Assessment of Variability and Selection of Promising Genotypes in Mango Ginger (*Curcuma amada* Roxb.) Accessions from Kerala

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Curcuma amada Roxb. (mango ginger) of the family Zingiberaceae is an under-exploited spice and tuber crop which grows luxuriantly on tropical soils. Being a marginalized crop, conservation and improvement are very important for the popularization of the crop as a food component, for product diversification and also for effective conservation of the genotypes. In Kerala, local landraces are being used extensively for cultivation and they show very high level of variability with respect to growth and yield. In this context a study was carried out during 2005-2009 to collect and conserve the available germplasm of mango ginger from Kerala and to evaluate their genetic potential. Fifty diverse accessions collected were evaluated in RBD in the first crop season for three consecutive years by adopting standard management practices. All the 15 growth/yield characters studied showed significant variation indicating the strength of the genetic base of the crop. Among the characters, the highest variability was observed in yield/plant followed by tiller number, leaf area and plant height. Accession No. CUM 34 showed the highest performance index with 494.44 g yield/plant followed by CUM 35 with 450 g yield/plant.

Key Words: *Curcuma amada*, Genetic variability, Mango ginger, Performance evaluation

Introduction

Curcuma amada Roxb. of the family Zingiberaceae is an under-exploited spice crop which grows luxuriantly on tropical soils. The plant grows wild and is also cultivated as an annual for its commercially important rhizomes. It is known as mango ginger in English, *karpuraharidra* in Sanskrit, *amada* in Bengali and *manga inchi* in Malayalam. The plant is indigenous to Bengal but now it is cultivated throughout India. The specific epithet *amada* is derived from Bengali meaning mango ginger referring to the rhizome having characteristic taste of unripe mango (Saji and Sasikumar, 2004). *Curcuma amada* is a rhizomatous aromatic herb with pseudostem and petiolate leaves. Inflorescence is lateral or central in position with sterile light violet terminal comma bracts. The underground part is the rhizome which is branched and showing sympodial growth (Sabu, 2006).

The tubers are regarded as cooling and useful in prurigo. They are employed as carminative and stomachic (Watt, 1972). The rhizome is used for preparing salads, chutneys and different value added products. Due to its exotic flavour and medicinal properties, it is used in the preparation of special foods, beverages and pharmaceutical and cosmetic products. It has a long history of traditional uses ranging from folk medicine to several culinary preparations. It has antibacterial, insecticidal, antifungal and antioxidant properties (Shankaracharya, 1982; Nadkarni, 2005; Jatoi *et al.*, 2007; Policegoudra and Aradhya, 2008).

Various types of mango gingers differing in rhizome morphology are reported from India (Saji and Sasikumar, 2004). Being a marginalized crop, conservation and improvement are very important for popularization of the crop as food component and also for product diversification. The only improved variety reported from India is Amba, which is a selection of local germplasm from High Altitude Research Station, Orissa University of Agriculture and Technology, Pottangi, Orissa. In Kerala, local cultivars are being used for cultivation and they show very high level of variability. Being a homestead crop which is not cultivated on a commercial scale in the state, the evaluation of its genetic potential and initiatives to conserve and improve the materials are highly essential. Jayasree *et al.* (2006) have made a preliminary study on the variability of mango ginger in Kerala. The present experiment was carried out to select the promising accessions for documentation and conservation.

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Materials and Methods

The experiment was conducted in the experimental net house of the Genetics and Plant Breeding Division of the Department of Botany, University of Calicut, Kerala, India during 2005-2009. The experiments were laid out in randomized block design with three replications of 50 accessions of *C. amada* collected from different locations of Kerala. Fresh, healthy rhizomes were collected from different localities in Kerala during March/April 2005 and planted in the first week of May 2005. The rhizomes were separated into fingers and one finger each planted in 38 cm x 35 cm polybags filled with garden soil, sand and enriched compost in 4:1:1 ratio. *Gliricidia sepium* leaf mulch was provided occasionally. Enriched compost was applied @ 60 g/plant at the end of the second and fourth month. Weeding was carried out regularly and optimum soil moisture was maintained. The plants were grown organically except for plant protection and package of practices of Kerala Agricultural University (Anonymous, 2003) was followed for plant protection. Data on growth, yield and rhizome characters were recorded at the end of six months by destructive sampling (Table 1). The data were analyzed for variability and related statistics and comparative performance of the accessions was analyzed based on major growth and yield characters with the help of performance index calculated as per Amaravenmathy and Sreenivasan (2003). To calculate performance index, accession means of the characters were divided by the grand mean of the corresponding character in the experimental population.

