

## Survey and Selection of Superior Rose Apple (*Syzygium jambos* L.) Genotypes from West Bengal

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### ABSTRACT

A study was conducted to survey and identify the elite rose apple germplasm among its natural population from different locations of West Bengal. Rose apple trees in different locations were initially screened for their fruit palatable characters. Among them best 10 genotypes were selected for full studies including physical and bio-chemical properties of fruit. The different elite class types were evaluated for fruit physical characters like average weight, fruit length, fruit diameter, pulp weight, pulp thickness and edible part percentage (%). Fruit biochemical parameter like TSS (°B), titratable acidity (%), total sugar (%), reducing sugar (%) and ascorbic acid (mg/100g) were also estimated. After evaluation, it was found that type-9 fruits are large in size, high pulp weight,

pulp thickness and high percentage of edible portion and type-5 is desirable for fruit quality such as high TSS, TSS acidity ratio, ascorbic acid, total sugar and lowest acidity. It can be concluded that the type-5 and type-9 from Baruipur were found most desirable and can be conserved by a sexual propagation.

**Keywords** Rose apple, Fruit quality, Underutilized fruit.

### INTRODUCTION

Rose apple (*Syzygium jambos* L.) also known as Golapjam, is an underutilized minor fruit in India, belongs to the family Myrtaceae. It is a non-climacteric tropical fruit with an excellent rosy fragrance. It is also known as Malabar plum, Malaya apple, Plum rose, Yambo (Kishore *et al.* 2016). The origin of this fruit is South East Asia and become grown in tropical India, Mexico, South America, West Indies and Australia (Tamang *et al.* 2020). Fruit contains rich source of vitamins, fat, minerals and antioxidants, and little amount of carotene and anthocyanin. The rose-like flavor of the fruit is due to linalool and its oxides which are present in the fruit (Lee *et al.* 1975). Phytochemical studies have shown that the rose apple plant contains 43 volatile components, among them 3-phenylpropanol, (Z)-3-hexen-1-ol and (E)-cinnamyl alcohol are the major volatile compounds (Wong and Lai 1996). The fruits mainly consumed as a table purpose as well as used to make several value-added

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products like jam, jelly and syrup for its flavor. In India, it is still considered as an underutilized fruit crop and their have no commercial orchard of rose apple. Most of the growing plant are propagated by seed. The very limited information is available on the germ plasm of rose apple. Seedling plant are highly variable on their character. As there are no or very few reports regarding the germplasms of rose apple in West Bengal, this investigation was conducted for survey and selection of superior rose apple based on fruiting and bio-chemical properties of the fruit.

## MATERIALS AND METHODS

The survey was done in South 24-parganas and Nadia district of West Bengal to identify and select 30 trees from distinct locations. Out of the 30 different trees, 10 best types based on initial fruit quality were identified which were shortlisted for further studies about fruiting and detailed physico-chemical properties. The studies about physico-chemical properties of the fruits were studied in Post Graduate Laboratory, Department of Fruit Science, Bidhan Chandra Krishi Viswavidyalaya, Mohanpur, Nadia. The location of best ten type were Baruipur, Mohanpur, Kalyani and types were named as type-1, type-2 to type-10. The fruit length and diameter were measured by digital vernier calipers. Edible percentage was estimated by total pulp weight with comparison to total fruit weight. The fruit weight was determined by average value of 10 fruit weight. The hand refractometer is used to determined total soluble solid (TSS). The

titratable acidity (TA), ascorbic acid content, reducing sugar and total sugar (TS) were estimated by method suggested by AOAC (1995).

## RESULTS AND DISCUSSION

### Fruit physical characteristics

Detailed study results about physical characteristics of different rose apple types are highlighted in Table 1. The weight of fruit was highly variable among the types. Highest fruit weight was observed in type-9 (32.73g) followed by type-4 (27.62g) where lowest fruit weight observed in type-2 (11.49g) followed by type-6 (12.07g). Maximum fruit length and fruit breadth were found in type-5 (5.01cm) and type-9 (4.71cm) respectively. Pulp weight of rose apple fruit was highest in type-9 (28.12g) followed by type-4 (23.67g). The lowest seed weight was observed in type-2 (2.3g) followed by type-6 (2.7g). Highest pulp thickness and edible percentage of fruit were observed in type-9 which value were (0.55cm) and (85.92%) respectively. This finding is according to the result of Tamang *et al.* (2020), Alam *et al.* (2020) and Mani *et al.* (2020).

