



Standardization and storage studies of rice papad incorporated with tomato pulp

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Abstract

In study preparation of Papad was successfully done. The aim to prepare Papad as a nutritional point of view and to provide convenience to the consumer. Papad is a traditional food item typically made from pulses flour & cereal flour, dough or batter. Papad are usually flat, crisp, round, wafers-like product. For preparation of Papad Rice flour, tomato pulp, sesame seed, salt, red chili powder, cumin and Papad khar used. All the mixed together with other ingredient. Then making a smooth dough then make small balls and rolling into thin sheet by the help of roller pin. Dry the Papad. For the preparation of Tomato Papad three trials were taken among the three trials, T2 get highest score on the basis of sensory evaluation. Proximate composition of Papad was Moisture content (11.3%), Ash (0.92%), Fat (7.2%), and Protein (3.1%), Carbohydrate (58%), Energy (350 kcal) were best among all the levels of Papad prepared recorded highest score in all the quality attributes and good storage ability. It was concluded that the Papad made from Tomato pulp can be store for six months in Low density polyethylene pouches at room temperature. So the Papad made from Tomato Pulp can be satisfy the consumer in accepts and quality.

Keywords: papad, tomato pulp, formulation, proximate analysis, packaging material, etc

Introduction

Papad is a delicious traditional Indian snack food used as an accompaniment with meals and snacks and croutons in soups. In recent years, it has gained recognition as India's unique contribution to international menu. Papads have crunchy wafer-like taste and are normally consumed after roasting or frying. The papad industry in India is predominantly a cottage industry and is mainly started for women empowerment and social welfare. Increased mass production of papad for domestic consumption and export has necessitated standardization and quality evaluation of the finished product. The commercial production of papads is more than 55,000 tonnes of which 12,000 tonnes are being exported. Various small scale and national brands are into papad manufacturing in India (Awalgaonkar *et al.*, 2015) [3]. In India, black gram papad is a commercial product and the variations in quality (Senthil, 2006). *Papad* is one of the popular snack items and it is very tasty so, used in every Indian diet since older days. It is consumed either as such often frying or roasting or as adjunct along with vegetable soups and curries. It is usually made from a blend of cereal flour, edible starch and pulse flour with common salt, spices, edible oil, and mucilaginous additives (Agrawal *et al.* 2016) [14].

Tomato, *Solanum lycopersicum* L. (Solanaceae) is native to South America, especially Peru and the Galapagos Island (Matteu, 2011). Peralta and Spooner (2007) [13] reported that the origin of tomato was traced to Peru and Mexico. Tomato is rich in protein with a trace amount of fat (Olaniyi *et al.*, 2010) [12] and also contains many vitamins and minerals that ensure good health. It is an excellent source of vitamins B6, ascorbic acid, and

niacin and minerals that function as cofactors in enzymatic activities (Nour *et al.*, 2013; Luthria *et al.*, 2006) [11]. Tomato (*Solanum lycopersicum*) is one of the world's major fruits. India ranks second position in tomato production after China. On a global scale, tomatoes are the most important vegetable crop with about 182.2 million tons of production (FAO stat, 2013). The production of tomato in Andhra Pradesh is 22.86 tonnes/ha and Telangana is 20.18 tonnes/ha (Horti stat, 2015) [5]. Tomato is one of the most important vegetable crops in Telangana supporting the livelihood and improving the economic life of many tomato growers in the state. It is often called "poor man's orange" because they are good source of vitamins, particularly vitamin A and C. It is also a rich source of natural lycopene, a carotenoid possessing antioxidative activity (Purkayastha 2011). Some of the Indian tomato varieties are Sankranti, Pesaruby, Arkaalok and Arka abha, Vaibhav (Kumar *et al.*, 2015) [8]. Nutritive value of tomato fruit, it contains moisture (94.5 g), fat (0.01 g), protein (1.0 g), carbohydrates (3.9 g), phosphorus (0.02 g), iron (1.0 g), calorific value (21 Kcal), carotene (350 mg), vitamin- C (32 mg), thiamin (0.7 mg), niacin (0.04 mg), per 100 g of edible portion (National Horticulture Board Websites, Database, 2011-12). Several epidemiological studies have underlined the beneficial effect of tomato consumption in the prevention of chronic diseases such as cancer and cardiovascular disease (Klipstein-Grobush *et al.*, 2000; Giovannucci *et al.*, 2002) [7, 4].

