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Variability in Physico-Chemical Properties of Some Selected Citrus Fruit in Arunachal Pradesh

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Abstract

Arunachal Pradesh has rich diversity in citrus. Out of various species of citrus, Khasi Mandarin, Valencia and Assam lemon are some of the commercially traded variety of citrus in Arunachal Pradesh. The Khasi Mandarin of Arunachal Pradesh is unique in its quality. However the same fruits are under different names in different provinces. Even within the same district a variety may often be known by different names. Actually farmers' fields, forest of Arunachal Pradesh are the treasures of citrus species. Other than the commercial species, some of other species of citrus namely Rough lemon, Kamala Australia, Samphola, Citron, Singkin various limes and lemons, pummelos, grapefruit are available in various types either in homestead or in forests. Considering this diversity, there is an urgent need to conserve them either in *situ* or in collective forms.

Key words : Citrus, Arunachal Pradesh, Diversity, Physico-chemical properties.

India stands fifth in the world with 5,677 thousand matric tons of citrus production. Collectively in India citrus fruit rank third in area and production after mango and banana and accounts for 14.86 and 12.65% of the total area and production (1). Rich natural resource base of Arunachal Pradesh provides a congenial environment for production of a wide range of citrus species in the state. Arunachal Pradesh, is situated between latitude of 26° 30′ to 29° 28′ north and longitude of 91° 25′ to 97° 24′ east. It has been blessed by nature with one of the richest flora and fauna on the earth and regarded as one of the 'biodiversity hot spot' areas in the world. Its unique phytogeographical positions, topography and high degree of precipitation are some of the important factors which are mainly responsible for its enormous biological diversity. Arunachal Pradesh has rich diversity in citrus (2). No other province in India probably has such a richer natural array of diverse forms of citrus. In a naturally cross pollinated genus like the citrus, nature has eventually created different forms of citrus and the state has the conducive environment, suitable soil and topography for perpetuation of these various forms (3). Keeping these in view the variability in citrus germplasm was studied.

Methods

The present investigation was carried out in Fruit Science Department of the College of Horticulture and Forestry, Central Agricultural University, Pasighat, Arunachal Pradesh. The experimental material consisting of citrus germplasms were collected from the farmers field of Arunachal Pradesh. These germplasms were grown in the college farm. Sample for study was collected from college farm also. Further, the College of Horticulture and Forestry, Central Agricultural University, Pasighat also organizes Arunachal citrus show and competition among citrus growers so that large number of citrus germplasm are collected. From the collected fruit the morphological characters and physico-chemical properties of the fruits viz., fruit weight, circumference of fruit, volume of fruit, rind weight, rind thickness, seed weight, seed number, seed length, seed breath, juice content, total soluble solids of the collected fruits were analyzed. The dates were collected from five random samples of each group and mean values are presented.

Results and Discussion

Result of the assessment of morphological char-

Table 1. characteristics of selected citrus fruits.

Citrus species	Fruit wt (g)	Fruit volume (cc)	Rind wt (g)	Rind thick-ness (mm)	Seed/ fruit	Juice content/ fruit	TSS (°B)
Khasi Mandarin	189.6	184.2	26.3	1.5	18.0	53.4	11.0
Samphola	698.2	750.3	189.6	12	32.0	256.0	10.0
Rough lemon	164.3	132.0	36.0	4.0	24.0	49.0	8.7
Singkin	340.5	340.0	154.6	10.0	8.0	45.0	7.0
Grapefruit	478	390	47.8	3.0	56.0	220	10.0
Citron	2042.6	1800.0	1082.4	15.0	31.0	60.0	8.0
Assam lemon	241.0	261.0	76.7	3.0	Nil	40.0	7.0
Pummelo	2325.6	3100	450.6	10.0	8.0	170.0	10.0
Lime	38.4	40.0	17.4	1.0	9.0	20.0	10.0
Valencia	159.6	180.0	37.6	4.0	4.0	72.0	10.0
Mosambi	186.2	160.0	32.6	3.0	4.0	75.0	9.0
Kamala Australia	518.6	446.2	239.3	13.0	27.0	19.0	7.5

acters and physico-chemical properties of the fruits are presented in Table 1. There were a lot of variations even within species. The fruit characteristic indicates that largest fruit weight up to 2.3 kg was found in pummelo. Murthy et al. (4) found highest locule number of 18.85 per fruit from six fruit shapes types of pummelo. Bharali and Saikia (5) reported highest juice content of 205.50 ml in pummel. The lowest fruit weigh up to 38 g was found in lime. Fruit volume ranges from 40.00 cc to 3100.00 cc. Similarly rind weight ranges from 17 to 1082 g and rind thickness varies from 1 to 15.0 mm. Juice content of fruit also varies from 20 to 256 ml. Highest juice content was observed in samphola. Regarding seed content of fruit some fruits are seedless as in some types of Assam lemon and Cleopetra mandarin. On the other hand, grapefruit contains seed upto 56.0 number per fruit. Taste ranges sweet to sour. Rind color varies from yellow, orange, green, skin smooth to rough.

Considering this diversity, there is an urgent need to conserve them either in *situ* or in collective forms. Most of the farmers do not realize the importance as these citrus species is not having market demand. Therefore, many citrus species are in the verge of extinction. To protect these valuable resources, proper attention is required. The traditional village councils of Arunachal Pradesh are efficient to manage the natural resources within their jurisdiction in sustainable manner. The traditional village councils are still revered by the villagers and can serve as important vehicles for conservation of these resources. Hence, they should be trained for this direction. Concerted efforts should be given by all related agencies to conserve these citrus resources for further exploitation.

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