# Variability of physical parameters of different cultivars of jackfruit


## ABSTRACT

A field experiment was carried out to study the “Evaluation of different jackfruit cultivars” at Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during 2016-17 in Randomized Block Design with thirteen different genotypes of jackfruits which were replicated thrice. The results revealed that, maximum seeds weight per fruit (0.81 kg) and number of bulbs per fruit. (159.33) was found in the genotype GDJF-13 and maximum rag weight per fruit (1.86 kg), highest bulb weight (30.3 g) was observed in the fruits of genotype GDJF-12, highest weight of flake (22.2 g), highest seed weight (10.71g). The maximum flakes to seed ratio (25.95) was observed in the genotype AKJF-3 and Maximum rag percentage was observed in the genotype GDJF-10 (53.48 %).


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(***Key words*: Jackfruit, Genotypes, bulb, Rag, seeds**)


Introduction :

*Artocarpus heterophyllus* Lam.) ~~Jackfruit~~ (Jackfruit~~*Artocarpus heterophyllus* Lam.)~~ is an important and indigenous fruit crop of India belonging to family Moraceae. Jackfruit is rich source of carbohydrates, proteins, potassium, calcium, iron, and vitamin A, B and C. Due to high levels of carbohydrates, jackfruit supplements other staple foods is time of dietary fibre. The jackfruit is a multipurpose species providing wood, timber, fuel, fodder, and medicinal and industrial products. It is one of the largest tree borne fruits in the world. The primary economic product of jackfruit is the fruit which is used both when mature and immature. Jackfruit seeds (nuts) can be roasted like chestnuts, or boiled. The fruit pulp is sweet and tasty and used as dessert or preserved in syrup. The fruits and seeds are also processed in a variety of ways for food and other products.. Seeds make-up around 10 to 15 per cent of the total fruit weight ~~.~~ and have high carbohydrate and protein contents (Tulyathan et al., 2002).

~~In spite of~~Despite such ~~a~~ vast potential and usefulness, jackfruit remains an underutilised fruit species. There is ~~a~~ considerable genetic variation exists in jackfruit with regard to quantitative character as well as traits contributing quality of fruits. The fruit weight, number of bulbs per fruit as well as rag weight of fruits, etc are

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the yield contributing characters while bulb contain determine the quality of fruit. Hence, the present research work is proposed to study the physical properties of fresh, ripe and dehydrated jackfruits collected from different traits. It is essential to access the degree of association of various quantitative characters in order to initiate effective selection programme.

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## Materials and Methods

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1.Sampling technique
2.Types of cultivars
3.Part of fruit use.
4. Analysis procedure
5.Provide with references

"Evaluation of deferent jackfruit cultivars for their physical parameters fruit" was carried out in Analytical laboratory, Department of Horticulture, Dr. Panjabrao Deshmukh Krishi Vidyapeeth, Akola during the year 2016-17. The different genotypes of jackfruits viz., AKJF-1 (Akot jackfruit -1), AKJF-2 (Akot jackfruit -2), AKJF-3 (Akot jackfruit -3), AKJF-4 (Akot jackfruit -4) AKJF-5 (Akot jackfruit -5), AKLJF-6 (Akola jackfruit -6), GDJF-7 (Gadchiroli jackfruit -7), GDJF-8 (Gadchiroli jackfruit -8), GDJF-9 (Gadchiroli jackfruit -9), GDJF-10 (Gadchiroli jackfruit -10), GDJF-11 (Gadchiroli jackfruit -11), GDJF-12 (Gadchiroli jackfruit -12) and GDJF-13(Gadchiroli jackfruit -13) were collected from the various region of Vidarbha, Korchi, Dist. Gadchiroli; Akot, Dist. Akola. Experiment was carried out in randomised block design with three replication and thirteen treatments. Observations on various quality and yield parameters were recorded at and analysed statistically by the method suggested by Panse and Sukhatme (1985).

## Result and discussion

### Physical Parameters of Jackfruits

### Seeds weight/fruit (kg)

~~Significantly~~ t~~T~~he data with respect to seeds weight per fruit in jackfruit is furnished in Table 1. Maximum seeds weight per fruit (0.81 kg) was found in the genotype GDJF-13 which was followed by GDJF-9 (0.45 kg) and minimum seeds weight per fruit was (0.03 kg) was recorded in the genotype AKJF-2, AKJF-3 and GDJF-7. Variation in seeds weight per fruit might be due to differences in morphoagronomic character of the tree since jackfruit is cross pollinated in nature. These results are in concurrence with the findings of Sahiba *et al*. (2006), Goswami *et al*. (2010) and Jagadeesh *et al*. (2010) in jackfruit.

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### Flakes to seed ratio

The data presented in Table 1 revealed that, the maximum flakes to seed ratio (25.95) was observed in the genotype AKJF-3 which was at par with AKJF-2 (16.61) and GDJF-7 (14.46). Whereas, minimum flakes to seed ratio (0.30) was noticed in the genotype GDJF-8. Differences in flake and seed weight per fruit may be due to genetic characteristics of the tree. Similar results were recorded by Sahiba *et al*. (2006) and Jagdeesh *et al*. (2010) reported variation in edible portion of jackfruit.

