



INTERNATIONAL JOURNAL OF TROPICAL AGRICULTURE

ISSN : 0254-8755

available at <http://www.serialsjournals.com>

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Volume 36 • Number 2 • 2018

Indian Mango Varieties: Carotenoids' Profiling & Distribution

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Abstract: Vitamin A deficiency is highly prevalent in India, particularly among children. The mango fruit, owing to its higher production and affordability, have potential to mitigate the disorder. Reports on the contents of vitamin A precursors and ranking among wide range of Indian mango varieties are scanty. The present study was therefore undertaken to characterize as many as 439 Indian mango varieties for their moisture, individual carotene and xanthophylls contents. The cultivars of mango fruits were sampled from different locations of the country at the level of farmers or local market and analyzed for moisture content, total carotenoids, β -Carotene, β -Cryptoxanthin, lutein and Zeaxanthin in the edible pulp. Interestingly, it was observed that 9 and 14 varieties of mangoes possessed the potential to provide 300% and 150% of RDA respectively for β -Carotene. β -Cryptoxanthin and lutein content of mango varieties was found to be in the range of 0.12-68.14 μ g/100g and 0.23-120.31 μ g/100g respectively for the edible pulp of mangoes. In our opinion, this report forms a novel attempt for a comprehensive evaluation of carotenoids content in various varieties of Indian mango and could be utilized as food source for alleviating the prevalence of vitamin A deficiency in Indian population.

Keywords: Carotenoids content, *Mangifera indica*, RPHPLC, recommended dietary allowance, vitamin A deficiency

INTRODUCTION

Vitamin A deficiency has been recognized as a major health issue in south Asian countries. India is reported to suffer from highest degree of clinical and subclinical VAD with 62% of pre-school

children being vitamin A deficient. About 35.3 million children in India are vitamin A-deficient followed by Indonesia (12.6 million) and China (11.4 million) [1]. Economic constraints, socio-cultural limitations, insufficient dietary intake, and poor

bioavailability/absorption are important determinants of VAD in South Asian developing countries [2]. Paradoxically, vitamin A deficiency appears to be a major issue in counties that are endowed with various β -Carotene-rich fruits and vegetables. Children and pregnant women are most vulnerable group for VAD, where they are living in "Poverty in the midst of plenty". VAD begins as a silent, unseen threat which if untreated can eventually rob children of their eye sight and their lives. The geriatric population in India is challenged with age-related macular degeneration (AMD) and dietary Lutein and Zeaxanthin have shown promise to combat AMD [3]. Epidemiological studies suggest that carotene rich foods may protect against many chronic diseases [4]. Carotenoids such as Lutein, Zeaxanthin, precursors of Vitamin A like α -Carotene and α -Cryptoxanthin are present in commonly consumed Indian foods [5, 6]. Recent studies by National Nutrition Monitoring Bureau (NNMB) indicated that, in addition to other factors, low consumption of leafy vegetables and fruits are linked to VAD in Indian population [7].

India being agriculture based country, accounts for a wide variety of fruits and vegetables cultivated across the nation. India is likely to be the most populous country by 2030, with approximately 1.6 billion people and ensuring food and nutrition security for such a large population is indeed a challenge [8]. Mango (*Mangifera indica* L.), commonly referred to as the king of the fruits, belongs to the *Anacardiaceae* family and is one of the most widely consumed tropical fruit known for its unique taste, attractive color and flavor, affordability and nutritional qualities. It is a rich source of vitamins, organic acids, carbohydrates, amino acids, phenolic acids and certain volatile compounds [9]. Many of the pharmacological properties of mango are attributable to presence of phenolic acids, due to which it can be termed as functional food. Mango has its origin from Manipur, India is the national fruit of India has been an integral part of the life and

culture since time immemorial [9]. There are over 1000 named mango varieties that are available in India, most having distinct characteristics and uses, some consumed year long as mango pickles while most others are consumed in raw form [10]. Nutrient and bioactive phytochemicals composition provides an important link for biodiversity, nutrition and health [11]. Despite India being one of the largest producers of mango, a fruit known for its therapeutic effect, information on carotenoids profile of mango varieties available in India are scanty. Thus, analytical determination and dissemination of quantitative information on nutrient and phytochemicals constituents of Indian mango varieties is necessary and important. In this context, following study was undertaken to comprehensively evaluate a large number of mango varieties available across India for their carotenoids' profile including total carotenoids, β -Carotene, β -Cryptoxanthin, lutein and Zeaxanthin.

MATERIALS AND METHODS

Ripened fruits of four hundred and thirty nine (439 Nos.) varieties of mangoes were procured either directly from farmers or from local markets across the country. The entire range of sampled varieties were identified and authenticated by local agricultural experts and scientists. Emphasis was laid on ensuring that samples collected were ripe (ready for consumption) and undamaged as evidenced by visual inspection. Representative samples were drawn from stratified pools of each variety for evaluation of nutrient and phytochemicals content. Cleaned mangoes were weighed before further processing for separating peel, pulp and seed. Individual weights of peel, pulp and seed were also recorded.

The edible pulps of all the mango varieties were analyzed for moisture content immediately by using the thermo gravimetric method (AOAC, 2000) [12]. The remaining test portions of the mango pulp were stored at -20 °C and were analyzed for individual carotenoids content within 7 days. Carotenoids were

extracted and individual carotenoids were quantified by RPHPLC as described previously [6]. Each analyte was determined in triplicate for each mango variety. The amount of the mango (pulp) needed to meet Vitamin A RDA (2010) was calculated using the ratio of α -carotene to Vitamin A (8:1) where as for other Vitamin A precursors the ratio (16:1) was adopted (ICMR, 2010) for the assessment of Vitamin A precursors and impact of Vitamin A requirements in Indian Population [13].

Statistical analysis: Mean was calculated for each parameter from individual values and data represented as mean \pm SD. The variability, range and distribution of the nutrient values were analyzed and plotted by using SPSS Inc., IBM.

RESULTS AND DISCUSSION

India being one of the largest producers of mango in the world, accounts for a very large number of cultivars of the fruit, there is scanty on nutritive value of individual varieties. Therefore in the present study, the carotenoid levels in various varieties (439) were quantified along with moisture content. Initial observations revealed that the fruit weights of different varieties were in the range of 42.19 g to 554 g. The pulp content of mango varieties was found to vary from 17.53 g in *Doodia Mamidi* to 117.23 g in *Alphonso*. The average pulp weight of the mango fruits was found to be 63.80 g. The peel content of mango varieties varied from 8.20 g in *Sora* to 55.13 g in *Prabhath Shankar*. The average seed weight of these mango varieties was found to be 22.59 g (data not shown). While pulp is the most important part of the fruit, other parts have potential to be exploited as source of bioactive components. It has been shown that mango varieties like *Alphonso* and *Raspuri* by-products can be utilized for deriving valuable bioactive compounds such as poly phenols, carotenoids, dietary fibers and enzyme [14]. Reports have suggested that Indians did have knowledge in mango biodiversity and traditional mango products [15].

Quantitative data on carotenoids content of the tested mango varieties are presented in Table 2. Our study reveals considerable variation in both content (Total carotenoids) and composition (Individual carotenes and xanthophylls) among cultivars (Table 1). Therefore, quantitative carotenoids data for mango varieties that could be used to estimate individual carotenoids intake from mangoes that are consumed at region/local level will be useful in epidemiological studies. The total carotenoids content of mango varieties varied from 15.96 mg/100g in *Jagath Ramani* to 0.225 mg/100g in *Swarna Jehangir*. The average total carotenoids content in the mango varieties was found to be 2.07 mg/100g. There were very few studies on mango varieties grown in India with respect to total carotenoids in general and carotenoids profile in particular. Studies conducted on three mango varieties at CFTRI, Mysore, India indicated higher contents with regard to the total carotenoids [16]. A dozen varieties of mango grown in Bangladesh were reported to have lower content of total carotenoids ranging from 108 μ g/100g in Arshini to 444.66 μ g/100g in Aamruapli [17].

Earlier studies performed by our group provide data on β -carotene content of commonly consumed Indian foods [5,6]. Although the contents of β -carotene in fruit samples (mostly in the range of 0.001 to 2.95 mg/100g) were found to be significantly lower as compared to leafy vegetables, mango stood out among fruits as a rich source for β -carotene [5]. The present study indicates that β -carotene is detectable in all the varieties studied with the highest α -carotene levels being found in *Swarna Butto* (11.52 mg/100g) and *Swantham* (11.51 mg/100g) followed by *Amini* (10.51 mg/100g), *Muvan Dan* (10.51 mg/100g), *Anar Mulgoa* (10.22 mg/100g), and *Vasi Badami* (9.85 mg/100g). The lowest β -carotene content of 113.88 μ g/100g was found in *Chausa* and *Swarna Jehangi*. Data on relative contribution of β -Carotene to total carotenoid pools of the fruit emerging from the present study is in agreement with the study of

Mercadante and Rodriguez-Amaya [18] who have demonstrated that all-trans- β -carotene is the most important of mango carotenoids, representing 48-85% of the total carotenoids content depending on cultivar and fruit maturity stage.

An average of 2.35mg/100g of β -Carotene was found among 52 fruits viz., *Sbravani*, *Kalanji*, *Karutha Columban*, *Khaja pasand*, *Pargi Himayath*, *Pedda nelum*, *Alampur Baneshan*, *Mylapuri*, *Gola Neek Noor*, *Section 19*, *K.O.17*, *Shabath bhob*, *Sharbati Borgin*, *Sora*, *Aryavartam Irsala*, *Azam Us samar*, *Panchavaranam*, *Gulab Khas*, *Hybert – 192*, *Arya Samaj*, *Bada – Gulabi*, *Vattam*, *Hybrid 11*, *Panchandan golla 132*, *Bombay green*, *Amrapali plot no 31*, *Kurnool mamidi*, *sunder shah*, *Hindustan Batli*, *Sanakulu X No.5*, *Chinarasalu*, *Dori*, *creeping*, *Surun gudi*, *raja pasand*, *Peach*, *Mahmood*, *Bombay no 1*, *Samar-e-behist*, *Ghotthi*, *Nelesharn x Gujarat*, *Almaas*, *Shakkargola*, *Asifus Samar*, *Tobancha*, *Sai Sugand*, *Hur*, *Gola Badam Model*, *Pairi*, *Olour*, *Yellai Mamidi*, *Meetha Mahmood*. Studies conducted with seven mango cultivars grown in Mexico revealed that wide variation in β -Carotene content [19]. Although the present study does not provide data on bioavailability of β -carotene content of the varieties studied, the work of Veda *et al.*, [20] clearly demonstrated appreciable bioavailability of β -carotene levels in common Indian mango varieties such as *Rasपुरi*, *Badami*, *Mallika*, *Mulgoa*, *Totapuri* and *Neelam*. β -Cryptoxanthin, commonly found xanthophyll in fruits is a powerful quencher of the singlet oxygen. Plant carotenoids play an important role in human health as antioxidants [21]. Correlation between serum β -Cryptoxanthin and circulating bone metabolic markers was found in healthy individuals upon intake of juice containing β -Cryptoxanthin [22]. In addition to β -carotene the present study also found, β -Cryptoxanthin to be present in substantial quantities in the pulp of tested mango varieties. β -cryptoxanthin content of mango varieties varied from 68.14 μ g/100g to 0.12 μ g/100g. The highest β -cryptoxanthin content with a value of 68.14 μ g/100g was found in *Paipasha*, followed by

in *Pairi* (56.14 μ g/100g) and *Panakalu* (55.31 μ g/100g). The lowest β -Cryptoxanthin content of 0.68 μ g/100g was found in *Malota*, *Malda*, *Bangbella x Samae best*, *Almaas X Rumani*, *Khader*, *Kolan ka Goa*, *Shabath bhob*, *Neelgoa*, *Aman*, *Alphonso*, *Amini*, *T/R – 16*, *Turpentine*, *Yellow arati*, *Anar Mulgoa*, *Ambalavi*, *Amir pasand*. The average β -cryptoxanthin in the mango varieties was found to be 4.25 μ g/100g. The esterified form as laurate, myristate, or palmitate is the primary storage form of β -Cryptoxanthin in fruits and vegetables [23]. Prior to absorption, $\hat{\alpha}$ -Cryptoxanthin esters are hydrolyzed by intestinal enzymes. The non-esterified β -Cryptoxanthin has a much higher bioavailability than esterified β -Cryptoxanthin, owing to the increased polarity that makes β -Cryptoxanthin to be easily incorporated into micelles, for relatively efficient transport from the lumen into enterocytes [24, 25]. The conversion rate of dietary β -Cryptoxanthin to vitamin A, proposed by the ICMR RDA, is the same as α -carotene, i.e., 16 μ g to 1 μ g retinol, and is twice the amount of β -carotene, i.e., 8 μ g to 1 μ g retinol (RDA, 2012). Other studies with human subjects have investigated the Vitamin A value of β -Cryptoxanthin. Indonesian schoolchildren with a marginal vitamin A status, who consumed orange fruit, containing a substantially high concentration of β -Cryptoxanthin, had a greater increase in serum retinol than those who obtained more provitamin A carotenoids from vegetables [19]. Based on these findings, future investigations may challenge and improve the current knowledge of the human body's capacity to convert dietary β -Cryptoxanthin to vitamin A.

