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**Agniva Halder**
Department of Horticulture & Postharvest Technology, Institute of Agriculture, Visva-Bharati, Sriniketan, West Bengal, India

**Prahlad Deb**
Department of Horticulture & Postharvest Technology, Institute of Agriculture, Visva-Bharati, Sriniketan, West Bengal, India

**Corresponding Author:**
**Agniva Halder**
Department of Horticulture & Postharvest Technology, Institute of Agriculture, Visva-Bharati, Sriniketan, West Bengal, India

# Flowering behaviour and floral morphology of some Jamun genotypes (*Syzygium cuminii* Skeels) under western dry tract of west Bengal

**Agniva Halder and Prahlad Deb**

**Abstract**
An experiment was conducted to know the variability on flowering characters of randomly selected 12 jamun genotypes (*Syzygium cuminii* Skeels) from different parts of Bankura district under Western dry tract of West Bengal during the year 2022. Significant difference was observed among the genotypes for the characters studied. The genotype JA 1 showed earliest panicle emergence (February last week). Time taken for bud development was observed 24 (days from panicle emergence) from three accessions like JA 1, JA 2 and JA 7 which was shortest among 12 jamun accessions studied. The length of panicle was recorded longest from JA 12 (12.78 cm) followed by JA 2 (11.26 cm) and shortest from JA 8 (4.73 cm). Highest flower length was measured from JA 5 (14.72 mm) and lowest from JA 12 (6.21). Maximum number of branch lets per panicle was recorded from accession JA 5 (14.27) followed by JA 4 (12.82) and JA 11 (12.07). In most of the cases light yellowish colour of inflorescence was observed.

**Keywords:** Jamun, flowering, genotypes

## Introduction
Jamun (*Syzygium cuminii* Skeels) is one of the evergreen tree of multipurpose use. This is considered as important minor fruit crop under the family Myrtaceae consisting of over 75 species. Jamun is beleied to be native of India. This fruit crop possesses immense nutritional importance due to presence of various nutraceutical components like anthocyanins, phenolic compounds and antioxidants in abundance. Recognition with respect to medicinal value of jamun is also a major concern due to which the crop has gained much popularity in recent past. The fruits are good source of iron, minerals, sugars and proteins. The fermented or fresh jamun juice is reported to have various medicinal values as stomachic, carminative and diuretic, apart from having cooling and digestive properties (Thaper, 1958) [13]. The fruit is a good remedy for diarrhoea. Seeds of jamun contain jambosin (an alkaloid) and a glycoside, jambolin or antimellin, which can reduce or stop diasthetic conversion of starch into sugars in human body.

A huge diversity of jamun with respect to their growing habits, flowering behavior, fruiting and fruit quality parameters can be observed in Western dry tract of West Bengal. Long gestation period and very little crop improvement programme resulted lack of recognized standard varieties of this crop this crop. Some efforts have been made by scientists to identify superior germplasm of jamun in different parts of India (Bajpai and Ravishankar, 2012; Devi *et al*., 2002; Misra and Bajpai, 1984) [2, 4, 6]. Studies n flowering behaviour, floral characters and fruit set etc. are very important part to start any crop improvement programme. Seasonal fruit crops like jamun exhibits a wide variation in flowering, fruit set and fruit drop. Thus the present study has been undertaken to evaluate some jamun genotypes with respect to their flowering and bearing habits under Western dry tract of West Bengal.

## Material and Methods
Present study was carried out after selecting 12 jamun genotypes (germplasm) randomly from different parts of Bankura district under Western dry tract of West Bengal during the year 2022. The GPS locations of all the jamun plants were recorded using handheld GPS (Garmin GPS 12H). The plans were visited frequently from January to April' 2022 to record different flowering parameters and panicles along with the flowers have been collected for floral morphology study. Observations ontime of panicle emergence, time taken in bud development (days), flushing time, duration of flowering (days), length of panicle (cm), length of flowers

(mm), number of branchlets/panicle, number of flowers /branchlets, number of stamens, number of sepals and flower colour have been taken during flowering season of all the jamun genotypes. All the numerical observations were subjected to simple mean analysis to compare all the jamun genotypes with respect to their flowering behavior and floral morphology using SPSS (George, 2011) [5].

