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CHARACTERIZATION OF DIFFERENT GENOTYPES OF BAEL ON THE BASIS OF MORPHOLOGICAL TRAITS

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ABSTRACT

Bael (*Aegle marmelos*) is one of the medicinally treasured tree species and widely distributed throughout India. It is a versatile tree for both food and medicinal values. Totally, twenty-five genotypes for morphological characters were evaluated during 2022-23 at two different places (Banaras Hindu University campus and Ramna village). A notable variability was observed in observed in qualitative character *viz*., plant growth habit, leaf size, leaf shape, leaf apex and leaf base among the various genotypes of bael. Bael leaf size was classified as small, medium and large. Eight genotypes showed small size leaf, eleven genotypes showed medium size leaf whereas BT-4, BT-6, BT-7, BT-12, BT-14 and BT-15 genotypes showed large size leaf.
Keywords : Bael, Genotypes, Leaf size, Leaf shape and Plant growth habit.

Introduction

Bael (*Aegle marmelos*) also known as Shriphal, Baelpatra, Bengal quince belongs to the family Rutaceae. The generic name (*Aegle*) is of Greek origin and the species (*marmelos*) is of Portuguese origin. The chromosome number is X = 9 and 2n = 36. A tree normally grown from 8 to 18 meters (26 to 59 feet). The leaves are trifoliate, complex and alternating, each of which has three leaflets. The bael tree produces huge, woody, globose fruits that are roughly the size of a grapefruit botanically known as amphisarca. The leaflets are broadly oval in shape, have a glossy green surface and a slightly serrated border. The wide range of diversity observed in north India in bael trees has been noticed which are not exploited yet. So characterization and exploitation of genetic diversity of bael seedling types in Varanasi region is mere. Therefore, study undertaken to characterization of morphological character of bael.

Materials and Methods

Site of Experimental field- The experimental site Varanasi city is situated at about 25°10' North latitude and 83°03' East longitude and Ramna village with 25°.37' Latitude and 82°.53' Longitude. All the bael trees selected were assumed as a specific genotype and denoted as Bael Tree (BT) and given number. Thus, there were 25 genotypes (BT-1 to BT-25) bael tree of diverse origin were selected. The observations regarding the morphological characteristics of trees were noted according to the guidelines for the conduct of the test for distinctiveness, uniformity and stability of bael (*Aegle marmelos* Correa) Protection of Plant Varieties and Farmers Right's Authority (PPV&FRA) of the Government of India and bael descriptor of NBPGR 2002 and data was shown in the form of table.

Result and Discussion

The data of morphological characteristics of bael genotypes in table 1 showed that the categories including dropping, upright, semi-spreading and spreading were used to classify the tree growth habit. Thirteen plants had an upright growth habit, eight had a spreading habit and BT-5, BT-13, BT-20 and BT-21 had a semi- spreading growth habit. These findings are supported by Gupta and Mishra (2002), Singh *et al.* (2006), Singh and Mishra (2010) and Bhawna and Mishra (2011). The bael plants showed four types of

leaf shape *i.e.,* broadly ovate, lanceolate, ovate and lanceolate to ovate. Twelve recorded lanceolate to ovate, six plant had lanceolate, six plant leaves had ovate and the genotypes (BT-13) recorded broadly ovate type leaf. These results collaborate the findings of Parihar and Pandey (2019). Bael leaf size was classified as small, medium and large. BT-11, BT-13, BT-18, BT-19, BT-20, BT-22, BT-24 and BT-25 showed small size leaf, eleven plants showed medium size leaf whereas remaining plants showed large size leaf. The leaf apex of bael genotype showed variation in the form of acute, acuminate and aristate types. Among the genotypes sixteen plant showed the acuminate type of leaf apex, B-15 and BT-24 showed aristate type of leaf apex whereas remaining plant showed acute type of leaf apex. As far as the leaf base is concerned, bael plants have a variety of leaf bases, including attenuate, round and cuneate. Seventeen plants displayed cuneate type, only one plant (BT-11) displayed attenuate type, while the remaining plants displayed round type of leaf base. These observations are in conformity with the findings of Parihar and Pandey (2019).