An important fact emerging from the study is that 9 mango varieties namely *Suvarana Butto*, *Swantham*, *K.O.18*, *Amini*, *Muan dan*, *Anar Mulgoa*, *Vasi Badami*, *Amir pasand*, *Motichoor* have $\hat{\alpha}$ -carotene levels of 300% above RDA with an average range of 7.865 mg to 11.53 mg. Another 14 fruits, namely *Ashquith*, *Bandariya*, *Doddia Mamidi*, *fajri white*, *Muffari*, *Nagin*, *Barbella*, *Pabilwan*, *Peta Sweet Metha*, *Shederiya Akhadi*, *Anarva X Langda*, *Anarva*, *Suvarna Sindhura*

and Java with an average range of 6.998mg to 4.653mg have β -carotene levels of 150% above RDA. Among 439 fruits, 29 varieties namely *K.0.32*, *Neelam Xbenishan*, *Navaneetam*, *nurjahan*, *Panthula Mamidi*, *Jehangir*, *Jhool*, *Almaas X Rumani*, *LARI Hyderabad 13*, *Rasamgola*, *Pasi-us-samar*, *Sindhura Arthi*, *Karanjio*, *Nadarsab*, *Jogeri*, *Kandursbod sikar*, *Surkeba Culcutta*, *Kalaalphonso*, *Rajapari*, *Mankurad*, *Kallra gadda*, *Jong*, *Betchas*, *chitrapudi goa*, *lal sundari*, *Bombaybutta*, *Dasbehari*, *Panchadbara* had β -carotene levels of 100% above RDA with an average range of 3.234 to 4.532mg respectively.

Lutein and Zeaxanthin are the two xanthophylls which are concentrated in macula of the human eye and have been shown to protect from age related macular degeneration [26]. Global researchers have identified lack of lutein and Zeaxanthin as dietary causes in cataract and AMD related blindness. More research on the development of xanthophylls rich foods is essential to formulate therapeutic/functional foods and develop dietary strategies for the management of cataract and AMD in particular for elderly people. A typical US diet contains 1 to 3 mg/day of Lutein and Zeaxanthin, while an intake of 6 mg/day have been related to decreased risk of AMD [27]. Both Lutein and Zeaxanthin were detectable in all the mango varieties tested in the present study. Lutein content of mango varieties varied from 0.23-120.31 μ g/100. The average Lutein content in the mango varieties is 6.40 μ g/100g. The highest Lutein content with a value of 120.31 μ g/100g is present in Mango green (Unripe) followed by *Paipash* with 57.70 μ g/100g and *Bobbili punasa* with 34.12 μ g/100g. The lowest Lutein content with an average value 0.62 μ g/100g is present in *Sabre*, *Naseem Pasand*, *Thambva*, *Podadiya*, *Prabbashankar kayallu*. About 87 mango varieties like, *Pahilwan*, *Peta Sweet Metha*, *Shams-us-samar*, *Rasamgola*, *T/R – 17*, *Borbacha*, *Cherukurasam*, *Rajapari Xlangda*, *Roos*, *ram phalya*, *rataul*, *ratnagiri alphonso*, *Bhopadiya*, *Narela*, *Malota*, *firangi ladwa*, *Gola langda*, *hajipur langra*, *Kurnool Goa*, *Safeda Mulgoa* etc., are having Lutein content of \sim 3.5 μ g/100g.

DISTRIBUTION OF MOISTURE AND CAROTENOIDS IN THE INDIAN MANGO VARIETIES

The negative and significant value of skewness (-1.867) for moisture contents indicates that the distribution frequency of moisture values are more toward the lower side than the central value. This means a large number of varieties are having moisture contents lesser than central value and only few of the varieties are having substantially higher moisture values. Significant and positive skewness values for total carotenoids (3.273), Lutein (8.572), Zeaxanthin (8.294), β -Cryptoxanthin (6.943) and β -Carotene (2.976) suggests that the distribution of the content values are comparatively more towards higher side of the central value than towards lower side of the central value. From the median, variance and range values it is evident that the proportion of individual carotenoids' content in the different mango varieties are in the order of beta Carotene>Lutein>Beta Cryptoxanthin>Zea Xanthin (**Table 1**). Positive value of the Kurtosis for individual carotenoids particularly that of Lutein and Zeaxanthin reveals that when compared to a normal distribution, the values are more clustered towards the central value. The percentile values of the moisture content suggest that more data values are distributed between 25 and 50 percentile while that of the individual carotenoids suggests that large numbers of values are distributed between 50 and 75 percentile (**Figure 1**).

Epidemiologic studies have suggested that dietary Lutein and Zeaxanthin may be of benefit in maintaining cognitive health. An examination of a relation between cognition and Lutein and Zeaxanthin concentrations in the brain tissue of decedents from a population-based study in centenarians found that Zeaxanthin concentrations in brain tissue were significantly correlated to antemortem measures of global cognitive function, memory retention, verbal fluency, and dementia

Table 1
Variability of moisture and carotenoids' content in Indian mango varieties, per 100g edible pulp

	<i>Moisture</i> (g)	<i>Total Carotenoids</i> (μ g)	<i>Lutein</i> (μ g)	<i>Zeaxanthin</i> (μ g)	<i>β-Cryptoxanthin</i> (μ g)	<i>β-Carotene</i> (μ g)	
N	439	439	439	439	439	439	
Median	80.2300	1633.9400	4.2000	2.3900	3.0900	1244.2000	
Mode	80.18 ^a	.00 ^a	2.31	2.46	3.53	71.84 ^a	
Variance	22.894	4345678.261	63.059	13.440	32.746	2897233.551	
Skewness	-1.867	3.273	8.572	8.294	6.943	2.976	
Kurtosis	9.110	13.161	115.115	103.483	61.160	11.140	
Range	42.65	15613.50	123.83	56.03	65.44	11471.85	
Minimum	47.08	.00	.68	.02	.16	71.84	
Maximum	89.73	15613.50	124.51	56.05	65.60	11543.69	
Percentiles	25	77.5900	1152.7800	2.7700	1.5700	1.9400	943.5000
	50	80.2300	1633.9400	4.2000	2.3900	3.0900	1244.2000
	75	82.7100	2518.7400	10.0600	3.3400	4.6100	2141.6800

a. Multiple modes exist. The smallest value is shown

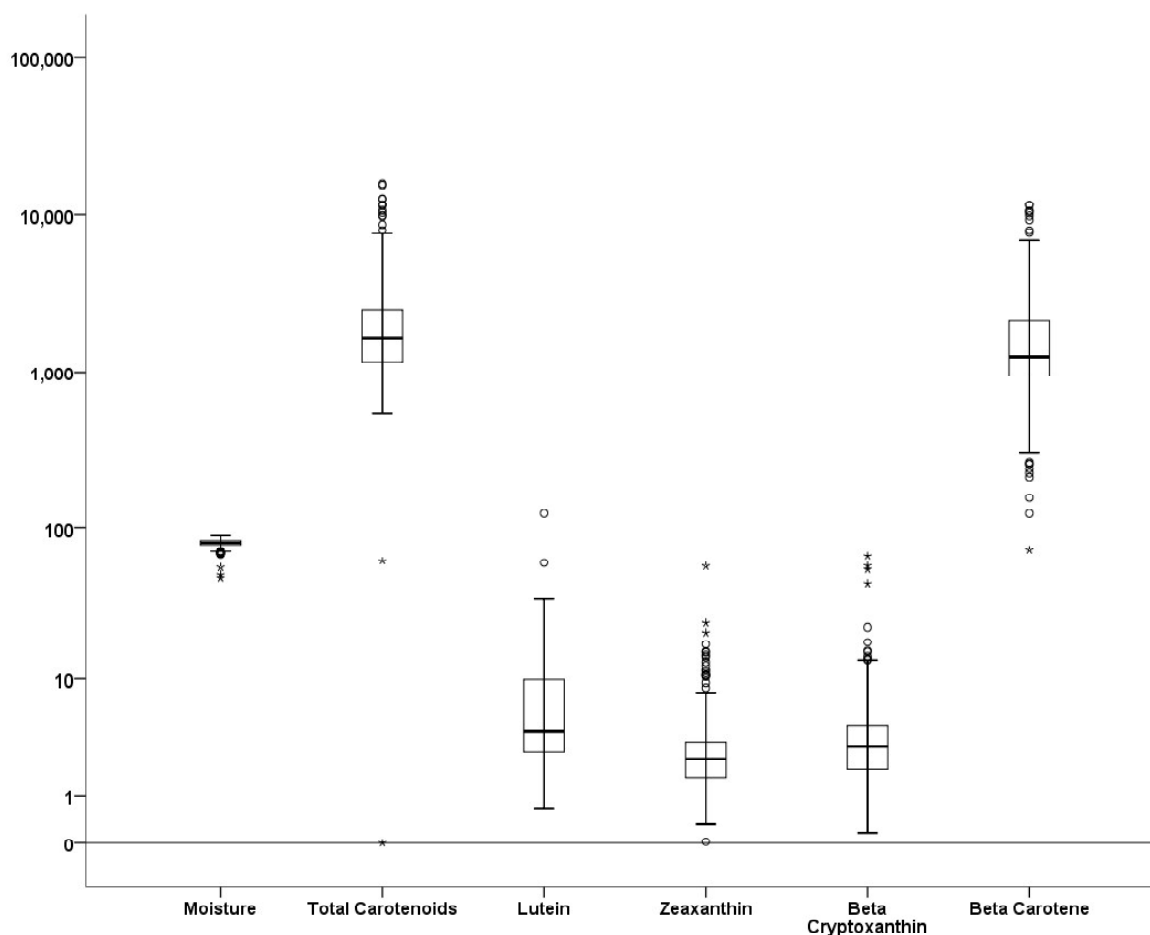


Figure 1: Range and distribution of moisture (g/100g), carotenoids and xanthophylls (μ g/100g) in Indian mango varieties on a logarithmic scale, n=439

