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ASSESSMENT OF ORNAMENTAL BANANA ACCESSIONS FOR FLORAL ATTRIBUTES

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ABSTRACT

The present investigation focussed on assessment of fifteen ornamental banana accessions Acc.1 (R1-8), Acc.2 (R1-11), Acc.3 (R1-76), Acc.4 (R2-9), Acc.5 (R2-52), Acc.6 (R2-92), Acc.7 (MR1-4), Acc.8 (MR2-3), Acc.9 (MR2-7), Acc.10 (SR5-15), Acc.11 (SR7-7), Acc.12 (SR8-9), Acc.13 (SR9-3), Acc.14 (*Musa laterita*) and Acc.15 (*Musa ornata*) for floral attributes was conducted at College of Horticulture, Dr.Y.S.R. Horticultural University Venkataramannagudem during 2023-24. All the accessions exhibited significant variation in terms of various floral attributes. Statistical analysis of data revealed that days taken for emergence of inflorescence recorded minimum in Acc.11 (SR7-7) that was found to be at par with Acc.14 (*Musa laterita*), Acc.10 (SR5-15), Acc.2 (R1-11) and Acc.7 (MR1-4) and in contrast, maximum was recorded in Acc.13 (SR9-3). Pseudo stem height at emergence of inflorescence was recorded minimum in Acc.14 (*Musa laterita*) and was at par with Acc.3 (R1-76), Acc.9 (MR2-7), Acc.10 (SR5-15), Acc.11 (SR7-7), Acc.12 (SR8-9) and Acc.15 (*Musa ornata*). Longest peduncle length was recorded in Acc.6 (R2-92) and shortest in Acc.12 (SR8-9). Peduncle diameter was found maximum in Acc.2 (R1-11) and was found to be at par with Acc.4 (R2-9) while minimum in Acc.13 (SR9-3). Longest rachis was recorded in Acc.2 (R1-11) that was found to be at par with Acc.4 (R2-9) and shortest was recorded in Acc.12 (SR8-9). Number of bracts was recorded maximum in Acc.7 (MR1-4) and minimum was recorded in Acc.12 (SR8-9). The longevity of bract was highest in Acc.14 (*Musa laterita*) and lowest in Acc.13 (SR9-3). Maximum bract anthocyanin content was recorded in Acc.7 (MR1-4) that was found to be at par with Acc.6 (R2-92) and Acc.9 (MR2-7).
Keywords: Banana Accessions, Floral Attributes, anthocyanin

Introduction

The flower consumption at domestic level has been increased tremendously owing to increased urbanization, change in lifestyle, rise in standard of living, and improved aesthetic sense with increasing habit of saying it with flowers. As it is generally thought that floriculture industry is highly dominated by well-known crops like rose, jasmine, marigold, tuberose etc., but there are other group of flower crops which have the same commercial importance. These crops have the potential to replace or alternative to the main flowers crops for their various characters and purpose of their utility. Although, these flower crops have potential, the lack of knowledge about their cultivation and utility among the growers and consumers made them as under exploited flower crops. However, the increasing demand for unique plant species within the ornamental market in recent times has caused a surge in interest in non-traditional crops

like ornamental banana, heliconia, alpinia, hydrangea, ornamental ginger, ornamental pineapple, lisianthus, limonium, stock, rice flower, corn flower etc. Intensification of cultivation of these crops can diversify basket of cut flowers.

Ornamental banana is a newly identified emerging cut flower becoming popular in both Asian and Western countries. It is a tropical plant belonging to the family Musaceae. The genus *Musa* L., which is believed to have originated in Southeast Asia (Ploetz *et al*., 2007), is categorized into five sections (Eumusa, Rhodochlamys, Callimusa, Australimusa, and Ingentimusa) based on the number of chromosomes and morphological characteristics (Stover and Simmonds, 1987), comprises approximately 70 species and over 500 cultivars (Hakkinen and Wallace, 2007). Notable ornamental species from Callimusa and Rhodochlamys include *Musa beccarii*, *M. coccinea*, *M. ornata*, *M. laterita*, and *M. rubra*. There have been significant efforts to create hybrids with desirable traits (Ramajayam *et al*., 2020). These inter specific ornamental banana hybrids can be used as potted plants in home gardens or for landscaping purposes because of their shorter height and smaller girth with erect vibrant inflorescences. Many of ornamental banana species and hybrids possess attractive bract colors like pink, red, bright red, orange-red, orange, orange–pink, yellow, purple, and even green, with less frequency. In tropical regions, these plants require minimal maintenance and flower year-round, making them ideal for aesthetic landscaping (Swangpol *et al.,* 2017).