Results and Discussion

All the 15 growth/yield characters studied showed significant variation indicating the strength of the genetic base of the crop (Table 1). Among the characters, the highest variability was shown by yield/plant followed by tiller number, leaf area and plant height. Accession No. CUM 34 showed the highest performance index with 494.44g yield/plant followed by CUM 35 with a 450 g yield/plant.

PCV was higher than GCV in case of all the characters indicating the quantitative nature of control of the characters studied. Heritability was the highest in case of plant height followed by leaf length and leaf area. Yield/plant showed 48.32% of heritability. Genetic advance was the highest in case of yield/plant. Performance indices of tested accessions are given in Table 2. CUM 34 showed highest performance index with 449.44 g yield/plant followed by CUM 35.

Table 1. Growth and yield characters of *Curcuma amada* accessions

Acc. No.	Characters														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CUM 1	98.72	1.00	8.67	40.30	8.76	243.24	4.44	14.44	9.57	7.02	2.27	2.03	4.97	2.70	293.89
CUM 2	117.95	1.10	9.33	50.06	10.08	350.00	4.55	18.44	10.80	6.68	2.55	2.24	6.61	2.89	430.00
CUM 3	115.50	1.33	8.22	48.17	10.17	341.69	5.11	17.78	1.89	6.60	2.47	2.24	5.40	2.86	452.22
CUM 4	112.33	1.20	9.78	49.32	10.02	340.52	5.11	17.11	10.24	7.04	2.19	1.96	5.61	2.77	415.55
CUM 5	102.33	1.00	8.33	41.61	9.33	268.65	5.44	13.78	9.98	7.08	2.31	2.14	5.91	3.27	314.44
CUM 6	104.89	1.00	8.67	43.83	8.84	268.55	4.45	15.00	10.69	6.65	2.31	2.13	5.77	3.29	301.11
CUM 7	94.95	1.00	8.56	40.63	7.85	217.49	4.33	12.67	9.06	6.37	2.22	1.97	5.10	2.89	257.22
CUM 8	93.89	1.10	9.00	39.78	7.81	215.58	4.78	14.00	9.26	5.47	2.27	1.93	4.67	2.74	242.78
CUM 9	107.11	1.23	8.78	40.81	8.38	233.59	4.78	14.89	10.35	6.44	2.27	1.97	5.07	2.78	266.67
CUM 10	104.28	1.23	9.40	41.48	8.49	244.85	4.89	13.89	9.23	7.05	2.39	2.07	5.42	3.18	353.33
CUM 11	100.17	1.00	9.55	41.55	8.62	245.39	4.55	12.33	10.39	7.17	2.43	2.12	4.82	2.85	265.55
CUM 12	103.11	1.00	9.22	43.68	8.34	248.66	4.89	15.00	10.26	7.18	2.37	2.16	4.70	2.83	296.67
CUM 13	109.44	1.33	8.78	43.37	8.62	256.82	5.22	14.78	10.19	6.54	2.53	2.35	4.98	2.79	323.11
CUM 14	107.56	1.10	9.11	41.61	8.46	248.72	4.89	14.11	9.37	6.63	2.30	2.18	5.11	2.93	313.33
CUM 15	112.50	1.10	8.22	45.46	8.98	283.36	4.89	12.33	9.82	7.18	2.59	2.20	5.27	3.34	387.78
CUM 16	107.11	1.10	8.89	42.77	9.04	265.76	5.00	14.33	10.08	7.59	2.23	2.27	5.34	3.25	312.78
CUM 17	115.61	1.00	9.22	46.89	9.53	309.12	5.22	16.89	10.48	7.71	2.52	2.22	5.70	3.53	420.00
CUM 18	114.44	1.00	9.22	47.62	9.64	310.61	4.56	13.00	10.23	8.28	2.51	2.38	5.72	3.71	386.67

Contd.

Table 1 contd.