Table 2
Moisture and carotenoids' content of Indian Mango varieties

CAROTENOIDS IN MANGO VARIETIES							
Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids (μ g/100g)	Lutein (μ g/100g)	Zeaxanthin (μ g/100g)	β -Crypto- xanthin (μ g/100g)	β -Carotene (μ g/100g)
1	Abe-hayath	83.69 \pm 0.25	1330.23 \pm 22.99	4.26 \pm 0.34	4.33 \pm 0.35	1.53 \pm 0.11	892.00 \pm 6.98
2	Afihm	79.80 \pm 0.21	1340.46 \pm 10.65	12.83 \pm 0.13	1.34 \pm 0.09	10.72 \pm 0.11	822.95 \pm 5.35
3	Ahewad	80.57 \pm 0.09	888.74 \pm 9.20	6.39 \pm 0.04	2.16 \pm 0.07	4.52 \pm 0.08	569.34 \pm 2.60
4	Akhadiya	71.74 \pm 0.08	1349.54 \pm 4.22	4.16 \pm 0.05	1.24 \pm 0.10	5.77 \pm 0.11	1035.88 \pm 8.20
5	Akhadiya 35	80.26 \pm 0.10	891.25 \pm 2.67	2.64 \pm 0.11	1.78 \pm 0.11	3.76 \pm 0.10	414.22 \pm 10.38
6	Alampur Baneshan	78.55 \pm 0.07	3090.2 \pm 3.57	2.56 \pm 0.08	1.64 \pm 0.06	1.83 \pm 0.05	2742.05 \pm 109.75
7	Almaas	77.54 \pm 0.14	2518.74 \pm 3.98	10.21 \pm 0.03	2.17 \pm 0.05	3.74 \pm 0.05	2156.48 \pm 48.40
8	Almaas X Rumani	79.82 \pm 0.07	4468.72 \pm 4.72	3.56 \pm 0.07	1.62 \pm 0.03	0.88 \pm 0.04	3939.41 \pm 35.36
9	Alphonso	77.08 \pm 0.07	8718.41 \pm 7.71	4.16 \pm 0.09	1.51 \pm 0.04	0.75 \pm 0.03	6126.15 \pm 5.53
10	Aman	86.22 \pm 0.11	4656.09 \pm 8.29	2.31 \pm 0.04	1.97 \pm 0.02	0.76 \pm 0.02	3152.81 \pm 8.73
11	Aman Angur	79.78 \pm 0.06	1348.14 \pm 3.59	2.36 \pm 0.06	2.13 \pm 0.03	3.25 \pm 0.03	1025.42 \pm 4.05
12	Aman No. 19	79.47 \pm 0.05	819.39 \pm 5.91	2.54 \pm 0.09	3.21 \pm 0.03	2.87 \pm 0.10	455.00 \pm 4.83
13	Amane Anguri Rumani	71.43 \pm 0.04	1484.01 \pm 7.63	1.03 \pm 0.02	1.26 \pm 0.03	2.39 \pm 0.04	1384.95 \pm 10.60
14	Ambalavi	76.51 \pm 0.04	2021.70 \pm 8.63	2.86 \pm 0.11	2.16 \pm 0.02	0.24 \pm 0.04	1953.99 \pm 45.21
15	Amini	72.19 \pm 0.05	12648.21 \pm 6.08	3.12 \pm 0.07	5.55 \pm 0.07	0.73 \pm 0.02	10547.48 \pm 3.18
16	Amir pasand	84.59 \pm 0.08	11652.23 \pm 7.02	2.91 \pm 0.05	4.21 \pm 0.19	0.16 \pm 0.04	9318.43 \pm 3.49
17	Amrapali plot no 31	84.06 \pm 0.05	2769.54 \pm 17.89	2.08 \pm 0.08	3.13 \pm 0.02	4.81 \pm 0.15	2253.38 \pm 4.54
18	Ananas	74.28 \pm 0.04	1871.67 \pm 3.45	0.72 \pm 0.55	1.24 \pm 0.05	2.32 \pm 0.04	1375.60 \pm 26.70
19	Anar Mulgoa	81.38 \pm 0.05	11431.12 \pm 96.06	3.41 \pm 0.13	3.47 \pm 0.05	0.33 \pm 0.07	10234.56 \pm 11.86
20	Anardana	72.81 \pm 0.04	1088.62 \pm 9.97	4.26 \pm 0.04	1.45 \pm 0.09	2.91 \pm 0.02	787.85 \pm 17.34
21	Anarva	86.54 \pm 0.05	5050.24 \pm 13.45	1.57 \pm 0.12	2.35 \pm 0.04	5.61 \pm 0.05	4889.25 \pm 8.97
22	Anarva X Langda	70.18 \pm 0.04	6536.83 \pm 13.61	3.42 \pm 0.03	2.70 \pm 0.17	4.80 \pm 0.08	5158.01 \pm 38.38
23	Anda	79.91 \pm 0.02	970.83 \pm 18.38	7.51 \pm 0.03	2.83 \pm 0.16	3.72 \pm 0.14	666.48 \pm 16.57
24	Anfas	76.30 \pm 0.03	1478.89 \pm 36.71	10.37 \pm 0.13	1.29 \pm 0.05	2.59 \pm 0.05	1137.77 \pm 9.19
25	Annata Phal	79.56 \pm 0.06	1458.55 \pm 5.57	16.42 \pm 2.81	17.41 \pm 1.73	1.86 \pm 0.13	1031.73 \pm 5.01
26	Arka Anmol	78.58 \pm 0.02	2435.32 \pm 188.86	2.34 \pm 0.11	1.63 \pm 0.06	4.60 \pm 0.06	1981.17 \pm 7.01
27	Arka puneeth	86.52 \pm 0.09	1219.13 \pm 7.06	3.33 \pm 0.06	2.05 \pm 0.14	2.06 \pm 0.05	946.30 \pm 6.94
28	Arkaneel kiran	79.61 \pm 0.06	1335.06 \pm 9.16	5.50 \pm 0.06	2.54 \pm 0.10	1.51 \pm 0.07	1029.00 \pm 6.74
29	Arya Samaj	86.20 \pm 0.07	2756.20 \pm 9.80	11.26 \pm 0.09	1.59 \pm 0.05	2.70 \pm 0.05	2358.24 \pm 9.97
30	Arya vartham jerda	76.25 \pm 0.04	1540.28 \pm 19.03	10.06 \pm 0.03	11.39 \pm 0.22	2.43 \pm 0.16	1150.93 \pm 7.91
31	Aryavartam Irsala	79.88 \pm 0.07	2671.69 \pm 24.88	12.34 \pm 0.10	1.47 \pm 0.22	3.50 \pm 0.08	2470.34 \pm 34.44
32	Ashquith	78.17 \pm 0.04	7565.93 \pm 81.15	13.23 \pm 0.08	2.60 \pm 0.04	1.07 \pm 0.05	6977.09 \pm 28.12

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
33	Ashraf – us. Samar	75.08±0.12	1616.73±7.27	10.07±0.06	4.13±0.14	2.16±0.03	1171.31±5.01
34	Asif Pasand	82.46±0.40	2636.81±20.70	6.59±0.07	1.55±0.04	1.13±0.04	1261.54±6.63
35	Asifus Samar	79.61±0.07	2048.12±1.83	13.60±0.23	1.03±0.03	4.87±0.19	2153.44±85.38
36	Azam Us samar	81.29±0.03	2136.56±24.36	12.36±0.06	1.59±0.13	3.43±.23	2414.89±26.74
37	Bada – Gulabi	76.34±0.05	3587.27±56.02	11.32±0.05	1.56±0.03	2.66±0.02	2355.00±4.24
38	Badami model	83.75±0.04	1258.17±5.26	10.32±0.05	1.32±0.04	2.56±0.12	1145.13±11.06
39	Bahare-gull	81.42±0.17	891.08±6.57	1.78±0.19	1.13±0.01	1.27±0.02	369.59±18.59
40	Bala kondA pari	80.31±0.04	1256.70±12.73	3.16±0.04	0.02±0.01	1.456±0.02	553.37±3.62
41	bandariya	77.55±0.03	9792.68±71.88	13.04±0.19	2.48±0.15	1.01±0.11	6960.52±53.45
42	Bangbella x Samae best	79.40±0.34	871.17±4.49	3.44±0.06	1.52±0.43	0.64±0.34	405.78±2.07
43	Banginapalli	77.85±0.08	1217.79±7.42	3.41±0.07	1.53±0.04	1.98±0.08	1014.23±2.23
44	Bar balia	79.25±0.05	1453.52±6.05	1.28±0.07	1.42±0.16	1.92±0.08	1342.38±15.35
45	Baramasi X Max	81.47±0.04	1338.54±17.90	12.03±0.03	0.90±0.07	2.06±0.06	1056.36±7.71
46	Barbella	78.49±0.04	7007.69±5.79	13.79±0.21	3.03±0.03	11.15±0.06	6088.74±10.1
47	Begum Pasand	83.69±0.03	1549.41±6.76	5.66±0.21	1.34±0.02	2.4±0.04	1458.71±5.23
48	Benigham	85.74±0.05	2226.96±33.70	3.24±0.02	1.32±0.03	2.53±0.03	1543.29±7.97
49	Bennet Alphonso	85.54±0.49	1557.85±10.17	6.02±0.02	1.63±0.04	1.93±0.03	1262.13±24.67
50	Betchas	78.91±0.05	3499.41±107.50	2.25±0.10	3.21±0.08	2.92±0.04	3254.8±4.04
51	Bhopadiya	79.82±0.06	4136.54±5.19	3.70±0.66	4.14±0.02	3.53±0.08	3115.26±9.52
52	Bhura	82.44±0.08	1466.63±1.49	2.35±0.21	1.41±0.17	1.38±0.06	1137.91±7.39
53	Bobbili punasa	78.38±0.21	1027.52±16.49	35.17±1.21	1.48±0.03	3.53±0.04	781.51±11.24
54	bombay darsha	81.57±0.20	2250.51±7.36	2.69±0.26	3.47±0.07	3.27±0.04	1348.54±4.88
55	Bombay green	77.67±0.40	2893.98±47.16	9.41±0.04	4.22±0.04	4.83±0.07	2261.84±2.99
56	Bombay no 1	80.64±0.11	2638.43±20.04	12.30±0.17	3.45±0.17	4.64±0.05	2135.32±9.38
57	Bombay peda	78.55±0.02	2074.27±19.36	11.47±0.10	2.78±0.21	3.53±0.03	1242.24±14.97
58	bombay yellow	76.82±0.04	1347.21±5.63	1.35±0.04	4.13±0.02	1.7±0.07	1126.53±1.89
59	Bombaybutta	83.90±0.06	4176.71±11.97	25.17±1.56	3.44±0.04	4.6±0.05	3252.16±8.25
60	borbacha	67.70±0.15	1460.99±3.83	3.88±0.09	1.83±0.06	3.47±0.3	1259.45±5.53
61	Brindavani	70.16±0.16	1060.00±13.73	4.20±0.06	1.37±0.01	2.81±0.21	871.6±6.49
62	burshanguti	89.73±0.04	1883.04±23.04	1.56±0.12	0.43±0.05	4.53±0.01	1468.97±22.77
63	Chambeliwala	82.75±0.03	2149.83±8.09	4.59±0.06	3.60±0.25	5.4±0.22	1545.36±2.62
64	Chandra karan & gola	85.77±0.04	887.78±10.86	2.57±0.42	1.19±0.09	6.51±0.02	401±11.53
65	Chandrakaran	81.76±0.06	1912.80±10.83	14.01±1.74	1.71±0.22	3.75±0.18	1811.45±10.41
66	Chausa	82.94±0.06	748.44±4.92	3.59±0.12	0.89±0.04	2.51±0.03	157.33±3.06
67	chenbu	78.88±0.05	1656.02±11.67	3.26±0.03	1.23±0.20	2.36±0.21	1541.47±6.98

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

<i>Sl. No.</i>	<i>Varieties Name</i>	<i>Moisture (g/100g)</i>	<i>Total carotenoids (µg/100g)</i>	<i>Lutein (µg/100g)</i>	<i>Zeaxanthin (µg/100g)</i>	<i>β-Crypto- xanthin (µg/100g)</i>	<i>β-Carotene (µg/100g)</i>
68	Cherukurasam	82.36±0.06	885.43±7.72	3.70±0.22	1.53±0.03	2.79±0.29	307.07±1.66
69	Chillukamukku	79.84±0.06	1045.93±11.57	3.39±0.21	2.46±0.32	5.46±0.17	665.75±27.59
70	Chinarasalu	81.32±0.03	2561.23±64.60	10.08±0.08	2.40±0.22	4.47±0.28	2260.58±32.7
71	chitla	76.44±0.07	804.82±2.76	1.33±0.04	2.14±0.02	1.02±0.01	437.58±13.94
72	chitrapudi goa	80.60±0.37	3952.47±6.68	2.29±0.03	3.26±0.02	2.85±0.1	3240.92±22.47
73	Cishm m2	72.91±0.04	1468.47±16.50	2.50±0.04	2.85±0.02	1.94±0.04	1332.4±11.05
74	Cishm-1	82.47±0.05	1971.77±23.08	6.64±0.19	3.46±0.03	1.74±0.05	1245.66±12.32
75	Cishm-2	85.51±0.04	2121.85±28.75	7.71±0.03	2±0.03	5.2±0.09	1778.61±25.59
76	creeping	85.73±0.04	2040.10±7.81	10.30±0.24	2.46±0.26	4.39±0.35	2227.43±10.74
77	Dalbia	85.57±0.06	1072.72±3.85	14.77±0.16	5.69±0.04	2.4±0.23	774.42±2.15
78	Dari	78.93±0.06	2088.08±9.23	2.13±0.03	1.78±0.09	4.1±0.02	1886.38±7.11
79	dashehari	74.23±0.10	4304.49±65.22	21.39±0.61	20.74±0.09	18±0.12	3245.26±11.13
80	Dashehari Mehmooda	47.08±81.72	1303.05±2.64	2.43±0.17	0.67±0.03	2.21±0.1	950.93±6.86
81	Dashehari x Samrebest	82.56±0.27	1120.94±5.45	10.35±0.21	3.35±0.19	10.24±0.11	1032.34±3.95
82	Dasheharilocal	75.10±0.06	819.09±7.31	12.51±0.06	2.63±0.07	1.14±0.07	591.33±10.62
83	Daulath	80.79±0.06	1138.76±7.26	4.64±0.15	4.31±0.05	5.44±0.02	975.43±15.99
84	Dedseri	84.44±0.10	1131.23±21.80	8.80±0.08	3.35±0.05	5.48±0.14	676.18±8.02
85	Dilpasand	79.67±0.04	2420.63±5.26	11.38±0.21	2.13±0.03	5.45±0.1	778.98±578.3
86	Doddia Mamidi	87.63±0.06	7578.78±18.07	2.63±0.06	1.88±0.09	2.56±0.07	6841.49±28.59
87	doodia	76.41±0.05	2092.86±5.60	7.74±0.11	1.90±0.09	5.13±0.03	1786.18±6.5
88	Doodia-plot-No-31	81.35±0.08	1372.81±13.99	3.18±0.02	1.52±0.05	1.85±0.06	1257.13±7.15
89	DoodiyaMulgoa	84.25±0.09	1016.18±8.85	3.5±0.13	1.26±0.02	2.15±0.04	885.22±1.26
90	Doragari kaya	81.26±0.09	1244.30±12.64	5.71±0.06	1.51±0.06	3.23±0.03	1140.63±7.16
91	dori	80.03±0.03	2586.92±24.84	10.18±0.12	2.61±0.05	4.65±0.04	2238.25±7.58
92	durr-e-behist	68.71±0.03	894.32±13.94	12.57±0.07	2.60±0.03	1.26±0.31	600.59±2.57
93	elaichi	79.71±0.06	1630.29±21.59	10.34±0.07	1.61±0.02	11.61±0.1	740.57±5.42
94	elephant head	86.75±0.03	1309.32±1.01	14.42±0.38	1.60±0.03	3.67±0.05	1038.41±3.23
95	Ergai palli pachadi	80.29±0.09	1636.49±23.36	10.40±0.15	1.61±0.04	11.66±0.03	754.98±13.28
96	Fajri	83.63±0.05	1038.92±5.91	7.63±0.07	1.51±0.06	3.49±0.09	882.46±12.23
97	fajri malda	79.83±0.02	2444.96±22.71	11.12±0.46	2.15±0.05	5.57±0.25	1137.55±23.93
98	fajri white	84.80±0.04	7594.89±94.61	2.62±0.03	1.88±0.09	2.45±0.26	6819.35±27.17
99	fajri zafarani	77.89±0.03	1389.52±33.86	3.17±0.02	1.58±0.06	1.87±0.12	1257.8±6.95
100	fakir wala	80.56±0.03	759.57±12.69	5.54±0.07	1.14±0.04	2.6±0.07	458.48±2.07
101	Fakr US Samar	78.59±0.03	1311.37±3.58	14.74±0.04	1.63±0.05	3.72±0.058	1036.24±0.7
102	Favaripechumamidi	80.85±0.03	907.19±2.84	5.13±0.03	1.85±0.06	4.2±0.079	787.09±20.42