**Rag weight per fruit**

Data revealed that significantly maximum rag weight per fruit (1.86 kg) was observed in the fruits of genotype GDJF-12 which was followed by GDJF-11 (1.37 kg) AND GDJF-10 (1.05 kg) while minimum rag weight per fruit(0.15 kg) was observed in the genotype AKJF-2 AND AKJF-3. The differences in the rag weight per fruit may be attributed to the difference in genetic makeup of the different jackfruit genotypes. Results are in close conformity with the findings of Mitra and Maity *et al*. (2002) and Rai *et al*. (2003).

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**Rag percentage**

The data presented in Table 1 revealed that, the rag percentage of fruits varied significantly among the different genotype studied. Maximum rag percentage was observed in the genotype GDJF-10 (53.48 %) which was at par with the genotype GDJF-12 (37.90 %) while minimum rag percentage (9.81 %) was found in the genotype AKJF-3. Present variation in rag percentage amongst different genotypes is due to the difference in the rag weight and fruit weight of the jackfruit genotype studied.

**Seed weight**

Significantly highest seed weight (10.71g) was recorded in the genotype GDJF-12 followed by GDJF-13 (5.11 g) whereas minimum seed weight (1.3 g) was observed in the genotype AKJF-2, AKJF-3 and GDJF-7. Variation might be attributed to the genetic make up and agroclimatic conditions of trees grown in different areas. Similar results were reported by Reddy *et al.* (2004) with maximum seed weight of 12.30 g and Rahman *et al.* (2016) with maximum seed weight of 8.19 g.

**Bulbs per fruit**

Maximum number of bulbs per fruit. (159.33 ) was observed in the genotype GDJF-13 which was followed by GDJF-9 (117.67) and minimum number of bulbs per

fruit (17.00) were recorded in the genotype GDJF-12. It might be due to number of bulbs per fruit depends upon the size of fruits and also genetical characteristics of the plant. **Results are** in conformity with the findings of Rai *et al*. (2003), Reddy *et al*. (2004), Singh *et al*. (2011) and Rahman *et al*. (2016) in jackfruit.

**Bulb weight**

Highest bulb weight (30.3 g) was recorded in the fruits of the genotype GDJF-12 which was followed by genotype GDJF-13 (10.3 g) while the genotype AKJF-2 recorded minimum bulb weight (2.33 g). Bulb weight of jackfruit is depending on the size of fruit and genetic characteristics of bearing tree. Since the jackfruits studied were from different trees and different region were bulbs varied. This is in agreement with the findings of Rai *et al*. (2003), Anu *et al*. (2015) and Rahman *et al*. (2016).

**Weight of flake**

Results indicated that highest weight of flake (22.2 g) was observed in the jackfruit genotype GDJF-12 which was followed by GDJF-13 (5.45 g) and minimum flake weight (1.2 g) was observed in the genotype AKJF-4. Superiority of any genotype for table purpose depend on the quality of flakes. The genotypes having higher number of big size flakes are desirable. This is in confirmation with the Rai *et al*. ( 2002 ) who observed the genotype HPJS-10/8 with the maximum flake weight of 33.75 g. Similar findings are reported by Reddy *et al*. (2004) in jackfruit.

**Conclusion**

On the basis of present investigation reported in jackfruit, the significant variation was observed in physical evaluation of different jackfruit genotypes and following conclusion could be drawn. GDJF-12 was found superior in respect of bulb weight per fruit , flake weight per fruit, seed weight per fruit, flakes to seed ratio and maximum seeds weight per fruit (0.81 kg) and number of bulbs per fruit. (159.33 ) was found in the genotype GDJF-13. Whereas minimum rag weight and rag percentage were found in genotype AKJF-3.

**References :**

Anu, Krishnan G., G. Jayalekshmi, Elizabedh Joseph and Thushara Susan Sabu, 2015. Assessment of physic-chemical properties of jackfruit collections

from Kuttanand region of Kerala. The Asian Journal of Horticulture, 10(2) : 262-266.

Goswami, C., M.A. Hossain, H.A. Kader and R. Islam, 2011. Assessment of physicochemical properties of jackfruits (*Artocarpus heterophyllus* Lam) pulps.[1] Department of Biochemistry, Bangladesh Agricultural University, Mymensingh-2202.

Jagadeesh, S.L, B.S. Reddy, G.S.K. Swamy and Laxminarayan Hegde, 2010. Variability studies in physical parameters of fruit in jackfruit (*Artocarpus heterophyllus* Lam.) clones of coastal zone of Karnataka. Journal of Maharashtra Agricultural Universities. 35(3): 388-92.

