

## Studies on *in situ* Characterization and Evaluation of Non-descript Jackfruit Genotypes of Tripura, India

H. Lembisana Devi\*, Biswajit Das, Satyapriya Singh, Doli Jamatia, Nadia Debbarma, Lord Litan Debbarma and Parag Majumder

ICAR Research Centre for North East Hill Region, Tripura Centre, Lembucherra, West Tripura, India

\*Corresponding author E-mail: lembihort@gmail.com

### Abstract

Tripura state in the Northeastern India is the reservoir of diverse jackfruit genotypes possessing traits of importance and hence, identification of trait specific superior jackfruit genotypes in the region is desirable. An investigation was carried out to characterize, evaluate and identify superior jackfruit genotypes from Tripura. Surveys were undertaken for 3 consecutive seasons in the West Tripura district of Tripura and 25 genotypes were collected and evaluated for morphological and biochemical parameters using IPGRI descriptors. Wide variability was observed among the studied accessions for morphological characters *viz.* crown shape, shape of leaf blade, fruit, flakes and seed characters. Values for traits *viz.* fruit weight, number of flakes/kg fruit and total soluble solids (TSS) ranged from 2.0-8.6 kg, 6-46 and 12.5-28.2 °Brix, respectively. Higher fruit weight was recorded in genotypes TJS 1 (8.6 kg), TJS 18 (6.82 kg) and TJS 9 (6.35kg), while higher TSS was observed in genotypes TJS 20 (28.2 °Brix) and TJS 21 (24 °Brix). These genotypes were found to be suitable for table and processing purpose. The results of the present study may be used for future breeding and crop improvement purpose to develop superior jackfruit genotype suitable for commercial cultivation.

**Key words:** *Genotypes, morphology, Northeastern India, physicochemical characters*

### Introduction

Jackfruit (*Artocarpus heterophyllus* Lam.) is an important nutritious fruit crop belonging to the Moraceae family. It is native to parts of South and Southeast Asia and is believed to be originated in the rainforests of the Western Ghats of India (Rowe-Dutton, 1985). It is cultivated throughout the low lands in South and Southeast Asia, parts of Central and Eastern Africa and Brazil. In India, it has wide distribution in the states of Assam, Tripura, West Bengal, Bihar, Uttar Pradesh, Kerala, Tamil Nadu, Karnataka and foothills of the Himalayas. Of these, Tripura, Assam and West Bengal produce major share of jackfruit in India.

Tripura is a reservoir of diverse jackfruit genotypes including those exhibiting year-round fruiting. Area under jackfruit cultivation in Tripura is 5,491 ha with annual production of 1,33,251 lakh t (Anon., 2021). Tripura has the highest productivity (24.27 t/ha) of jackfruit in India followed by Odisha, Assam and West Bengal. There is huge local demand of jackfruit in the state. The best

quality jackfruits are available from May to July and are transported to neighboring states and countries. According to some report, every year large quantity of jackfruits is legally and illegally exported to Bangladesh from Tripura (Sarkar, 2017).

Jackfruit cultivation is preferred by the farmers of the state due to its remunerative prices, hardy nature, low input requirement, easy cultivation and suitability for rainfed condition. Favorable agro-climate coupled with availability of cultivable (hilly and undulated) land for the crop offers immense potentiality for its cultivation. The Government aimed to set up a jackfruit mission to promote its production, processing, value addition and marketing which could help to determine its export potential to foreign countries (Anon., 2022). Thus, there is an immediate need to identify trait specific superior jackfruit genotypes in the region. Despite the wider genetic diversity available, no commercial variety/superior genotypes have been developed for the region. Thus, an attempt was made to identify unique germplasm from West Tripura through systematic morphological and physico-chemical characterization.

**Materials and methods**

The survey was carried out in Lefunga block of West Tripura district of Tripura during 2019-2021. The study area has tropical climate with average rainfall of 2,200 mm, extending over a period of 8 months in a year. Average temperature falls to 10°C in winter and the summer temperature is 35°C. The humidity ranges from 60 to 98%. The soils of the hillocks and undulated (*tilla*) land are deep, well drained and acidic in nature (pH: 4.5 to 6.0).

