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Studies on fruit morphological traits of different jackfruit (*Artocarpus heterophyllus* Lam.) genotypes

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Abstract

The present investigation entitled "Studies on Fruit Morphological Traits of Different Jackfruit (*Artocarpus heterophyllus* Lam.) Genotypes" was carried out at the Main Experiment Station and the laboratory of Post-Harvest Technology, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya (U.P.), during 2022-2023. Eleven jackfruit genotypes, namely NJ-1, NJ-4, NJ-5, NJ-6, NJ-7, NJ-9, NJ-11, NJ-12, NJ-14, NJ-15 and NJ-16, were evaluated for fruit weight, fruit length, fruit diameter and rind percentage, using a Completely Randomized Design with three replications. Significant differences were recorded among genotypes for all the physical traits studied. Genotype NJ-4 recorded the maximum fruit weight (19.00 kg), fruit length (58.27 cm) and fruit diameter (26.33 cm), while NJ-6 recorded the minimum values for these traits. The rind percentage was highest in NJ-15 (41.1%) and lowest in NJ-5 (21.76%). The results indicate considerable genotypic variability in fruit morphological traits, with NJ-4 identified as a superior genotype in terms of overall fruit size and NJ-5 found suitable for processing owing to its lower rind percentage and higher edible portion.

Keywords: Jackfruit, *Artocarpus heterophyllus*, genotypes, morphological traits, rind percentage, CRD

Introduction

Jackfruit (*Artocarpus heterophyllus* Lam.) is the largest tropical tree fruit in the world and belongs to the family Moraceae. It is an evergreen species believed to have originated in the rainforests of the Western Ghats of southwestern India (Baliga *et al.*, 2011) [2]. The name "jackfruit" is derived from the Portuguese word "jaca" itself borrowed from the Malayalam term "chakka". In India, it is widely known by regional names such as kanthal, kathal and kathar and remains an important seasonal food during the spring and summer months. Owing to its wide availability and affordability, jackfruit is often referred to as the "poor man's food", while its fibrous flesh has earned it the title of "vegetarian's meat".

India is a major producer of jackfruit, with an estimated production of about 1,877,000 metric tonnes from 187,000 hectares (Anonymous, 2022) [1] and Kerala alone accounts for nearly 92,000 hectares and 1,025,000 metric tonnes of this output. Beyond India, jackfruit is extensively cultivated in Bangladesh, Malaysia, Indonesia, Thailand, the Philippines and Sri Lanka and holds the status of national fruit in both Bangladesh and Indonesia (Matin, 2015) [5].

Despite its abundance and nutritional importance, jackfruit remains an underutilized fruit crop, largely due to the substantial genetic variability that exists among genotypes grown across different agro-climatic regions. This variability is prominently reflected in the fruit's physical and morphological characteristics including fruit weight, length, diameter, rind percentage and other external attributes which differ considerably from tree to tree, even within the same locality. Such morphological diversity arises primarily because jackfruit is largely propagated through seedlings rather than clonal methods, resulting in extensive heterozygosity and a lack of uniformity among trees and their fruits (Baliga *et al.*, 2011) [2].

Morphological characterization of fruit crops is a fundamental step in any varietal improvement or genetic resource evaluation program. The physico-chemical parameters not only help in distinguishing genotypes but also serve as important indicators of yield potential, edible portion recovery and suitability for specific end-uses, whether for fresh consumption, processing, or value

addition. Documenting this morphological variability is therefore essential for identifying superior genotypes, conserving valuable germplasm and providing a scientific basis for future selection and breeding programs.

Keeping the above facts in view, the present investigation was undertaken to evaluate and document the morphological variability among different jackfruit genotypes.

