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Comparison of fruit characteristics of exotic mango cultivars under agroclimatic conditions of Shujabad, Punjab, Pakistan

Faheem Khadija[1]*, Muhammad Azhar Bashir[1], Javed Iqbal[1], Sidra Kiran[1], Muhammad Shahzad Zafar[1], Ghulam Mustafa[1], Zahoor Hussain[2] and Muhammad Shafiq[3]

[1]Mango Research Station, Basti Malook Road, Shujabad, Pakistan
[2]The Department of Horticulture, Ghazi University, Dera Ghazi Khan, Pakistan
[3]Plant Production Department, College of Food and Agricultural Sciences, King Saud University, Riyadh, Kingdom of Saudi Arabia

*Corresponding author: Faheem Khadija (fkdurani@gmail.com)

Abstract

Mango (*Magnifera indicia* L.), the king of fruit, 2nd most important fruit crop in Pakistan after Citrus, is facing serious threats in terms of growth, yield and quality. The current study was conducted on the exotic cultivars of mango which are planted at Mango Research Station-Shujabad and the results showed significant differences among the different exotic cultivars of mango under the climatic conditions of Shujabad-Pakistan. However, the higher fruit weight (411.67 g) was observed in the mango cv. Indo-Chinese Late followed by the Sapa (319.67 g), and Carabao Lamao (229.67 g). However, the minimum fruit weight was observed in mango cv. Banana Long (57.33 g), Dasi (89.00 g) and Crimson blush (107.33 g). During the current study, mango seed and stone characteristic was observed and the results showed significant differences among the exotic cultivars of mango under the climatic conditions of Shujabad-Multan-Pakistan. The higher seed weight of Sapa (22.83 g), followed by the Indo-chinese Late (17.83 g), Crimson Blush (15.83 g). While the minimum seed weight was observed in mango cv. Carabao Lamao (1.90 g) followed by Banana Long (7.83 g). It is concluded from the current study that exotic mango cv. Indo-Chinese Late performed better as compared to all other exotic cultivars of mango under climatic conditions of Shujabad.

Keywords: Exotic, Fruit, Mango cultivars, Performance, Quality, Stone

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Introduction

There is a strong and expanding demand for tropical fruit in the international markets as well as locally. Pakistan is the 5th important largest mango producing country in the world and mango is known as national fruit crop of Pakistan. However, mango production from Pakistan is about 1.72 million tons (MT) from 168.6 thousand hectares of area. Mango is the 2nd most cultivated fruit after citrus in Pakistan and very delicious, attractive and rich in nutrition (Grewal et al., 2024). Mango (*Mangifera indica* L.) belongs to the very famous Anacardiaceae family which has 69 species and 27 has very famous edible fruit in different countries of the world (Bompard, 2009; Gao et al., 2011; Lora & Hormaza, 2018; Wang et al., 2020; Zhou et al., 2020). It is second most important fruit after citrus in Pakistan which is also most popular in ninety tropical and sub-tropical countries in the world. It is very delicious fruit which belongs to the genus *Mangifera* which *has* $2n = 40$ and $n = 20$ chromosomes. Mango is part of human diet because it is very rich in vitamins and minerals and has unique flavor and taste (Mumzuroglu et al., 2003). It is most popular fruit in the world (Karishna et al., 2009) hence known as "King of the Fruit".