Acc. No.	Characters														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
CUM 19	107.11	1.10	8.89	45.49	9.92	311.52	5.00	16.66	10.53	8.11	2.62	2.39	5.17	3.16	549.44
CUM 20	88.72	1.00	8.34	39.00	8.41	225.02	5.00	14.55	10.88	7.34	2.44	2.24	5.49	3.19	305.55
CUM 21	101.61	1.00	9.67	43.94	8.86	255.14	5.11	16.78	11.35	8.45	2.57	2.40	5.35	3.82	455.55
CUM 22	91.39	1.00	8.44	38.70	8.30	219.72	4.11	12.78	9.63	5.49	2.47	2.10	4.62	2.98	229.45
CUM 23	87.52	1.33	8.11	37.89	9.25	239.10	4.55	13.11	9.41	7.41	2.27	2.16	4.94	3.32	277.22
CUM 24	80.67	1.70	7.57	35.57	8.63	211.01	4.67	17.89	9.71	6.36	2.38	2.12	5.30	3.17	259.44
CUM 25	86.72	1.10	8.89	37.72	9.02	231.88	5.56	15.89	10.76	6.56	2.47	2.22	5.04	3.13	307.22
CUM 26	82.78	1.10	7.78	34.77	8.62	205.54	4.22	11.33	9.08	5.18	2.31	1.92	4.90	3.07	192.78
CUM 27	90.28	1.43	8.33	38.61	9.68	254.46	5.44	16.11	9.91	7.35	2.43	2.17	5.40	3.48	326.11
CUM 28	89.55	1.43	8.11	39.03	9.64	257.80	5.33	15.89	9.73	7.54	2.30	2.27	5.03	3.41	374.44
CUM 29	63.72	1.33	8.44	30.34	7.36	156.58	5.33	9.55	7.42	4.61	1.93	1.68	4.27	2.81	150.00
CUM 30	75.12	1.80	7.78	37.13	9.49	242.48	5.00	15.11	10.16	7.05	2.40	2.12	5.37	3.63	361.89
CUM 31	107.83	1.43	8.45	46.96	10.29	319.76	5.67	16.66	10.53	8.73	2.60	2.35	6.05	3.77	468.33
CUM 32	114.07	1.00	10.22	48.64	10.88	361.81	5.33	15.67	9.78	7.54	2.35	2.20	5.65	3.26	377.22
CUM 33	111.28	1.20	8.78	48.40	11.61	397.45	5.89	16.22	10.81	8.64	2.53	2.46	5.57	3.61	441.67
CUM 34	110.50	1.43	9.22	48.33	11.41	375.30	5.56	18.56	9.82	8.87	2.47	2.38	6.17	3.83	494.44
CUM 35	114.00	1.43	8.67	48.69	10.88	362.62	5.56	17.67	10.60	8.03	2.25	2.34	6.16	3.84	450.00
CUM 36	109.11	1.43	8.78	46.59	11.01	350.86	5.33	13.56	9.80	8.26	2.32	2.24	6.16	4.12	406.11
CUM 37	96.72	1.10	9.22	41.84	10.06	290.60	5.00	13.66	10.53	7.76	2.39	2.21	5.45	3.28	390.00
CUM 38	89.45	1.90	7.44	41.37	9.96	280.99	5.33	17.57	10.96	8.85	2.35	2.28	5.44	3.51	458.33