Survey was undertaken for three consecutive seasons in the West Tripura district of Tripura and 25 identified

genotypes were evaluated for morphological and biochemical characters using IPGRI descriptors (IPGRI, 2000). For the identified 25 genotypes, GPS coordinates and data on the various morphological parameters of trees, leaves, fruits, seeds and quality characters were recorded. The qualitative characters were measured by observation and frequency distribution analysis was performed. The variations among the different types of trees were determined by calculating the coefficient of variation. The quantitative characters were analyzed using statistical tools such as mean, standard deviation, and coefficient of variations (Panse and Sukhatme, 1967).

**Table 1. GPS coordinates of the identified accessions of jackfruit**

Sl. No.	Genotypes	Location	Altitude (m)	Latitude (N)	Longitude (E)
1	TJS1	West Tripura	108.02	23.963955	91.315794
2	TJS2	West Tripura	102.31	23.903882	91.316115
3	TJS3	West Tripura	101.07	23.902873	91.31607
4	TJS4	West Tripura	102.35	23.90274	91.315921
5	TJS5	West Tripura	86.68	23.904756	91.316406
6	TJS6	West Tripura	93.39	23.904952	91.316346
7	TJS7	West Tripura	87.13	23.903638	91.31499
8	TJS8	West Tripura	104.98	23.903401	91.315016
9	TJS9	West Tripura	98.13	23.902915	91.314681
10	TJS10	West Tripura	101.43	23.902463	91.314703
11	TJS11	West Tripura	103.28	23.902574	91.314611
12	TJS12	West Tripura	85.43	23.902419	91.314587
13	TJS13	West Tripura	93.27	23.902487	91.314637
14	TJS14	West Tripura	86.54	23.902442	91.31457
15	TJS15	West Tripura	82.89	23.902449	91.314611
16	TJS16	West Tripura	81.28	23.902466	91.314639
17	TJS17	West Tripura	86.23	23.902433	91.314514
18	TJS18	West Tripura	81.7	23.90244	91.314489
19	TJS19	West Tripura	77.78	23.902368	91.314539
20	TJS20	West Tripura	98.63	23.905545	91.314259
21	TJS21	West Tripura	100.61	23.902649	91.314855
22	TJS22	West Tripura	89.75	23.90228	91.314673
23	TJS23	West Tripura	83.35	23.902529	91.314455
24	TJS24	West Tripura	51.21	23.905283	91.31532
25	TJS25	West Tripura	89.88	23.904438	91.316482

### Results and discussion

During the survey it was observed that being underutilized fruit, jackfruit was mainly grown in the backyards or homestead gardens without any management practice, mixed with other forest/ fruit trees or randomly at roadside. However, at two locations (Cocotilla and Belbari, West Tripura), a systematic seedling progenies plantation of 35 - 40 yearsold with around 80-100 trees was recorded. The crop is found to be suitable in different land situation viz. *lunga* (lowland) and *tilla* (upland) lands in Tripura. The peak season starts from March – April and ends in June – July. Das and Saha (2020) reported the broad classification of jackfruit viz. (1) Normal bearing, (2) Early bearing, (3) Late bearing, (4) Twice bearing and (5) All season types (*Baramasi*) based on the season at Tripura.

Jackfruit, being cross-pollinated and mostly seed propagated, exhibits great variation in economic traits,

which is considered as a prerequisite for any crop improvement programme. Wide variability was observed among the selected jackfruit genotypes for morphological characters viz. growth habit, tree characters, leaf characters, inflorescence characters, fruiting behaviour and yield attributing characters. The frequency distribution of the qualitative characters is presented in Table 2. Irregular (52%), Elliptical growth habit (16%), cluster bearing (64%), spiny surface (84%), soft texture flakes (68%), reddish yellow rind colour (56%) were found more frequent among the accessions studied. Mitra and Mani (2000) also observed wide variations among seedling progeny of jackfruit with regard to growth habit, canopy structure, leaf size, fruit bearing, fruit shape, fruit size and fruit quality. Dey and Baruah (2019) also reported wide variability among 24 jackfruit accessions of Assam for various tree, leaf, fruit and seed morphological characters. Similarly, Reddy et al. (2004) observed enormous variability in the qualitative and quantitative traits of jackfruit in South Karnataka.