**Table 1:** Locations of Randomly Selected 12 Jamun Accessions from Various Blocks of Bankura, West Bengal

| Sl. No. | Jamun Accessions | Location | | | GPS location | |
|---|---|---|---|---|---|---|
| | | Village | Block | District | Latitude (º) | Longitude (º) |
| 1 | JA 1 | Bheduasole | Hirbandh | Bankura | 23.113 | 86.908 |
| 2 | JA 2 | Senapatia | Khatra | Bankura | 22.983 | 86.853 |
| 3 | JA 3 | Panrari | Raipur | Bankura | 22.817 | 86.931 |
| 4 | JA 4 | HetiaPathar | Ranibandh | Bankura | 22.922 | 86.821 |
| 5 | JA 5 | Tapata | Borjora | Bankura | 23.438 | 87.289 |
| 6 | JA 6 | Jamrepara | Bishnupur | Bankura | 23.067 | 87.299 |
| 7 | JA 7 | Pirargari | Saranga | Bankura | 22.853 | 87.003 |
| 8 | JA 8 | Benchtabani | Simlapal | Bankura | 22.896 | 87.010 |
| 9 | JA 9 | Chenchurya | Taldangra | Bankura | 23.038 | 87.088 |
| 10 | JA 10 | Chururi | Gangajalghati | Bankura | 23.448 | 87.019 |
| 11 | JA 11 | Dhulai | Sonamukhi | Bankura | 23.362 | 87.415 |
| 12 | JA 12 | Birsingha | Patrasayer | Bankura | 23.202 | 87.451 |

## Results and Discussion

The jamun is commonly propagated through seed, which, leads to a great variability in the plant. Before the initiation of any crop improvement programme through any breeding method, a good knowledge about reproductive characteristic is very essential. Accessing the flowering characteristics are one of the important aspects for a fruit breeder. In the present experiment the data pertaining to physical characteristics of jamun inflorescence showed significant differences and a high degree of variability for all the reproductive characteristics studied. The findings of present investigation summarized in table number 2.

The length of panicle was recorded longest from JA 12 (12.78 cm) followed by JA 2 (11.26 cm) and shortest from JA 8 (4.73 cm). Highest flower length was measured from JA 5 (14.72 mm) and lowest from JA 12 (6.21). More number of branchlets per panicle was recorded from accessions like JA 5 (14.27), JA 4 (12.82) and JA 11 (12.07). Whereas, Singh *et al.* (2012) reported highest panicle length (15.5 cm) and minimum panicle length (15.12 cm) from Gujarat.

Maximum number of flowers per branchlets was observed from JA 1 (27.09) followed by JA 2 (18.07) and it was very low in JA 6 (7.89) and JA 11 (7.21). Number of stamens per flower varied between10.37 - 66.01. The total number of sepals were 5 in all the accessions. The flower colour of JA 2, JA 3, JA 4, JA 5, JA 6, JA 7, JA 11 and JA 12 was light yellow where in JA 9 flower colours was creamy white. Pale green colour of flower was recorded in JA 1, JA 8 and JA 10 accessions of jamun. Alam *et al.* (2020) [1] observed light yellowish colour of inflorescence in most of the jamun accessions.

The earliest panicle emergence and flushing was recorded in JA 1 on February last week and March 3rd week respectively. Very late emergence of panicle was recorded from JA 8 (April 2ndweek). Similar observations on flower initiation was reported by Mishra and Bajpai (1984) [6]; Bajpai *et al.* (2012) [2] and Solomon *et al.* (2014) [10].

Time taken for bud development was observed 24 (days from panicle emergence) from three accessions like JA 1, JA 2 and JA 7 which was shortest among 12 jamun accessions studied. Longest time for bud development was observed in JA 10 (41 days). Tarai and Kundu (2008) [11] studied the flowering behavior of jamun and other minor fruits in the new alluvial zone of West Bengal. They recorded the jamun flowered once in the spring season, the number of days for flower bud development was 5 days and the type of inflorescence in jamun was panicle.