Pakistan is a leading mango producing country in the world which approximately 1.72 million tons from 169 thousand hectares during the year 2024 and hence have 5th ranked among mango producing country (Grewal et al., 2024). Meanwhile, Pakistan has a significant share in the world fresh fruit market (Khan et al., 2015). Mango is produced in Multan, Muzaffargarh, Shujabad, Layyah, Faisalabad and Dera Ghazi Khan in Punjab and Hyderabad, Mirpur, Sukkur Khas, Nawab Shah in Sindth while Dera Ismael Khan in KPK (Jilani et al., 2010; Rajwana et al., 2011). However, Multan is known as city of mango and also called the heart of mango. Multan is the 6th biggest city of regarding mango production in Pakistan (Tahir et al., 2012). More than 250 cultivars of mango are grown in Pakistan (Riaz et al., 2018; Zahoor et al., 2023). However, Sindhri and Chaunsa are the most famous cultivars in Pakistan. The mango harvesting starts in Pakistan during the months of May and remained till August-September. Mango is an important fruit of Pakistan and Chaunsa, Sindhri, Dusehri as well as Anwar Retaul are the leading cultivar of mango which are grown in all over Pakistan.

Characterization is an important aspect for the improvement of any type of existing germplasm. The variation exists among different cultivars of mango and even it may occur among fruit characters may be due to difference in soil, climate or because

of variable rootstock used in propagation (Jagirdar & Maniyar, 1960). Unfortunately, information regarding the physico-morphological and physico-chemical characteristics of mango varieties growing under different regions of Pakistan is scanty. Only a few characters of a limited number of cultivars have been studied (Jilani et al., 2010; Rajwana et al., 2011; Naz et al., 2014; Khan et al., 2015; Azmat et al., 2016; Zahoor et al., 2023; Ansari et al., 2026). Similarly, botanically, reported that within *M. indica*, there are two distinct types that can be distinguished on the basis of their mode of reproduction and their respective centers of diversity: (1) a subtropical group with mono-embryonic seed (Indian type); and (2) a tropical group with poly-embryonic seed (Southeast Asian) (Mukherjee & Litz, 2009; Warschefsky & Wettberg, 2019).

Mango is a premier fruit which exhibits many variations among different cultivars regarding flowering and fruiting. It has been reported that these variations among flowering and fruiting may be due variation in environment condition's, tree age, growth such as dry and humid tropics (Jameel et al., 2018). The inflorescence is generally an axillary or terminal panicle bearing hermaphrodite and male flowers. The androecium consists of stamens and staminodes, altogether five in number, of which usually one, or rarely two, is fertile and the rest are sterile. The ovary in mango flower is sessile and one-celled. The pollen grains are of variable shapes, with the size varying from 20 to 35 micron and are 3-monocolporate. Pollination is essential for fruit setting in mango. About 50% or more of the perfect flowers remain unpollinated in nature. Being highly cross-pollinated and owing to the fact that most of superior clones of mango "Indian" and "Floridan" cultivars are nonembryonic, propagation through sexual means does not ensure true-to-type plant production. As mango is cross-pollinated, this is affected by insects such as the common house fly, honeybees and thrips, and possibly by other insects (Mukherjee & Litz, 2009; Kumar et al., 2014).

The main exportable mango cultivars from Pakistan are Sindhri, Sammar Bahisht Chaunsa, Chenab Gold, Sufaid Chaunsa and Azeem Chaunsa which comprise of major exports of the country. These mango cultivars are familiar due to their unique taste, flavor and season of availability to the consumers in the global market. SB Chaunsa cultivation comprised 36% and Sindhri occupied 18%, while Sufaid Chaunsa covered an area of 16% in the Punjab province under its cultivation. However, more than 1000 cultivars of mango are grown throughout the world (Wang et al., 2020). Pakistan is 5th largest producer of mango in the world. However, growers have limited choice of mango cultivars. Therefore, there is need to introduce new mango cultivars to compete with the major mango producing country such as India. In the current study, 10 different exotic mango cultivars were collected from research area of Mango Research Station, Shujabad and a comparison of fruit, stone and seed as well as internal quality characteristic of exotic mango cultivars were conducted under the climatic conditions of Shujabad.

Materials and Methods

Location and climatic conditions

The current research work was conducted at Mango Research Station, Shujabad, which is famous city to produce mango in Pakistan. However, the average annual temperature ranges from 15 to 45°C in winter and summer, respectively. Meanwhile, the average annual rainfall ranges between 200-300 mm. These conditions affect the grafting success, requiring careful management of nutrition and disease control (https://www.accuweather.com/en/pk/multan). Ten mango cultivars were used during this study (Table 1; Fig. 1).

