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Genetic Variability in Babycorn (*Zea mays* L.) Genotypes

Key words : Babycorn, Variability

Maize (*Zea mays*. L.) occupies a prominent position in global agriculture next to wheat and rice. Research efforts have led to the development of special corn types such as sweet corn, pop corn, waxy corn, babycorn etc. The term babycorn refers to young tender flowering maize ears harvested within 2-4 days after silk emergence before fertilization. Breeders have diverted their research efforts for the development of babycorn lines which are prolific cob producers, high in protein and sugar content. Therefore, the present investigation was undertaken to assess the magnitude of genetic variability, heritability and genetic advance for some important quantitative traits in babycorn.

The experimental material for the study consists of one hundred babycorn genotypes selected based on their good agronomic and *per se* characters and was grown in simple lattice design with two replications adopting inter- and intra-row spacing of 75 x 30 cm at College Farm, College of Agriculture, Rajendranagar, Hyderabad. All the recommended package of practices and plant protection measures were followed. Young baby cobs were harvested twice at weekly intervals within four to six days after silk emergence. Observations were recorded from five randomly chosen plants from each genotype or on plot basis in each of the replication for thirteen characters, namely days to 50 per cent silking, days to 50 per cent tasselling, plant height (cm), ear height (cm), number of pickings, shoot length (cm), shoot girth (mm), shoot weight with husk (g), shoot weight without husk (g), number of shoots plant^{-1}, protein per cent, sugar content (mg g^{-1} of fresh weight) and babycorn yield plant^{-1} (g). Data were analysed as suggested by Panse and Sukhtame (1961) and heritability in broad sense were given as per Burton and Devane (1953). The methods of Johnson *et al.* (1955) were followed for calculating the expected genetic advance and genetic advance as per cent of mean (GAM).

Analysis of variance revealed the existence of highly significant differences for all the characters among the genotypes. High variability was observed for babycorn yield plant^{-1}, shoot weight without husk, number of shoots plant^{-1}, number of pickings, protein per cent, sugar content, shoot girth and shoot length, whereas moderate variability was recorded for ear height (Table). Hence, there is a possibility for improvement of these traits. Low variation was observed for days to 50% tasselling, days to 50% silking and plant height indicating the difficulty in improvement of such traits through simple selection whereas the reverse was true for rest of the traits. Protein content ranged from 2.53 per cent to 22.06 per cent, while sugar content varied from 9.83 mg g^{-1} to 24.50 mg g^{-1}.

The characters, days to 50% taselling and days to 50% silking exhibited low GCV and PCV values with a narrow difference between them, indicating less sensitivity of these attributes to environment. They exhibited high heritability along with low GAM, which is indicative of the predominance of non-additive gene action in controlling these characters. Hence, selection for such traits may not be rewarding. The character, plant height, recorded low values for both GCV and PCV with a narrow difference between them, suggesting greater role of genetic factors in determining the variability of this character. High heritability and moderate genetic advance observed for this trait indicating the predominance of non-additive gene action.

GCV and PCV observed for ear height were moderate with a minor difference between them indicating less influence of environment on this character. It exhibited high heritability coupled with high GAM, which revealed the involvement of additive gene action in controlling this trait. Similarly other traits such as number of shoots per plant, shoot weight with husk, shoot weight without husk, shoot length, shoot girth, number of pickings, protein per cent, sugar content and babycorn yield plant^{-1} also exhibited high heritability and high GAM. Hence, a good reponse to selection can be anticipated in improving these characters. High heritability estimates were earlier reported by Debnath (1987) for ear height and Li and Yang (1985) for ear length. Johnson *et al.* (1955) also reported the involvement of additive gene action in controlling the above mentioned traits. Satyanarayana *et al.* (2005) also reported low ECV for ear height, days to 50% silking, plant height, shoot length, shoot weight with husk, number of shoots plant $^{-1}$ and protein per cent revealing greater role of genetic factors in controlling the inheritance of these attributes. High ECV noticed

Table. Variability parameters for yield and its component characters in babycorn.

Character	Mean	Range		PCV	GCV	ECV	Herita-bility (%)	Genetic advance	Genetic advance as per cent of mean
		Minimum	Maximum						
Days to 50 per cent tasselling	53.45	51.15	59.85	4.02	4.79	0.76	70.52	4.92	9.20
Days to 50 per cent silking	58.14	54.60	66.10	5.05	4.80	0.24	90.38	5.47	9.41
Plant height (cm)	201.24	162.77	225.07	7.06	6.40	0.66	82.01	24.03	11.94
Ear height (cm)	63.36	40.95	83.45	14.91	14.80	0.11	98.53	19.17	30.26
Number of shoots plant^{-1}	2.50	1.16	4.16	34.85	31.63	3.20	82.43	1.48	59.17
Shoot weight with husk (g)	21.59	10.05	33.40	28.92	26.32	2.59	82.86	10.66	49.37
Shoot weight without husk (g)	7.92	1.95	15.20	46.31	35.40	10.90	76.45	4.42	55.76
Shoot length (cm)	6.58	3.65	11.60	30.29	29.59	0.69	95.45	3.92	59.56
Shoot girth (mm)	4.23	1.75	6.80	32.99	28.21	4.78	73.09	2.10	49.68
Number of pickings	2.50	1.16	4.16	34.83	31.57	3.26	82.14	1.47	58.94
Protein per cent	12.22	2.53	22.06	34.05	31.74	2.31	86.88	7.61	60.95
Sugar content (mg/g)	14.84	9.83	24.50	32.05	26.75	5.35	69.42	6.47	45.91
Babycorn yield plant^{-1} (g)	55.32	19.23	137.33	52.04	44.97	7.07	74.66	44.28	80.05

for shoot weight without husk followed by babycom yield, sugar content and shoot girth indicate the greater involvement of environmental interaction in controlling these characters. These findings are in agreement with the observations of Tan (1991), who emphasized the involvement of environmental interaction with lower or higher values for yield and its component traits.

Number of shoots per plant, shoot weight with husk, shoot weight without husk, shoot length, shoot girth, number of pickings, protein per cent, sugar content and babycorn yield plant^{-1} are important characters for yield improvement in babycorn as they exhibited high genotypic coefficient of variation, heritability along with high genetic advance as per cent of mean.

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