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Quality characters in acid lime cultivars (*Citrus aurantifolia* Swingle)

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Abstract : Evaluation studies were carried out in acid lime for selection of cultivars suitable for growing in the tropical region of Tamil Nadu. Six acid lime cultivars viz., PKM1, Saisarbati, Pramalini, Vikram, Tenali and Kasipentla were evaluated for two seasons (July – August and December – February) at Horticultural College and Research Institute, Periyakulam, under the Tamil Nadu conditions during 2006 – 2008. The results revealed that the quality parameters viz., highest juice content, ascorbic acid content and total soluble solids was recorded in the cultivar Vikram during both the season and highest acidity content were recorded in the cultivar Tenali during both the season. The quality character estimates will be more effective in selection of acid lime cultivars for tropical region of Tamil Nadu.

Key words : Acid lime cultivars, Evaluation, Quality

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Acid lime (*Citrus aurantifolia* Swingle) is an important commercial species of citrus considered to be indigenous to India, and is extensively cultivated in many states under tropical and subtropical climatic conditions. India is the largest producer of acid lime in the world, (Chadha, 2002). In Tamil Nadu, it is widely cultivated under rainfed and irrigated conditions in the districts of Dindigul, Trichy, Tirunelveli, Virudhunagar, Ramanathapuram, Madurai, Theni etc., in an area about 1,060 ha with a production of about 4,400 tonnes per annum (Anonymous, 2003). Availability of a wide gene pool in the form of genetic diversity is a prerequisite for crop improvement. Genetic diversity is the extent of genetic variability among the individual in a single species and between the species. In recent years, collection and conservation were primarily made for the quality of fruits. The great genetic diversity is under serious threat of rapid extinction or depletion of the germplasm mainly due to population pressure and farmers preference (Singh *et al.*, 2004). Though acid lime has been in cultivation for many years, no significant achievements have been obtained in cultivar improvement. A successful progress in breeding depends upon the genetic variability present in population.

Acid lime is more popular for its uses in preparation of refreshing juice and in seasoning foods and making of pickles. Acid lime pickles are very popular not only in India but also in other parts of the world. India exports small quantum of acid lime pickles to other countries viz., USA, England etc. It is also used in the manufacture of lime squash either alone or in combination with lemons and other citrus fruits. It is a good source of vitamin C and has good antioxidant properties.

The purpose of the present study was to evaluate different varieties of acid lime cv. PKM1, Saisarbati, Pramalini, Vikram, Tenali and Kasipentla with emphasis on quality attributing characters and increasing adaptability under tropical region of Tamil Nadu

RESEARCH METHODS

The experimental field was situated at the central block of Horticultural college and Research Institute, Periyakulam, which is located at 10° N and 77° E with an altitude of 300 m above MSL. The study was conducted during 2006 – 2008. Six acid lime cultivars viz., PKM - 1, Saisarbathi, Pramalini, Vikram, Tenali and Kasipentla were utilized for the study. The study was carried out in

two seasons (July – August and December – February). The experiment was laid out in a randomized block design and replicated four times. Nine year old trees which were planted at a spacing of 5m x 5m were selected for evaluation.

RESEARCH FINDINGS AND DISCUSSION

Among the six cultivars, during first season, the highest juice content (27.30ml fruit⁻¹) was recorded in the cultivar Vikram, which was at par with PKM -1 (25.80ml fruit fruit⁻¹). The lowest juice content was observed in Kasipentla (23.10ml fruit⁻¹). This finding is in concurrence with the report of Badiyala *et al.* (1992) who reported that the variation in percentage of juice indicates more scope for selection, since higher juice content in fruits signifies superiority of acid lime strain (Josan and Kaur, 2006). The qualitative characteristics of fruits varied among the varieties probably due to genetic composition of the varieties. These findings were also reported by Mitra *et al.* (2006).

The highest TSS (7.80°Brix) was recorded in Vikram, followed by PKM – 1 (7.17°Brix). The lowest total soluble solids were recorded in Kasipentla (6.30 °Brix). The highest acidity was recorded in Tenali (8.35%) followed by Saisarbati (8.02%). The lowest acidity was observed in PKM – 1 (7.52%), and the highest ascorbic acid content was recorded in Vikram (35.68 mg/100g) followed by Tenali (35.02 mg/100g). The lowest ascorbic acid content was observed in Saisarbati (33.17mg/100g) (Table 1). Environmental factors such as long dry spell, high temperature and varietal differences, improved the quality of fruits. These findings were also reported by Singh *et al.* (1977).

During second season, highest juice content was noticed in Vikram (28.52ml fruit⁻¹) which was at par with PKM -1 (26.47ml fruit fruit⁻¹). The lowest juice content

was recorded in Kasipentla (22.27ml fruit⁻¹). The highest total soluble solids were noticed in Vikram (7.45°Brix) which was at par with Saisarbati (7.14 °Brix). The lowest total soluble solids were recorded in Pramalini (6.70 °Brix). Significant differences were noticed for juice content among cultivars. The highest acidity were noticed in Tenali (8.72%) followed by Vikram (8.18%). The lowest acidity was recorded in Pramalini (6.87%). The highest ascorbic acid content was noticed in Vikram (36.94mg/100g) which is at par with PKM-1 (36.16mg/100g). The lowest ascorbic acid content was recorded in Kasipentla (32.41mg/100g). In acid lime, juice content, ascorbic acid, TSS, acidity, and flavour provide quality to the fruit. In this research study, variety Vikram and PKM-1 recorded highest quality traits for extensive cultivation under tropical region of Tamil Nadu. These findings are in close conformity with the results of Lodh *et al.* (1974) and Kulkarni and Rameshwar (1981) in mango.

The difference in quality traits is an important factor for identification of superior clones or varieties. The highest juice content, T.S.S, acidity and ascorbic acid content were found superior for best clone selection (Reddy *et al.*, 2004; Srinivas *et al.*, 2006) in seedling strains of kagzi lime.

Though the trial was a preliminary attempt to assess performance of varieties, it could be observed that Vikram and PKM-1 were superior in their quality point of view. These findings are also in agreement with the findings of Sahoo *et al.* (2005).

Summary :

Six acid lime varieties were studied for their quality attributing characters. Among the six varieties cv. VIKRAM had registered highest juice content, TSS, ascorbic acid content and lowest acidity content during both the seasons. Vikram, followed by PKM-1 are suitable for growing in

Table 1 : Evaluation in acid lime cultivars for fruit quality attributes in acid lime cultivars

Sr. No.	Cultivars	Season							
		July – August I				December - February II			
		Juice content (ml)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100g)	Juice content (ml)	TSS (°Brix)	Acidity (%)	Ascorbic acid (mg/100g)
1.	PKM – 1	25.80	7.17	7.52	34.20	26.47	6.75	7.67	36.16
2.	Saisarbati	24.65	7.02	8.02	33.17	26.13	7.14	7.82	34.62
3.	Pramalini	23.92	6.75	7.97	33.49	24.39	6.70	6.87	33.16
4.	Vikram	27.30	7.80	7.87	35.68	28.52	7.45	8.18	36.94
5.	Tenali	23.75	6.55	8.35	35.02	26.24	7.00	8.72	33.68
6.	Kasipentla	23.10	6.30	7.24	33.50	22.27	6.85	7.15	32.41
	S.E.±	0.81	0.22	0.26	1.12	0.83	0.23	0.23	1.14
	C.D. (P=0.05)	1.74	0.47	0.55	2.39	1.78	0.50	0.50	2.43

the tropical region of Tamil Nadu.

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