Table 1 Ten mango cultivars used as experimental Treatments

Treatments	Mango cultivars
T_1	Banana Long
T_2	Rosa
T_3	Rocdale Siagon
T_4	Pirie
T_5	Crimson Blush
T_6	Carabao Lamao
T_7	Koew
T_8	Olour
T_9	Sapa
T_{10}	Indo-Chinese Late

Fruit weight, length and width

The fruit weight was measured by using digital balance and expressed in gram. The fruit length was measured by digital vernier caliper, and length was measured in mm. The fruit width was measured by vernier caliper, and length was expressed in mm.

Stone and seed weight

The stone and seed weight were measured by using digital weighing balance.

Stone and seed length as well as width

The seed stone length/width and seed length/width (mm) were measured by vernier caliper. Similarly, fruit flavor, sinus, juiciness, polyembryony and mono-embryony as well as fibers content in different exotic cultivars of mango were also reported.

Total soluble solids (TSS), Titratable acidity and TSS/TA ratio

Total soluble solids (TSS) of each mango cultivars were measured by using digital refractometer (ATAGO, RX 5000). Reading was noted and it was expressed in percentage. The acidity of juice was determined in terms of percent anhydrous malic acid. TSS/TA ratio was calculated by dividing TSS with TA and expressed in percent.