Given the unique climatic and environmental conditions of the Godavari region of Andhra Pradesh, it was felt essential to evaluate and characterize these accessions for fully understand their ornamental potential. Therefore, this study was conducted with the primary objective of assessing floral characteristics and evaluating the ornamental potential of banana accessions specific to the Godavari zone of Andhra Pradesh.

Material and Methods

The experiment was laid out in Randomized Block Design with two replications under open field conditions at College of Horticulture, Dr. Y.S.R Horticultural University, Venkataramannagudem, West Godavari district, Andhra Pradesh, India. The location falls under 'Agro-climatic Zone-10, humid, East Coast Plain and Hills' (Krishna-Godavari Zone) with an average annual rainfall of 900 mm at an altitude of 34 m (112 feet) above the mean sea level. The experimental site was geographically situated at 16.88º north latitude and 81.45º east longitude with a hot humid summer and mild winter climate. The study included fifteen accessions viz., Acc.1 (R1-8), Acc.2 (R1-11), Acc.3 (R1-76), Acc.4 (R2-9), Acc.5 (R2-52), Acc.6 (R2-92), Acc.7 (MR1-4), Acc.8 (MR2-3), Acc.9 (MR2-7), Acc.10 (SR5-15), Acc.11 (SR7-7), Acc.12 (SR8-9), Acc.13 (SR9-3), Acc.14 (*Musa laterita*) and Acc.15 (*Musa ornata*). Of these, thirteen were interspecific hybrids between *Musa ornata* and *Musa rubra*, *Musa rubra* and *Musa accuminata* subsp. *Zebrina*, *Musa ornata* and *Musa accuminata* subsp. *Zebrina*, and *Musa ornata* and *Musa velutina* and other two were ornamental banana species. Planting material was collected from Centre of Excellence for Research and Training in Protected Cultivation, Dr. YSRHU, Venkataramannagudem (Accessions 1-13) and Horticultural Research Station, Kovvur (Accessions 14 & 15). Observations were recorded on floral attributes viz., days taken for inflorescence, height of pseudo stem at the initiation of inflorescence, peduncle colour, length, diameter and pubescence, rachis position, length, and colour and bract characteristics and statistically analyzed.

Days taken for inflorescence was determined by considering the total number of days taken from planting to the visual emergence of inflorescence was recorded. The height of pseudo stem at the initiation of inflorescence was measured from the ground level to the point of emergence of inflorescence and recorded. Peduncle colour, pubescence and rachis position was assessed using International Plant Genetic Resources Institute (IPGRI) descriptors. The upright and angled orientation of the peduncle was observed and recorded. The length of the peduncle was measured from the leaf crown to the first hand of the fruit. The diameter of peduncle was measured by using Vernier callipers and expressed in centimetres. After the end of male phase, the distance from last hand of fruit to the end of rachis after end of male phase was measured as length of rachis. The colour of rachis was observed and recorded after emergence of inflorescence. Bracts on the inflorescence were counted and recorded, and the duration of male bracts that lasted on inflorescence was observed and recorded in days. The amount of anthocyanin content inbract was estimated by using UV Spectrophotometer as per the procedure detailed by Das *et al.* (2021).

