

Development of Food Products Using Pomegranate Skin

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Abstract: *The present study was incorporated with pomegranate skin into idli as influenced by different levels of pomegranate skin powder and to determine sensory evaluation. Pomegranate skin powder incorporated idli were prepared by using pomegranate skin powder in different levels to the idli flour, whereas idli prepared out of without adding pomegranate skin powder were served as control. Among the different treatments, 10 percent incorporation of pomegranate skin powder was recorded highest scores for overall acceptability.*

Keywords: Pomegranate skin, vitamin-C.

1. Introduction

Health is the level of functional or metabolic efficiency of living organisms. In humans, it is the ability of individuals or communities to adapt and self manage when focusing physical, mental or social challenges [1]. Health and nutrition are the most important factors for human resource development of the country.

The pomegranate (*Punica granatum*) is one of the oldest fruit and originating from Iran to the Himalayas in the Northern India and cultivated throughout the Mediterranean region of Asia, Africa and Europe. Early fall is prime time for pomegranates October and November in the northern hemisphere, but they are usually available into early winter [2]. Pomegranate are also good source of many vital B-complex groups of vitamins such as pantothenic acid (vitamin B-5), folates, pyridoxine and vitamin K and minerals like calcium, copper, potassium, and manganese. Pomegranate peel is rich in antioxidant, antiviral, anticancer and antitumor properties and these antioxidants as high capable of protecting Low Density Lipoprotein LDL cholesterol against oxidation and lower risk of cancer and heart disease. It attracts attention due to its apparent wound healing properties and immune modulating activity [3]. Pomegranate is rich in vitamin C and proved to have high antioxidants and some early evidence suggests that it may have preventative effects against prostate cancer.

Vitamin C has potent antioxidant properties meaning it is able to reduce damage caused by oxidizing chemicals such as free radicals. These oxidizing radicals sometimes called as Reactive Oxygen Species (ROS) are the normal byproducts of the cellular reactions that take place inside the human body and converting them to less harmful molecules. Reducing oxidative damage can have many benefits for the human body including reducing cancer and heart disease. They can protect your body from signs of premature aging, wrinkled skin and cardiovascular health [4].

Per 100 g the skin powder is made up of energy 252.5 kcal, protein 15.56 g, fat 1.228 g, CHO 44.98 g, Fibre 5.24 g and vitamin C 50.842 mg. FAO/WHO (1973) provided the composition of Aminoacids contents as per 100 g Arginine 8.58 g, Histidine 8.20 g, Lysine 7.08 g, Aspartic 11.19 g, Glutamic 19.4 g and Glycine 15.20 g and USDA (2010) provided the composition of mineral contents containing calcium 10mg, magnesium 12mg, phosphorus 36mg, zinc 0.35mg, sodium 3mg and potassium 236 mg,

The edible parts of pomegranate fruits are consumed fresh or used for the preparation of fresh juice, canned beverages, jelly, jam and paste and also for flavoring and coloring beverage products. Pomegranate skin powder can be used in a variety of recipes or blended into favorite smoothie for flavor and a kick of antioxidants. Pomegranate were used to treat a range of health problems including cancer, asthma, piles, diarrhea, Alzheimer's disease, stomach ache, skin inflammation, coughing, sneezing, piles, intestinal worms, hyperacidity and memory loss [5]. Pomegranate is rich in vitamin C and proved to have high antioxidants [6] and some early evidence suggests that it may have preventative effects against prostate cancer [7].

Pomegranate Peel Extracts (PPE) were used to determine their antioxidant capacity by the formation of phosphomolybdenum complex and antimutagenicity against the mutagenicity of sodium azide. The order of antioxidant capacity varied because of differential responses at four concentrations (25, 50, 75, 100 µg/ml) [8].

Total antioxidant strength of pomegranate fruit measured in terms of its Oxygen Radical Absorbance Capacity (ORAC) is 2341 µmol TE/100 g. The peel is the part of the fruit with the highest antioxidant activity, which is in line with its high content of polyphenols [9]. Moreover, pomegranate peels also show higher antioxidant capacity in vitro when compared to other fruits such as mangos, bananas and coconuts [10]. Polyphenols are also antioxidant, meaning that they help to protect cells from damage and may lower inflammation in the body [11].

2. Materials and Methods

Pomegranate skins were selected for the preparation of the powder. Pomegranate were initially cleaned, peeled, discarded and dried for two or three days in a hygienic manner. The skin was grinded in to powder form. Then, pomegranate skin powders were incorporated into idli. The treatments for preparation of pomegranate skin powder incorporated in idli were as follows;

Treatment Details

- T1- idli flour (control)
- T2- idli flour + 10% pomegranate skin powder
- T3- idli flour + 15% pomegranate skin powder
- T4- idli flour + 20% pomegranate skin powder

The pomegranate skin powder incorporated idli was prepared by mixing the idli flour with specified amount of pomegranate skin powder as mentioned treatments. All the ingredients such as rice, urad dal, salt and water were used and set for 8 to 9 hours or overnight for fermenting in the ratio of 3:1.

Organoleptic evaluation of pomegranate skin powder incorporated in idli were carried out by 10am among a panel of 30 semi-trained members including staff and post graduate students, Department of Home Science, Mother Teresa Women's University, Chennai and Justice Basheer Ahmed Sayeed college, Chennai. The cooked idli were placed for evaluation. The sensory attributes of idli in terms of external sensory characteristics like Fluffiness, Compactness, Sponginess and Firmness, Springiness and Stickiness and internal characteristics like color, flavour, taste and over all acceptability were determined by rating scale. The mean scores given by thirty members were used for statistical analysis.

3. Results and Discussion

The organoleptic properties of idli were evaluated Aroma, Appearance, Fluffiness, Compactness, Sponginess, Taste, Firmness, Springiness, Stickiness and overall acceptability. The data pertaining to the organoleptic evaluation was influenced by different treatments were presented in Table 1. The overall acceptability and rating scale score was higher for the 10% level of incorporation of pomegranate skin powder. The data reveals that there were significant differences at the level of 1% significances among 10%.

4. Conclusion

Pomegranate skin powder incorporated in idli and other ready to cook products can also introduced from kids to adults to provide more nutritious meal. It improves vitamin C and protein and to reduce cancer and cholesterol. The product has introduced to all community since it contains unique package of antioxidants especially vitamin C of special mention at an affordable price.

Table 1: Organoleptic evaluation of pomegranate skin powder incorporated idli

S.No	Level of Incorporation	Mean \pm S.D	t-value	Level of Significance
1	Control	49.6 \pm 0.62	5.30	Not Significant
2	10%	45.7 \pm 2.8	2.70	1% Significant
3	15%	43.26 \pm 3.4	1.20	1% Significant
4	20%	41.3 \pm 0.83	8.50	Not Significant

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