Mannan Sabiha, M.A. Sultana and S.A.K.U. Khan, 2006. Evaluation of physical characteristics of some off-season jackfruit germplasms from South-Western region of Bangladesh Agrotechnology Discipline, Khulna University Studies. 7(2): 71-76.

Mitra, S. K. and Maity, C.S. 2002. A summary of the genetic (Artocarpus heterophyllus Lam.) in West Bengal, India . In : International Synposis on Tropical and Sub-tropical Fruits. pp. 575.

Panse, V.G. and P.V. Sukhatme, 1985. Statistical methods for Agricultural Workers, ICAR, New Delhi.

Rahman, M.H., M.M. Alam Patwary, H. Barua, S. Nahar and Abu Noman Faruq Ahmmed, 2016. The Agriculturists 14(1):107-111 (2016) ISSN 2304-7321(Online), ISSN 1729-5211(Print)., A Scientific Journal of Krishi Foundation.

Rai, Mathura, Vishal Nath, Bikash Das, Ashok Rai and Manoj Kumar, 2003. Evaluation of Jackfruit genotypes for yield ad quality attributes under Eastern Indian Condition, Horticulture and Agro Forestry Research Programme, Plandu, Ranchi -834 010. The Orissa Journal of Horticulture Vol.31(1).

Reddy, B.M.C, Prakash, Patil, Kumar, S.S. and Govindaraju, R. 2004. Studies on physico-chemical characteristics of jackfruit clones of South Karnataka. Karnataka Journal of Agricultural Sciences. 17 (2): 279-82.

Singh, S.R., P. Narayanswamy, B.C. Banik, S. Shyamalamy and L. Simon, 2011. Evaluation of cracking and non-cracking genotypes of jackfruit (*Artocarpus heterophyllus* Lam.), Plant Molecular Biology Laboratory, Division of Horticulture University of Agricultural Sciences, G.K.V.K., Banglore-560065. (Karnataka), Crop. Res. 42(1,2 & 3) : 157-162.

Tulyathan, V., Tananuwonga, K., Songjinda, P. and Jaiboonb,N. (2002).Some physico-chemical properties of jackfruit seedflour and starch. Sci.

Asia,28: 37-41.

**Table 1: Evaluation of different jackfruit genotypes with respect to physical parameters/ Fruit seed and bulb parameter**

| Name of genotypes | Seeds weight/fruit (kg) | Flakes to seed ratio | Rag weight/ fruit (kg) | Rag % | Number of bulbs /fruit | Bulb weight (g) | Flake weight (g) | Seed weight (g) |
|---|---|---|---|---|---|---|---|---|
| AKJF-1 | 0.09 | 3.32 | 0.29 | 14.70 (21.32) | 106.33 | 3.33 | 2.36 | 1.85 |
| AKJF-2 | 0.03 | 16.61 | 0.15 | 10.13 (18.48) | 100.00 | 2.33 | 2.53 | 1.3 |
| AKJF-3 | 0.03 | 25.95 | 0.15 | 9.81 (18.16) | 101.00 | 4.33 | 3.75 | 1.3 |
| AKJF-4 | 0.14 | 0.96 | 0.39 | 19.98 (26.53) | 110.66 | 2.67 | 1.2 | 1.33 |
| AKJF-5 | 0.15 | 1.74 | 0.21 | 10.56 (18.93) | 95.67 | 4.67 | 2.75 | 1.5 |
| AKLJF-6 | 0.18 | 1.15 | 0.48 | 24.07 (28.89) | 107.67 | 3.67 | 1.9 | 1.63 |
| GDJF-7 | 0.04 | 14.46 | 0.25 | 18.93 (25.66) | 24.00 | 5.67 | 4.6 | 1.3 |
| GDJF-8 | 0.16 | 0.30 | 0.44 | 32.91(34.94) | 36.67 | 5.67 | 1.27 | 4.33 |
| GDJF-9 | 0.45 | 1.08 | 0.99 | 25.58 (30.37) | 117.67 | 6.67 | 2.6 | 3.83 |
| GDJF-10 | 0.15 | 1.18 | 1.05 | 53.48(47.19) | 33.33 | 9.67 | 5.17 | 4.53 |
| GDJF-11 | 0.16 | 2.04 | 1.37 | 17.32 (23.80) | 52.33 | 7.00 | 3.8 | 3.1 |
| GDJF-12 | 0.18 | 1.17 | 1.86 | 37.90(37.83) | 17.00 | 30.3 | 22.2 | 10.71 |
| GDJF-13 | 0.81 | 6.25 | 0.85 | 16.67(24.10) | 159.33 | 10.3 | 5.45 | 5.11 |
| 'F' Test | Sig. | Sig. | Sig. | Sig. | Sig. | Sig. | Sig. | Sig. |
| SE (m)± | 0.18 | 6.25 | 0.16 | 3.52 | 9.55 | 0.57 | 0.43 | 0.19 |
| CD at 5% | 0.55 | 17.81 | 0.48 | 10.02 | 27.20 | 1.74 | 1.32 | 0.57 |