For measurement of bract anthocyanin, approximately 0.5 g of fresh bract tissue samples were homogenized by grinding in 20 ml of extracting mixture solution containing propanol-HCl-H_2O (18:1:81 on v/v). The extraction vials or flasks were incubated in boiling water for 1.5 min. The tubes were incubated in dark for 24 h in the extraction medium at

25°C for the complete pigment extraction. Subsequently, extracts were centrifuged for 40 min at about 5000G and supernatant was collected for recording the absorbance (A) at 535nm and 650nm. The absorbance values at 535nm were corrected for scattering (S) using the A values at 650 nm (A650) using Rayleigh's formula. Thus, corrected A535 nm is considered for actual anthocyanin calculation, since there is no or less absorption by anthocyanin at 650 nm (Das *et al*., 2021). Total anthocyanin was calculated using below formulae:

$$\text{Corrected A535} = \text{A535nm} - \text{A650nm}$$

$$\text{Anthocyanin (mg/100 g)} = (\text{Corrected A535}) \times \text{Volume made up} \times (1/W) \times (1/1000) \times 100$$

Where, W is the weight of bract taken for extraction, and V is volume of the bract extract.

Result and Discussion

Days taken for emergence of inflorescence

The results obtained on days taken for emergence of inflorescence (Table 1) revealed that significantly minimum number of days taken for emergence of inflorescence initiation was in Acc.11 (130.00 days) which was found at par with Acc.14 (139.00 days), Acc.10 (139.00 days), Acc.2 (146.50 days) and Acc.7 (147.00 days) whereas maximum number of days was observed in Acc.13 (191.50 days). On an average, it took 156.39 days for emergence of inflorescence in ornamental banana accessions. Similar results were reported by Dalawai *et al.* (2017) in *Heliconia* genotypes under shade house conditions, Safeena *et al.* (2023) in *Heliconia* genotypes under Pune conditions and Ramajayam *et al.* (2024) in ornamental banana hybrids at NRCB, Thiruvananthapuram. This might be due to plant vigour, genetic makeup and seasonal adaptability of the accessions.

Pseudo stem height at emergence of inflorescence (cm)

Data recorded on pseudo stem height at the initiation of inflorescence was found significantly different amongst accessions and presented in Table 1.The pseudo stem height at the initiation of inflorescence was registered highest in Acc.4 (95.12 cm) which was at par with Acc.1 (87.19 cm) and lowest was recorded in Acc.14 (53.30 cm) which was found to be at par with Acc.11 (53.62 cm), Acc.12 (55.45 cm), Acc.3 (58.70 cm), Acc.15 (60.32 cm), Acc.10 (60.92 cm) and Acc.9 (62.93 cm).The pseudo stem height at inflorescence initiation was primarily considered for potted plant purpose which also resembles the compactness of the plant. In banana cv. Jahaji, Chaudhuri and Baruah (2010) reported maximum pseudo stem height (169.61cm) at inflorescence emergence.

Table 1 : Days taken for emergence of inflorescence (days) and pseudo stem height at emergence of inflorescence (cm) in ornamental banana accessions

Accessions	Days taken for emergence of inflorescence (days)	Pseudo stem height at emergence of inflorescence (cm)
T_1: Acc.1 (R1-8)	165.34	87.19
T_2: Acc.2 (R1-11)	146.50	78.64
T_3: Acc.3 (R1-76)	160.33	58.70
T_4: Acc.4 (R2-9)	165.67	95.12
T_5: Acc.5 (R2-52)	168.33	81.30
T_6: Acc.6 (R2-92)	164.50	72.24
T_7: Acc.7 (MR1-4)	147.00	75.80
T_8: Acc.8 (MR2-3)	162.50	84.72
T_9: Acc.9 (MR2-7)	150.00	62.93
T_{10}: Acc.10 (SR5-15)	139.00	60.92
T_{11}: Acc.11 (SR7-7)	130.00	53.62
T_{12}: Acc.12 (SR8-9)	150.83	55.45
T_{13}: Acc.13 (SR9-3)	191.50	64.59
T_{14}: Acc.14 (*Musa laterita*)	139.00	53.30
T_{15}: Acc.15 (*Musa ornata*)	165.34	60.32
Mean	**156.39**	**69.65**
SEm±	6.50	3.18
CD at 5%	19.71	9.64