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
103	Ferdous pasand	83.20 \pm 0.03	763.06 \pm 6.18	8.69 \pm 0.05	2.53 \pm 0.07	2.57 \pm 0.086	670.81 \pm 1.95
104	ferhad	83.10 \pm 0.05	1348.63 \pm 6.79	1.81 \pm 0.22	1.59 \pm 0.16	10.48 \pm 0.049	1249.79 \pm 7.72
105	fernandis	77.75 \pm 0.06	1436.87 \pm 17.67	2.96 \pm 0.08	1.28 \pm 0.07	2.45 \pm 0.1	1334.78 \pm 18.96
106	firangi ladwa	79.74 \pm 0.09	1637.32 \pm 22.24	3.69 \pm 0.11	0.84 \pm 0.05	10.49 \pm 0.04	1036.41 \pm 1.25
107	FRS Selection	75.70 \pm 0.14	1210.06 \pm 5.07	6.99 \pm 0.14	4.28 \pm 0.02	2.84 \pm 0.08	374.9 \pm 5.13
108	gadhe mar	86.78 \pm 0.06	1218.70 \pm 23.71	3.53 \pm 0.51	2.34 \pm 0.20	3.58 \pm 0.058	1031.45 \pm 6.91
109	Ghanya	76.80 \pm 0.05	2726.57 \pm 212.70	12.23 \pm 0.30	1.10 \pm 0.02	2.48 \pm 0.25	1828.32 \pm 26.57
110	Ghotthi	84.27 \pm 0.06	2584.91 \pm 134.22	10.53 \pm 0.07	1.08 \pm 0.02	1.73 \pm 0.16	2148.24 \pm 15.76
111	Gola	81.30 \pm 0.04	3314.24 \pm 46.04	7.72 \pm 0.15	1.46 \pm 0.03	10.52 \pm 0.08	3127.22 \pm 4.78
112	Gola Badam Model	83.29 \pm 0.03	2150.17 \pm 16.39	11.27 \pm 0.05	1.5 \pm 0.06	11.32 \pm 0.065	2036.75 \pm 21.43
113	Gola Bandar	83.76 \pm 0.07	1427.94 \pm 5.64	2.92 \pm 0.12	1.24 \pm 0.02	2.41 \pm 0.12	1334.62 \pm 18.7
114	Gola langda	78.64 \pm 0.07	1638.86 \pm 24.13	3.44 \pm 0.31	0.87 \pm 0.03	10.5 \pm 0.066	1043.04 \pm 11.66
115	Gola Neek Noor	81.70 \pm 0.12	2937.54 \pm 34.64	1.80 \pm 0.21	1.63 \pm 0.06	3.61 \pm 0.07	2657.66 \pm 50.42
116	Gopal Bhog	79.67 \pm 0.09	1349.56 \pm 8.38	1.93 \pm 0.06	1.53 \pm 0.02	10.53 \pm 0.04	1235.99 \pm 16.49
117	Gulab	86.80 \pm 0.02	539.91 \pm 20.67	5.40 \pm 0.22	1.1 \pm 0.02	2.66 \pm 0.08	469.67 \pm 10.6
118	Gulab Khas	84.11 \pm 0.06	3358.44 \pm 3.28	3.20 \pm 0.05	1.36 \pm 0.03	3.9 \pm 0.04	2374.51 \pm 30.93
119	Gulabi	78.53 \pm 0.06	631.64 \pm 2.33	4.77 \pm 0.21	1.32 \pm 0.02	3.17 \pm 0.06	570.61 \pm 24.16
120	Gulaliya	81.86 \pm 0.07	769.15 \pm 3.67	5.58 \pm 0.12	2.46 \pm 0.03	2.62 \pm 0.05	673.03 \pm 1.49
121	Gumadi	77.44 \pm 0.03	1053.02 \pm 23.29	7.83 \pm 0.13	2.37 \pm 0.04	2.81 \pm 0.06	963.13 \pm 21.82
122	Gumadi Ganneru	78.45 \pm 0.39	1142.66 \pm 14.55	10.25 \pm 0.09	1.06 \pm 0.04	1.43 \pm 0.06	1037.34 \pm 16.77
123	Gundu	88.29 \pm 0.03	1428.27 \pm 4.34	3.29 \pm 0.15	1.40 \pm 0.06	1.55 \pm 0.07	1155.28 \pm 27.05
124	Guruvam murth	80.59 \pm 0.04	1537.79 \pm 9.67	4.13 \pm 0.13	1.51 \pm 0.06	1.74 \pm 0.02	1460.27 \pm 4.48
125	Hafooz	79.66 \pm 0.07	1648.28 \pm 28.61	5.52 \pm 0.24	1.05 \pm 0.19	1.78 \pm 0.11	1555.72 \pm 19.36
126	hajipur langra	84.63 \pm 0.08	1805.86 \pm 131.02	3.60 \pm 0.13	0.83 \pm 0.07	10.46 \pm 0.04	1036.23 \pm 0.78
127	Hamlet	76.53 \pm 0.04	1258.12 \pm 6.38	11.16 \pm 0.02	2.21 \pm 0.04	8.21 \pm 0.02	998.06 \pm 1.35
128	Harabhara	55.08 \pm 47.67	1158.87 \pm 8.98	9.70 \pm 0.22	3.14 \pm 0.02	4.54 \pm 0.03	1047.13 \pm 4.64
129	Hasmuk-sahaz	80.26 \pm 0.10	1246.70 \pm 17.26	10.29 \pm 0.16	4.55 \pm 0.03	6.49 \pm 0.08	1142.15 \pm 12.42
130	Himannu X Gola	83.08 \pm 0.06	1156.00 \pm 38.42	6.60 \pm 0.15	3.59 \pm 0.12	1.26 \pm 0.03	1049.96 \pm 4.31
131	Himayat Pasand	73.50 \pm 0.02	1475.16 \pm 17.04	6.69 \pm 0.11	3.76 \pm 0.03	1.33 \pm 0.03	1185.25 \pm 5.62
132	Himayuddin XL B	82.86 \pm 0.10	1448.18 \pm 8.13	7.29 \pm 0.06	1.04 \pm 0.02	3.59 \pm 0.05	1185.61 \pm 1.08
133	Himsagar	82.18 \pm 0.06	1657.22 \pm 2.58	6.55 \pm 0.02	1.23 \pm 0.025	4.543 \pm 0.04	1217.66 \pm 7.67
134	Hindustan ball	81.66 \pm 0.05	1428.01 \pm 7.87	8.21 \pm 0.04	5.46 \pm 0.03	7.83 \pm 0.068	1346.38 \pm 3.53
135	Hindustan Batli	79.40 \pm 0.04	2615.59 \pm 3.04	5.25 \pm 0.04	2.8 \pm 0.05	1.58 \pm 0.03	2237.24 \pm 2.37
136	Hur	79.66 \pm 0.06	2148.19 \pm 12.15	3.52 \pm 0.02	1.45 \pm 0.03	8.65 \pm 0.04	2034.74 \pm 0.36
137	Husnara	79.74 \pm 0.06	3469.11 \pm 56.31	10.14 \pm 0.03	6.75 \pm 0.22	6.53 \pm 0.041	3016.22 \pm 0.97

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

<i>Sl. No.</i>	<i>Varieties Name</i>	<i>Moisture (g/100g)</i>	<i>Total carotenoids (µg/100g)</i>	<i>Lutein (µg/100g)</i>	<i>Zeaxanthin (µg/100g)</i>	<i>β-Crypto- xanthin (µg/100g)</i>	<i>β-Carotene (µg/100g)</i>
138	Hybert – 192	76.57±0.14	3334.90±24.24	3.25±0.20	1.34±0.05	3.85±0.015	2354.53±8.09
139	Hybrid 11	68.23±0.06	2431.73±14.27	2.31±0.14	3.46±0.18	1.32±0.04	2345.52±2.59
140	Hybrid 12	78.76±0.15	791.60±4.28	1.33±0.01	4.81±0.19	3.55±0.09	459.92±8.5
141	Hybrid 13	81.65±0.08	817.62±6.78	3.20±0.05	3.21±0.065	4.25±0.036	537.3±13.73
142	Hybrid-165	85.38±0.04	1626.98±19.75	12.28±0.25	1.84±0.058	3.32±0.03	1074.66±3.41
143	Hyder saheb	81.60±0.03	1186.37±7.09	13.53±0.15	2.38±0.09	5.07±0.035	224.44±4.68
144	IARI Hyderabad 13	83.16±0.05	4242.31±22.48	1.31±0.05	1.84±0.145	3.25±0.036	3887.42±10.57
145	Iari x 165	89.37±0.16	3467.71±18.66	1.43±0.25	1.45±0.025	4.54±0.047	3144.51±3.28
146	Imam pasand	87.32±0.04	1778.82±16.95	6.69±0.10	3.57±0.026	3.59±0.12	1653.95±5.49
147	Intemax	82.27±0.08	1985.92±2.12	10.40±0.17	0.32±0.04	1.38±0.04	1763.06±2.69
148	Intima	83.37±2.35	1827.94±7.78	5.77±0.26	0.54±0.045	7.09±0.009	1059.51±10.24
149	Jafrani Gola	73.24±0.07	845.08±17.42	2.67±0.16	1.36±0.025	11.15±0.09	668.31±16.32
150	Jagath Ramani	80.54±0.09	1585.08±13.94	25.73±1.00	1.36±0.026	1.646±0.03	1314.74±0.57
151	Jalal	85.86±0.08	1146.91±3.24	14.69±1.28	1.2±0.073	1.6±0.04	1032.68±1.31
152	Jamadar	80.55±0.11	1015.53±6.98	6.34±0.12	1.15±0.015	3.146±0.041	928.24±6.25
153	Java	81.42±0.07	5654.86±21.78	4.47±0.25	2.46±0.125	1.52±0.09	4553.13±32.86
154	Jehangir	82.38±0.04	5561.12±10.09	5.60±0.10	1.57±0.015	1.49±0.079	4354.83±4.04
155	Jhongiri	80.84±0.11	1526.64±2.74	1.93±0.07	1.74±0.05	1.85±0.04	1349.38±39.16
156	Jhool	74.54±0.08	4479.53±21.14	1.27±0.02	1.57±0.01	1.94±0.06	4026.86±2.98
157	Jogeri	80.63±0.06	4419.91±8.56	2.51±0.04	1.76±0.02	1.47±0.02	3546.85±3.26
158	Jong	75.61±0.07	3557.29±14.08	2.72±0.26	2.63±0.22	2.26±0.02	3257.66±2.92
159	K.0.15	75.36±0.05	15312.07±146.94	12.39±0.21	4.55±0.24	2.03±0.02	1145.27±3.6
160	K.0.18	83.35±0.09	12612.52±110.64	10.51±0.07	3.35±0.16	1.61±0.05	8013.82±5944.99
161	K.0.32	73.53±0.06	10293.35±57.83	1.47±0.02	3.18±0.09	3.5±0.06	4442.29±14.79
162	K.0.8	78.86±0.10	1353.61±176.98	9.60±0.14	2.53±0.04	1.28±0.04	1237.81±10.17
163	K.O.17	72.39±0.06	2746.67±13.30	1.06±0.04	2.66±0.03	3.84±0.15	2574.35±17.39
164	Kacha Meetha	82.71±0.03	1531.51±6.29	2.36±0.18	1.63±0.04	4.36±0.11	1438.7±5.67
165	Kaju	77.40±0.02	1547.61±1.50	3.04±0.02	2.15±0.03	4.55±0.03	1345.87±3.59
166	Kalaalphonso	85.74±0.12	4449.46±12.19	1.43±0.05	2.5±0.1	1.33±0.05	3457.16±2.7
167	Kalakhand	87.15±0.08	764.42±2.45	10.14±0.04	2.61±0.02	22.42±0.06	560.42±20.7
168	Kalakhand goa	77.64±0.06	561.03±9.75	5.52±0.34	3.44±0.04	11.45±0.36	343.42±5.65
169	Kalam-e-Hindustan	79.79±0.06	1275.79±23.73	4.05±0.03	3.37±0.32	1.76±0.11	239.43±6.13
170	Kalanji	77.64±0.04	3449.11±58.58	1.97±0.03	2.56±0.025	4.44±0.25	2948.99±34.84
171	Kalaphad	83.69±0.03	3583.40±13.32	21.65±2.55	2.57±0.1	4.38±0.03	3047.37±4.06
172	Kalari	82.77±0.07	1306.58±1.75	2.92±0.05	2.86±0.1	1.56±0.04	970.37±12.31

