Journal of Pharmacognosy and Phytochemistry

Available online at www.phytojournal.com

E-ISSN: 2278-4136
P-ISSN: 2349-8234
www.phytojournal.com
JPP 2020; 9(5): 301-303
Received: 22-05-2020
Accepted: 28-06-2020

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Nutritional evaluation of herbal orange peel biscuit

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Abstract
The Aim of present study is to formulate biscuit enrich with orange peel. The value added biscuit samples were prepared in four different ratio and combination T_0, T_1, T_2 and T_3. Nutritional and proximate value was determined by AOAC method (2010) all data were statistical analyzed using standard deviation techniques. It may be concluded from the study that orange peel can be successfully incorporated in wheat flour biscuits up to a level of 10% to which is T_2 treatments was found to be best of enhanced nutritional quality with acceptable attributes. Hence, development and utilization of such functional foods will not only improve the nutritional status of the population but also helps those suffering from degenerative diseases. More studies should be conducted to investigate the possibility of using degenerative as an ingredient in other food products in order to increase applications of such value-added food ingredient.

Keywords: Biscuits, orange peel powder, crude fiber, refined wheat flour, antioxidant, and minerals

1. Introduction
Orange peel is rich in Dietary fiber which is the endogenous components of plant material in the diet which are resistant to digestive enzymes produced by man. Dietary fiber is an important part of a healthy diet. It helps move food and waste efficiently through the digestive system [1]. Fiber is the part of plant foods that cannot be broken down by human digestive enzymes in the small intestine [2]. Fiber is mostly complex carbohydrates. The two types of fiber are soluble and insoluble. While they work differently, both are needed for proper bowel function. Most fiber sources contain both kinds of fiber in varying amounts. Insoluble Fiber cannot be dissolved in water. This type of fiber attracts water to the intestines, making stools bulky and soft. It also speeds the movement of food through the digestive tract. Therefore, insoluble fiber may help prevent diverticular disease, colon cancer, hemorrhoids, and constipation. Cellulose, hemi cellulose and lignin are insoluble fibers. They produce the tough, chewy texture of wheat bran, whole grains, corn bran, and some vegetables [3]. Soluble fiber, or fiber that can dissolve in water, slows the movement of food through the body but does not increase fecal bulk. Soluble fiber helps maintain a healthy cholesterol level, normalize blood sugar levels in diabetics and may even help reduce blood pressure. Pectins and gums are examples of soluble fibers, and they are also found in Orange peel, beans, oat bran, psyllium husks, Apple, Apricot, Carrots, Yams and some fruits and vegetables [4, 5].
Dietary fiber is essentially intact within the plant matrix, and the enzymes within the human digestive tract are unable to hydrolyze or break it down. Dietary fiber is made up of three varying components. The largest component consists of polysaccharides, or plant fibers such as bran; pectins from fruits and vegetables; various gums; and betaglucans from oats and rye [5]. The second-largest component is lignin, composed of polyphenylpropane molecules and present in very small amounts in the diet. Lignin is found in stalks and stems. The final component is made up of resistant starches and non-digestible oligosaccharides [6]. These are naturally occurring parts of fiber that resist digestion in the upper digestive tract yet feed and stimulate the growth of friendly bacteria in the lower digestive tract. Resistant starches and oligosaccharides are sometimes added to food as isolated ingredients (e.g., polydextrose) and occur naturally in legumes, various fruits and vegetables, seeds and grains [5]. Many observational studies have found an association between high-fiber food consumption and reduced risk of type II diabetes. Dietary fiber is thought to play a vital role in reducing overall risk by helping to normalize postprandial glucose response and decrease insulin concentration and overall insulin requirements. Higher intakes (13–16 g/dy in one study and as much as 30–50 g/dy in a different study) from whole-food sources in particular, cereal fiber—have been consistently associated with lower risk of type II diabetes and improved insulin sensitivity [7].

The American Dietetic Association states that 30 to 50 g/day of fiber from whole food sources consistently assists in lowering blood glucose concentrations [8]. Dietary fiber has been shown to improve insulin sensitivity in individuals with type II diabetes [9] The suggested benefits of increased intake of fiber include not only the reduction in postprandial rise in blood glucose concentration but also lower basal glucose concentration, enhanced sensitivity to insulin, and lower cholesterol level. The soluble fibers, e.g., guar and pectin, increase intestinal transit time [4].

Whereas the insoluble fibers such as wheat bran and whole grain decrease the intestinal transit time and increase intestinal bulk. Studies with D-xylose have shown that the glucose-lowering effects may be a consequence of decreased rate of carbohydrate absorption rather than increased total glucose utilization or suppression of hepatic glucose production [3].

The possible effects of fiber within the small intestine include changes in mixing, motility, and convection; intraluminal digestion rates; thickness of the unstirred layer; inhibition of maximum transport capacity; altered pH profile; and, with long-term treatment, altered intestinal morphology [9]. Dietary fiber is considered as an important and essential component of diet and fiber obtained from various sources has been successfully incorporated in the food products with significant results.

In recent years several types of breakfast cereals containing high amount of bran has been developed and marketed as it helps in weight control and play a key role in reducing colon cancer. Enhancement of fiber content in snack foods, beverages, spices, sauces, frozen foods, meat products and other foods has also been investigated. Health benefits of dietary fiber indicate that dietary fiber may give protection against cardiovascular diseases, diabetes and obesity [10].