Peduncle colour

The variations in peduncle colour in ornamental banana under Godavari zone of Andhra Pradesh was revealed in Table 2. Acc.13 was observed with whitish green coloured peduncle, accessions 3, 10, 11, 12 and 14 were observed with green peduncle. In contrast, purple peduncle was observed in accessions 1, 4, 5 and 8 and dark green peduncle was noticed in Acc.15. Accession 9 was observed with greenish brown peduncle while greenish purple peduncle was observed in Acc.2 and purple brown peduncle was observed in Accessions 6 and 7. Santos- Serejo *et al.* (2012) characterized the progeny of ornamental *Musa* L. hybrids and observed that among the 42 hybrids evaluated, 90% of the hybrids presented variation of peduncle colour as olive green, pinkish and brown purple. Ramajayam *et al.* (2020) categorized 193 ornamental banana hybrids *viz.,* OR (119), OZ (37) and RZ (37) and reported that 53% of OZ hybrids were with green peduncle and 47% were with purple coloured peduncle while OR hybrids were observed with green coloured peduncle and 90% of RZ hybrids were with purple coloured peduncle. These variations might be probably related to the genetic makeup of individual accessions of ornamental banana under study.

Peduncle orientation

The visible characteristics in peduncle orientation in ornamental banana were mentioned in Table 2 and Figure-1. Angled peduncle was observed in accessions1, 2, 4, 5, 6, 7, 8 and 9. Accessions 3, 10, 11, 12, 13, 14 and 15 fall under upright peduncle category. Upright peduncle as observed in some of the accessions is a fascinating characteristic in terms of ornamental value. In the Accessions 3, 10, 11, 12, and 13 this upright peduncle characteristic was similar to the parents i.e., *M. ornata*, *M. velutina* and *M. rubra.*

Peduncle pubescence

The peduncle pubescence in ornamental banana accessions showed variations as mentioned in Table 2. Hairless peduncle was noticed in Accessions 1, 2, 3, 4, 5, 8, 10, 11, 12, 13 and 15 while peduncle with very hairy, short hairs was found in accessions 6, 7 and 9. Acc.14 possessed slightly hairy peduncle. Peduncle pubescence gives a fascinating velvety aspect to ornamental plants, which is a fairly valued characteristic. The results are in concurrence with the reports of Ramajayam *et al.* (2020) who recorded great variability of peduncle orientation and peduncle pubescence in ornamental banana interspecific crosses.

Table 2 : Peduncle characters in ornamental banana accessions in Godavari zone of A.P

Accessions	Peduncle colour	Peduncle orientation	Peduncle pubescence
T_1: Acc.1 (R1-8)	Purple	Angled	Hairless
T_2: Acc.2 (R1-11)	Greenish purple	Angled	Hairless
T_3: Acc.3 (R1-76)	Green	Upright	Hairless
T_4: Acc.4 (R2-9)	Purple	Angled	Hairless
T_5: Acc.5 (R2-52)	Purple	Angled	Hairless
T_6: Acc.6 (R2-92)	Brownish purple	Angled	Short hairs
T_7: Acc.7 (MR1-4)	Brownish purple	Angled	Short hairs
T_8: Acc.8 (MR2-3)	Brownish purple	Angled	Hairless
T_9: Acc.9 (MR2-7)	Greenish brown	Angled	Short hairs
T_{10}: Acc.10 (SR5-15)	Green	Upright	Hairless
T_{11}: Acc.11 (SR7-7)	Green	Upright	Hairless
T_{12}: Acc.12 (SR8-9)	Green	Upright	Hairless
T_{13}: Acc.13 (SR9-3)	Whitish Green	Upright	Hairless
T_{14}: Acc.14 (*Musa laterita*)	Green	Upright	Slightly hairy
T_{15}: Acc.15 (*Musa ornata*)	Dark green	Upright	Hairless

Peduncle length (cm)