Very late flushing (May 2nd week) was observed in three genotypes as JA 6, JA 8 and JA 10. Variation in time requirement for flower bud development might be due to the genotypic content and their interaction with environment, the result found by Bajpai *et al.* (2012) [2] and Devi *et al.* (2016) [3] was similar. Tarai *et al.* (2006) [12] reported that the flowering of jamun was started at the last week of March and ends at the last week of April which takes four-week duration of flowering.

Duration of flowering was highest of 33 days in genotype JA 9 followed by 32 days in JA 7 and 31 days in JA 2. It was least (24 days) in JA 3. The corresponding observation was recorded for 43 days in jamun by Misra and Bajpai (1984) [6]; Bajpai *et al.* (2012) [2]; Devi *et al.* (2016) [3].

**Table 2:** Flowering Behaviour of Randomly Selected 12 Jamun Accessions From Various Blocks of Bankura

| Sl. No. | Jamun Genotypes | Time of Panicle Emergence | Time taken in bud development (Days) | Flushing Time | Duration of Flowering (Days) | Length of panicle (cm) | Length of flowers (mm) | No. of Branchlets/ panicle | No. of Flowers /Branchlets | No. of stamens | No. of sepals | Flower Colour |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | JA1 | February Last week | 24 | March3rd week | 29 | 9.2 | 8.37 | 9.84 | 27.09 | 64.08 | 5 | Pale green |
| 2 | JA2 | March Last week | 24 | April4th week | 31 | 11.26 | 11.43 | 8.2 | 18.07 | 62.38 | 5 | Light yellow |
| 3 | JA3 | March Last week | 26 | April4th week | 24 | 9.91 | 13.09 | 8.31 | 12.71 | 66.01 | 5 | Light yellow |
| 4 | JA4 | March1st | 31 | April1st | 25 | 7.62 | 9.16 | 12.82 | 9.76 | 10.37 | 5 | Light |

| | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | week | | week | | | | | | | | yellow |
| 5 | JA5 | March2nd week | 35 | April3rd week | 27 | 5.71 | 14.72 | 14.27 | 12.07 | 59.71 | 5 | Light yellow |
| 6 | JA6 | April1st week | 32 | May2nd week | 28 | 5.83 | 11.59 | 11.4 | 7.89 | 57.02 | 5 | Light yellow |
| 7 | JA7 | April1st week | 24 | April4th week | 32 | 6.86 | 10.6 | 9.34 | 6.91 | 61.76 | 5 | Light yellow |
| 8 | JA8 | April2nd week | 29 | May 2nd week | 28 | 4.73 | 8.96 | 8.41 | 8.01 | 62.37 | 5 | Pale green |
| 9 | JA9 | March2nd week | 32 | April2nd week | 33 | 5.94 | 14.08 | 10.24 | 9.2 | 12.89 | 5 | Creamish white |
| 10 | JA10 | April1st week | 41 | May 2nd week | 29 | 8.62 | 12.27 | 9.34 | 10.38 | 60.41 | 5 | Pale green |
| 11 | JA11 | March 1st week | 34 | April 2nd week | 30 | 6.57 | 10.81 | 12.07 | 7.21 | 64.32 | 5 | Light yellow |
| 12 | JA12 | March 2nd week | 35 | April 3rd week | 26 | 12.78 | 6.21 | 6.91 | 12.82 | 57.34 | 5 | Light yellow |
| | Mean | | 30.12 | | 28.5 | 7.94 | 10.93 | 10.12 | 11.86 | 60.81 | 5 | |

## Conclusion

After evaluation of the flowering characteristics of 12 jamun accessions from different locations of Bankura district the following conclusion may be lined out:

- The earliest panicle emergence was recorded in JA 1 on February last week. Very late emergence of panicle was recorded from JA 8 (April 2nd week).
- Time taken for bud development (days from panicle emergence) was ranged from 24 to 41 days.
- The length of panicle was recorded longest from JA 12 (12.78 cm) and shortest from JA 8 (4.73 cm). Largest flower was found in JA 5 (14.72 mm) and smallest in JA 12 (6.21).
- In most of the jamun accessions light yellowish colour of inflorescence were observed.

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