CUM 39	73.67	1.43	8.00	35.35	9.07	218.61	5.78	15.34	10.33	7.02	2.31	2.09	5.87	3.25	300.00
CUM 40	77.89	1.70	6.89	35.33	8.94	226.30	5.44	16.44	10.28	7.42	2.26	2.18	4.89	3.25	273.33
CUM 41	80.28	1.80	7.33	36.11	9.19	225.84	5.55	15.00	9.45	8.45	2.43	2.13	4.49	3.90	336.11
CUM 42	71.55	1.67	7.33	33.05	8.66	194.89	5.33	15.00	9.87	6.69	2.21	1.97	5.09	3.24	235.00
CUM 43	78.61	1.20	9.78	34.90	9.20	220.28	5.44	14.56	9.99	6.20	2.21	2.04	4.66	2.98	187.22
CUM 44	74.83	1.33	8.22	34.81	8.46	200.29	5.89	14.11	10.33	7.28	2.36	2.10	5.28	3.27	283.89
CUM 45	80.56	1.00	8.67	35.50	8.73	210.93	4.89	13.00	10.38	7.49	2.52	2.18	6.03	3.84	290.56
CUM 46	77.61	1.30	7.44	33.35	9.03	206.93	5.56	9.55	8.29	5.16	1.82	1.63	4.91	2.67	146.67
CUM 47	78.56	11.67	7.44	34.39	9.26	217.62	5.78	14.56	10.42	8.10	2.40	2.21	5.33	3.51	343.89
CUM 48	72.50	1.90	7.22	32.76	8.87	198.43	5.67	15.33	10.56	8.73	2.41	2.28	5.17	3.64	341.67
CUM 49	64.11	1.90	7.11	31.84	8.55	187.19	5.56	14.34	8.84	6.58	2.13	1.98	4.42	2.84	255.56
CUM 50	65.83	1.67	9.00	32.30	8.93	199.12	5.89	10.44	8.68	5.52	2.07	1.75	5.02	2.58	149.44
Mean	94.32	1.29	8.53	40.55	9.22	258.97	5.18	14.75	9.99	7.15	2.36	2.15	5.30	3.24	329.07
Range	46-141	1-3	5-12	21.00-61.33	4.43-14.80	66.32-578.33	3-9	3-47	2.50-15.17	1.40-12.07	0.82-3.36	0.66-3.08	2.8-9.6	1.37-6.11	30-1230
SD	15.90	0.29	0.78	5.47	0.91	56.25	0.46	2.10	0.74	1.02	0.16	0.18	0.49	0.38	92.62
CV	16.86	22.48	9.14	13.49	9.87	21.72	8.88	14.24	7.41	14.27	6.78	8.37	9.25	11.73	28.15
CD @ 5%	11.94	0.39	1.41	5.10	1.30	63.98	0.95	4.04	1.22	1.57	0.27	0.28	0.88	0.48	134.30
GCV	16.26	18.60	6.10	12.73	8.57	19.89	6.18	10.44	6.00	11.89	5.94	6.51	6.98	10.80	24.17
PCV	18.02	27.13	12.30	14.87	12.15	24.99	12.74	19.73	9.60	17.90	9.32	10.23	12.45	14.19	34.76
Heritability (broad sense) (%)	81.47	50.00	32.72	73.19	49.60	63.34	22.72	27.80	39.13	43.64	40.00	40.00	32.56	57.14	48.32
Genetic advance (%)	30.23	27.95	8.30	22.42	12.41	32.60	5.96	11.30	7.75	16.09	7.68	8.43	8.35	16.71	34.60