**Table 2. Frequency distribution of jackfruit genotypes of the polymorphic qualitative characters**

Characters	Frequency	Frequency (%)	Characters	Frequency	Frequency (%)
<b>Tree Vigor</b>			<b>Fruit shape</b>		
Low	11	44	Ellipsoid	6	24
Medium	13	52	Spheroid	7	28
High	5	20	Clavate	7	28
<b>Trunk surface</b>			Oblong	5	20
Very rough	4	16	<b>Fruit surface</b>		
Rough	10	40	Spiny	21	84
Smooth	11	44	Smooth	4	16
<b>Crown Shape</b>			<b>Flake texture</b>		
Elliptical	4	16	Coarse	5	20
Irregular	13	52	<b>Soft</b>	17	68
Broadly Pyramidal	1	4	Firm	3	12
Pyramidal	1	4	<b>Pulp flavor</b>		
Semi-circular	1	4	Strong	8	32
<b>Tree growth habit</b>			Weak	1	4
Semi erect	2	8	Intermediate	16	64
Spreading	4	16	<b>Fruit rind colour</b>		
Erect	1	4	Green	2	8
Elliptical	18	72	Yellow	5	20
<b>Fruit clustering habit</b>			Light yellow	1	4
Cluster	16	64	Greenish yellow	3	12
Solitary	9	36	Reddish yellow	14	56

Great variability existed with regard to desirable characters viz. bearing habits (cluster/ solitary), number of fruits per tree, average fruit weight (2.05 – 9.70 kg), number of flakes per kg fruit (7 – 46), total soluble solids (TSS) content of flakes (12.5 to 28.2 °Brix), shelf life at room temperature (2 -10days). Wide variation in yield, fruit quality and seed characters have also been reported

by earlier researchers (Azad and Haq, 1998; Singh and Srivastava, 2000).Such considerable range of variation in morpho-agronomic characters observed in jackfruit may be due to cross pollination and seedling origin. Wangchu et al. (2013) also reported great variation in the morpho-physiochemical characters among 44 superior jackfruit genotypes from West Bengal.

**Table 3. Estimates of performance for range in growth and yield characters**

Characters	Range		Stdev	Mean	CV
	Max	Min			
Trunk circumference (m)	2.25	0.68	0.36	1.3252	26.90
No. of fruits/tree	53	6	12.77	30.16	42.34
Stalk length (cm)	33.2	7.2	6.79	14.7228	46.14
Stalk diameter (cm)	2.7	1.5	0.31	2.1064	14.68
Fruit length (cm)	41.4	19.3	6.67	31.274	21.32
Fruit diameter (cm)	28.30	13.25	4.52	19.408	23.30
Fruit weight (kg)	9.70	2.05	2.12	4.9344	42.99
No. of flakes/kg fruit	46	7	9.81	29	33.81
Weight of flakes/kg fruit (g)	739.6	418.0	93.13	642.016	14.51
Weight of fresh flakes with seed (g)	700.23	264.61	134.13	461.9348	29.04
Weight of fresh flakes without seed (g)	512.11	147.00	119.64	318.8156	37.53
Flake length (cm)	9.2	3.5	1.52	5.496	27.59
Flake width (cm)	5.85	2.30	0.94	3.482	27.09
Rind thickness (mm)	13.8	10.1	1.05	11.46	9.14
TSS (°Brix)	28.2	12.5	3.76	20.836	18.06
Rachis length (cm)	34.0	13.1	6.16	24.656	24.97
Rachis diameter (cm)	20.3	5.3	4.01	9	44.57
Seed length (cm)	4.25	1.75	0.68	2.994	22.57
Seed width (cm)	3.4	0.9	0.60	1.894	31.73
100-seed weight (g)	800.0	131.2	167.99	592.5772	28.35
No. of seeds/kg of fruit	46	17	8.35	29.4	28.40
Shelf life (days)	10	2	2.49	5.68	43.90

The tree morphological characters mainly observed in the genotypes collected are medium tree vigor, smooth trunk surface, irregular crown shape, erect growth habit, sparse branching density, verticillate branching and

cluster fruit bearing habit. The genotypes viz. TJS1, TJS2, TJS3, TJS4, TJS8, TJS12, TJS13, TJS15, TJS17, TJS18, TJS19, TJS20, TJS21, TJS23, TJS24 and TJS25 showed cluster fruit bearing habit, which is a desirable character for future jackfruit improvement (Table 4).

