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Suitability of sweet potato accessions for culinary purpose - A substitute for potato

Sweet potato (*Ipomoea batatas*) is a tuber belonging to Convolvulaceae family which is native to tropical America. Sweet potatoes are full of vitamins and minerals that are essential to daily health. The β-carotene rich orange flesh sweet potato is an excellent source of provitamin A. It acts as a long-term food-based therapy for vitamin A deficiency. Yellow fleshed sweet potatoes have considerable potential for processing and canning for export purposes. Anthocyanin in purple varieties is considered as an anti-cancerous agent and prevents hypertension. Sweet potatoes are also a great source of vitamin C, a powerful antioxidant that plays a key role in immune system health, connective tissue development, and wound healing.

Many parts of the sweet potato plant are edible, including the root, leaves, and shoots. Sweet potato vines also provide the basis for a high-protein animal feed. With high starch content, it is well suited to processing and has become an important source of raw material for starch and starch-derived industrial products. Added value for farmers comes from a variety of products and ingredients made from sweet potato root including flour, dried chips, juice, bread, noodles, candy, and pectin.

Sweet potato is popularly known as 'white potato' or 'Irish potato' in southern part of United States of America, while in India it is commonly called as 'Sakarkand' (Iranna hejjegar et al*.,* 2022). Sweet potato is a plant grown for its tuberous roots in tropical, subtropical and warm-temperate regions. Tubers are a staple food or an alternative food in many countries and part of the production is used for animal feeding. It forms the primary food of tribal population due to its hardiness and adaptability into diversified farming system. In developing countries, it can be a potential crop in terms of economic, social, staple and nutritional food supplier.

The present investigation was undertaken at the College Orchard, Department of Vegetable Science, Horticultural College & Research Institute, TNAU, Coimbatore during the year 2021-2022 in a randomized block design with four replications. Six sweet potato accessions viz., Sree Arun, Sree Kanaka, Bhu Krishna, CO 5, Ib 73 and Ib 74 were evaluated to study the yield, quality and sensory parameters. All the accessions used in this study were morphologically different in tuber skin and flesh colour. Statistical analysis (AGRES 2.0) also confirmed that each accession showed a significant difference among them for yield, quality and sensory parameters.

Among the six accessions evaluated, the accession Ib 74 recorded the highest single tuber weight (205.65 g), tuber yield per plant (1.10 kg), tuber yield per plot (32.62 kg). The quality parameters viz., Dry matter (%), TSS and Total sugar contents mainly decide the quality and nutritive value of sweet potato. There is a significant variation in the quality parameters i.e, TSS, Dry matter, Total sugar and β-carorene contents. Higher values were recorded for dry matter content in Ib 73 (33.50%). Dayal et al., (2006) stated that dry matter content of the sweet potato influenced the growth performance of the plant. The highest total sugar content was observed in Ib 74 with 6.21 g $100g^{-1}$.

The variety Sree Arun recorded the highest TSS content of 12.11°Brix and it is followed by Sree Kanaka (10.20 °Brix). Oliveira et al*.,* (2019) observed that a greater total soluble solids was found in cultivar UGA 34 (13.00 °Brix) and lower were found in UGA 49 (7.10 °Brix). Elevated total soluble solids level are signs of greater sucrose contents in the food and it can increase the acceptability by the farmer.

The maximum β-Carotene contend was found in the accession Sree Kanaka. It might be due to the presence of dark orange colour flesh which is responsible for carotene content. Season. Takahata et al., (1993) also found a strong positive correlation between b-carotene content and colour value.

Overall Ib 74 recorded the highest values for single tuber weight, tuber yield per plant, tuber yield per plot and tuber yield per ha. During sensory evaluation by a group of judges, the accession Ib 73 recorded to be the most acceptable one for culinary type. This accession got a highest score in terms of flavor, less sweetness, less fiber, texture and overall acceptability. This is due to the

Table 1. Morphological, agronomic and biochemical characters of sweet potato genotypes

Genotypes	Tuber skin colour	Tuber flesh colour	Single tuber weight (g)	Per plant yield (kg)	Plot yield (kg)	Dry matter (%)	TSS (^{O} Brix)	β-Carotene (mg 100g^{-1})	Total sugar (g 100 g^{-1})
Sree Arun	Yellowish white	Cream	49.62	0.22	13.68	30.61	12.11	0.78	5.58
Sree Kanaka	Yellowish Orange	Orange	148.81	0.53	24.63	22.29	10.20	1.55	5.42
Bhu Krishna	Purplish red	Purple	53.15	0.13	11.82	23.41	9.39	0.06	5.49
CO 5	dark Pink	Light Orange	135.55	0.44	22.48	21.58	8.52	1.21	5.38
Ib 73	dark Pink	White	203.04	1.09	32.19	33.49	7.23	0.68	4.31
Ib 74	Light Pink	Cream	205.65	1.10	32.62	26.91	8.76	0.71	6.21
Mean			132.64	0.59	22.90	26.38	9.37	0.83	5.40
SEd			17.42	0.01	0.26	0.64	0.07	0.02	0.12
CD(.05)			37.13	0.02	0.57	1.36	0.16	0.03	0.26
CV %			18.58	1.83	1.63	3.44	1.19	2.59	3.24

Table 2. Mean performance of sweet potato genotypes for sensory quality

	Sensory quality traits						
Genotypes	Appearance	Flavour	Sweetness	Texture	Fibrousness	acceptability	acceptability %
Sree Arun	6.50	7.75	7.25	6.25	6.75	7.50	83.33
Sree Kanaka	8.00	7.00	6.75	6.00	7.75	6.75	75.00
Bhu Krishna	6.50	6.75	7.00	5.75	6.25	6.25	69.44
CO 5	6.75	6.25	7.25	6.75	7.25	6.75	75.00
Ib -73	7.75	8.50	8.75	8.25	8.00	8.50	94.44
Ib-74	7.25	7.50	6.50	6.25	7.50	7.00	77.78
Mean	7.13	7.29	7.25	6.54	7.25	7.13	79.17
SEd	0.51	0.62	0.49	0.42	0.49	0.39	
CD(.05)	1.09	1.32	1.04	0.90	1.04	0.82	
CV %	10.12	11.99	9.53	9.08	9.53	7.65	

special nature of less sweet type which is ideal for making many dishes like curry purpose instead of potato as it contains more nutrients than potato. The findings are in accordance with findings of Teshome Anshebo (2002).

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