Table 3 depicts the results on peduncle length of accessions. There was a significant difference between the accessions. The peduncle length ranged from 16.80 cm in Acc.8 to 30.62 cm in Acc.6. Longest peduncle was recorded in Acc.6 (30.62 cm) while Acc.8 (16.80 cm) recorded shortest peduncle which was found to be at par with Acc.12 (17.12 cm), Acc.13 (17.49 cm), Acc.10 (17.50 cm), Acc.15 (17.92 cm) and Acc.5 (18.92 cm). Length of peduncle is an important characteristic for the selection of plants for cut flower, and a long and thin stalk is desirable to facilitate the making of arrangements and reduce the weight to be transported. The results are also in conformity with the reports of Ramajayam and Saraswathi (2022) who observed great variability for peduncle length among interspecific ornamental banana hybrids grown in open field conditions. In a study conducted by Anu *et al.*

(2019) on the morphological characterization of banana, maximum peduncle length was recorded in red banana (> 61 cm) and minimum in Njalipoovan and Nendran cultivars (< 30 cm).

Peduncle diameter (cm)

There was a significant variation in peduncle diameter of ornamental banana accessions (Table 3). Maximum peduncle diameter was recorded in Acc.7 (2.35 cm) which was found to be at par with Acc.1 (2.30 cm), Acc.6 (2.30 cm), Acc.8 (2.30 cm), Acc.2 (2.25 cm), Acc.9 (2.25 cm) and Acc.11 (2.20 cm). Minimum peduncle diameter was recorded in Acc.13 (1.55 cm) which was at par with Acc.15 (1.62 cm) and Acc.12 (1.7cm).

Table 3 : Peduncle length (cm), peduncle diameter (cm), number of bracts, bract longevity, anthocyanin content in bract (mg $100g^{-1}$) and rachis length (cm) in ornamental banana accessions

Accessions	Peduncle length (cm)	Peduncle diameter (cm)	Number of bracts	Bract longevity (days)	Anthocyanin content in Bract (mg $100g^{-1}$)	Rachis length (cm)
T_1: Acc.1 (R1-8)	22.53	2.30	72.33	2.33	39.32	39.32
T_2: Acc.2 (R1-11)	22.95	2.25	78.34	2.00	44.48	44.48
T_3: Acc.3 (R1-76)	21.67	1.97	73.67	2.67	21.62	21.62
T_4: Acc.4 (R2-9)	21.07	2.08	80.84	2.67	41.72	41.72
T_5: Acc.5 (R2-52)	18.92	2.05	74.34	2.17	39.97	39.97
T_6: Acc.6 (R2-92)	30.62	2.30	123.33	3.33	40.58	40.58
T_7: Acc.7 (MR1-4)	23.35	2.35	132.83	2.50	40.12	40.12
T_8: Acc.8 (MR2-3)	16.80	2.30	82.34	3.00	36.08	36.08
T_9: Acc.9 (MR2-7)	25.47	2.25	104.84	2.84	37.35	37.35
T_{10}: Acc.10 (SR5-15)	17.50	1.92	62.33	2.67	17.28	17.28
T_{11}: Acc.11 (SR7-7)	23.17	2.20	81.83	3.00	24.28	24.28
T_{12}: Acc.12 (SR8-9)	17.12	1.70	47.00	2.33	16.18	16.18
T_{13}: Acc.13 (SR9-3)	17.49	1.55	51.84	1.50	17.08	17.08
T_{14}: Acc.14 (*Musa laterita*)	20.85	2.03	64.67	3.67	22.68	22.68
T_{15}: Acc.15 (*Musa ornata*)	17.92	1.62	62.00	2.33	18.13	18.13
Mean	**21.16**	**2.06**	**79.50**	**2.60**	**30.46**	**30.46**
SEm±	1.00	0.06	2.86	0.18	1.11	1.11
CD at 5%	3.05	0.18	8.66	0.53	3.36	3.36

Number of bracts

There was a significant variance among the accessions in number of bracts (Table 3). Maximum number of bracts was noted in Acc.7 (132.83) followed by Acc.6 (1023.33) and minimum number of bracts was recorded in Acc.12 (47.00) which was at par with Acc.13 (51.84). Less number of bracts alleviates the floral phase of the plant. Identical results were reported by Karmakar *et al.* (2024) in banana cultivars under West Bengal conditions.