**Table 4. Tree morphological characters of the different Jackfruit accessions as per the IPGRI descriptor**

Accessions/ Genotypes	Tree Vigor	Trunk surface	Crown Shape	Tree growth habit	Branching density	Branching Pattern	Fruit clustering habit
TJS1	Medium	Rough	Irregular	Semi-erect	Medium	Irregular	Cluster
TJS2	High	Rough	Semi-circular	Spreading	Verticillate	Horizontal	Cluster
TJS3	Low	Very Rough	Erect	Erect	Sparse	Erect	Cluster
TJS4	Low	Smooth	Broadly Pyramidal	Spreading	Medium	Horizontal	Cluster
TJS5	Low	Smooth	Irregular	Erect	Sparse	Erect	Solitary
TJS6	Low	Smooth	Sparse	Elliptical	Sparse	Erect	Solitary
TJS7	Low	Smooth	Irregular	Spreading	Sparse	Horizontal	Solitary
TJS8	Medium	Very Rough	Irregular	Spreading	Medium	Horizontal	Cluster
TJS9	Medium	Smooth	Paramidal	Erect	Medium	Verticillate	Solitary
TJS10	Low	Rough	Elliptical	Erect	Sparse	Erect	Solitary
TJS11	Low	Smooth	Elliptical	Erect	Sparse	Erect	Solitary
TJS12	Medium	Rough	Spherical	Erect	Medium	Verticillate	Cluster
TJS13	Medium	Smooth	Spherical	Erect	Medium	Verticillate	Cluster
TJS14	Medium	Smooth	Irregular	Erect	Sparse	Verticillate	Solitary
TJS15	Low	Very Rough	Irregular	Erect	Sparse	Verticillate	Cluster
TJS16	Medium	Rough	Irregular	Erect	Sparse	Erect	Solitary
TJS17	Low	Rough	Irregular	Erect	Sparse	Erect	Cluster
TJS18	Low	Smooth	Elliptical	Erect	Sparse	Opposite	Cluster
TJS19	Low	Smooth	Irregular	Erect	Sparse	Erect	Cluster
TJS20	Medium	Smooth	Elliptical	Erect	Medium	Verticillate	Cluster
TJS21	Medium	Rough	Irregular	Erect	Sparse	Verticillate	Cluster
TJS22	Medium	Very Rough	Irregular	Erect	Sparse	Verticillate	Solitary
TJS23	Medium	Rough	Irregular	Semi-erect	Medium	Irregular	Cluster
TJS24	Medium	Rough	Irregular	Erect	Medium	Erect	Cluster
TJS25	Medium	Rough	Irregular	Erect	Medium	Erect	Cluster

Large variation was also recorded among the genotypes (Table 5) for characters *viz.* fruit shape (ellipsoid, spheroid, clavate and oblong), stalk attachment to fruit (flat and intermediate), shape of spines (sparse and sharp pointed), fruit rind colour (yellow, reddish yellow, light yellow, greenish yellow and green), latex exudation (high, medium & low) and fruit quality (excellent, moderate & good). Fruit shape (obovate, oblong with

curved tip, irregular, cordate, twisted and rectangular), flakes texture (coarse, soft & firm), pulp flavor (weak, intermediate & strong), flakes thickness (thick, medium & thin), fibre content (low, medium & high), pulp taste (insipid, slight sweet, moderate sweet, very sweet & sweet), pulp colour (light yellow, yellow & deep yellow) and seed shape (irregular, ramiform, ellipsoid, oblong & spheroid) were recorded (Table 6).