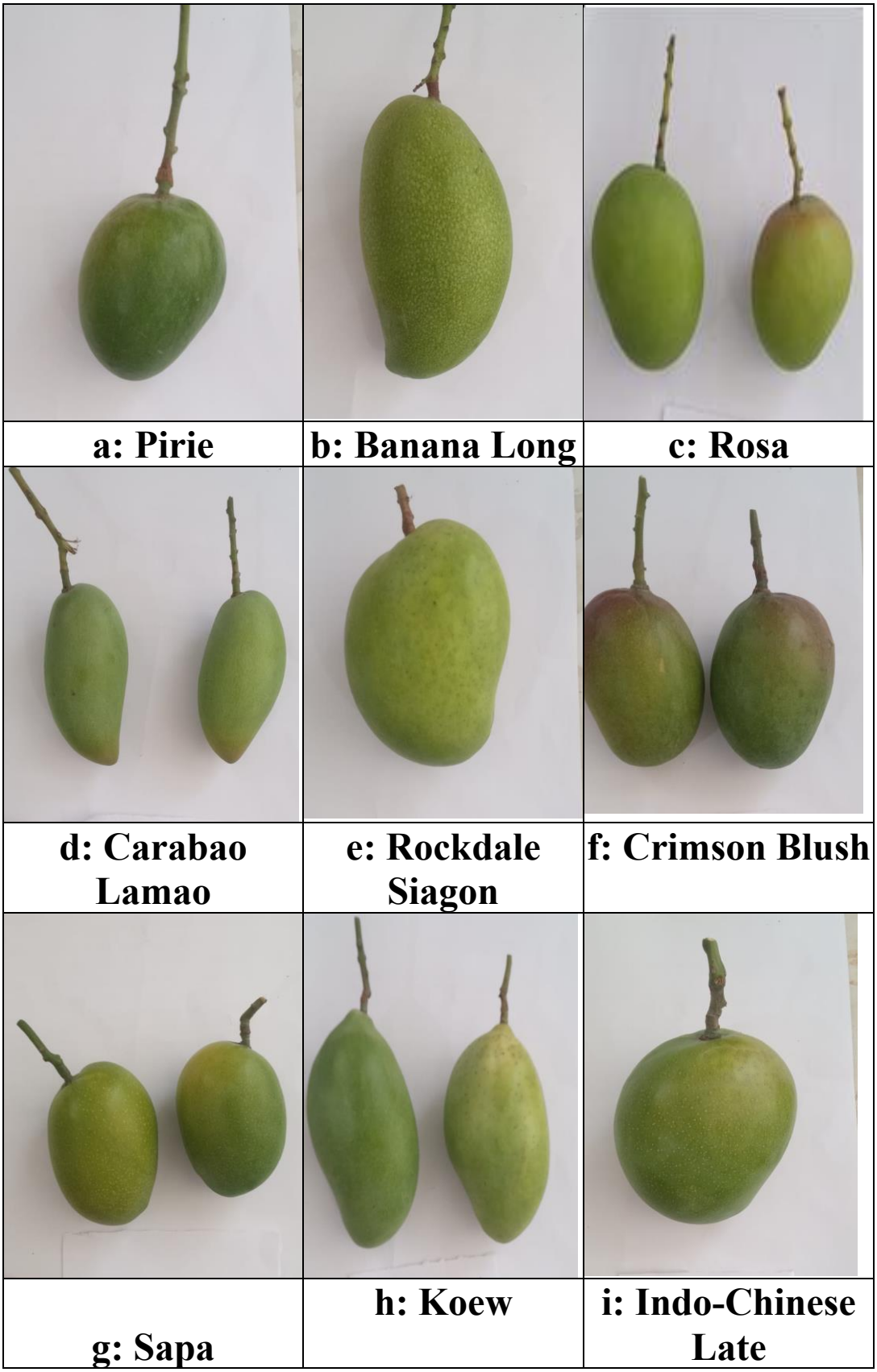

Fig. 1 Different exotic cultivars of mango: a (Pirie), b (Banana Long), c (Rosa), d (Carabao Lamao), e (Rockdale Siagon) f (Crimson Blush), g (Sapa), h (Koew), I (Indo-Chinese Late)

Statistical analysis

The Statistix 8.1 was used for analysis of data by using least significant difference (LSD) test at 5 percent probability level (Steel et al., 1997).

Results and Discussion

Fruit characteristics

The results showed significant differences among the different exotic cultivars of mango under the climatic conditions of Shujabad-Pakistan. However, the higher fruit weight (411.67 g) was observed in the mango cv. Indo-chinese Late followed by the Sapa (319.67 g), and Carabao Lamao (229.67 g) (Table 1). However, the minimum fruit weight was observed in mango cv. Banana Long (57.33 g), Rosa (89.00 g) and Crimson Blush (107.33 g). Similarly, the results showed significant variation among different exotic cultivars of mango regarding fruit width under the climatic conditions of Shujabad. Meanwhile, the highest fruit width was observed in mango cv. Indo-chinese Late (8.67 cm) followed by Carabao Lamao (7.17 cm), Sapa (6.33 cm) and Koew (5.67 cm). Whereas, minimum fruit width was observed in mango cv. Banana Long (4.00 g), Rosa (4.33 g) and Pirie (4.83 cm). The highly significant variations were also noted regarding fruit length among different exotic cultivars of mango under the climatic conditions of Shujabad Punjab Pakistan. However, the higher fruit length was observed in mango cv. Sapa (14.67 cm) followed by Indo-chinese Late (11.33 cm), Carabao Lamao (9.33 cm) and Pirie (8.33 cm). However, minimum fruit length was observed in Banana Long (5.83 cm) followed by Rosa (7.67 cm).

Table 1 Fruit characteristic of exotic cultivars of mango under agroclimatic conditions of Shujabad

Treatments	Fruit weight (g)	Fruit width (cm)	Fruit length (cm)
Banana Long	57.33 g	4.00 h	5.83 f
Rosa	89.00 fg	4.33 gh	8.00 de
Rockdale Siagon	186.00 d	5.50 de	7.67 de
Pirie	119.00 f	4.83 fg	8.33 d
Crimson Blush	107.33 f	5.00 ef	7.50 de
Carabao Lamao	229.67 c	7.17 b	9.33 c
Koew	157.67 de	5.67 d	8.17 de
Olour	126.67 ef	5.50 de	7.33 e
Sapa	319.67 b	6.33 c	14.67 a
Indo-Chinese Late	411.67 a	8.67 a	11.33 b
p≤0.05			
	37.814	0.5789	0.84

