysaccharides. being reported to be successfully used for the treatment of high cholesterol. (TripathiDevika et al., (2019). Considering the chemical composition, the resultant husk contains 6.83% moisture, 0.94% protein, 4.07% ash and 84.98% of the total carbohydrate. Psyllium husk is used for food, medicine and Used in the cosmetic industry.

In foods, it is used in ice cream, juice, breakfast cereals and bakery products such as biscuits, cakes, breads and muffins with various functional and health aspects (Casrani. B. Tahira. et al., 2014). Primarily, its essential use was as a laxative and colon cleansing agent, it is believed that the dietary fiber from psyllium husk may aid in weight management and weight loss (Kaisrani. B. Tahira. et al., 2014).

Like other herbs, psyllium has been traditionally used as medicine and its consumption has expanded due to its recognized nutraceutical potential. It is used in the treatment of constipation, diarrhea, inflammatory bowel disease and ulcerative colitis. (TripathiDevika et al., 2019; Kaisrani. B. Tahira et al., 2014). Biscuits are one of the most popular bakery products widely consumed across the world mainly as a result of their ready to eat nature, affordable cost, good nutritional quality, availability in various flavors and longer shelf life. (Raymundo. Anabela et al., 2014).

II. MATERIALS AND METHODS

Characterization of psyllium husk and product development was carried out in Babasaheb Bhimrao Ambedkar University (BBAU), A Central University, Lucknow.

2.1 Procurement of Raw Material

Psyllium husk (*Plantago ovata* forsk) was purchased from Shahid Nagar, Lucknow. To make diet cookies, non-nutritive condensed milk and sugar powder were used. Condensed Milk and Sugar Powder Direct grade flour and shortening was procured from the local market, Lucknow.

2.2 Product Development

The justification for the development of dietary cookies containing isabgol was to obtain an acceptable quality product for those initial trials. After determining the ingredients, different formulations of cookies were created and evaluated for different quality characteristics.

2.3 Preparation of cookies

Three different formulations of cookies were prepared using

varying concentrations of isabgol husk (table 2). Control cookies were prepared by selected ingredients: 100 gm commercial wheat flour, 25gm sugar powder, 30 ml condensed milk, 1tbsp cocoa powder, baking powder ½ tbsp, vanilla essence 5-10 drops, salt ½ tbsp.

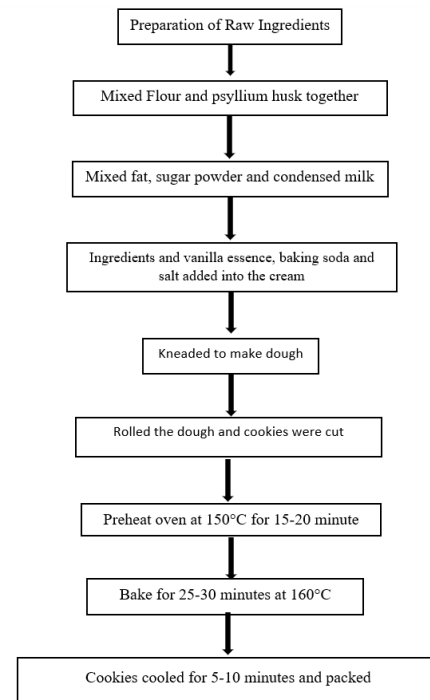
Table.1. Ingredients for preparation of standard cookies

Ingredients	Quantity
Wheat flour	100 gm
Psyllium husk	5%
Sugar powder	25 gm
Condensed milk	30 ml
Cocoa powder	1 tbsp
Baking powder	½ tbsp
Vanilla essence	5-10 drops
Salt	½ tbsp

Table.2. Different formulations (Including control) of isabgoldietic cookies

Formulations	Flour%	Isabgol%
T0	100%	-
T1	80%	20%

T0 – control



2.4 Physical analyses of cookies

It is important for the manufacturer as well as consumers that product should be of acceptable quality in the first look.

2.5 Diameter, thickness and spread ratio

Cookies were analyzed for physical traits like diameter (D) (mm), thickness (T) (mm) and spread factor according to their respective methods in AACC (2000). Diameter (D) of three cookies was measured.

The cookies were kept horizontally to take reading. For duplicating reading cookies were rotated at an angle of 90° and repeated the procedure for average calculation. Likewise, thickness (T) was calculated by measuring the height of three cookies with ruler kept on top of one another. The practice was repeated twice and average value was presented in (mm).

Table.3. Physical Traits

S. No.	Parameters	T0(control)	T1
1.	Diameter (mm)	5.825	6.235
2.	Thickness (mm)	0.26	1.19

2.6 Sensory Evolution

The sensory development of cookies for various characteristics such as appearance, taste/taste, aroma, texture, acceptability was done on a fortnightly basis using a 9-point hedonic scale system for a total of one day. Cookies were presented to the trained taste panel in transparent plates and framed randomly to avoid bias. The judges were requested to do a mouth wash with warm water before each sample to avoid any taste of the seasoned samples. Panelists rated the product from their strongly liking to strongly disliking, giving a score of 9 to 1, respectively.

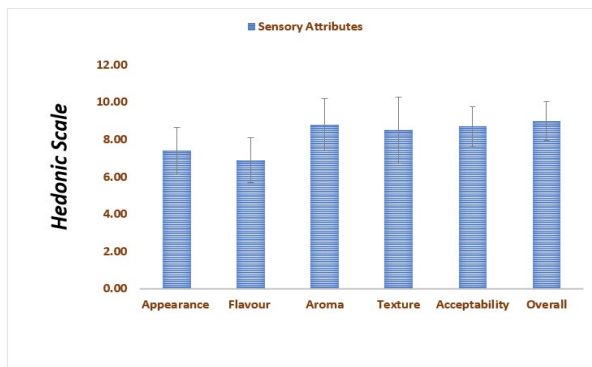


Fig.1. Sample – T0 (Sensory evolution)

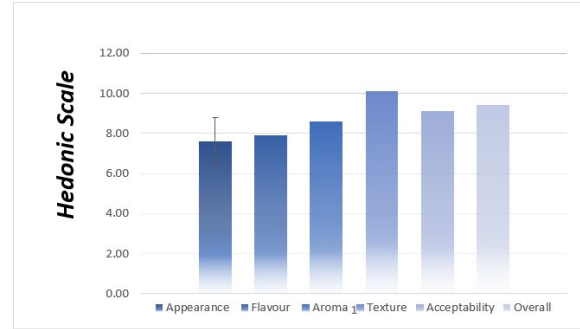


Fig.2. Sample T1 (Sensory evolution)

III. RESULT AND DISCUSSION

The present investigation was conducted to evaluate the quality and acceptability of diet cookies prepared with the addition of isabgol. Physical and sensory assessment of isabgol cookies was performed. The physical analysis results showed a decreasing trend in diameter with an increase in the isabgol content in the cookies, that is, from 5.825 (mm) to 5.82 (mm). Similarly, an increase in thickness was observed in the formulation with increasing levels of isabgol 0.26 (mm) in control cookies while a maximum value of 1.3 (mm).

IV. CONCLUSION

The production of biscuits enriched with isabgol can be considered as an alternative way to incorporate this health promoting fiber into human nutrition. The dietary fiber of isabgol has been widely used in both medicinal supplements and food ingredients and in processed food. Isabgol based cookies showed a gradual increase in dietary fiber content as the amount of husk in the composition increased. The resulting cookies may have the potential to manage digestion and bowel function in human subjects.

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