1. Plant height (cm); 2. Number of tillers; 3. Number of leaves/tiller; 4. Leaf length (cm); 5. Leaf breadth (cm); 6. Leaf area (cm2); 7. Number of primary fingers; 8. Number of secondary fingers; 9. Length of primary fingers (cm); 10. Length of secondary fingers (cm); 11. Diameter of primary fingers (cm); 12. Diameter of secondary fingers (cm); 13. Length of mother rhizome (cm); 14. Diameter of mother rhizome (cm); 15. Yield/plant (g)

Table 2. Performance indices of *Curcuma amada* accessions

Acc. No.	Characters/Performance index																Rank of performance
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	Total	
CUM 1	1.05	0.78	1.02	0.99	0.95	0.94	0.86	0.98	0.96	0.98	0.90	0.87	0.94	0.83	0.89	13.94	39
CUM 2	1.25	0.85	1.09	1.23	1.09	1.35	0.88	1.25	1.08	0.93	1.01	0.96	1.25	0.89	1.31	16.42	7
CUM 3	1.22	1.03	0.96	1.19	1.10	1.32	0.99	1.21	1.09	0.92	0.98	0.96	1.02	0.88	1.37	16.24	9
CUM 4	1.19	0.93	1.15	1.22	1.09	1.31	0.99	1.16	1.03	0.98	0.87	0.84	1.06	0.85	1.26	15.93	13
CUM 5	1.08	0.78	0.98	1.03	1.01	1.04	1.05	0.93	1.00	0.98	0.91	0.91	1.12	1.01	0.96	14.79	25
CUM 6	1.11	0.78	1.02	1.08	0.96	1.04	0.86	1.02	1.07	0.92	0.92	0.91	1.09	1.02	0.92	14.72	27
CUM 7	1.01	0.78	1.00	1.00	0.85	0.84	0.84	0.86	0.91	0.88	0.88	0.84	0.96	0.89	0.78	13.32	44
CUM 8	1.00	0.85	1.06	0.98	0.85	0.83	0.93	0.95	0.93	0.76	0.90	0.82	0.88	0.85	0.74	13.33	43
CUM 9	1.14	0.95	1.03	1.01	0.91	0.90	0.93	1.01	1.04	0.89	0.90	0.84	0.96	0.86	0.81	14.18	36
CUM 10	1.11	0.95	1.11	1.02	0.92	0.95	0.95	0.94	0.93	0.98	0.94	0.88	1.02	0.98	1.07	14.75	26
CUM 11	1.06	0.78	1.12	1.02	0.93	0.95	0.88	0.84	1.04	1.00	0.96	0.91	0.91	0.88	0.81	14.09	38
CUM 12	1.09	0.78	1.08	1.08	0.90	0.96	0.95	1.02	1.03	1.00	0.94	0.92	0.89	0.87	0.90	14.41	31
CUM 13	1.16	1.03	1.03	1.07	0.93	0.99	1.01	1.00	1.02	0.91	1.00	1.00	0.94	0.86	0.98	14.93	23
CUM 14	1.14	0.85	1.07	1.03	0.92	0.96	0.95	0.96	0.94	0.92	0.91	0.93	0.96	0.90	0.95	14.39	32
CUM 15	1.19	0.85	0.96	1.12	0.97	1.09	0.95	0.84	0.98	1.00	1.02	0.94	0.99	1.03	1.18	15.11	19
CUM 16	1.14	0.85	1.04	1.06	0.98	1.03	0.97	0.97	1.01	1.05	0.88	0.97	1.01	1.00	0.95	14.91	24
CUM 17	1.23	0.78	1.08	1.16	1.03	1.19	1.01	1.15	1.05	1.07	1.00	0.95	1.08	1.09	1.28	16.15	11
CUM 18	1.21	0.78	1.08	1.17	1.05	1.20	0.88	0.88	1.03	1.15	0.99	1.02	1.08	1.15	1.18	15.85	14
CUM 19	1.14	0.85	1.04	1.12	1.08	1.20	0.97	1.13	1.06	1.13	1.04	1.02	0.98	0.98	1.67	16.41	8
CUM 20	0.94	0.78	0.98	0.96	0.91	0.87	0.97	0.99	1.09	1.02	0.96	0.96	1.04	0.98	0.93	14.38	33
CUM 21	1.08	0.78	1.13	1.08	0.96	0.99	0.99	1.14	1.14	1.17	1.02	1.03	1.01	1.18	1.38	16.08	12
CUM 22	0.97	0.78	0.99	0.95	0.90	0.85	0.80	0.87	0.97	0.76	0.98	0.90	0.87	0.92	0.70	13.21	45
CUM 23	0.93	1.03	0.95	0.93	1.00	0.92	0.88	0.89	0.94	1.03	0.90	0.92	0.93	1.02	0.84	14.11	37
CUM 24	0.86	1.32	0.89	0.88	0.94	0.81	1.10	1.21	0.97	0.88	0.94	0.91	1.00	0.98	0.79	14.48	29
CUM 25	0.92	0.85	1.04	0.93	0.98	0.90	1.08	1.08	1.08	0.91	0.98	0.95	0.95	0.97	0.93	14.55	28
CUM 26	0.88	0.85	0.91	0.86	0.93	0.79	0.82	0.77	0.91	0.72	0.91	0.82	0.92	0.95	0.59	12.63	47
CUM 27	0.96	1.11	0.98	0.95	1.05	0.98	1.05	1.09	0.99	1.02	0.96	0.93	1.02	1.07	0.99	15.15	18