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
173	Kalifazri	80.56 \pm 0.08	1347.66 \pm 1.82	1.35 \pm 0.02	2.8 \pm 0.06	1.56 \pm 0.03	1140.8 \pm 13.25
174	Kalipari	81.18 \pm 0.06	553.44 \pm 10.60	10.57 \pm 1.12	1.35 \pm 0.02	1.65 \pm 0.04	456.61 \pm 8.33
175	Kallra gadda	80.77 \pm 0.05	3436.07 \pm 20.21	11.43 \pm 0.14	1.55 \pm 0.015	1.73 \pm 0.04	3332.82 \pm 13.88
176	Kandurshod sikar	70.11 \pm 0.15	4466.20 \pm 30.77	1.47 \pm 0.13	1.56 \pm 0.09	2.34 \pm 0.16	3555.81 \pm 19.66
177	Karanjio	75.83 \pm 0.10	4005.42 \pm 11.02	1.34 \pm 0.10	2.48 \pm 0.03	1.94 \pm 0.06	3652.2 \pm 33.15
178	Karela	77.63 \pm 0.04	3764.61 \pm 4.78	3.57 \pm 0.03	2.852 \pm 0.053	1.86 \pm 0.02	3026.41 \pm 5.38
179	karutha columban	82.76 \pm 0.05	3334.49 \pm 0.56	1.69 \pm 0.17	3.29 \pm 0.05	3.28 \pm 0.03	2878.55 \pm 28.12
180	kasi ratnalu	80.46 \pm 0.13	1347.86 \pm 3.71	3.44 \pm 0.05	5.54 \pm 0.12	1.75 \pm 0.03	1328.53 \pm 9.26
181	Kesar	70.38 \pm 0.03	1546.49 \pm 3.30	3.08 \pm 0.08	2.15 \pm 0.025	4.53 \pm 0.02	1348.16 \pm 6.07
182	Ketra Gadda	82.71 \pm 0.04	3124.12 \pm 2.73	3.22 \pm 0.04	2.46 \pm 0.03	1.96 \pm 0.02	3022.62 \pm 3.43
183	khader	72.17 \pm 0.07	1827.13 \pm 172.90	3.13 \pm 0.04	1.94 \pm 0.04	0.87 \pm 0.02	1445.95 \pm 2.08
184	khader pasand	82.66 \pm 0.04	1207.20 \pm 2.22	1.94 \pm 0.04	2.66 \pm 0.05	4.61 \pm 0.02	966.21 \pm 2.11
185	Khaja pasand	80.64 \pm 0.08	3332.79 \pm 3.18	1.63 \pm 0.04	3.27 \pm 0.026	3.29 \pm 0.05	2918.28 \pm 40.5
186	Khajri	81.18 \pm 0.06	1473.65 \pm 21.60	1.86 \pm 0.09	1.57 \pm 0.24	1.39 \pm 0.09	1337.48 \pm 18.86
187	Khajur	74.72 \pm 0.22	1118.44 \pm 11.70	1.57 \pm 0.02	1.35 \pm 0.04	1.56 \pm 0.02	1039.99 \pm 5.64
188	khandeshi borashio	70.34 \pm 0.03	1337.93 \pm 9.51	3.53 \pm 0.03	2.61 \pm 0.08	5.59 \pm 0.25	1159.24 \pm 4.84
189	Kharbuja A	83.29 \pm 0.05	1456.60 \pm 10.95	1.28 \pm 0.04	1.45 \pm 0.04	2.03 \pm 0.03	347.12 \pm 2.64
190	Kharbuja B	76.71 \pm 0.03	2409.02 \pm 1.84	17.47 \pm 0.42	2.38 \pm 0.02	3.94 \pm 0.04	1332.74 \pm 2.38
191	Khas-ul- khas	83.17 \pm 0.04	1557.26 \pm 37.06	3.07 \pm 0.01	2.15 \pm 0.02	4.55 \pm 0.08	1347.64 \pm 4.93
192	Khatta gola	78.60 \pm 0.18	2058.35 \pm 37.16	10.33 \pm 0.06	1.94 \pm 0.04	2.13 \pm 0.09	1483.63 \pm 20.92
193	Khirsapat	76.48 \pm 0.05	2181.64 \pm 63.79	1.84 \pm 0.07	2.45 \pm 0.09	2.44 \pm 0.08	1053.2 \pm 6.96
194	Khobrya	82.29 \pm 0.03	944.19 \pm 5.14	1.89 \pm 0.07	1.05 \pm 0.03	2.91 \pm 0.05	852.56 \pm 0.97
195	Khudad x Nelum	67.16 \pm 0.04	2382.16 \pm 330.35	2.77 \pm 0.09	1.88 \pm 0.02	4.52 \pm 0.04	1937.94 \pm 26.36
196	Khudadad	79.06 \pm 0.05	1273.81 \pm 15.15	5.48 \pm 0.29	4.15 \pm 0.04	2.02 \pm 0.03	1045.53 \pm 3.23
197	Killard	84.55 \pm 0.07	1446.93 \pm 2.07	3.54 \pm 0.26	5.63 \pm 0.04	1.76 \pm 0.03	1335.5 \pm 20.64
198	Kishan Bhog	76.49 \pm 0.06	1107.36 \pm 4.34	4.77 \pm 0.11	3.79 \pm 0.09	2.26 \pm 0.15	1096.75 \pm 1.56
199	KO 22	82.28 \pm 0.02	862.99 \pm 2.91	2.35 \pm 0.04	0.34 \pm 0.06	2.56 \pm 0.01	524.64 \pm 14.67
200	Kohinoor	71.55 \pm 0.13	1959.72 \pm 7.74	3.41 \pm 0.13	2.23 \pm 0.06	1.65 \pm 0.03	1130.61 \pm 1.63
201	Kohitoor	81.24 \pm 0.06	1880.77 \pm 13.97	3.24 \pm 0.21	1.05 \pm 0.02	1.91 \pm 0.03	866.45 \pm 6.78
202	Kolan ka Goa	81.28 \pm 0.08	1931.43 \pm 5.52	3.07 \pm 0.03	1.96 \pm 0.02	0.86 \pm 0.03	1449.81 \pm 6.25
203	Kottapalli Kober Mamidi	78.69 \pm 0.18	1207.38 \pm 2.17	1.80 \pm 0.21	2.6 \pm 0.02	4.63 \pm 0.05	963.78 \pm 5.85
204	Krishna pasand	75.77 \pm 0.10	1862.33 \pm 4.41	3.56 \pm 0.02	1.52 \pm 0.04	8.64 \pm 0.03	1349.13 \pm 9.36
205	Kurnool Goa	75.29 \pm 0.04	1090.40 \pm 3.32	3.72 \pm 0.14	1.04 \pm 0.02	3.86 \pm 0.09	949.82 \pm 11.85
206	Kurnool mamidi	78.49 \pm 0.08	2357.14 \pm 7.36	2.87 \pm 0.35	2.07 \pm 0.08	1.24 \pm 0.3	2250.76 \pm 1.97
207	Kurnool mulgoa	77.87 \pm 0.08	1880.36 \pm 6.79	10.45 \pm 0.11	1.67 \pm 0.02	1.66 \pm 0.02	1547.08 \pm 7.85

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

<i>Sl. No.</i>	<i>Varieties Name</i>	<i>Moisture (g/100g)</i>	<i>Total carotenoids (µg/100g)</i>	<i>Lutein (µg/100g)</i>	<i>Zeaxanthin (µg/100g)</i>	<i>β-Crypto- xanthin (µg/100g)</i>	<i>β-Carotene (µg/100g)</i>
208	Lal bahar	87.48±0.07	1932.73±7.19	6.14±0.04	1.07±0.03	1.61±0.07	1356.36±3.03
209	lal sundari	81.78±0.11	3998.88±13.76	22.34±0.45	3.35±0.04	6.42±0.07	3252.92±5.87
210	Lalkhatra	71.55±0.10	2008.04±6.97	2.72±0.12	1.35±0.07	5.54±0.05	1221.48±6.44
211	Lalmuni	85.27±0.05	929.46±2.34	7.32±0.03	3.72±0.15	2.62±0.07	556.59±2.52
212	Langra	82.41±0.07	886.76±2.61	10.73±0.14	2.36±0.05	1.59±0.05	668.39±3.81
213	Langra & himayat	80.54±0.07	1046.95±1.76	4.61±0.29	2.66±0.21	4.59±0.06	964.83±20.09
214	Langra Banarasi	74.85±0.10	2033.70±0.48	8.48±0.08	2.34±0.18	2.27±0.06	1672.44±6.56
215	lashkar shikan	85.26±0.07	1150.15±13.60	4.39±0.11	3.69±0.04	11.47±0.18	1062.55±60.74
216	Latifus samar	81.91±0.04	2175.53±33.43	12.18±0.13	3.11±0.1	15.77±0.08	1126.73±5.63
217	Lazatbaksh	80.61±0.04	2354.27±8.80	16.58±0.04	5.13±0.036	5.31±0.07	1258.13±8.02
218	litchi	78.48±0.05	1852.9±7.18	2.99±0.13	1.49±0.45	1.93±0.24	1548.19±6.23
219	Local dasheri	84.53±0.06	945.68±9.14	4.67±0.83	3.34±1.04	3.47±0.73	865.6±8.48
220	lohara	80.18±0.06	1832.24±5.81	5.04±1.01	2.22±1	3.13±0.21	1278.29±7.99
221	Lotan	78.12±0.04	966.20±10.53	1.78±0.38	4.89±0.3	12.27±1	881.68±4.92
222	M B Round	82.38±0.03	1306.78±2.40	2.68±1.00	2.04±0.28	2.44±0.71	943.5±20.69
223	Madhava – Rao- Pasand	76.53±0.05	920.08±5.54	3.20±0.57	2.68±0.57	3.81±1.92	634.18±21.75
224	Mahamood bahar	78.39±0.48	2252.12±18.51	11.35±0.24	3.11±0.41	8.39±0.67	1974.29±5.49
225	Mahmood	80.19±0.07	2576.81±17.27	3.59±0.08	1.5±0.06	5.66±0.72	2169.87±26.79
226	Mahmood bahoor	68.64±0.09	963.18±5.32	2.73±0.62	3.12±0.49	1.65±0.45	855.91±8.19
227	Mahmooda (mahimooda)	81.26±0.06	641.65±11.09	3.62±0.52	1.38±0.59	4.85±0.36	430.55±32.8
228	Mahmooda benisha	80.41±0.03	1532.05±10.52	4.13±1.03	2.8±1.18	3.39±0.29	749.75±8.37
229	Mahmooda uppal	78.47±0.04	883.50±15.14	3.00±0.14	1.66±0.04	1.73±0.05	259.24±10.31
230	Maisum kayallu	80.22±0.10	938.80±15.31	1.96±0.52	2.59±0.12	2.74±0.13	424.76±11.99
231	Malai	85.45±0.07	3465.23±17.80	2.68±0.42	3.99±0.77	3.73±0.4	3145.9±2.54
232	Malaimisri	80.04±0.04	1565.28±2.70	3.92±0.6	2.98±0.53	4.95±0.34	1438.3±15.76
233	Malda	79.90±0.08	2669.64±42.04	4.71±0.15	1.42±0.14	0.87±0.08	1410.19±73.01
234	Maldives	79.56±0.07	1791.88±5.01	5.22±0.09	1.83±1.1	1.83±0.95	1655.92±2.94
235	Maliha Golla	78.47±0.04	1643.02±13.28	3.27±0.30	2.18±0.3	1.74±0.09	1544.36±4.35
236	Mallika	85.85±0.10	1834.64±10.15	4.39±0.63	1.49±0.2	2.67±0.18	1304.65±52.8
237	Malota	76.32±0.04	1264.81±1.03	4.03±0.63	2.56±0.97	1.66±0.6	927.55±23.57
238	Mangeeragola	79.77±0.07	1109.48±31.67	3.34±0.84	1.95±0.15	4.71±0.17	867.61±12.53
239	Mango Green (Unripe)	78.42±0.21	938.27±20.41	124.51±6.98	1.19±0.68	13.71±2.25	71.84±3.01
240	Mankurad	79.73±0.10	3574.95±23.00	1.97±0.31	1.28±0.35	5.08±0.54	3362.36±23.49
241	Mankurad Golla	80.43±0.12	1245.79±10.56	4.10±0.57	2.84±0.06	1.78±0.17	1026.52±18.99
242	Manoranjan	83.20±0.04	875.27±21.51	1.62±0.31	3.72±0.27	2.26±0.62	261.14±26.25