Rice (*oryza sativa*) is a one the most important crop in world belongs to family Poaceae approximately 95% of its production is Asia. Brown rice is a superior to other polished rice as it has

high dietary fiber, amild laxative which prevents gastrointestinal disorders and healthy food for diabetic patients. (Krishnaveni and Dhanalakshmi, 2014) ^[9]. Rice contains approximately 7.3% protein, 2.2% fat, 64.3% available carbohydrate, 0.8% fiber and 1.4% ash content (Zhou *et al.*, 2002) ^[18]. Rice contain lower quantities of phytochemicals, in the form of flavones/flavonols (21-24µ/g) and Ƴ-orzanol (12.3-8.2µ/g), together with trace levels of carotenoids lutein and zeaxanthin. Neither Anthocyanins nor procyanidins were detected in rice. By describing the profile the heterogeneous mixture of phytochemicals present in different rice varieties. (J. Agric, 2013) ^[6] Toxin contamination in rice can create a health risk for the consumers. In this study, the measurement of 23 mycotoxins in rice samples (*n* = 180) was performed using a validated LC–MS/MS method. A food frequency questionnaire was used to get rice consumption data for the assessment of mycotoxin dietary exposure, before calculating the health risk in adults and children of north and south regions of the Pakistani Punjab province. The prevalence of aflatoxin B₁ (56%), aflatoxin B₂ (48%), nivalenol (28%), diacetoxyscirpenol (23%), fumonisin B₁ (42%), zearalenone (15%), HT-2 toxin (10%), deoxynivalenol (8%), and ochratoxin A (6%) was estimated in samples with a mean concentration range between 0.61 and 22.98 µg/kg. (Saima. Majeedet.al, 2018).

Materials and Methods

Ingredients, Chemical and Equipments

Raw materials required during present investigation were procured from local market of Saralgaon such as Rice Flour, Tomato, Red Chilli Powder, Cumin, Sesame seed, Papad khar, Salt, etc. Most of the chemicals and equipments used in this investigation were of analytical grade which are obtained from College of Food Technology Saralgaon, Thane.

Physical and Chemical Analysis

Chemical Analysis such as moisture is determined by using hot air oven, fat is determined by Soxhlet apparatus and protein is determined by using Kjeldahl's method. Acidity is determined by using titration method and pH is measured by digital pH meter. All quality parameters were determined by AOAC (2000).

Statistical analysis

The analysis of variance of the data obtained was done by using Completely Randomized Design (CRD) for different treatments as per the method given by Panse and Sukhatme (1967). The analysis of variance revealed at significance of *P*<0.05 level S.E. and C.D. at 5per cent level is mentioned wherever required.

Organoleptic Evaluation

Prepared product were evaluated for sensory characteristics in terms of appearance, color, flavor, aftertaste, texture and overall acceptability by 10 semi-trained panel members comprised of academic staff members using 9- point Hedonic scale. Judgments were made through rating the product on a 9 point Hedonic scale with corresponding descriptive terms ranging from 9 'like extremely' to 1 'dislike extremely'. The obtained results were recorded in sensory score card.

Formation of Tomato Papad

Papad prepared with incorporation varying levels of Tomato Pulp with Rice flour were investigated. The formulation was made by varying levels of Rice flour, Tomato pulp, *viz.*, 00g:90g, 50g:40g, 60g:30g, 70g:20g percent respectively and data given are illustrated in table.

Table1

Ingredients	Treatments			
	T0	T1	T2	T3
Tomato Pulp	00	50	60	70
Rice flour	90	40	30	20
Sesame Seed	2	2	2	2
Cumin	2	2	2	2
Salt	2	2	2	2
Red Chilli Powder	2	2	2	2
Papad Khar	2	2	2	2

Where,

T0-00g Tomato Pulp + 90g Rice flour+10g other ingredients

T1-50g Tomato Pulp + 40g Rice flour+10g other ingredient

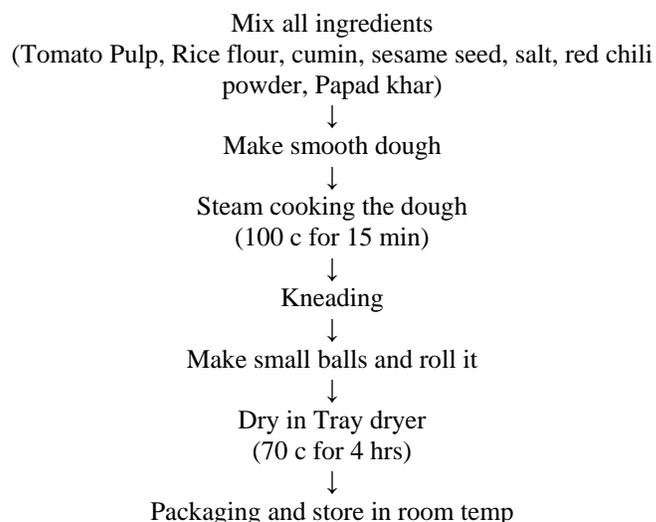
T2-.60g Tomato Pulp + 30g Rice flour+10g other ingredients