Bract longeivity

The data regarding bract longevity (Table 3) revealed significant variations among the accessions. Maximum bract longevity was recorded in Acc.14 (3.67 days), at par with Acc.6 (3.33). Least bract longevity was found in Acc.13 (1.50 days) that was found to be at par with Acc.2 (2.00 days). The results are in line with findings of Smisha and Sabu (2017) in an interspecific hybrid *Musa* × *calicutensis*.

Anthocyanin content in bract (mg 100 g^{-1})

Data presented in Table 3 indicated that highest content of anthocyanin in bracts was recorded in Acc.7 (17.70 mg 100 g^{-1}) which was at par with Acc.6 (16.95 mg 100 g^{-1}) and Acc.9 (15.65 mg 100 g^{-1}). Lowest anthocyanin content in bract was recorded in Acc. 13 (2.15 mg 100 g^{-1}) that was found to be at par with Acc.10 (2.95 mg 100 g^{-1}), Acc.11 (3.65 mg 100 g^{-1}), Acc.15 (3.70 mg 100 g^{-1}), Acc.12 (3.75 mg 100 g^{-1}) and acc.3 (4.20 mg 100 g^{-1}). Similar findings were reported by Preethi and Balakrishnamurthy (2011) in bracts of banana cultivars and Rosalina *et al.* (2022) in bracts of *Musa sapientum* L. var. *Rubra.* From the data, it was clear that anthocyanin content was higher in progeny of *Musa accuminata ssp.* zebrina than other hybrids and species. Identical findings were reported

by Ramajayam *et al.* (2018) in ornamental banana species and hybrids and confirmed that Ant-FH-SSR11, a genic SSR marker that was identified from the F35H-1 gene present in the anthocyanin pathway was capable of differentiating the hybrids & species and their progeny. Similarly, another marker, 430-SSR, was also able to differentiate coloured parent (*Musa acuminata* ssp. zebrina) from other ornamental green parents and their hybrids. The presence of variegation in bracts is much appreciated in potted plants and landscape plants of ornamental banana.

Rachis length (cm)

From the Table 3, it is clear that there was significant variation between the accessions. Longest rachis was recorded in the Acc.2 (44.48 cm) which was at par with Acc.4 (41.72 cm). Shortest rachis was observed in the Acc.12 (16.18 cm) that was found to be at par with Acc.13 (17.08 cm), Acc.10 (17.28 cm) and Acc.15 (18.13 cm). Chawla *et al.* (2016) assessed twenty-five *Heliconia* genotypes and recorded maximum rachis length in *Heliconia rostrata* Parrot Beak (47.79 cm). Safeena *et al.* (2023) reported similar results in *Heliconia* genotypes under Pune conditions.

Rachis position

The position of rachis on the plant was observed evidently and mentioned in Table 4 and Figure -1. Erect rachis was observed in accessions 3, 10, 11, 12, 13, 14 and 15 whereas rachis position on accessions 4, 5 and 8 was at an angle. Horizontal rachis was found in accessions 1, 7 and 9 and the position of rachis on Acc.2 was falling vertically on the plant.

Rachis colour

The colour variations in rachis of ornamental banana accessions were stated in Table 4. Accessions 3, 12 and 14 were observed with green coloured rachis whereas light green colour was observed in Accessions 10 and 11 while Acc.13 and Acc.15 were observed with whitish green and dark green coloured rachis respectively. Purple and brown colour rachis was noticed in Acc.8 and Acc.6 correspondingly. Accessions 1 and 4 were purplish green coloured while greenish brown was noticed on Accessions 7 and 9 and brownish purple was noticed on Accessions 2 and 5. Great variability was observed in the colour of rachis by Ramajayam *et al.* (2022) among the interspecific hybrids of ornamental banana progeny.

