Int.J.Curr.Microbiol.App.Sci (2020) Special Issue-11: 684-687

International Journal of Current Microbiology and Applied Sciences
ISSN: 2319-7706 **Special Issue-11 pp. 684-687**
Journal homepage: http://www.ijcmas.com

Original Research Article

Physico-chemical Characteristics of Mature Green Mango Fruit Pulp Variety Ramkela and Mint Leaves

Tanu Malik*, Rakesh Gehlot, Rekha and Ritu Sindhu

Centre of Food Science and Technology,
CCS Haryana Agricultural University, Hisar, Haryana, India

**Corresponding author*

A B S T R A C T

Mango (*Mangifera indica* L.) belongs to the family Anacardiaceae and is rich in a variety of phytochemicals and nutrients. The fruit pulp is high in prebiotic dietary fiber, vitamin C, polyphenols, and carotenoids. Unripe fruits of mango are acidic in taste and utilized for different culinary purposes. Ripe fruits are used in preparing various processed products such as ready-to-serve drinks, nectar, squash, jam, cereal flakes, custard powder, baby food, and toffee. In the present investigation, physicochemical analysis of mature green mango fruits of variety Ramkela and mint was carried out to determine its suitability for the development of value-added squash. The mango fruit pulp had TSS (4%), acidity (2.17%), pH (3.21), ascorbic acid (92 mg/100 g), total carotenoids (9.79 µg/100 g), total phenols (11.1 mg/100 g), total sugars (2.74 mg/100 g), reducing sugars (0.86 mg/100 g), pectin (2.35%) and browning (0.128). The mint paste had TSS (2%), acidity (0.036%), pH (3.81), ascorbic acid (4.10%), total chlorophyll (79.1 mg/100g), total phenol (336.7mg/100g), browning (0.578) and antioxidant activity (4.74%).

Keywords

Mature green mango, Mint, Physicochemical, Characteristics

Introduction

Mango (*Mangifera indica* L.) belongs to the family Anacardiaceae and is rich in a variety of phytochemicals and nutrients. The fruit pulp is high in prebiotic dietary fiber, vitamin C, polyphenols, and carotenoids. Young and unripe fruits of mango are acidic in taste and utilized for various culinary purposes. Ripe fruits are used in preparing various processed products such as squash, nectar, jam, cereal flakes, custard powder, baby food, and toffee. It is an excellent source of β-carotene (provitamin A carotenoid), vitamin C, and polyphenolic compounds with traces of vitamin E, K, and B. These bioactive compounds are good antioxidants and their daily intake in diet has been related to the prevention of degenerative processes such as cardiovascular diseases and cancer (Liu, 2003). Thus, consumption of mango could provide significant quantities of bioactive compounds possessing antioxidant activity. As mango is a seasonal fruit, it is processed into various forms like frozen and canned slices, puree, jam, squash, nectar, toffee, powder, and wine (Varakumar *et al.*, 2011). Mango fruits provide energy, dietary fiber, carbohydrates, proteins, fats, and phenolic compounds (Tharanathan *et al.*, 2006), which are vital to normal human growth,

development, and health. During the ripening of the fruit, sucrose rose from 5.8 to 14.2% of the fresh weight, while the pH rose from 3.0 to 5.2.

In the post-climacteric stage, the content of non-reducing sugars fell to 0.6% and total acidity (as citric acid) varied from 0.13 to 0.71%. Oxalic, citric, malic, succinic, pyruvic, adipic, galacturonic, glucuronic, and mucic acids, together with two unidentified acids, were reported; citric acid was the major organic acid present in mango fruit (Jain *et al.,* 1959).

Mint (*Mentha viridis* L.) belongs to the family Lamiaceae and has the common name 'Pudina'. Mint leaves contain several vitamins and minerals, which are vital for maintaining a healthy body. It is also reported to relieve symptoms of indigestion, heartburn, and irritable bowel syndrome by relaxing the muscles in and around the intestine; acts as a powerful antioxidant, protecting the body against the formation of cancerous cells, a very good cleanser for blood, and helps in clearing up skin disorders such as acne (Aflatuni *et al.*, 2005).

In the modern age, people have become more concerned about their diet, health, and wellness. Consumer awareness concerning juice beverages has increased the number of positive attributes desired for these products, apart from refreshment.

