

To Study Phenological Behaviour and Quantitative Floral Morphology of Indigenous Seedling Mango Germplasm

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Short Communication

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ABSTRACT

The present experiment was undertaken to study the floral characteristics of twenty five seedling mango germplasm, locally available at central and sub-montane zones of Punjab. After surveyed the mango growing areas of these zones it was observed that there exist a great variability among the different seedling mango germplasm in inflorescence viz. the time of panicle emergence, time of start of flowering, time of end of flowering, full bloom, duration of flowering (days), time of fruit set, panicle length, panicle breadth, hermaphrodite flower (%), male flower (%) and sex ratio (m/h). Thus, there is tremendous possibility to evolve new varieties with desirable traits using of such genotypes for further propagation as well as for breeding purposes.

INTRODUCTION

It belongs to genus *Mangifera* under family Anacardiaceae and order Sapindales comprising of 69 species, which are distributed throughout the world. Mango (*Mangifera indica* L.) is the most important fruit of tropical and sub-tropical agro climatic regions of the world [1]. Presently, India harbours more than 1000 mango varieties/landraces in different diversity regions and represents the biggest mango germplasm in the world.

India is the largest producer of choicest table varieties of mango in the world and wide variability has been found in fruit shape, size and taste but commercial importance is given to few cultivars in the country [2]. But still, mango industry lags far behind in the world due to low productivity, higher incidence of insect pests, diseases and physiological disorders etc. Mango is cross pollinated fruit crop and almost majority of mango cultivars under cultivation in the world are selections from open pollinated seedling populations.

The mango germplasm in the state is not properly characterized and it is the need of the hour to evaluate and characterize the existing germplasm in the central and sub-montane zones of the Punjab to use them in future breeding programmes.

DISCUSSION

In the present investigation, one hundred genotypes of mango were selected and coded with location wise abbreviation as AA for Amritsar Attari, AKCA for Amritsar Khalsa College, AP for Amritsar Pairewal, AUG for Amritsar Ugar Aulak, AGKB for Amritsar Guru Ka Bagh, ABG for Amritsar Bhure Gill, AKS for Amritsar Kotli Sakka, AR for Amritsar Rayya, GQ for Gurdaspur Qadian, GRB for Gurdaspur Ranjit bagh and GJB for Gurdaspur Jawahar Bagh [3]. Among the selected genotypes, twenty five elite promising mango accessions were selected on the basis of desirable horticultural traits for final evaluation in a randomized block design (RBD) with three replications during the period 2012 to 2013. For qualitative parameters the evaluation was done with the help of 'Mango Descriptor', IPGRI. The recorded data were analysed to assess the genetic divergence using computer software Windostat 9.3 version.

On year' selections were AA-1, AA-2, AA-3, AA-4, AA-8, AA-15, AA-16, AA-19, AA-20, AA-29, AUG-1 and GQ-3. 'Off year' selections were AA-7, AA-9, AA-42, AA-39, AKCA-14, AR-1, AP-1, GJB-1 and GRB-1. AA-101, AGKB-64 and ABG-1 were regular bearers.

Twenty panicles in all directions on selected genotypes branches were tagged to determine the following characters.

Phenological behaviour and quantitative floral morphology

Various flowering events, floral morphology and quantitative fruit parameters showed tangible variation among the twenty five genotypes under present investigation. The earliest panicle emergence was observed in genotype AKS-1 and AUG-1, which took place on 24th February, followed by genotypes AA-2, AA-9, AA-20 and GQ-3 in which panicle emergence occurs on 25th February. Late panicle emergence was recorded in GRB-1 i.e. on 20th February. In case of regular plants time of panicle emergence was earliest in AA-101, followed by AGKB-64 and late in ABG-1 which took place on 20th, 21st and 23rd February, 2016 and 26th, 27th and 28th February, 2017, respectively [4]. It was also observed that the earliest panicle emergence was at south direction in all the genotypes. It might be due to more sunlight in south direction than other directions of the plants. Earliest flowering commenced on 2nd March in genotype AA-9, whereas late flowering occurs in genotypes AA-7, AA-39 and GRB-1 i.e. on 6th March. End of flowering was the earliest in AA-2 i.e. on 23rd March and late in the genotype GRB-1 (on 30th March). In case of regular plant end of flowering was recorded as the earliest in genotype AA-101 (23rd March), followed by ABG-1 and late in AGKB-64. Full bloom occurred as the most earliest in genotypes AA-2 and AA-29 (i.e. on 15th March). The longest duration of flowering (26 days) was reported in genotype AA-20 and GRB-1. In case of regular plants the longest duration of flowering was recorded in AGKB-64, followed by AA-101 and short duration in ABG-1 (i.e. 25, 24 and 22 days, respectively, in 2012).

In 2013 longest duration of 22 days was recorded in AA-101, followed by AGKB-64 (21 days) and shortest in ABG-1 (20 days). The variation in time of start of flowering, full bloom, end and duration of flowering might have governed by local weather conditions, which varied from place to place and also varied with in varieties grown under the same climatic conditions [5]. Fruit set occurred as the earliest on 25th March in genotypes GJB-1 and GQ-3 and late fruit set was noted in genotype GRB-1 (on 31st March). In case of regular plants time of fruit set was the earliest in AA-101, followed by ABG-1. The maximum panicle length (30.10 cm) was recorded in the genotype AKS-1 and it was followed by genotypes AA-7, AA-1, AA-3, AA-4, AA-42, GJB-1, AA-16, AA-101, and AR-1 having panicle length of 28.40, 27.30, 25.10, 24.70, 21.00, 17.20, 16.90, 15.70 and 14.60 cm, respectively. The minimum panicle length (12.10 cm) was recorded in genotype AP-1. Male flower percentage was recorded as the minimum (79.10%) in the genotype AA-9 and maximum in AA-29 (84.10%). The highest hermaphrodite flower percentage (20.90%) was recorded in the genotype AA-9, whereas it was recorded as the least (15.90%) in genotype AA-29. The maximum and minimum sex ratio of 5.28 and 3.78 were documented for genotypes AA-29 and AA-9, respectively.

CONCLUSION

From the overall outcomes of the present investigation it is evident that the germplasm with desirable traits can be proved to be good genetic material for the utilization in future breeding programmes for improving the mango varieties in Punjab. The fruit set was the earliest in genotype GJB-1 and genotypes GQ-3 and AA-29 had the maximum sex ratio. Amongst the evaluated germplasm AA-101, ABG-1 and AGKB-64 showed tendency towards regular bearing. Hence, these genotypes can be included for future systematic breeding as well as hybridization programme of mango to inculcate and/or concentrate favorable attributes among the improved progenies.

REFERENCES

1. Asif M, et al. Comparative study of flower sex ratio in different cultivars of mango (*Mangifera indica* L.). Int J Agr Biol. 2002;4:220-222.
2. Sanjay S, et al. Evaluation of mango cultivars for their flowering, fruiting and fruit quality attributes. Progressive Horticult. 2002;34:240-243.
3. Halder S, et al. Qualitative and quantitative characterization of off-season mango cultivars in some districts of West Bengal. J Crop Weed. 2020;16:147-154.
4. Larsen AS, et al. Advances in domestication of indigenous fruit trees in the West African Sahel. New Forests. 2011;41:297-315.
5. Bally IS, et al. Mango (*Mangifera indica* L.) Breeding. In Advances in Plant Breeding Strategies: Fruits. Springer. 2018;811-896.