**Table 5. Fruit quality characters of the jackfruit accessions as per the descriptor**

Accessions/ Genotypes	Fruit shape	Stalk attachment to fruit	Shape of spine	Fruit rind colour	Latex exudation	Fruit quality
TJS1	Ellipsoid	Flattened	Intermediate	Yellow	High	Good
TJS2	Ellipsoid	Flattened	Intermediate	Reddish Yellow	High	Excellent
TJS3	Spheroid	Flattened	Flat	Green	Low	Moderate
TJS4	Ellipsoid	Flattened	Intermediate	Reddish Yellow	Medium	Good
TJS5	Spheroid	Flattened	Intermediate	Reddish Yellow	Intermediate	Good
TJS6	Clavate	Flattened	Intermediate	Greenish Yellow	Medium	Good
TJS7	Spheroid	Flattened	Sharp Pointed	Reddish Yellow	Medium	Moderate
TJS8	Spheroid	Flattened	Sharp Pointed	Yellow	Medium	Good
TJS9	Ellipsoid	Flattened	Intermediate	Greenish Yellow	High	Good
TJS10	Clavate	Flattened	Sparse	Reddish Yellow	Medium	Good
TJS11	Clavate	Flattened	Intermediate	Reddish Yellow	Medium	Excellent
TJS12	Spheroid	Flattened	Intermediate	Reddish Yellow	High	Moderate
TJS13	Oblong	Flattened	Sharp Pointed	Reddish Yellow	High	Excellent
TJS14	Clavate	Flattened	Intermediate	Reddish Yellow	Medium	Good
TJS15	Ellipsoid	Flattened	Sharp Pointed	Yellow	Medium	Good
TJS16	Clavate	Flattened	Sharp Pointed	Reddish Yellow	Medium	Good
TJS17	Clavate	Flattened	Sharp Pointed	Reddish Yellow	Low	Good
TJS18	Spheroid	Flattened	Sharp Pointed	Reddish Yellow	Low	Good
TJS19	Clavate	Flattened	Sharp Pointed	Yellow	Medium	Good
TJS20	Oblong	Flattened	Intermediate	Reddish Yellow	Medium	Good
TJS21	Oblong	Flattened	Sharp Pointed	Yellow	High	Good
TJS22	Ellipsoid	Flattened	Sharp Pointed	Reddish Yellow	Medium	Good
TJS23	Oblong	Flattened	Sharp Pointed	Green	Medium	Excellent
TJS24	Spheroid	Flattened	Flat	Yellow	Medium	Good
TJS25	Oblong	Flattened	Flat	Light Yellow	Medium	Excellent

Wide variations were also observed for various fruits physical parameters (Table 7). Genotypes viz. TJS1, TJS8, TJS13, TJS20 and TJS21 recorded higher number of fruits per tree *i.e.* 53, 47, 46, 46 and 41, respectively. The genotypes viz. TJS1, TJS11, TJS14, TJS19 and TJS 21 recorded longer fruit length of 38.9 cm, 35.6 cm, 36.5 cm, 38.6 cm and 41.4 cm, respectively as compared to genotype TJS 3 with the lowest fruit length of 19.3 cm. Higher fruit diameter of 25.35 cm, 25.1 cm, 28.3 cm, 26.3 cm were recorded in genotypes TJS1, TJS13, TJS 21, TJS 23, respectively while it was the lowest in genotype TJS

24 (13.7cm). Heavier fruits were observed in genotypes TJS 21 (9.7 kg), TJS 1 (8.6 kg) and TJS 22 (7.85 kg), while fruit weight was lower in genotypes TJS 3 (2.05 kg), TJS 24 (2.5 kg) and TJS 9 (2.9 kg). Higher weight of flakes/kg fruit of 725.5 g, 739.6 g, 734.4 g and 719.6 g was recorded in genotypes TJS 1, TJS 20, TJS 21 and TJS 23, respectively as compare to minimum number of flakes/kg fruit of 418 g observed in genotype TJS 7. Genotype TJS12 recorded the maximum number of flakes/kg fruit (46).