Fruit mixtures present a series of advantages such as a combination of different aromas and flavors and the sum of its nutritional components. Therefore, the blending of mature green mango pulp and mint leaves paste with spices, low-calorie ingredients, and honey is a convenient and economical alternative for its utilization in the development of value-added nutritive and therapeutic beverages.

Materials and Methods

Extraction and storage of mature green mango pulp and mint paste

The present study was conducted at the Centre of Food Science and Technology, CCS HAU, Hisar during 2019-20. Mature green mango Ramkela fruits and mint were procured from local market, Hisar for collecting pulp for analyzing its physicochemical characteristics.

Analysis

Mature green mango pulp was collected using the standardized method. Fresh tender twigs of mint with green leaves were washed thoroughly, air-dried, and ground to a fine paste in blender. The fresh pulp of mango and mint paste were evaluated for physicochemical parameters including fruit weight (g), yield of pulp (%), pH, total soluble solids (%), total sugars (mg/100gm), Reducing sugars (%), Acidity (%), Pectin (%), Ascorbic acid (mg/100 g), Total carotenoids (µg/100 g), Total chlorophyll (mg/100gm), Total phenols (mg/100 g), Antioxidant Activity (%), and Browning. Fruit weight and pulp yield were calculated by direct weighing with an electronic balance. Five fruits were selected randomly, weighed, and replicated thrice for recording observations. Total soluble solids (TSS) were estimated at ambient temperature by hand refractometer (0-32%) and the values were expressed as percent TSS. The pH of fresh mango and mint was estimated by a digital pH meter. The sample in the case of fruit pulp and mint was diluted to a 1:10 ratio for pH determination. Total and reducing sugars were estimated by the method of Hulme and Narain (1931). Browning in fresh fruit pulp was estimated by the method of Ranganna (2014). Acidity, ascorbic acid, and pectin (as calcium pectate) in fresh mango and mint

were analyzed by the methods of Ranganna (2014). Antioxidant activity was measured using stable 2, 2-diphenyl-1-picrylhydrazyl (DPPH) radical as per the method described by Shimada *et al.*, (1992). Total carotenoids were analyzed by the Rodriguez-Amaya method (2004), while total phenols were estimated as per the methods given by Amorium *et al.*, (1997).

Results and Discussions

The fruit weight of mango was 203.21 gm per fruit and pulp yield 62.33%. The mango fruit pulp had TSS 4%, acidity 2.17%, pH 3.21, ascorbic acid 92 mg/100 g, total carotenoids 9.79 µg/100 g, total phenols 11.1 mg/100 g, total sugars 2.74 mg/100 g, reducing sugars 0.86 mg/100 g, pectin 2.35% and browning 0.128. Comparable results were recorded by Zanwar (2018) - TSS found to be 5%, acidity a little bit lower than present result i.e. 1.7% and total phenol content found to be 10.5 mg/100g whereas ascorbic acid content was somewhat lesser than present result i.e. 34.8 mg/100g and Kaur (2013) in Ramkela mango fruit has recorded the similar results.

The mint had TSS 2%, acidity 0.036%, pH 3.81, ascorbic acid 4.10%, total chlorophyll 79.1 mg/100g, total phenol 336.7 mg/100g, browning 0.578 and antioxidant activity 4.74%. Comparable results were recorded by Zanwar (2018) for the mint sample -TSS was recorded as 3%, acidity was similar to present mint sample i.e. 0.092%, ascorbic acid recorded was 3.5% but chlorophyll content has much difference i.e. 237 mg/100g (Table 1).

Table.1 Physico-chemical characteristics of fresh Ramkela mango fruit and mint

Sr. No.	Parameters	Fresh samples	
		Mango	Mint
1.	Fruit weight (g)	203.21	-
2.	Yield of pulp (%)	62.33	79.27
3.	pH	3.21	3.81
4.	Total soluble solids (%)	4	2
5.	Total sugars (mg/100gm)	2.74	-
6.	Reducing sugars (%)	0.86	-
7.	Acidity (%)	2.17	0.036
8.	Pectin (%)	2.35	-
9.	Ascorbic acid (mg/100 g)	92	4.10
10.	Total carotenoids (µg/100 g)	9.79	-
11.	Total chlorophyll (mg/100gm)	-	79.1
12.	Total phenols (mg/100 g)	11.1	336.7
13.	Antioxidant Activity (%)	-	4.74
14.	Browning	0.128	0.578

*All values are mean of three replicates

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