

GENETIC VARIABILITY IN TURMERIC (*CURCUMA LONGA* L.)

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ABSTRACT

Fifteen turmeric types were evaluated for yield and eight other attributes. Significant variation was observed for all characters, except leaf number and tillers per plant, among the entries. Generally pcv estimates were larger than the gcV values. Heritability estimates were high for all traits except leaf number and tillers/plant. Plot yield had moderate heritability value. Maximum genetic advance was observed for leaf-length followed by weight of fingers. 'Dehradun local' had recorded maximum yield. Local types like 'Assam Diphu' and 'Manipur Local' were also moderately good yielders.

Turmeric (*Curcuma longa* L.) is one of the rhizomatous spices produced and exported from India. Apart from the traditional turmeric growing states of Andhra Pradesh, Tamil Nadu, Bihar, Orissa, Maharashtra and Kerala, it is also cultivated to a larger extent in the north eastern states of India. In fact, many local types of turmeric are prevalent in the states of Tripura, Nagaland, Manipur, Meghalaya, Assam, Sikkim etc. The present investigation relates to the genetic evaluation of different turmeric selections, including some local types of north eastern region, for yield and yield attributes.

The experiment was conducted at the Tripura Centre of ICAR Research Complex for NEH Region. Fifteen varieties of turmeric viz. 'Assam Diphu',

'Kasturi Tanaka', 'Dehradun Local', 'Sugandham', 'De-ghi', 'Manipur Local', 'Avanigadda', 'Lakadong', 'Tripura Local', 'Nandyal Type', 'Amlapuram', 'Kuchipudi', 'C.L. Puram', 'Rajpuri' and 'V.K. 5' were grown in 3 sq.m plots replicated 3 times in RBD with spacing of 25 cm. between plants and 40 cm. between rows. Observations were recorded on plant height (cm.), tiller number, leaf number, leaf length and width (cm.), finger length (cm.), finger circumference (cm.), finger weight (g) and plot yield (kg) from 3 random plants per plot. The crop was raised as per the practice in yogue. The genetic parameters were estimated following standard procedures.

Mean values for yield and yield attributes are given in Tanle 1. Variance analysis revealed significant differences among the entries for all characters studies except tillers/plant and leaf number. Non significant difference for suckers/plant and leaf number in 17 selections of turmeric have been reported earlier(1). Highest mean height was recorded by 'Assam Diphu' followed by 'G.L. Puram'. 'Manipur Local' had the lowest height. Maximum number of tillers were observed in 'Kuchipudi' while 'Assam Diphu' had the least number of tillers. Highest number of leaves were recorded in 'Rajpuri'. 'Assam Diphu' had maximum leaf length while 'Tripura Local' had the maximum width of leaf. Lowest leaf length and breadth were observed in 'Sugandham' and 'Daghi' respectively. Longest fingers were observed in 'Tripura Local' and shortest in 'Nandyal Type'. 'Manipur Local' had maximum circumference of fingers and 'Avanigadda' had least finger weight. Maximum plot yield was observed in 'Dehradun Local' while 'Tripura Local' recorded the lowest yield. 'Dehradun Local' had registered maximum yield at Mizoram as well(2).

All the characters had higher pcv estimates as compared to gcv values indicating the influence of environmental factors (Table 2). Highest gcv was observed for leaf length and the lowest for

tillers/plant. All traits except tillers/plant and leaf number had high estimates of heritability. However, plot yield had only moderate heritability value. Maximum genetic advance (GS) was observed for leaf length followed by weight of fingers. Plot yield had moderate genetic advance(3).

High estimates of heritability and moderate to high genetic advance observed for plant height, leaf length and width, finger length, circumference of fingers and finger weight indicated the predominance of additive genetic variance for these characters. This implies that selection for these characters would be effective to improve the yield. As local selections like 'Assam Diphu' and 'Manipur Local' are moderately good yielders and have got good mean values for yield attribute, these selections can also be exploited besides 'Dehradun Local'.

REFERNCES

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	(cm)	plant	(cm)	(cm)	(cm)	(g)	(g)	(kg)
ssam Diphu	101.27	3.10	8.00	69.26	14.93	5.79	14.74	4.17
asturi Tanoka	90.00	3.43	8.67	44.68	11.78	6.16	14.60	3.53
ehradun local	96.40	3.60	8.00	52.12	15.77	6.69	12.38	5.20
ugendam	84.53	4.00	8.33	40.00	11.93	6.20	14.54	4.83
aghi	54.17	3.50	9.27	40.42	10.77	6.27	10.65	4.57
anipur local	70.00	3.17	8.00	40.25	13.37	6.84	23.90	3.98
vanigadda	82.78	3.27	9.17	41.25	12.73	6.40	9.61	3.87
akalong	82.87	3.50	8.10	40.00	13.03	6.58	14.68	3.05
ripura local	76.50	4.20	5.47	52.03	16.70	7.10	13.41	2.75
andyal type	87.07	3.90	9.00	52.00	13.76	5.67	12.16	3.20
malapuram	88.67	3.83	9.00	40.75	13.60	6.06	14.43	4.27
uchipudi	90.80	4.25	9.33	44.92	10.05	5.71	11.99	6.35
S.L. puram	98.80	3.90	9.00	51.20	13.82	6.99	12.54	4.13
Rajpuri	54.50	3.90	9.57	45.25	15.50	5.41	10.43	3.75
V.K. 5	96.80	3.67	9.10	66.00	14.25	6.50	13.15	4.00
C.D. at 5%	9.92			1.85	0.82	0.54	2.98	1.76

Table 2. Genetic parameters for yield and yield attributes in turmeric.

Characters	Genotypic coefficient of variation (scv)	Phenotypic coefficient of variation (pcv)	Heritability (bread-sense) %	Genetic advance (as % of mean) 5% selection intensity
Plant height (cm)	10.31	12.23	71.17	18.05
No. of tillers/plant	2.69	18.28	2.16	0.82
Leaf number	4.7	11.93	15.92	3.90
Leaf width (cm)	11.85	12.40	91.43	23.34
Leaf length (cm)	58.90	60.20	97.84	121.36
Length of finger (cm)	7.6	9.10	69.96	13.10
Circumference of finger (cm)	9.13	11.06	67.98	15.47
Wt. of finger (g)	24.40	27.73	77.50	44.36
Plot yield (kg)	17.91	25.92	47.86	25.49