**Table 6. Morphological and sensory characters of the flakes for the jackfruit accessions as per the descriptor**

Accessions/ Genotypes	Flake Shape	Flake Texture	Pulp Flavor	Flake Thickness	Fibre Content	Pulp Taste	Pulp Colour	Seed Shape
TJS1	Obovate	Coarse	Strong	Thick	Low	Inspid	Yellow	Irregular
TJS2	Irregular	Soft	Strong	Medium	Medium	Sweet	Deep Yellow	Irregular
TJS3	Cordate	Soft	Weak	Medium	Medium	Slight Sweet	Light Yellow	Reniform
TJS4	Oblong With Curved Tip	Soft	Intermediate	Medium	Low	Sweet	Yellow	Irregular
TJS5	Spheroid	Firm	Intermediate	Medium	Medium	Sweet	Yellow	Irregular
TJS6	Irregular	Soft	Strong	Medium	Medium	Sweet	Light Yellow	Ellipsoid
TJS7	Cordate	Coarse	Intermediate	Medium	Low	Slight Sweet	Light Yellow	Ellipsoid
TJS8	Irregular	Soft	Intermediate	Medium	High	Sweet	Light Yellow	Ellipsoid
TJS9	Twisted	Firm	Intermediate	Medium	Medium	Sweet	Yellow	Ellipsoid
TJS10	Rectangular	Soft	Intermediate	Thin	Low	Moderate Sweet	Light Yellow	Ellipsoid
TJS11	Twisted	Soft	Strong	Medium	High	Sweet	Deep Yellow	Oblong
TJS12	Cordate	Soft	Intermediate	Thin	High	Sweet	Yellow	Spheroid
TJS13	Rectangular	Soft	Strong	Thick	High	Sweet	Light Yellow	Ellipsoid
TJS14	Oblong	Coarse	Intermediate	Thick	Low	Sweet	Yellow	Oblong
TJS15	Cordate	Soft	Intermediate	Medium	Low	Sweet	Light Yellow	Irregular
TJS16	Rectangular	Coarse	Intermediate	Thick	Low	Sweet	Yellow	Ellipsoid
TJS17	Irregular	Firm	Intermediate	Thick	Low	Sweet	Yellow	Spheroid
TJS18	Rectangular	Coarse	Intermediate	Thick	Low	Sweet	Light Yellow	Irregular
TJS19	Spheroid	Soft	Intermediate	Thin	Medium	Sweet	Yellow	Spheroid
TJS20	Rectangular	Soft	Intermediate	Medium	High	Sweet	Yellow	Irregular
TJS21	Oblong	Soft	Strong	Medium	Medium	Very Sweet	Light Yellow	Reniform
TJS22	Twisted	Soft	Strong	Medium	Medium	Sweet	Deep Yellow	Irregular
TJS23	Spheroid	Soft	Strong	Thin	Medium	Sweet	Yellow	Irregular
TJS24	Rectangular	Soft	Intermediate	Thin	Medium	Slight Sweet	Light Yellow	Ellipsoid
TJS25	Spheroid	Soft	Intermediate	Medium	Medium	Sweet	Light Yellow	Irregular