Table 4 : Rachis characteristics in ornamental banana

Accessions	Rachis position	Rachis colour
T_1: Acc.1 (R1-8)	Horizontal	Purplish green
T_2: Acc.2 (R1-11)	Falling vertically	Brownish purple
T_3: Acc.3 (R1-76)	Erect	Green
T_4: Acc.4 (R2-9)	At an angle	Purplish green
T_5: Acc.5 (R2-52)	At an angle	Brownish purple
T_6: Acc.6 (R2-92)	Horizontal	Brown
T_7: Acc.7 (MR1-4)	Horizontal	Greenish brown
T_8: Acc.8 (MR2-3)	At an angle	Purple
T_9: Acc.9 (MR2-7)	Horizontal	Greenish brown
T_{10}: Acc.10 (SR5-15)	Erect	Light green
T_{11}: Acc.11 (SR7-7)	Erect	Light green
T_{12}: Acc.12 (SR8-9)	Erect	Green
T_{13}: Acc.13 (SR9-3)	Erect	Whitish green
T_{14}: Acc.14 (*Musa laterita*)	Erect	Green
T_{15}: Acc.15 (*Musa ornata*)	Erect	Dark green

Conclusion

Even though almost all the ornamental banana accessions under this study performed well, but based on the results obtained, it could be inferred that Acc.11 (SR7-7) outperformed all the accessions and had greater ornamental potential with minimum days for emergence of inflorescence, minimal pseudo stem height at emergence of inflorescence, longer floral phase, negatively geotropic behavior of inflorescence, upright peduncle and rachis and attractive male bud colour, making it suitable for commercial production under Godavari zone of Andhra Pradesh.

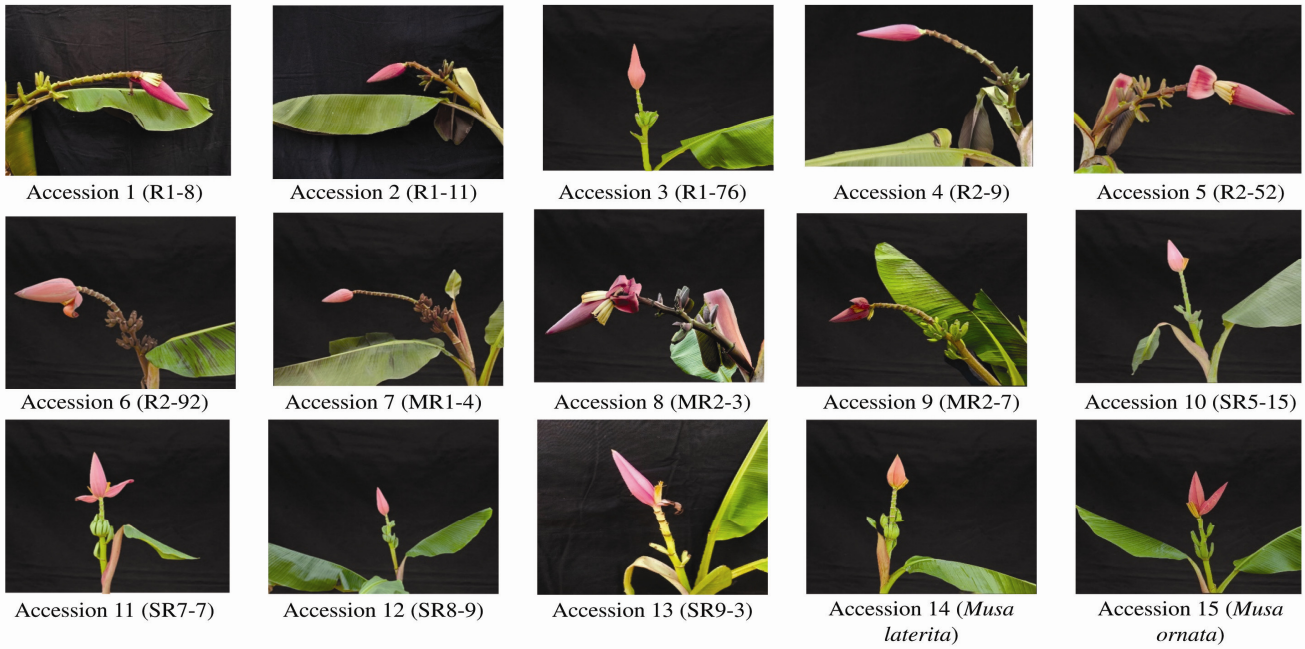

Fig. 1 : Orientation of inflorescence in ornamental banana accessions

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