T3-.70g Tomato Pulp +20g Rice flour+10g other ingredients

Preparation and Process of Tomato Papad

All Ingredients purchase from local market like tomato, rice flour, salt, cumin seed, sesame seed, red chili powder and papad khar. Firstly clean tomato to remove foreign material. trimm it to remove seed and core and extract pulp from tomato by cold method. Take all ingredients in plate or bowl mix it proper and make a smooth dough. Steam cook the dough at 100 °C for 15min. knead a dough again to soft. Make small ball of that dough and roll on rolling board by help of roller to make thin, flat sheet. Dry the papad in tray dryer at 70 °C for 4 hrs. Package and store at room temperature.

Flow sheet for Preparation of Tomato Papad



Results and Discussion

Table 2: Physical Properties of composition of Tomato Papad

Physical Parameter	Average Value
Diameter of Raw Papad (cm)	11.1
Width of Papad (mm)	0.8
Kneading time (min)	10
Cooking time (min)	15
Oil content of Papad	0.3
Diameter of fried Papad (cm)	17.4
Width of fried Papad (mm)	1.5

It was evident from above tabulated. All the physical parameter measured by Vernier Caliper and measuring scale. Average value of Papad ware Diameter of Raw Papad (11.1cm), Width of Papad (0.8mm), Kneading time (10min), Oil content of Papad (0.3), Diameter of fried Papad (17.4cm) and Width of fried Papad (1.5mm) respectively.

Table 3: Chemical Properties of composition of Tomato Papad

Chemical Parameter	Units
Ash	0.92±0.01
Moisture	11.3±0.02
Fat	7.2±0.09
Protein	3.1±0.03
Carbohydrate	58±0.01
Energy	371kcal

It was evident from tabulated. Tomato Papad having Ash Content (0.92±0.01%), Moisture content 11.3±0.02% is near, Fat content in concentration 7.2±0.09% is near, Protein content 3.1±0.03% is

Table 5: Storage Study of Tomato Papad

Period of Storage (Days)	Papad Sample	Moisture Content	Observation		
			Texture	Flavour	Remark
0	Tomato Papad	11.30	Crispy	Good	Good
15		11.32	Crispy	Good	Good
30		11.30	Crispy	Good	Good
60		11.27	Crispy	Good	Good
90		11.26	Crispy	Good	Good
120		11.25	Crispy	Good	Good
150		11.22	Crispy	Good	Good
180		11.27	Crispy	Good	Good
After 180		11.12	Less Crispy	Slight Rancid	Freshness Declined

Tomato Papad sample was used for storage studies at room temperature (27°C-33°C) for 0-180 days. The effect of storage time (0, 15, 30, 60, 90,120,150 and 180 days) on physical properties such as flavour & texture of the papad were studied and represented. Tomato papad would be assessed after 180 days storage in LDPE pouches for keeping quality, taste & flavor. The Papad became decrease in moisture content after 15 days& but otherwise remained satisfactory upto 180 days of storage.

Conclusion

In the current study finally it is concluded that Papad prepared from Rice flour from Tomato pulp has high Nutrition quality and also its is rich in Protein, carbohydrates and some vital minerals such as phosphorus and iron, and it is an excellent source of vitamins B6, ascorbic acid, and niacin has great health benefits. The lycopene content in tomato reduce risk of cancer. The present investigation carried out for information of Papad in which T2 sample found more superior than sample T1 and T3 so, T2 sample is more acceptable on its sensory attributes.

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near carbohydrate 58±0.01% is near and energy was found to be 350 Kcal.

Sensory Evaluation of Papad

Table 4: Sensory Evaluation Result

Sample	T0	T1	T2	T3
Colour	07	6.5	8.5	7.5
Flavour	07	07	08	07
Taste	7.5	6.5	08	07
Texture	07	07	8.5	07
Appearance	08	08	08	08
Overall Acceptance	7.1	7	8.2	7.3

As evident in sensory evaluation the color score were higher for the Sample T2.

The Texture and taste score were 8 higher than T1 and T3 sample. Overall acceptability (8.2) of T2 sample is more acceptable than sample T1 and T3.

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