**Table 7. Physico-chemical characters of the flakes for the jackfruit accessions as per the descriptor**

Genotypes	No. of fruits/tree	Fruit length (cm)	Fruit diameter (cm)	Fruit weight (kg)	No. of flakes/kg fruit	Weight of flakes/kg fruit (g)	Weight of fresh flakes without seed (g)	Flake length (cm)	Flake width (cm)	TSS (°Brix)	Seed length (cm)	Seed width (cm)	100-seed weight (g)	No. of seeds/kg of fruit	Shelf life at room temperature (days)
TJS1	53	38.9	25.4	8.6	31	725.5	353.2	7.5	3.8	19.8	4	2.1	692	31	3
TJS2	37	27.4	16.3	4.3	23	614.0	392.1	9.2	5.9	23.6	4.3	3.4	516	23	5
TJS3	26	19.3	13.3	2.1	18	555.0	469.0	6.4	4.3	12.5	2.6	1.9	679	18	8
TJS4	6	27.0	16.7	5.2	26	675.0	368.0	5.1	4.2	19.8	2.3	1.3	703	26	2
TJS5	17	23.3	16.9	3.4	22	570.9	313.2	5.2	3.0	20.4	2.3	1.2	539	22	5
TJS6	25	25.2	14.0	3.2	7	595.6	512.1	6.0	4.8	22.4	1.8	0.9	398	17	6
TJS7	31	26.3	18.3	3.9	29	418.0	161.0	5.9	3.7	17.4	3.0	1.6	689	29	8
TJS8	47	29.9	22.1	4.3	36	478.3	183.2	3.5	2.6	19.2	2.4	1.2	400	36	8
TJS9	29	34.9	19.5	6.4	28	679.6	322.1	6.3	4.0	22.6	3.2	1.7	613	28	10
TJS10	25	31.8	17.2	3.4	28	508.6	256.9	4.5	3.5	18.6	3.0	1.8	569	28	4
TJS11	33	35.6	22.9	4.2	32	694.4	251.0	4.5	3.3	23.0	3.3	2.2	800	32	5
TJS12	19	19.9	15.8	2.9	46	680.8	159.9	4.9	2.8	20.6	3.8	2.6	632	46	10
TJS13	46	35.2	25.1	5.5	34	707.2	350.3	5.2	2.3	26.2	2.7	1.5	620	34	8
TJS14	19	36.5	16.6	5.6	21	682.5	510.0	8.5	3.5	22.8	3.0	1.8	460	21	10
TJS15	33	30.4	22.6	4.5	26	689.5	370.2	5.5	2.4	18.0	3.7	2.0	712	26	3
TJS16	20	37.2	18.5	6.0	26	715.0	455.0	5.4	3.2	21.8	2.5	2.0	468	26	5
TJS17	16	33.6	20.8	3.0	41	600.7	173.9	4.1	2.8	19.6	3.0	2.1	609	41	4
TJS18	27	33.9	22.1	6.8	36	646.5	209.9	4.9	2.9	20.8	3.1	2.1	717	36	5
TJS19	21	38.6	18.5	4.2	30	639.2	301.2	5.2	3.6	19.3	3.9	2.1	631	30	5
TJS20	46	28.5	16.7	5.1	43	739.6	232.1	4.3	2.9	22.0	2.3	2.2	566	43	7
TJS21	40	41.4	28.3	9.7	27	734.4	409.9	6.1	4.2	24.2	3.2	2.0	671	27	5
TJS22	42	36.0	22.2	7.9	23	696.9	465.1	4.8	3.6	20.1	3.0	2.2	675	23	4
TJS23	28	34.8	26.3	5.2	32	719.6	311.3	5.2	4.3	28.2	2.8	1.6	131	32	4
TJS24	31	22.0	13.7	2.5	38	638.4	147.0	4.1	2.8	16.2	3.0	2.1	735	38	5
TJS25	37	34.4	15.6	5.6	22	645.3	292.7	5.1	2.8	21.8	2.9	2.0	588	22	3
S.Em	2.29	1.23	0.83	0.38	1.70	16.65	22.56	0.27	0.16	0.64	0.12	0.10	28.29	1.52	0.46
CV	37.90	19.69	21.42	38.38	29.26	12.97	35.38	24.12	23.58	15.32	20.17	26.71	23.87	25.83	40.89

With regard to the fruit quality characters, considerable variations were observed. Maximum TSS was recorded in the genotypes TJS 23 (28.2 °Brix) followed by TJS 13 (26.2 °Brix), TJS 21 (24.2 °Brix) and TJS 2 (23.6 °Brix). Maximum flake dimension (9.2 cm length, 5.85 cm width) and seed size (4.25 cm length, 3.4 cm width) was observed in TJS 2. Genotype TJS 11 recorded the highest 100 seed weight (800 g) followed by genotype TJS 24 (735.4 g). Lower number of seeds per kg fruit was recorded in genotypes viz. TJS 6 (17), followed by TJS 3 (18) and TJS 14 (21), which is a beneficial trait for future breeding programmes.

Crop improvement in perennials is a complex process and use of available genetic resources is crucial for any crop improvement programme. Variation in economic traits is a prerequisite for any crop improvement programme. Thus, there is a need to identify the areas holding rich genetic diversity of jackfruit that can be used for improving the productivity and quality. From this study, the following genotypes from Tripura are identified for their specific traits.

**1.Types suitable for use as a table fruit** (Excellent fruit quality and high TSS content):TJS 2, TJS 5, TJS 6, TJS 12, TJS 11, TJS 13, TJS 23 and TJS 25.



**2.Types suitable for vegetable/cooking purpose** (small-medium size fruits with less fibre content, green or greenish yellow rind and tender flakes): TJS 3, TJS4, TJS 6, TJS9, TJS7, TJS14, TJS15, TJS18 and TJS 23.

**3. Types suitable for processing purpose** (Medium large size fruits, high TSS content and soft flesh): TJS 11, TJS 13, TJS 14, TJS 18, TJS21, TJS22, TJS 23 and TJS 25.

The information generated during the study could be used as a baseline for fruit breeders in selecting genotypes with superior fruit qualities for jackfruit improvement programmes in the future.

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