Any two means in column or a row followed by different letters are significantly different

Total soluble solids (TSS), Titratable acidity (TA) and TSS/TA ratio:

In the current study, mango fruit stone characteristics were also observed and the results showed significant differences among the different exotic cultivars of mango under the climatic conditions of Shujabad-Punjab-Multan. However, the higher TSS (23.80%) was observed in the mango cv. Rosa followed by the Olour (22.00%), Crimson Blush (20.90%), Rockdale Saigon (20.70%). However, the minimum TSS was observed in Sapa (14.60%) followed by Koew (15.00%). The results showed significant variation among different exotic cultivars of mango regarding Titratable acidity (TA) under the climatic conditions of Shujabad (Table 2). Meanwhile, the highest titratable acidity (TA) was observed in mango cv. Sapa (0.77), Indo-Chinese Late (0.50), Rosa (0.37). The highly significant variations were also noted regarding TSS/TA ratio among different exotic cultivars of mango under the climatic conditions of Shujabad. However, the higher TSS/TA ratio was observed in Rosa (66.61%) followed by Crimson Blush (64.14%) Banana Long (56.30 %) However, minimum TSS/TA ratio was observed in Pirie (33.47%) followed by Koew (33.61%). Overall, the result showed significant difference regarding total soluble solids (TSS), titratable acidity (TA) and TSS/TA ratio among different exotic mango cultivars under the climatic conditions of Shujabad.

Stone characteristics

In the current study, mango fruit stone characteristics were also observed and the results showed significant differences among the different exotic cultivars of mango under the climatic conditions of Shujabad-Punjab-Multan. However, the higher stone weight (33.50 g) was observed in the mango cv. Banana Long followed by Rosa (30.50 g), Crimson Blush (24.50 g). However, the minimum stone weight was observed in Indo-chinese Late (11.83 g) followed by Sapa (12.67 g) and Koew (14.00 g). The results showed significant variation among different exotic cultivars of mango regarding stone width under the climatic conditions of Shujabad. Meanwhile, the highest stone width was observed in mango cv. Banana Long (2.00 cm), Indo-chinese Late (1.90 cm). Whereas minimum stone width was observed in Rosa (1.17 cm). The highly significant variations were also noted regarding stone length among different exotic cultivars of mango regarding fruit length under the climatic conditions of Shujabad. However, the higher stone length was observed in Rosa (7.00 cm) followed by Carabao

Lamao (4.33 cm), Indo-chinese Late (2.53 cm) and Rocdale siagon (2.90 cm). However, minimum stone length was observed in Pirie (2.47 cm). Overall, the result showed significant difference among different exotic mango cultivars under the climatic conditions of Shujabad (Table 3).

Table 2 Total Soluble solids, Titratable acidity and TSS/TA ratio characteristic of exotic cultivars of mango under the climatic conditions of Shujabad

Treatments	Total soluble solids (%)	Titratable acidity (%)	TSS/TA ratio (%)
Carabao Lamao	18.43 c	0.50 b	37.75 bc
Olour	22.00 b	0.367 bc	61.36 a
Pirie	16.37 d	0.50 b	33.47 cd
Crimson Blush	20.90 b	0.33 c	64.14 a
Koew	15.00 e	0.47 bc	33.61cd
Rocdale Siagon	20.70 b	0.40 bc	53.77ab
Indo-chines Late	16.50 d	0.50 b	34.03 cd
Sapa	14.60 e	0.77 a	19.55 d
Rosa	23.80 a	0.37 bc	66.61a
Banana Long	18.33 c	0.33 c	56.30 a
p≤0.05			
	1.30	0.16	16.66