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
243	MB -1	79.30 \pm 0.04	2054.54 \pm 24.99	6.59 \pm 0.51	2.11 \pm 1.04	3.83 \pm 0.23	1747.69 \pm 17.86
244	Meetha Mahmood	84.37 \pm 0.04	2125.11 \pm 34.59	2.59 \pm 0.41	2.9 \pm 0.24	3.84 \pm 0.68	2024.6 \pm 17.97
245	Mehamooda Vikarabad	78.53 \pm 0.08	1469.3 \pm 12.20	4.50 \pm 0.10	2.2 \pm 0.38	4.25 \pm 0.82	1323.15 \pm 59.25
246	Melleshwari	79.85 \pm 0.11	1764.40 \pm 34.78	1.86 \pm 0.76	12.64 \pm 1.74	1.99 \pm 0.25	1450.75 \pm 82.56
247	Metauri pesumamidi	76.84 \pm 0.06	60.63 \pm 1.25	6.72 \pm 0.41	3.86 \pm 0.57	2.47 \pm 0.6	1078.65 \pm 2.63
248	MFT Selection	81.44 \pm 0.05	1871.65 \pm 3.70	5 \pm 0.53	2.46 \pm 0.85	3.23 \pm 0.34	1504.41 \pm 9.24
249	Model – 46	71.73 \pm 0.06	1657.76 \pm 2.97	2.90 \pm 0.59	1.7 \pm 0.17	5.03 \pm 0.75	1458.61 \pm 6.8
250	Mohandan	85.17 \pm 0.06	1678.38 \pm 4.42	8.87 \pm 0.27	1.66 \pm 0.49	3.33 \pm 0.24	1009.95 \pm 4.12
251	Mohandan & cross	79.86 \pm 0.10	1770.28 \pm 3.69	4.81 \pm 0.33	2.39 \pm 1.04	3.78 \pm 0.74	1549.38 \pm 2.96
252	Mohsin	78.38 \pm 0.03	1681.34 \pm 20.74	11.65 \pm 0.28	2.29 \pm 0.79	1.6 \pm 0.6	1063.4 \pm 3.83
253	Mombasa	74.24 \pm 0.05	1351.26 \pm 5.27	5.93 \pm 0.74	2.67 \pm 0.56	3.03 \pm 1.09	926.38 \pm 43.8
254	Motichoor	80.18 \pm 0.17	9898.94 \pm 67.79	6.63 \pm 0.74	3.75 \pm 0.44	3.32 \pm 0.8	7765.58 \pm 88.65
255	Motichoor-P.No.86	83.18 \pm 0.03	1168.89 \pm 39.09	4.50 \pm 0.64	2.88 \pm 0.64	2.4 \pm 0.54	951.83 \pm 4.04
256	Muffari	82.14 \pm 0.03	7654.15 \pm 5.32	10.46 \pm 0.28	4.04 \pm 0.87	3.93 \pm 0.83	6543.06 \pm 6.2
257	Muffida	77.10 \pm 0.04	1351.84 \pm 4.21	1.53 \pm 1.21	2.07 \pm 0.42	2.25 \pm 1.03	1152.38 \pm 4.29
258	Mulgoa – Deshi	80.23 \pm 0.07	974.05 \pm 15.94	3.62 \pm 0.83	4.12 \pm 0.76	2.54 \pm 1.03	876.7 \pm 9.86
259	Mulgoa – Goa – Bandar	77.59 \pm 0.05	1046.10 \pm 9.80	3.42 \pm 1.03	2.12 \pm 0.69	2.03 \pm 0.42	984.01 \pm 14.17
260	Mulgoa Goa black 32	83.49 \pm 0.06	2075.85 \pm 7.25	10.61 \pm 0.37	1.26 \pm 0.42	1.71 \pm 0.15	1792.93 \pm 5.72
261	Mulgoa-Nelkra	73.64 \pm 0.06	1050.15 \pm 16.50	2.03 \pm 0.43	3.57 \pm 1.05	4.23 \pm 1.01	460.58 \pm 6.01
262	Mundappa	81.12 \pm 0.06	1544.53 \pm 23.11	8.52 \pm 0.85	2.55 \pm 0.77	10.3 \pm 0.26	1244.2 \pm 33.31
263	murshidabad	84.68 \pm 0.08	1075.57 \pm 27.15	3.63 \pm 0.85	2.27 \pm 0.95	5.38 \pm 1.12	873.27 \pm 7.53
264	Muthawar Pasand	81.53 \pm 0.16	1454.16 \pm 5.64	17.66 \pm 0.73	2.63 \pm 0.45	7.9 \pm 0.43	1283.92 \pm 14.48
265	Muvan dan	81.18 \pm 0.09	11478.80 \pm 107.17	3.77 \pm 0.49	3.33 \pm 0.3	3.56 \pm 0.9	10520.13 \pm 9.83
266	Mylapuri	77.47 \pm 0.16	3342.79 \pm 273.00	10.78 \pm 0.47	3.38 \pm 2.81	5.48 \pm 0.96	2702.74 \pm 200.72
267	Nabdar	77.69 \pm 0.21	780.68 \pm 11.28	6.86 \pm 0.55	4.56 \pm 0.99	3.02 \pm 0.62	338.31 \pm 9.23
268	Nadarsah	84.42 \pm 0.15	4791.29 \pm 204.85	4.41 \pm 1.12	5.51 \pm 0.941	7.67 \pm 0.83	3563.34 \pm 15.48
269	Nagin	83.74 \pm 0.04	7577.34 \pm 7.75	29.95 \pm 1.91	15.59 \pm 0.98	12.31 \pm 1.14	6172.68 \pm 70.7
270	Nagulapalli irsala	76.33 \pm 0.06	1469.48 \pm 14.47	12.09 \pm 0.56	1.54 \pm 0.49	10.33 \pm 0.08	1238.28 \pm 8.71
271	Najmooi	69.63 \pm 0.09	1776.37 \pm 8.36	3.54 \pm 0.10	2.26 \pm 1.01	15.48 \pm 0.92	1648.43 \pm 5.77
272	Naranjio	82.28 \pm 0.07	1834.50 \pm 17.19	4.79 \pm 0.52	3.17 \pm 0.32	4.56 \pm 0.52	1749.3 \pm 32.25
273	Narela	81.13 \pm 0.09	1879.71 \pm 6.13	4.13 \pm 0.31	0.93 \pm 0.51	1.77 \pm 0.29	1761.33 \pm 3.5
274	Naseem Pasand	82.78 \pm 0.16	844.06 \pm 6.56	1.45 \pm 0.71	2 \pm 0.145	4.18 \pm 0.18	770.5 \pm 14.59
275	Nas'Tota	69.57 \pm 0.08	1460.32 \pm 2.93	16.49 \pm 0.55	6.55 \pm 0.14	5.67 \pm 0.39	354.62 \pm 8.64
276	navaneetam	78.81 \pm 0.05	5184.91 \pm 68.63	12.77 \pm 2.08	4.9 \pm 0.33	6.94 \pm 0.53	4375.27 \pm 5.24
277	Nawab pasand	79.84 \pm 0.10	1051.13 \pm 6.75	6.25 \pm 0.33	1.72 \pm 0.37	4.83 \pm 0.37	975.67 \pm 11.1

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

<i>Sl. No.</i>	<i>Varieties Name</i>	<i>Moisture (g/100g)</i>	<i>Total carotenoids (µg/100g)</i>	<i>Lutein (µg/100g)</i>	<i>Zeaxanthin (µg/100g)</i>	<i>β-Crypto- xanthin (µg/100g)</i>	<i>β-Carotene (µg/100g)</i>
278	Nayeeb saheeb	80.09±0.05	1071.84±12.08	2.86±0.23	3.78±0.18	1.44±0.17	976.43±8.87
279	Nazuk badan	82.32±0.15	1085.88±14.00	9.19±0.42	2.93±0.65	2.97±0.24	575.22±40.22
280	Neelam	86.85±0.10	1877.60±15.34	3.00±0.60	2.21±0.24	2.44±0.61	1291.35±4.96
281	Neelam Xbenishan	85.21±0.03	5918.42±68.88	15.75±0.26	8.1±0.23	11.74±0.33	4442.56±26.83
282	Neelashaw X Ferangi Langda	84.45±0.08	925.88±8.93	5.36±0.09	1.71±0.34	3.02±0.5	336.63±25.13
283	Neeleshan	77.49±0.03	2166.54±57.99	6.65±0.11	3.11±0.589	8.82±0.61	1839.18±17.49
284	Neeleshwary	83.68±0.14	846.10±9.77	18.65±0.78	8.74±0.26	2.52±0.78	561.37±25.05
285	Neelgoa	76.48±0.05	889.41±6.17	3.92±0.47	2.1±0.31	0.99±0.3	454.57±2.92
286	Neeluddin	82.87±0.10	8024.73±17.88	5.65±0.98	2.8±0.69	3.72±0.71	418.56±55.69
287	Nelesharn x Gujarat	78.14±0.12	2347.52±3.93	10.44±0.12	2.43±0.185	6.98±0.15	2141.68±9.23
288	Neleshwari	81.46±0.03	2122.37±22.92	1.68±0.52	2.53±0.68	3.53±0.59	1984.27±9.09
289	Nella Andrews	74.65±0.12	2056.10±7.32	4.37±0.78	1.57±0.569	1.76±0.01	1978.47±5.1
290	Nelleshwari vanraj	79.73±0.07	3459.47±7.08	6.03±0.39	2.846±0.371	5.17±0.07	3155.21±16.7
291	Nelshan Gujarath	76.67±0.05	825.87±9.67	2.93±0.51	3.17±0.06	3.92±0.3	431.92±26.49
292	Nettayam	77.58±0.11	1879.34±13.12	2.67±0.50	2.49±0.71	2.37±0.28	1283.67±8.37
293	Nujividu tiyya mamidi	72.80±0.07	1339.13±11.74	3.83±0.38	3.47±0.95	5.73±0.51	1152.09±3.34
294	nurjahan	80.18±0.07	5157.87±9.95	11.55±0.45	4.85±0.25	6.78±0.28	4365.74±27.52
295	Oip Plot 02	81.87±0.10	1778.35±9.28	2.31±0.18	3.2±0.35	3.06±0.35	1559.94±23.07
296	Olour	80.13±0.06	2207±42.25	1.65±0.34	1.763±0.55	4.78±1.45	2037.6±6.84
297	P.S.Special No3	77.67±0.02	1982.27±7.12	1.63±0.05	2.77±0.19	2.77±0.43	1783.6±13.22
298	paccharasi	72.52±0.22	3142.30±17.74	2.27±0.89	5.413±1.196	3.57±0.57	3034.61±17.79
299	padiri	78.78±0.07	1153.51±28.40	4.05±0.73	1.48±0.57	2.57±0.55	975.98±15.57
300	Paheri	84.52±0.16	1159.75±22.46	2.60±0.11	6.87±0.56	10.37±0.03	1049.36±7.95
301	pahilwan	81.86±0.09	6557.12±21.34	4.03±0.06	1.84±0.06	4.372±0.27	5850.09±7.99
302	Paipasha	78.72±0.03	1768.38±6.40	59.05±1.27	56.05±3.16	65.6±2.45	1073.9±23.81
303	pairi	80.79±0.18	2392.17±81.45	24.61±1.39	10.59±0.27	56.21±2.01	2038.83±8.72
304	Panakalu	78.56±0.11	3477.05±17.67	19.44±0.11	23.8±2.52	53.62±1.6	3177.9±65.69
305	Panchadara kalasha	80.35±0.05	3247.53±4.03	11.68±0.57	13.33±0.12	14.46±0.11	3028.78±16.55
306	Panchadhara	82.89±0.08	3352.66±14.92	10.63±0.16	14.73±0.26	43.43±0.27	3234.88±93.21
307	Panchandan golla 132	77.57±0.09	2658.25±51.51	10.68±0.24	1.09±0.12	3.02±0.49	2325.09±19.63
308	Panchavaranam	72.79±0.15	2558.49±94.83	1.94±0.53	3.46±0.03	2.33±0.78	2445.4±27.71
309	Pandor vadi Mamidi	78.79±0.05	1238.07±29.48	2.13±0.27	1.15±0.13	3.93±0.34	1143.53±15.98
310	Panthula Mamidi	80.20±0.07	5143.84±15.65	11.28±0.19	5.21±0.59	6.81±0.35	4380.51±13.65
311	Papaya Raju Goa	83.89±0.05	1348.32±4.69	4.24±0.66	2.75±0.67	5.86±0.55	1153.77±6.21