Biscuits are ideal for their nutritive value, palatability, compactness and convenience [11]. Having low moisture content than cakes and bread, biscuits are generally safer from microbiological spoilage and have long shelf-life [12]. The present investigation was planned to develop a product with high fiber content and low caloric value. Biscuits have always been one of the most popular and appealing food products due to its superior nutritional, sensorial and textural characteristics, ready to eat convenience as well as cost competitiveness [13].

2. Materials and Method

2.1. Place of Experiment: The samples analyses were conducted in the laboratory of Food Science and Technolohy Department, Sharadchandraji Pawar College of Food Technology (Affiliated To Dr. Balasaheb Sawant Konkan Krishi Vidyapeeth, Dapoli) Kharawate-Dahiwali, Tal: Chiplun, Dist: Ratnagiri (M.S).

2.2 Raw materials

Refined wheat flour: The good quality, white coloured refined wheat flour was purchased from local market of Chiplun and care was taken to avoid adulteration.

Orange peel powder: The good quality of yellowish colour orange peel powder was purchased from local market of Chiplun and care was taken to avoid adulteration.

Sugar: The good quality of, white coloured icing sugar was purchased from local market of Chiplun.

Dalda (HVO): The good quality of dalda was purchased from local market of Chiplun.

Baking powder: It was purchased from local market of Chiplun.

SMP: It was purchased from local market of Chiplun.

2.3 Processing Equipments: Baking Oven**,** Weighing Balance**,** Containers, Sieves**,** Baking trays.

2.4 Packaging materials: The Polythene bags were used for packaging of biscuits. It was purchased from local market of Chiplun.

2.5. Procedure

Select the ingredients and shift the dry ingredients after weighing. Next to the weighing creaming of shortening, icing sugar and Skimmed Milk Powder. In next step Addition of Maida and baking powder and Addition of orange peel powder. Mix it well and Knead the dough and Roll it of sheet 3.5 thick. Then Bake at 175ºc for 25-30 min. After baking prepared biscuit cool at room temp. Cooled biscuit well packed and dispatched.

Table 1: Formulation of biscuits

Ingredients \ Treatments	Control T_0	T_1	T_2	T_3
Maida(gm)	100	90	85	80
Orange peel powder(gm)	-	10	15	20
Sugar(gm)	60	60	60	60
Fat(gm)	60	60	60	60
Baking powder(gm)	2	2	2	2
SMP	5	5	5	5

2.6. Biochemical Quality: Analysis All the samples were subjected to chemical quality assessment. Moisture was determined by oven-drying method, Ash was determined by incineration method, Fat was determined by soxhlet apparatus method, Protein by Kjeldahl method and Crude fiber by AOAC – 1995 method [15].

3. Result and Discussion

In order to evaluate the quality as well as acceptability of orange peel biscuit, chemical composition and organoleptic evaluation of orange peel biscuit has been carried out in present investigation.

The result of present project work is tabulated as follows:

3.1 Results of chemical analysis of final product.

Table 2: Chemical analysis of orange peel biscuit

Sr. No.	Parameters	Values (%)
1.	Moisture	3.25%
2.	Ash	1.87%
3.	acidity	0.39%

The chemical analysis of orange peel biscuit was carried out in the laboratory of S. P. college food Science and Technology, kharawate-Dahiwali. Parameters such as moisture content, ash content and acidity were evaluated.

The moisture content of orange peel biscuit obtained was 3.25%. The ash contain was found to be 1.87% and the acidity of orange peel biscuit was determined 0.39% in terms of citric acid.

3.1 Graphical Representation of Chemical Analysis

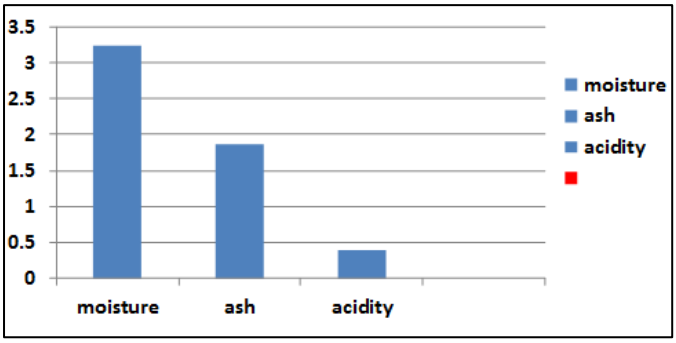

Fig 1: Chemical analysis graphical representation

4. Summary and Conclusion

4.1 Summary

The cereals based baked products are part of our daily diet and excellent food for ingredients like orange peel powder and rich in Vitamine, minerals and fiber and free from cholesterol. Scale was used to access the quality and acceptability of finished food product by panel of judge.

4.2 Conclusion

Orange peel addition into biscuit formulation had considerable effects on physicochemical properties of biscuits. It may be concluded from the study that orange peel can be successfully incorporated in wheat flour biscuits up to a level of 10% to which is T_2 treatments was found to be best of enhanced nutritional quality with acceptable attributes. Hence, development and utilization of such functional foods will not only improve the nutritional status of the population but also helps those suffering from degenerative diseases. More studies should be conducted to investigate the possibility of using degenerative as an ingredient in other food products in order to increase applications of such value-added food ingredient.

5. Acknowledgements

We are thankful to the technical members of the Department of Food Science and Technology and to the participant subjects in this study for their all cordial assistance.

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