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Short Communication

Selection indices and *per se* performance of morphologically diverse anthurium genotypes

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Anthurium (*Anthurium andreanun* Linden.) is currently being promoted as export oriented cut flower crop. The genus is native of tropical zones of central and south America. It is a tropical plant of great beauty grown for its colourful long lasting flowers and handsome foliage. The warm humid tropical climate of Kerala in South India is congenial for its wide spread cultivation. Basic information on the breeding behaviour of anthurium to improve the existing types and varieties are found wanting. Moreover, selection of genotypes based on suitable index is highly efficient in any breeding programme. Selection index aids the breeder in indirect selection. Hence, the present study was under taken with a view to study the various morphological characters and selection index for the improvement of anthuriums.

The 50 genotypes of anthurium showing variation in spathe colour, shape, size and other commercially valuable morphological characters were utilized for the study during 2001-2002 at the Department of Plant Breeding and Genetics, College of Agriculture, Vellayani, Thiruvananthapuram. The 17 characters under study were plant height, internode length, suckering ability, leaf area, days from emergence to maturity of leaves, days from emergence to maturity of inflorescence, number of spadices per plant per year, candle length, inclination of candle, number of flowers per candle, life of spadix, days to initiation of female phase, duration of female phase, days of interphase, duration of male phase, pollen fertility and anthocyanin content. Total anthocyanin content was estimated as per the procedure

Table 1. *Per se* performance of 17 Characters in *anthurium* genotypes

Sl. No.	Characters	Mean	Range	Genotypes		SEm
				Low	High	
1.	Plant height (cm)	41.28	22.17 to 64.80	LJ × MW	LR × PR	2.695
2.	Internode length (cm)	1.56	0.97 to 2.57	MW × PR	MW × FR (1)	0.739
3.	Suckering ability	1.88	1.00 to 3.00	MW × DT	LR × FR	0.274
4.	Leaf area (cm^2)	138.70	41.32 to 323.70	LJ × MW	MW × FR (1)	7.589
5.	Days form emergence to maturity of leaves	27.56	15.33 to 41.00	OG × LR	DT × FR	0.397
6.	Days from emergence to maturity of inflorescence	30.00	16.67 to 37.67	NO × LR (1)	MO × KR (1)	0.319
7.	Number of spadices/plant/year	4.38	3.00 to 7.00	PR × DT	KO × DT	0.492
8.	Candle length (cm)	4.71	3.13 to 9.17	FR × MW (2)	FR × MW (1)	0.250
9.	Inclination of candle to spathe (degrees)	43.10	10.67 to 89.33	PR × MO	MO × KR (1)	0.754
10.	Number of flowers/candle	328.81	149.67 to 689.33	LJ × MW	MW × FR (1)	6.046
11.	Life of spadix (days)	77.08	48.33 to 124.67	KO × DT	MO × KR (1)	0.889
12.	Days to initiation of female phase	6.10	3.0 to 8.0	FR × CR (1) & LR × FR	KR × CR	0.210
13.	Duration of female phase (days)	6.10	3 to 11	OG × KR	MW × FR (1)	0.169
14.	Days of interphase	6.49	2 to 11	PR × KR	MO × KR (2)	0.221
15.	Duration of male phase (days)	8.29	4 to 12	MW × DT	MW × PR	0.290
16.	Pollen fertility (%)	24.24	7.03 to 50.80	PR × FR (2)	LJ × MW	0.578
17.	Anthocyanin content (mg/g)	234.86	26.81 to 710.79	FR × KR	PR × LR (3)	4.007
			120.84	OG × DT (Obaki)		

SEm : Standard Error of Mean

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of Rangana (1977) (1). The various genotypes were discriminated for 17 characters using the selection index developed by Smith (1947) (2) based on discriminate function of Fisher 1936 (3).

Per se performance of Anthurium genotypes for 17 characters are given in Table 1. Short and downward curving candle with an angle less than 45° is an extremely desirable character for commercial anthurium varieties. The inclination ranged from 10.670 in PR × MO to 89.330 in MO × KR (1) with mean value of 43.100. Initiation of female phase was identified by the slight projection of stigmas and presence of viscous exudates in the candle. The study clearly highlighted the protogynous nature of this species. The number of days in female phase was recorded as 3 days in OG × KR to 11 days in MW × FR (1). Interphase between female and male phase was marked by drying up of stigmatic droplet. The character ranged from 2 days in PR × KR to 11 days in MO × KR (2). Male phase which was marked by the extrusion of anthers starting from the base of the candle, proceeding towards tip, lasted for about 4 days in MW × DT to 12 days in MW × PR with a mean of 8.29 days.

High pollen fertility was recorded for the genotypes LJ × MW (50.8%). Pollen fertility was minimum for the genotypes PR × FR (2) (7.03%). Low pollen fertility in *A. andreanum* indicated its hybrid nature. Anthocyanin contributes various colours to the spathe. Anthocyanin content ranged from 26.81 mg/g in FR × KR (pink spathe) to 710.79 mg/g in PR × LR (3) (maroon spathe). Genotype OG × DT showed double colored spathe (Obaki) with an anthocyanin content of 120.84 mg/g.

The selection index values (descending order) and genetic gain are presented in Table 2. High selection index values were recorded by the genotype LR × DT, followed by FR × MW (1), PR × LR (3), MW × FR (1) and HR × LW and so on. Least index values were recorded by the genotype FR × KR. High selection index values indicates that there is scope for improvement of the characters for a particular genotype.

Genetic gain worked out reveals that if the parents are selected based on selection index values, for crop improvement 45% genetic gain can be expected in the next generation (Table 2). From the results, the genotypes LR × DT, FR × MW (1), PR × LR (3), MW × FR (1) and HR × LW with high selection index values indicated that the desirable characters which are of economic importance could be exploited. These genotypes can be utilized in breeding programme.

Table 2. Selection index of 50 genotypes of *anthurium* arranged in descending order

Sl. No.	Genotypes	Selection index
1.	LR × DT	4690
2.	FR × MW(1)	4501
3.	PR × LR(3)	4497
4.	MW × FR(1)	4485
5.	HR × LW	4244
6.	PR × DT	3961
7.	PR × LR(1)	3851
8.	PR × OG	3713
9.	FR × LR	3550
10.	LR × FR	3399
11.	PR × FR (2)	3389
12.	MO × KR (1)	3372
13.	MW × DT	3302
14.	MO × LR	3283
15.	KR × CR	3248
16.	PR × FR (4)	3174
17.	PR × LR (2)	3127
18.	TR × MW	3111
19.	NO × LR (2)	3048
20.	PR × FR (1)	3031
21.	DT × FR	3007
22.	NO × DT	2997
23.	MO × KR (2)	2992
24.	PR × FR (3)	2910
25.	PR × MW	2832
26.	NO × TR	2765
27.	KR × LR	2760
28.	PR × KR	2735
29.	LR × PR	2684
30.	OG × DT	2634
31.	NO × PR	2609
32.	NO × LR (1)	2604
33.	FR × MW (2)	2577
34.	MW × PR	2524
35.	KR × DT	2516
36.	FR × CR (2)	2477
37.	DT × KR	2464
38.	MW × FR (2)	2458
39.	KO × CR	2458
40.	NO × CR	2439
41.	FR × DT (2)	2414
42.	FR × CR (1)	2356
43.	PR × MO	2341
44.	OG × KR	2340
45.	KO × LR	2296
46.	OG × LR	2283
47.	KO × DT	2176
48.	FR × DT (1)	1922
49.	LJ × MW	1859
50.	FR × KR	1857

Genetic Gain, 0.45

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