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
312	Pargi Himayath	75.84 \pm 0.04	3346.90 \pm 12.25	2.12 \pm 0.44	3.7 \pm 0.53	3.66 \pm 0.45	2884.65 \pm 8.26
313	parnad	80.86 \pm 0.09	1465.05 \pm 11.49	1.71 \pm 0.22	2.01 \pm 0.56	1.69 \pm 0.51	1332.53 \pm 11.57
314	Parsapalli doodia	79.48 \pm 0.09	947.46 \pm 13.16	12.68 \pm 0.51	1.67 \pm 0.1	2.2 \pm 0.23	333.49 \pm 11.16
315	Pasi-us-samar	78.41 \pm 0.11	3866.06 \pm 10.97	3.97 \pm 0.63	3.33 \pm 0.3	3.98 \pm 0.24	3662.07 \pm 31.75
316	Peach	84.68 \pm 0.04	2367.19 \pm 17.43	1.70 \pm 0.23	2.95 \pm 0.49	3.51 \pm 0.05	2157.75 \pm 7.18
317	Pedda jehangir	78.74 \pm 0.16	829.42 \pm 18.50	14.57 \pm 0.58	10.57 \pm 0.09	3.63 \pm 0.54	306.41 \pm 3.49
318	Pedda nelum	80.18 \pm 0.05	3158.65 \pm 17.21	3.68 \pm 0.53	4.78 \pm 0.3	1.48 \pm 0.04	2879 \pm 4.55
319	peddarasam	79.24 \pm 0.06	879.35 \pm 2.77	2.95 \pm 0.60	1.75 \pm 0.46	3.59 \pm 0.57	536.85 \pm 11.79
320	Peta Sweet Metha	70.59 \pm 0.08	6586.82 \pm 254.14	3.91 \pm 0.39	2.5 \pm 0.63	4.6 \pm 0.55	5843.94 \pm 8.1
321	Podadiya	72.49 \pm 0.14	1187.52 \pm 11.81	0.68 \pm 0.52	2.3 \pm 0.28	3.26 \pm 0.023	1012.4 \pm 10.82
322	Podiri	80.75 \pm 0.09	1027.72 \pm 16.91	3.04 \pm 0.18	3.12 \pm 0.39	1.6 \pm 0.56	860.9 \pm 22.01
323	Prabhashankar kayallu	76.85 \pm 0.07	1166.45 \pm 45.13	1.34 \pm 1.16	1.79 \pm 0.51	5.71 \pm 0.54	1050.72 \pm 7.64
324	Prabhath Shankar	68.21 \pm 0.09	833.93 \pm 40.49	4.66 \pm 0.52	5 \pm 0.35	2.43 \pm 0.63	446.16 \pm 10.12
325	PS Special 16	49.59 \pm 36.24	968.60 \pm 14.29	2.39 \pm 0.85	3.41 \pm 0.14	2.46 \pm 0.97	677.4 \pm 5.33
326	PS Special 17	76.60 \pm 0.26	822.85 \pm 10.12	2.66 \pm 0.19	2.07 \pm 0.59	3.43 \pm 0.16	585.49 \pm 18.76
327	Pulan goa	82.26 \pm 0.09	1058.39 \pm 29.84	1.77 \pm 0.18	5.34 \pm 0.02	2.82 \pm 0.52	976.93 \pm 27.29
328	pulihora	86.75 \pm 0.13	827.35 \pm 15.39	14.72 \pm 0.59	10.96 \pm 0.58	3.88 \pm 0.76	315.56 \pm 12.09
329	puthi	84.12 \pm 0.07	2024.67 \pm 11.48	17.64 \pm 0.55	3.03 \pm 0.54	6.8 \pm 0.59	1836.52 \pm 5.68
330	Raj manu	86.28 \pm 0.04	1153.84 \pm 8.86	2.73 \pm 0.53	0.78 \pm 0.21	4.3 \pm 1.08	982.08 \pm 16.94
331	raja pasand	81.80 \pm 0.18	2754.70 \pm 19.30	19.72 \pm 0.11	2.77 \pm 0.35	5.323 \pm 0.34	2165.52 \pm 19.28
332	Rajapari	81.62 \pm 0.11	4170.14 \pm 5.19	24.00 \pm 0.65	7.15 \pm 0.16	13.72 \pm 0.11	3369.03 \pm 19.33
333	Rajapari Xlangda	82.74 \pm 0.09	881.60 \pm 14.84	3.94 \pm 0.28	2.21 \pm 0.32	2.13 \pm 1.01	373.23 \pm 20.72
334	Rajuba – chaptta	78.53 \pm 0.11	1943.06 \pm 16.72	2.66 \pm 0.02	2.68 \pm 0.5	1.89 \pm 0.56	1762.18 \pm 36.81
335	ram phalya	77.79 \pm 0.09	1672.92 \pm 12.19	4.42 \pm 0.76	1.42 \pm 0.5	2.59 \pm 0.57	967.52 \pm 4.24
336	Ram Tella Kayalu	74.07 \pm 0.05	3132.45 \pm 14.04	1.79 \pm 0.60	5.88 \pm 0.38	4.48 \pm 1.34	3037.97 \pm 11.94
337	Rangoon Goa	80.40 \pm 0.05	1140.91 \pm 5.07	3.78 \pm 0.52	2.24 \pm 1.05	3.04 \pm 0.98	974.33 \pm 10.77
338	Rani tella kayalu	81.51 \pm 0.16	1140.32 \pm 12.26	3.04 \pm 0.42	5.98 \pm 1.26	10.39 \pm 0.05	1049.43 \pm 8.22
339	Rasamgola	80.54 \pm 0.17	4316.57 \pm 9.91	4.47 \pm 0.63	10.55 \pm 0.33	5.6 \pm 0.1	3758.85 \pm 6.58
340	rataul	78.72 \pm 0.07	1679.90 \pm 5.20	3.91 \pm 0.40	1.7 \pm 1.25	2.76 \pm 0.63	958.81 \pm 9.34
341	Ratna	74.33 \pm 0.29	1653.86 \pm 28.78	8.83 \pm 0.08	5.21 \pm 0.23	4.08 \pm 0.38	945.78 \pm 6.59
342	ratnagiri alphonso	81.52 \pm 0.04	1683.85 \pm 9.90	4.40 \pm 0.75	1.22 \pm 0.256	2.65 \pm 0.45	963.99 \pm 1.81
343	Ratta Gola	85.87 \pm 85.72	1271.50 \pm 24.47	3.78 \pm 0.71	3.006 \pm 0.82	3.016 \pm 0.73	954.9 \pm 9.08
344	Red colour	85.74 \pm 0.12	1274.93 \pm 5.69	4.43 \pm 0.15	1.56 \pm 0.37	2.64 \pm 0.35	556.46 \pm 7.6
345	Rehman Pasand	76.76 \pm 0.12	869.48 \pm 26.76	3.76 \pm 0.60	1.136 \pm 0.75	1.95 \pm 0.06	554.1 \pm 4.18
346	Risa Patti	68.24 \pm 0.12	1764.58 \pm 9.34	5.35 \pm 0.12	2.95 \pm 0.69	3.473 \pm 0.58	1590.16 \pm 5.35

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
347	Rital	86.32±0.07	1354.04±12.34	4.77±0.38	11.34±0.125	3.76±0.43	1028.94±6.05
348	roos	79.85±0.15	2077.26±27.74	3.98±0.25	1.95±0.495	2.78±0.13	1031.43±5.06
349	ropdya	87.85±0.04	1141.70±8.56	3.79±0.52	2.26±0.48	2.68±0.25	641.41±12.89
350	rote	79.84±0.09	2149.04±12.54	4.97±0.38	1.87±0.109	3.036±0.28	581.63±17.06
351	Royal special	81.54±0.07	1914.59±9.15	5.81±0.30	2.45±0.59	3.53±0.06	1556.78±12.48
352	Rumani	84.42±0.19	1237.20±7.86	1.52±0.18	3.55±0.7	4.25±0.13	1139.35±6.41
353	Rumani X neelam	80.47±0.05	1445.98±16.91	11.95±0.38	1.69±0.41	3.03±0.371	445.3±9.6
354	Sabre	87.76±0.13	864.69±2.10	0.89±0.14	2.42±0.8	2.065±0.32	447.37±19.25
355	sada bahar	79.80±0.12	1857.91±4.70	14.08±0.57	6.04±0.17	8.02±0.091	1838.33±15.9
356	safdar pasand	81.85±0.11	1485.06±18.78	2.31±0.97	1.39±0.16	6.45±0.097	1051.07±5.05
357	Safeda	78.73±0.19	1128.50±6.04	1.61±0.45	10.38±0.07	1.63±0.3	1053.39±6.81
358	Safeda Mulgoa	77.55±0.07	1177.89±7.77	3.76±0.27	1.39±0.7	2.49±0.16	932.78±22.3
359	Sai Sugand	80.26±0.22	2174.64±10.66	2.56±0.10	0.74±0.47	1.61±0.177	2054.9±7.09
360	Sajan	81.45±0.16	872.87±3.16	5.22±0.15	2.49±0.13	1.613±0.266	315.93±9.07
361	Sale Bhai Amdi	80.22±0.03	1745.97±7.15	5.55±0.60	2.61±0.11	4.4±0.13	1238.2±22.82
362	Samar best X Mahamuda	83.86±0.12	1036.20±27.14	4.39±0.15	1.41±0.21	2.48±0.67	831.21±13.33
363	Samar-e-behist	80.01±0.03	2260.76±24.95	4.15±0.53	1.83±0.57	4.74±0.13	2142.08±7.06
364	Sanakulu X No.5	77.23±0.07	2546.40±0.81	10.27±0.07	15.37±0.34	2.72±0.37	2245.18±11.09
365	Sannakulu	84.44±0.12	1256.20±10.53	5.28±0.16	3.42±0.31	1.68±0.19	1035.67±2.78
366	sardar	83.77±0.25	1470.72±1.46	6.89±0.62	2.82±0.14	3.8±0.34	332.59±13.63
367	Sardar pasand	80.26±0.09	882.66±12.71	4.27±0.30	1.31±0.24	1.75±0.53	553.87±11.22
368	saru	76.58±0.04	834.00±4.38	4.15±0.13	1.16±0.06	1.3±0.07	546.32±19.5
369	Section 19	86.87±0.08	2869.70±11.06	3.80±0.44	1.736±0.049	2.43±0.13	2569.55±5.53
370	Selding – dasheri	75.29±0.04	1526.71±5.67	2.90±0.53	2.03±0.53	2.92±0.33	955.86±8.67
371	Sensation	73.81±0.03	1161.18±11.56	3.84±0.37	3.13±0.375	4.22±0.714	1049.59±6.57
372	sepia	76.20±0.08	1955.51±31.07	13.94±0.35	5.94±0.76	8.05±0.095	1834.2±9.25
373	seri khas	81.26±0.07	1686.49±163.67	1.84±0.70	2.38±0.96	7.13±0.53	1055.37±7.68
374	Shabath bhob	79.60±0.06	2798.87±49.84	1.80±0.36	2.55±0.67	1.02±0.21	2545.4±3.43
375	Shajehan	83.24±0.14	706.09±2.59	2.97±0.68	1.94±0.67	2.376±0.5	577.03±24.94
376	Shakkargola	79.35±0.06	2720.13±22.52	10.78±0.32	4.18±0.34	5.63±0.12	2115.54±3.21
377	Shaknam gutti	77.23±0.09	2750.57±36.36	14.98±0.35	2.72±0.61	13.94±0.513	1916.22±23.38
378	Shams-us-samar	86.35±0.03	1036.93±5.40	4.03±0.21	2.91±0.24	1.95±0.087	985.46±1.15
379	Sharbati Borgin	83.11±0.04	2766.57±8.11	3.51±0.65	2.77±0.27	4.1±0.94	2528.72±16.14
380	sharbati gadi	75.78±0.04	1241.39±24.88	6.57±0.62	1.9±0.29	3.78±0.537	1450.61±16.29
381	Shederiya Akhadi	77.10±0.03	6542.27±41.01	1.65±0.44	2.46±0.13	5.1±0.45	5568.69±5.49