Any two means in column or a row followed by different letters are significantly different

Table 3 The stone characteristics of exotic cultivars of mango under agroclimatic conditions of Shujabad

Treatments	Stone weight (g)	Stone width (cm)	Stone length (cm)
Carabao Lamao	17.50 e	1.47 c	4.33 b
Olour	20.17 d	1.67 b	2.60 d
Pirie	24.00 c	1.47 c	2.47 d
Crimson Blush	24.50 c	1.23 d	2.83 d
Koew	14.00 f	1.47 c	2.50 d
Rockdale Siagon	23.67 c	1.43 c	2.90 cd
Indo-Chinese Late	11.83 g	1.90 a	2.53 d
Sapa	12.67 g	1.47 c	2.53 d
Rosa	30.50 b	1.17 d	7.00 a
Banana Long	33.50 a	2.00 a	3.53 c
p≤0.05			
	0.84	0.12	0.64

Any two means in column or a row followed by different letters are significantly different

Seed characteristics

In the study, mango seed characteristic was observed and the results showed significant differences between the exotic cultivars of mango under the climatic conditions of Shujabad-Multan-Pakistan. However, the higher seed weight of Sapa (22.83 g), followed by the Indo-chinese Late (17.83 g), Crimson Blush (15.83 g), Rockdale Siagon (14.83 g), Koew (14.17 g), Pirie (13.17 g), Rosa (9.83 g) and Olour (9.17 g). The minimum seed weight was observed in mango cv. Carabao Lamao (1.90 g) followed by Banana Long (7.83 g) (Table 4). Similarly, the results showed significant variation between different exotic cultivars of mango regarding seed width under the climatic conditions of Shujabad. Meanwhile, the highest seed width was observed in mango cv. Indo-chinese Late (1.50 cm) followed by Koew (1.27 cm), Rockdale Siagon (1.10 cm), Pirie (1.07 cm). Whilst minimum stone width was observed in mango cv. Carabao Lamao and Sapa (0.53 cm), respectively, followed by Banana Long (0.57 cm) and Rosa (0.87 cm). The highly significant variations were noted regarding seed length between different exotic cultivars of mango regarding fruit width under the climatic conditions of Shujabad. However, the higher seed length was observed in mango cv. Sapa (3.43 cm) followed by Indo-chinese Late (3.00 cm), Rosa (2.50 cm), Pirie (2.37 cm) and Koew (2.17 cm). However, minimum stone length was observed in mango cv. Carabao Lamao (1.47 cm) followed by Banana Long (1.53 cm).

Comparative evaluation of fruit quality traits, embryony type, and fiber content in different mango cultivars

During the current study, the organoleptic properties of different mango cultivars were also conducted and the results showed that fruit flavor were also present in the cultivars such as Banana Long, Rosa, Rockdale Siagon, Pirie, Carabao Lamao, Olour, Indo-Chinese late. However, the very poor or no aroma was found from mango cv. Crimson Blush, Koew and Sapa. Similarly, the fruit sinus was present in Rosa, Rocdale siagon, Pirie, Koew and it was absent in the following cultivars such as

Banana Long, Carabao Lamao, Crimson Blush, Olour, Sapa and Indo-chinese Late (Table 5). Similarly, fruit colour between different cultivars were also observed and the results showed that fruit colour was green in the mango cv. Banana Long followed by yellow in the Rosa. However, yellow red fruit colour was observed in the mango cvs. Rockdale Siagon and Olour. While the green + orange fruit colour was observed in mango cv. Pirie followed by Carabao Lamao, Koew and Sapa. The polyembryony and monoembryony is an important character in the mango and the current showed that some exotic cultivars also the polyembryony such as Banana Long, Rockdale Siagon, Crimson Blush, Carabao Lamao, Koew, Olour and Indo-Chinese Late. However, the polyembryony character express was not observed in mango such as Rosa, Pirie and Sapa.