Materials and Methods

The present investigation was carried out at the Main Experiment Station and in the laboratory of Post-Harvest Technology, College of Horticulture & Forestry, Acharya Narendra Deva University of Agriculture & Technology, Ayodhya (U.P.), during 2022-2023. Eleven jackfruit genotypes growing at the Main Experiment Station were selected for the study and designated as treatments T1 to T11, comprising different genotypes of Narendra jackfruit NJ-1, NJ-14, NJ-5, NJ-9, NJ-15, NJ-7, NJ-12, NJ-6, NJ-4, NJ-11 and NJ-16, respectively. From each genotype, three fully ripened fruits were randomly selected and used for recording observations on fruit weight, fruit length, fruit diameter and rind percentage. Fruit weight was recorded using a digital balance and expressed in kilograms, while fruit length and diameter were measured with a measuring tape and expressed in centimetres. Rind percentage was determined by separating the inedible rind portion from each fruit and calculating its proportion relative to the total fruit

weight, expressed on a percentage basis. The experiment was laid out in a Completely Randomized Design (CRD) with eleven treatments and three replications. The data generated were statistically analysed using SAS software, with treatment means compared using Duncan's Multiple Range Test (DMRT) to determine significant differences among the genotypes.

Results and Discussion

The physical characteristics of different genotypes of Narendra jackfruit evaluated in the present investigation are presented in Table 1. Significant differences were observed among the genotypes for all the physical parameters studied, viz., fruit weight, fruit length, fruit diameter and rind percentage.

The fruit weight ranged from 3.74 kg (NJ-6) to 19.00 kg (NJ-4), with NJ-4 recording the maximum fruit weight among all genotypes. Fruit length varied from 22.67 cm (NJ-6) to 58.27 cm (NJ-4), with NJ-4 and NJ-7 (50.7 cm) being statistically at par and recording the highest values. Fruit diameter followed a similar trend, with NJ-4 (26.33 cm) recording the maximum diameter, statistically at par with NJ-7 (24.33 cm), while the minimum diameter was recorded in NJ-6 (14.77 cm). The rind percentage was highest in NJ-15 (41.1%), statistically at par with NJ-4 (36.79%), whereas the lowest rind percentage was recorded in NJ-5 (21.76%), with genotypes NJ-1, NJ-9, NJ-12, NJ-14, NJ-11 and NJ-16 being statistically at par with it.

Table 1: Physical characteristics of different genotypes of Narendra jackfruit

Treatments/Genotypes	Fruit weight (kg)	Fruit length (cm)	Fruit diameter (cm)	Rind%
T ₁ NJ-1	3.83 ^e	23.37 ^{de}	16.13 ^{fe}	26.19 ^{bc}
T ₂ NJ-14	9.52 ^c	40.77 ^b	21.30 ^{bc}	28.77 ^{bc}
T ₃ NJ-5	4.96 ^{de}	31.83 ^{dc}	17.77 ^{def}	21.76 ^c
T ₄ NJ-9	6.07 ^d	32.07 ^{bcd}	18.57 ^{cde}	25.63 ^c
T ₅ NJ-15	5.46 ^{de}	31.65 ^{dc}	18.05 ^{de}	41.11 ^a
T ₆ NJ-7	15.83 ^b	50.70 ^a	24.33 ^{ab}	30.97 ^{abc}
T ₇ NJ-12	8.55 ^c	36.78 ^{bc}	19.70 ^{cd}	29.22 ^{bc}
T ₈ NJ-6	3.74 ^e	22.67 ^e	14.77 ^f	24.22 ^c
T ₉ NJ-4	19.00 ^a	58.27 ^a	26.33 ^a	36.79 ^{ab}
T ₁₀ NJ-11	6.36 ^d	33.03 ^{bc}	19.30 ^{cd}	24.81 ^c
T ₁₁ NJ-16	4.76 ^{de}	28.33 ^{cde}	18.03 ^{cd}	22.23 ^c
Mean	8.01	35.41	19.48	28.34
L.S.D(0.05%)	2.17	8.8	3.06	11.06