contd. table 2

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
382	shendrya	81.86 \pm 0.10	965.17 \pm 10.61	3.52 \pm 0.52	2.96 \pm 0.08	3.14 \pm 0.247	349.14 \pm 6.62
383	Shendrya Mamidi	77.17 \pm 0.02	933.35 \pm 16.20	4.73 \pm 0.52	0.95 \pm 0.27	5.83 \pm 0.41	671.1 \pm 18.01
384	Shendrya X Himayat	86.37 \pm 0.03	1075.71 \pm 23.95	10.58 \pm 0.05	1.49 \pm 0.06	2.05 \pm 0.418	978.03 \pm 26.37
385	Shravani	76.41 \pm 0.35	3080.69 \pm 19.99	3.89 \pm 0.32	4.71 \pm 0.54	5.01 \pm 0.22	2972.66 \pm 16.8
386	Sindhee	80.02 \pm 0.15	1666.96 \pm 12.06	4.57 \pm 0.54	3.16 \pm 0.56	3.006 \pm 0.61	1346.56 \pm 3.81
387	Sindhura	73.47 \pm 0.08	845.19 \pm 11.27	12.04 \pm 0.28	3.525 \pm 0.106	2.34 \pm 0.27	480.63 \pm 15.16
388	Sindhura Arthi	86.17 \pm 0.08	3825.14 \pm 17.34	2.10 \pm 0.69	2.49 \pm 0.457	3.61 \pm 0.51	3658.43 \pm 8.97
389	siroli	80.34 \pm 0.08	1939.68 \pm 20.20	13.90 \pm 0.30	6.05 \pm 0.596	7.35 \pm 0.78	1838.17 \pm 8.81
390	sita bhog	78.68 \pm 0.03	5432.73 \pm 3.81	1.68 \pm 0.28	2.58 \pm 0.41	4.53 \pm 0.53	1555.19 \pm 27.01
391	Sora	83.24 \pm 0.09	2732.54 \pm 20.82	1.27 \pm 0.27	1.72 \pm 0.56	1.86 \pm 0.345	2548.95 \pm 29.8
392	Sora X Neelam	73.07 \pm 0.05	1262.34 \pm 7.68	13.26 \pm 0.37	1.57 \pm 0.69	2.57 \pm 0.061	1056.96 \pm 10.99
393	Sri khas	84.47 \pm 0.44	1198.41 \pm 89.35	14.63 \pm 0.50	1.75 \pm 0.1	2.16 \pm 0.44	980.18 \pm 21.79
394	Sultan Buzurg	78.59 \pm 0.05	1937.09 \pm 14.33	6.53 \pm 0.65	1.47 \pm 0.09	9.03 \pm 0.528	1454.73 \pm 35.79
395	Sultan US Samar	81.40 \pm 0.02	875.15 \pm 13.22	7.94 \pm 0.35	1.06 \pm 0.18	1.86 \pm 0.07	558.81 \pm 14.73
396	sunder shah	79.18 \pm 0.04	2345.65 \pm 3.15	2.18 \pm 0.57	3.69 \pm 0.51	1.39 \pm 0.085	2249.22 \pm 6.6
397	Sura amrutham	72.17 \pm 0.07	1847.69 \pm 5.36	13.73 \pm 0.70	1.82 \pm 0.2	2.6 \pm 0.47	1163.19 \pm 3.16
398	Suriyam Murthan	82.23 \pm 0.11	1647.95 \pm 11.04	10.39 \pm 0.15	4.44 \pm 0.18	1.48 \pm 0.16	1454.39 \pm 5.57
399	Surkha Culcutta	88.73 \pm 0.10	4460.07 \pm 30.25	11.41 \pm 0.05	9.43 \pm 0.83	5.11 \pm 0.21	3485.35 \pm 7.9
400	Surmedani	78.26 \pm 0.09	3155.48 \pm 12.37	15.78 \pm 0.32	5.75 \pm 0.2	1.55 \pm 0.08	3050.07 \pm 8.62
401	Surun gudi	83.61 \pm 0.03	2346.61 \pm 9.66	3.26 \pm 0.28	1.98 \pm 0.68	2.42 \pm 0.14	2225.62 \pm 19.68
402	Suryambrutham	83.71 \pm 0.03	945.26 \pm 21.81	10.30 \pm 0.21	2.75 \pm 0.59	3.75 \pm 0.7	815.95 \pm 8.32
403	Suvarna rekha	84.22 \pm 0.04	3459.55 \pm 8.52	10.37 \pm 0.05	5.93 \pm 0.43	2.49 \pm 0.45	3164.98 \pm 21.28
404	Suvarna Sindhura	75.85 \pm 0.12	5449.54 \pm 34.57	1.97 \pm 0.59	4.03 \pm 0.41	2.72 \pm 0.34	4654.18 \pm 1.02
405	Suwarana Butto	83.32 \pm 0.13	15613.50 \pm 242.27	1.73 \pm 0.64	1.58 \pm 1.16	2.07 \pm 0.63	11536.19 \pm 54.72
406	Swantham	83.53 \pm 0.10	2734.32 \pm 15.18	3.22 \pm 0.26	2.52 \pm 0.18	3.13 \pm 0.2	11543.69 \pm 45.44
407	Swarna Jehangir	78.36 \pm 0.04	843.74 \pm 17.11	2.87 \pm 0.28	1.48 \pm 0.61	2.81 \pm 0.39	124.32 \pm 12.44
408	T/R – 16	80.61 \pm 0.07	983.14 \pm 4.01	3.47 \pm 0.20	2.41 \pm 0.13	0.87 \pm 0.17	211.32 \pm 4.88
409	T/R – 17	82.54 \pm 0.08	1084.89 \pm 11.16	4.5 \pm 0.58	2.54 \pm 0.82	2.73 \pm 0.58	856.6 \pm 7.28
410	T/R 46	81.42 \pm 0.06	1152.78 \pm 12.32	2.77 \pm 0.43	1.66 \pm 0.53	3.79 \pm 0.39	1055.27 \pm 9.5
411	Taimur pasand	80.69 \pm 0.08	1528.97 \pm 6.83	3.46 \pm 0.48	2.08 \pm 0.07	1.6 \pm 0.026	990.16 \pm 5.95
412	Tella gulabi	82.55 \pm 0.07	1767.99 \pm 4.56	10.66 \pm 0.52	1.82 \pm 0.65	1.64 \pm 0.313	1567.26 \pm 2.91
413	Tephala	80.50 \pm 0.03	1633.94 \pm 22.00	4.24 \pm 0.22	3.23 \pm 0.5	10.75 \pm 0.48	1285.77 \pm 11.59
414	Thambva	76.54 \pm 0.09	2165.90 \pm 19.13	0.95 \pm 0.11	3.16 \pm 0.42	3 \pm 0.58	1553.93 \pm 9.81
415	Tirsapati	84.84 \pm 0.10	1878.35 \pm 15.14	2 \pm 0.59	4.62 \pm 1.03	1.94 \pm 0.51	1569.68 \pm 6.55
416	Tofancha	81.27 \pm 0.06	2253.74 \pm 5.67	7.66 \pm 0.4	1.92 \pm 0.12	5.22 \pm 0.4	2083.86 \pm 16.43

contd. table 2

Indian Mango Varieties: Carotenoids' Profiling & Distribution

Sl. No.	Varieties Name	Moisture (g/100g)	Total carotenoids ($\mu\text{g}/100\text{g}$)	Lutein ($\mu\text{g}/100\text{g}$)	Zeaxanthin ($\mu\text{g}/100\text{g}$)	β -Crypto- xanthin ($\mu\text{g}/100\text{g}$)	β -Carotene ($\mu\text{g}/100\text{g}$)
417	Tota puri	80.72 \pm 0.09	933.39 \pm 10.80	13.56 \pm 1.02	2.6 \pm 0.42	4.48 \pm 0.79	622.17 \pm 26.46
418	Totancha	77.54 \pm 0.07	1944.21 \pm 17.39	4.76 \pm 0.32	2.27 \pm 0.94	11.823 \pm 0.66	1765.94 \pm 2.54
419	Turpentine	81.13 \pm 0.09	1156.55 \pm 6.95	3.84 \pm 0.37	3.88 \pm 0.56	0.53 \pm 0.113	1239.74 \pm 7.63
420	U.K.	74.76 \pm 0.12	2528.16 \pm 15.94	2.13 \pm 0.21	2.54 \pm 0.37	4.3 \pm 0.21	1446.15 \pm 37.37
421	Urindhu	71.39 \pm 0.17	1237.27 \pm 10.69	4.63 \pm 0.58	2.79 \pm 0.23	3.2 \pm 0.076	1033.11 \pm 11.85
422	Vanraj	74.37 \pm 0.05	1779.44 \pm 14.91	10.65 \pm 0.53	1.5 \pm 0.14	1.83 \pm 0.54	1555.66 \pm 20.11
423	Vasi Badami	80.84 \pm 0.11	10644.97 \pm 68.82	2.60 \pm 0.66	10.41 \pm 0.11	5.47 \pm 0.8	9850.89 \pm 4.24
424	Vattam	80.54 \pm 0.07	3156.51 \pm 11.61	5.84 \pm 0.66	1.79 \pm 0.69	11.52 \pm 0.421	2349.93 \pm 5.74
425	Vazeer pasand	85.67 \pm 0.18	1039.26 \pm 15.45	4.46 \pm 0.27	14.35 \pm 0.1	10.46 \pm 0.1	976.76 \pm 11.56
426	Willard	72.99 \pm 0.03	1436.39 \pm 23.51	5.95 \pm 0.30	2.91 \pm 0.48	2.68 \pm 0.47	1031.41 \pm 12.35
427	Yellai Kolam Born	80.59 \pm 0.09	1152.35 \pm 14.47	5.58 \pm 0.13	1.44 \pm 0.11	3.53 \pm 0.085	1052.97 \pm 6.76
428	Yellai Mamidi	80.67 \pm 0.10	2138.94 \pm 8.17	2.30 \pm 0.39	1.83 \pm 0.27	3.69 \pm 0.18	2019.94 \pm 4.4
429	Yellow arati	80.22 \pm 0.04	1350.34 \pm 5.41	3.92 \pm 0.30	3.57 \pm 0.09	0.63 \pm 0.21	1238.01 \pm 6.28
430	Yerra anmol	80.85 \pm 0.09	1884.37 \pm 16.66	6.10 \pm 0.13	5.15 \pm 0.16	6.46 \pm 0.19	1233.25 \pm 4.599
431	Yerra arthi	76.73 \pm 0.11	1356.48 \pm 8.04	5.50 \pm 0.14	2.41 \pm 0.2	2.13 \pm 0.13	922.11 \pm 10.05
432	Yerra Mulgoa	70.76 \pm 0.07	1161.63 \pm 8.31	10.31 \pm 0.05	4.39 \pm 0.15	1.71 \pm 0.25	976.38 \pm 27.5
433	Yerra sa haz	79.53 \pm 0.02	1549.7 \pm 8.11	1.46 \pm 0.02	6.3 \pm 0.06	4.55 \pm 0.47	1443.49 \pm 17.2
434	Yerrarati	82.12 \pm 0.04	1359.02 \pm 34.69	6.33 \pm 0.18	2.77 \pm 0.69	3.09 \pm 0.08	721.97 \pm 7.18
435	Zafrani Gola	80.47 \pm 0.05	835.52 \pm 17.98	3.59 \pm 0.11	3.44 \pm 0.29	1.66 \pm 0.12	530.85 \pm 29.83
436	Zafran-Zaikha	80.60 \pm 0.04	1154.04 \pm 13.29	5.83 \pm 0.36	4.63 \pm 0.34	1.51 \pm 0.22	981.45 \pm 17.66
437	Zarda	84.19 \pm 0.05	1747.78 \pm 17.90	10.46 \pm 0.13	1.7 \pm 0.26	1.58 \pm 0.15	1559.24 \pm 8.65
438	Zardalu	84.53 \pm 0.06	562.91 \pm 26.98	4.93 \pm 0.54	2.55 \pm 0.49	1.68 \pm 0.08	468.49 \pm 5.15
439	Zuvedrathiyamamidi	85.85 \pm 0.11	848.85 \pm 16.87	2.34 \pm 0.12	1.2 \pm 0.23	1.94 \pm 0.15	266.85 \pm 11.91

severity after adjustment for age, sex, education, hypertension, and diabetes [26]. Human studies have demonstrated the presence of Lutein and Zeaxanthin in the skin. Animal studies have provided evidence of effective protection against ultraviolet light-induced skin damage [28]. Therefore role of Zeaxanthin in human health is widening. Thus it is interesting to enumerate the food sources of Lutein and its coexistent isomer, Zeaxanthin. Present study additionally screened for Zeaxanthin in mango varieties and it is found in the range of 0.02 $\mu\text{g}/100$ to 55.40 $\mu\text{g}/100\text{g}$ of edible pulp. The average content in the mango varieties is 2.94 $\mu\text{g}/100\text{g}$. The highest

Zeaxanthin content with a value of 55.40 $\mu\text{g}/100\text{g}$ is found in Paipasha followed by Panakalu with 21.45 $\mu\text{g}/100\text{g}$ and Dashehari with 20.8240 $\mu\text{g}/100\text{g}$. The lowest Zeaxanthin content of 0.73 $\mu\text{g}/100\text{g}$ was observed in *Baramasi X Max*, *Rehman Pasand*, *Mankurad*, *Zuvedrathiyamamidi*, *ram phalya*, *rataul*, *ratnagiri alphonso*, *Chausa*, *Sultan US Samar*, *firangi ladwa*, *Gola langda*, *bajipur langra*, *Shendrya Mamidi*, *Mulgoa Goa black 32*, *Safeda Mulgoa*, *Dashehari Mehmooda*, *Mango Green (Unripe)*, *Raj manu*, *Intima*, *Narela*, *Burshanguti*, *KO 22*, *Suwarana Butto*, *Sai Sugand*, *Intemax* etc.,. Around 178 mango fruits contained an average of 1.48 $\mu\text{g}/100\text{g}$ of Zeaxanthin.

CONCLUSIONS

Analytical data of moisture, Beta carotene, Lutein, Beta Cryptoxanthin and Zeaxanthin contents of commonly consumed Indian mango varieties (439 Nos.) are concurrently reported for the first time. The quantified data presented will be helpful for estimating the dietary intake of carotenoids as well as Vitamin A (retinol activity equivalents) from mango fruits in the Indian population. Since the health benefits of the reported carotenoids is well established, we opine that the data could be used for enhancing the utility of different mango varieties as a source of pro-vitamin A carotenoids to alleviate vitamin A deficiency, particularly among children. Since mango is the chief ingredient in many commercial food products such as fruit bars and juices that are abundantly and ubiquitously available in India, the nutrient values in the present report could also provide wide range of options for the selection of suitable mango varieties for food production, processing and manufacture. Although the effect of processing and shelf life on the carotenoids content need further studied, it appear that the mango-based products have potential to be utilized as source of carotenoids particularly during off seasons.

CONFLICT OF INTEREST

Authors declare no conflict of interest.

ACKNOWLEDGMENTS

The authors wish to thank Director, National Institute of Nutrition, Hyderabad for providing opportunity to do the work.

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