Table 4 The seed characteristics of exotic cultivars of mango under agroclimatic conditions of Shujabad

Treatments	Seed weight (g)	Seed width (cm)	Seed length (cm)
Banana Long	7.83 i	0.57 e	1.53 g
Rosa	9.83 g	0.87 d	2.50 c
Rockdale Siagon	14.83 d	1.10 c	2.00 f
Pirie	13.17 f	1.07 c	2.37 d
Crimson Blush	15.83 c	0.93 d	2.20 e
Carabao Lamao	1.90 j	0.53 e	1.47 g
Koew	14.17 e	1.27 b	2.17 e
Olour	9.17 h	1.03 c	1.97 f
Sapa	22.83 a	0.53 e	3.43 a
Indo-Chinese Late	17.83 b	1.5a	3.00 b
p≤0.05			
	0.49	0.10	0.11

Any two means in column or a row followed by different letters are significantly different

Table 5 Comparison of fruit flavor, fruit sinus, juiciness, fruit color, embryony type, and fiber content among different mango cultivars

Treatments	Fruit flavor	Fruit sinus	Juiciness	Fruit colour	Expressed Poly-embryony	Fibers
Banana Long	Present	Absent	Dry	Green	Poly-embryony	low
Rosa	Present	Present	Juicy	Yellow	Poly-embryony	low
Rockdale Siagon	Present	Present	Dry	Yellow red	Poly-embryony	medium
Pirie	Present	Present	Juicy	Green +orange	Poly-embryony	low
Crimson Blush	Absent	Absent	Juicy	Green red	Poly-embryony	low
Carabao Lamao	Present	Absent	juicy	Green + orange	Poly-embryony	low
Koew	Absent	Present	Dry	Green + orange	Poly-embryony	medium
Olour	Present	Absent	Juicy	Yellow red	Poly-embryony	low
Sapa	Absent	Absent	Dry	Green + orange	Poly-embryony	low
Indo-Chinese Late	Present	Absent	Juicy	Green yellow	Poly-embryony	low

Discussion

Pakistan is leading mango producing country in the world which approximately 1.4 million tons during the year 2025 and hence have 5th ranked among mango producing country. Meanwhile, Pakistan has a significant share in the world fresh fruit market (Khan et al., 2015). Mango is produced in Multan, Muzaffargarh, Shujabad, Layyah, Faisalabad and Dera Ghazi Khan in Punjab and in Hyderabad, Mirpur, Sukkur Khas, Nawab Shah in Sindth while Dera Ismael Khan in KPK (Jilani et al., 2010; Rajwana et al., 2011). However, in Pakistan, mostly growers are producing mango cultivars such as Chounsa (White and Black), Sindhri (From Sindh), Anwar Ratual, Dusahri, and Malda. Therefore, there is need to introduce some new exotic cultivars of mango in Pakistan which may boost the mango Industry of Pakistan. Therefore, the current study was conducted on the exotic cultivars of which are already planted at Mango Research Station-Shujabad.

The results showed significant differences among different exotic cultivars of mango under the climatic conditions of Shujabad-Pakistan. However, the higher fruit weight (411.67 g) was observed in the mango cv. Indo-chinese Late followed by the Sapa (319.67 g), and Carabao Lamao (229.67 g) (Table 1). However, the minimum fruit weight was observed in mango cv. Banana Long (57.33 g), Rosa (89.00 g) and Crimson Blush (107.33 g). However, the current study was supported by the findings of Jilani et al. (2010) and claimed that maximum fruit weight in mango cv. Fajri. While the minimum fruit weight Anwar Ratual (Syamal & Mishra, 1989; Shafqat et al., 1992). Similar findings were also reported by Islam et al. (2019); Ntsoane et al. (2019). Similarly, in the current study the

significant difference was found TSS, TA and TSS/TA ratio in various mango cultivars (Table 2). However, our finding was also supported by the findings of Sing et al. (2012) and Bora et al. (2015). It may be argued that difference in TSS and TA may be due to environment factor or varietal character.