The variation observed among genotypes for fruit weight, length and diameter can be attributed to the inherent genetic makeup of each genotype, as jackfruit is largely propagated through seedlings, resulting in high heterozygosity and wide morphological variability even within the same locality (Ramachandra *et al.*, 2021; Chandrashekar *et al.*, 2018) [6, 3]. The consistently superior performance of NJ-4 across weight, length and diameter suggests that these traits may be genetically linked, since larger fruit size (length and diameter) directly contributes to greater overall fruit weight. Environmental and edaphic factors prevailing at the experimental site, along with tree age and vigour, may have further influenced the expression of these traits. The variation in rind percentage among genotypes, on the other hand, is largely governed by the proportion of flesh and seed content relative to the outer rind and genotypes with a lower rind percentage may therefore be more desirable for processing purposes, as they offer a higher proportion of edible pulp (Ibrahim *et al.*, 2014) [4]. Similar variability in fruit weight, length, diameter and rind percentage among jackfruit genotypes has been reported by Wangchu *et al.* (2013) [7] and Yadav *et al.* (2021) [8], confirming that these traits are highly influenced by genotypic differences rather than being uniform across the species.

Conclusion

Significant genotypic variability was recorded among the jackfruit genotypes for fruit weight, length, diameter and rind percentage. NJ-4 emerged as the most promising genotype in terms of overall fruit size, while NJ-5 recorded the lowest rind percentage, making it suitable for processing purposes. These findings highlight the genetic diversity among jackfruit genotypes and offer useful baseline data for future selection and improvement programmes.

References

- Anonymous. Area, production and productivity of important horticulture crops. 2022. <https://doi.org/10.33545/26174693.2024.v8.i4h.1029>
- Baliga MS, Shivashankara AR, Haniadka R, Dsouza J, Bhat HP. Phytochemistry, nutritional and pharmacological properties of *Artocarpus heterophyllus* Lam (jackfruit): A review. Food Research International. 2011;44(7):1800-1811. <https://doi.org/10.1016/j.foodres.2011.02.035>
- Chandrashekar KG, Vijayakumar RM, Subramanian S, Kavino M, Joel AJ. Morphological characterization of jackfruit (*Artocarpus heterophyllus* Lam.) local genotypes

- under coffee ecosystem of Lower Pulney Hills. International Journal of Current Microbiology and Applied Sciences. 2018;7(3):261-266.
<https://doi.org/10.20546/ijemas.2018.703.261>
4. Ibrahim M, Islam MS, Helali MOH, Alam AKMS, Shafique MZ. Morphological fruit characters and nutritional food value of different jackfruit (*Artocarpus heterophyllus* Lam.) cultivars in Rajshahi region of Bangladesh. Bangladesh Journal of Scientific and Industrial Research. 2014;48(4):287-292.
<https://doi.org/10.3329/bjsir.v48i4.18280>
 5. Matin MA. Jackfruit, *Artocarpus heterophyllus* Lam., in Bangladesh: Current status and future prospects. Bangladesh Journal of Agricultural Research. 2015;40(2):313-328.
 6. Ramachandra RK, Vishnuvardhana V, Fakrudin B, Reddy BA. Advances in breeding of jackfruit crop: A review. Agricultural Reviews. 2021;42(4):463-469.
<https://doi.org/10.18805/ag.r-1843>
 7. Wangchu L, Singh D, Mitra SK. Studies on the diversity and selection of superior types in jackfruit (*Artocarpus heterophyllus* Lam.). Genetic Resources and Crop Evolution. 2013;60(5):1749-1762. <https://doi.org/10.1007/s10722-013-9985-0>
 8. Yadav A, Pathak S, Kumar V. Genetic diversity assessment for horticultural, fruit characters, yield and quality traits among jackfruits genotypes. International Journal of Current Microbiology and Applied Sciences. 2021;10(2):398-404.
<https://doi.org/10.20546/ijemas.2021.1002.366>