Conclusion

Bael genotypes exhibit substantial morphological variation in growth habit, leaf shape, leaf apex, leaf size and leaf base. Genotypes BT-4, BT-6, BT-7, BT-12, BT-14 and BT-15 had large leaf size. Larger leaf size enhances photosynthetic efficiency, thereby contributing to increasing yield.

Table 1: Different bael genotypes used for experimental study

Sl. No.	Genotype	Collected from
1	BT-1	BHU Campus
2	BT-2	BHU Campus
3	BT-3	BHU Campus
4	BT-4	BHU Campus
5	BT-5	BHU Campus
6	BT-6	BHU Campus
7	BT-7	BHU Campus
8	BT-8	BHU Campus
9	BT-9	BHU Campus
10	BT-10	BHU Campus
11	BT-11	Ramna village
12	BT-12	Ramna village
13	BT-13	Ramna village
14	BT-14	Ramna village
15	BT-15	Ramna village
16	BT-16	Ramna village
17	BT-17	Ramna village
18	BT-18	Ramna village
19	BT-19	Ramna village
20	BT-20	Ramna village
21	BT-21	BHU Campus
22	BT-22	BHU Campus
23	BT-23	BHU Campus
24	BT-24	BHU Campus
25	BT-25	BHU Campus

*BT = Bael Tree

Table 2: Variation of bael genotypes according to DUS characterization by Protection of plant variety and farmers right authority.

Genotype	Tree growth habit	Leaf shape	Leaf apex	Leaf base	Leaf size
BT-1	Spreading	Lanceolate to ovate	Acute	Cuneate	Medium
BT-2	Upright	Lanceolate	Acuminate	Cuneate	Medium
BT-3	Upright	Ovate	Acute	Round	Medium
BT-4	Upright	Lanceolate to ovate	Acute	Round	Large

Genotype	Tree growth habit	Leaf shape	Leaf apex	Leaf base	Leaf size
BT-5	Semi spreading	Lanceolate to ovate	Acuminate	Round	Medium
BT-6	Spreading	Lanceolate to ovate	Acuminate	Cuneate	Large
BT-7	Upright	Lanceolate to ovate	Acuminate	Round	Large
BT-8	Upright	Ovate	Acuminate	Cuneate	Medium
BT-9	Spreading	Ovate	Acute	Cuneate	Medium
BT-10	Upright	Lanceolate	Acuminate	Cuneate	Medium
BT-11	Spreading	Lanceolate to ovate	Acuminate	Attenuate	Small
BT-12	Upright	Ovate	Acuminate	Round	Large
BT-13	Semi- spreading	Broadly ovate	Acute	Cuneate	Small
BT-14	Spreading	Lanceolate to ovate	Acuminate	Round	Large
BT-15	Spreading	Lanceolate to ovate	Aristate	Cuneate	Large
BT-16	Upright	Lanceolate	Acuminate	Cuneate	Medium
BT-17	Upright	Lanceolate to ovate	Acute	Cuneate	Medium
BT-18	Upright	Lanceolate	Acuminate	Cuneate	Small
BT-19	Upright	Lanceolate to ovate	Acuminate	Cuneate	Small
BT-20	Semi spreading	Ovate	Acuminate	Cuneate	Small
BT-21	Semi spreading	Lanceolate to ovate	Acuminate	Round	Medium
BT-22	Upright	Lanceolate	Acute	Cuneate	Small
BT-23	Spreading	Ovate	Acuminate	Cuneate	Medium
BT-24	Upright	Lanceolate	Aristate	Cuneate	Small
BT-25	Spreading	Lanceolate to ovate	Acuminate	Cuneate	Small

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