It has been previously reported that mango fruit weight will increase at initial stage and will be reduced to some extent at ripening stage (Mannan et al., 2003). Similar results were also reported by Hulme, (1971), Medlicott and Thompson, (1985), Aina, (1990) and Singha et al. (1991), Naryana et al. (1996) and Noreen et al. (2025). Similarly, the results of the current study showed significant variation among fruit width, and the highest fruit width was observed in mango cv. Indo-chinese Late (8.67 cm) followed by Carabao Lamao (7.17 cm), Sapa (6.33 cm) and Koew (5.67 cm). Whereas minimum fruit width was observed in mango cv. Banana Long (4.00 g), Rosa (4.33 g) and Pirie (4.83 cm). However, the higher fruit length was observed in mango cv. Sapa (14.67 cm) followed by Indo-Chinese Late (11.33 cm), Carabao Lamao (9.33 cm) and Pirie (8.33 cm). However, minimum fruit length was observed in Banana Long (5.83 cm) followed by Rosa (7.67 cm).

The current study was supported by the findings of Bora et al. (2017); Kher & Sharma (2002) who observed significant difference in fruit length and widths among different cultivars of mango. It may be argued that differences may be because of genetic differentiation in different varieties of fruit and the way the environment affects them. Mannan et al. (2003) also claimed that the variability in fruit weight among different cultivars might be due to their genetic and environmental effects as well as cultural practices (Mannan et al., 2003). During the current study, mango seed and stone characteristic was observed and the results showed significant differences among exotic cultivars of mango under the climatic conditions of Shujabad-Multan-Pakistan. However, the higher seed weight of Sapa (22.83 g), followed by the Indo-chinese Late (17.83 g), Crimson Blush (15.83 g). The minimum seed weight was observed in mango cv. Carabao Lamao (1.90 g) followed by Banana Long (7.83 g).

It is reported by different scientists that fruit characteristics such as fruit weight, fruit volume and stone length as well as seed have positive correlations with the mango fruit pulp (Hayat et al., 2024). It is observed that bigger fruit has more pulp and elongated fruit have higher stones. Therefore, this study was current study was strengthened by the observation of Singh et al. (2012); Narvariya et al. (2016). Similarly, Kulkarni et al. (2019) also claimed a large range of diversity in mango germplasm due to their fruit size in India. Similar findings were noted in Kenya (Gitahi et al., 2016) and Sudan (Ahmed & Mohamed, 2015). Similarly, Ansari et al. (2026) also observed the different characteristics of fruit such as fruit width, length, weight, and fruit internal quality attributes like pulp and fiber content. In line with these findings, the present study confirms that fruit traits exhibit greater variability compared to other morphological traits, making them key descriptors for distinguishing mango accessions.

Conclusion

The current study was conducted on the exotic cultivars of mango which are planted at Mango Research Station-Shujabad and the results showed significant differences among different local and exotic cultivars of mango under the climatic conditions of Shujabad-Pakistan. However, the higher fruit weight (411.67 g) was observed in the mango cv. Indo-chinese Late followed by the Sapa (319.67 g), and Carabao Lamao (229.67 g). However, the minimum fruit weight was observed in mango cv. Banana Long (57.33 g), Dasi (89.00 g) and Crimson Blush (107.33 g). During the current study, mango seed and stone characteristic was observed and the results showed significant differences among the exotic cultivars of mango under the climatic conditions of Shujabad-Multan-Pakistan. The higher seed weight of Sapa (22.83 g), followed by the Indo-chinese Late (17.83 g), Crimson Blush (15.83 g). While, the minimum seed weight was observed in mango cv. Carabao Lamao (1.90 g) followed by Banana Long (7.83 g). It is concluded from the current study that exotic mango cv. Indo-chinese Late (was performed better as compared to all other exotic cultivars of mango under climatic conditions of Shujabad.

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