CUM 28	0.95	1.11	0.95	0.96	1.05	1.00	1.03	1.08	0.98	1.05	0.91	0.97	0.95	1.05	1.14	15.18	17
CUM 29	0.68	1.03	0.99	0.75	0.80	0.60	1.03	0.65	0.74	0.64	0.76	0.72	0.81	0.87	0.46	11.53	49
CUM 30	0.80	1.40	0.91	0.92	1.03	0.94	0.97	1.02	1.02	0.98	0.95	0.91	1.01	1.12	1.11	15.09	21
CUM 31	1.14	1.11	0.99	1.16	1.12	1.23	1.10	1.13	1.06	1.21	1.03	1.00	1.14	1.16	1.42	17.00	4
CUM 32	1.21	0.78	1.20	1.20	1.18	1.40	1.03	1.06	0.98	1.05	0.93	0.94	1.07	1.01	1.15	16.19	10
CUM 33	1.18	0.93	1.03	1.19	1.26	1.53	1.14	1.10	1.08	1.20	1.00	1.05	1.05	1.11	1.34	17.19	3
CUM 34	1.17	1.11	1.08	1.19	1.24	1.45	1.08	1.26	0.98	1.23	0.98	1.02	1.16	1.18	1.50	17.63	1
CUM 35	1.21	1.11	1.02	1.20	1.18	1.40	1.08	1.20	1.06	1.12	0.98	1.00	1.16	1.19	1.37	17.28	2
CUM 36	1.16	1.11	1.03	1.15	1.19	1.35	1.03	0.92	0.98	1.15	0.92	0.96	1.16	1.27	1.23	16.61	5
CUM 37	1.03	0.85	1.08	1.03	1.09	1.12	0.97	0.93	1.06	1.08	0.94	0.94	1.03	1.01	1.19	15.35	15
CUM 38	0.95	1.47	0.87	1.02	1.08	1.09	1.03	1.19	1.10	1.23	0.93	0.97	1.03	1.09	1.39	16.44	6
CUM 39	0.78	1.11	0.94	0.87	0.98	0.84	1.12	1.04	1.04	0.98	0.91	0.89	0.92	1.00	0.91	14.33	35
CUM 40	0.83	1.32	0.81	0.87	0.97	0.87	1.05	1.11	1.03	1.03	0.89	0.93	0.92	1.00	0.83	14.46	30
CUM 41	0.85	1.40	0.86	0.89	1.00	0.87	1.08	1.02	0.95	1.17	0.96	0.91	1.04	1.20	1.02	15.22	16
CUM 42	0.76	1.29	0.86	0.82	0.94	0.75	1.03	1.02	0.99	0.93	0.87	0.84	0.96	1.00	0.71	13.77	40
CUM 43	0.83	0.93	1.15	0.86	1.00	0.85	1.05	0.99	1.00	0.86	0.87	0.87	0.88	0.92	0.57	13.63	41
CUM 44	0.79	1.03	0.96	0.86	0.92	0.77	1.14	0.96	1.04	1.01	0.93	0.90	1.00	1.01	0.86	14.18	36
CUM 45	0.85	0.78	1.02	0.88	0.95	0.81	0.95	0.88	1.04	1.04	1.00	0.93	1.14	1.19	0.88	14.34	34
CUM 46	0.82	1.01	0.87	0.82	0.98	0.80	1.08	0.65	0.83	0.72	0.72	0.70	0.93	0.82	0.45	12.20	48
CUM 47	0.83	1.29	0.87	0.85	1.00	0.84	1.12	0.99	1.05	1.13	0.95	0.94	1.01	1.08	1.05	15.00	22
CUM 48	0.77	1.47	0.85	0.81	0.96	0.77	1.10	1.04	1.06	1.21	0.95	0.97	0.98	1.12	1.04	15.10	20
CUM 49	0.68	1.47	0.83	0.79	0.93	0.72	1.08	0.97	0.89	0.91	0.84	0.85	0.83	0.88	0.78	13.45	42
CUM 50	0.70	1.29	1.06	0.80	0.97	0.77	1.14	0.71	0.87	0.77	0.82	0.75	0.95	0.80	0.45	12.85	46

1. Plant height; 2. Number of tillers; 3. Number of leaves/tiller; 4. Leaf length; 5. Leaf breadth; 6. Leaf area; 7. Number of primary fingers; 8. Number of secondary fingers; 9. Length of primary fingers; 10. Length of secondary fingers; 11. Diameter of primary fingers; 12. Diameter of secondary fingers; 13. Length of mother rhizome; 14. Diameter of mother rhizome; 15. Yield/plant

The superior accessions show significantly high level of agronomic characters and these accessions can be subjected to further selection procedures so that superior planting material could be made available to the farmers. In spite of the presence of a strong genetic base at present, serious efforts are required to conserve the germplasm of this under-exploited crop. Efforts should also be made to popularize the inclusion of this crop in the day to day food of the common man both for its richness in starch content and also for its curative properties.

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