### Biochemical characteristics

Biochemical properties of different rose apple types are described in Table 2. The highest value of TSS was observed in type-5 (15 °B) followed by type-2 (14.50 °B), type-8 (12.70 °B) and type-10 (12.41°B). The

**Table 1.** Fruiting characteristics of different rose apple accessions.

Type	Fruit weight (g)	Fruit length (cm)	Fruit breadth (cm)	Pulp weight (g)	Seed weight (g)	Pulp thickness (cm)	Edible percentage (%)
Type-1	15.98	3.92	3.19	12.75	3.23	0.51	79.79
Type-2	11.49	3.63	2.94	9.19	2.30	0.40	79.98
Type-3	13.46	3.86	3.11	9.19	3.15	0.45	68.28
Type-4	27.62	4.20	4.30	23.67	3.95	0.45	85.70
Type-5	18.95	5.01	3.41	14.98	3.97	0.38	79.05
Type-6	12.07	3.76	2.88	9.37	2.70	0.41	77.63
Type-7	23	3.85	3.28	19.68	3.32	0.48	85.57
Type 8	17	3.65	3.37	13.74	3.26	0.46	80.82
Type-9	32.73	4.35	4.71	28.12	5.34	0.55	85.92
Type-10	20.98	4.70	3.64	17.05	3.55	0.44	81.27
Mean	19.33	4.09	3.48	15.77	3.48	0.45	80.40
Range	32.73-11.49	5.01-3.63	4.71-2.88	28.12-9.19	5.34-2.3	0.55-0.38	85.92-68.28

**Table 2.** Bio-chemical properties of different rose apple accessions.

	TSS	Acidity	TSS: Acidity	Vit C	Total sugar	Reducing sugar	Non-reducing sugar
Type-1	10.36	0.12	80.94	11.42	6.06	4.0	1.96
Type-2	14.5	0.19	78.13	17.14	6.45	4.4	1.95
Type-3	11.0	0.11	100.00	15.60	6.35	4.0	2.23
Type-4	11.2	0.17	65.88	16.80	7.05	5.12	1.83
Type-5	15.0	0.10	145.00	21.75	9.18	7.74	1.37
Type-6	11.5	0.14	82.14	18.24	7.83	5.82	1.91
Type-7	13.0	0.12	108.33	19.72	6.98	4.08	2.76
Type-8	12.70	0.14	90.71	14.65	7.36	5.37	1.89
Type-9	12.04	0.12	94.06	11.50	8.33	6.66	1.59
Type-10	12.41	0.12	96.95	13.85	8.33	7.63	0.67
Mean	12.37	0.13	94.22	16.07	7.39	5.48	1.81
Range	15-10.36	0.19-0.10	145.00-65.88	21.75-11.42	9.18-6.06	7.74-4.0	2.76-0.67

lowest titratable acidity (%) was observed in type-5 (0.10%), where highest found in type-2 (0.19%). Highest value of TSS and acidity ratio was found in type-5 (145.0) followed by type-7 and type-3 which were 108.33 and 100.0 respectively. Ascorbic acid content in rose apple fruits were maximum in type-5 (21.75 mg/100g) followed by type-7 (19.72 mg/100g), type-6 (18.24 mg/100g) and type-2 (17.14 mg/100g). Total sugar of fruit were highly variable. Highest total sugar was estimated from type-5 (9.18%) followed by type-9 and type-10 which was same value 8.33. Reducing sugar (%) was highest in type-5 (7.74%) followed by type-10 (7.63%). Non-reducing sugar content in rose apple fruits was also observed very low which vary from 2.76 to 0.67%. The similar result also found by Nashrin *et al.* (2021), Kishore *et al.* (2016) and Sirisha and Shreeja (2019).

## CONCLUSION

After evaluation of 10 elite class rose apple types for fruiting and biochemical properties, it is found that type-9 fruits are large in size, pulp weight, pulp thickness and high percentage of edible portion, and type-5 is desirable for fruit quality such as high TSS, TSS acidity ratio, ascorbic acid, total sugar and lowest acidity. It can be concluded that the type-5 and type-9

from Baruipur were found most desirable and can be conserved by a sexual propagation.

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