



Correlation and path analysis in Senna (*Cassia senna*)

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Senna (*Cassia senna*) is a small perennial under shrub, native of Yemon and Saudi Arabia. Amongst over-the-counter-drugs, "Senna" (leaves and pod powder) is a well known drug in the unani system of medicine. Report on genetic correlations and path analysis are scanty in this crop. Twenty-five genotypes used in this study were grown in a randomized block design with two replications. Each plot contained three rows of 5 m long with a 50 × 30 cm row to plant spacing. Five competitive plants were taken at random from each plot to record data on seven metric traits viz., number of days to flower, plant height (cm), number of branches per plant, leaf area (cm²), fresh leaf yield per plant (g), dry leaf yield per plant (g) and 100 seed weight (g).

Observations recorded were subjected to analyses of variance. Mean squares for yield and other traits indicated that genotypes were variable in their genetic make-up for almost all plant performance traits. Broad sense estimates of high heritability was recorded in dry leaf yield per plant (0.51) and 100 seed weight (0.45) and for remaining characters were ranging from moderate (0.32) to low (0.16). Phenotypic and genotypic correlation coefficient (Table 1) indicated that dry leaf yield per plant showed significant and positive genotypic association with number of branches per plant and fresh leaf yield per plant. Whereas, phenotypic correlation was significant and positive only in one pair i.e. dry leaf yield with fresh leaf yield per plant. The magnitude of genotypic correlation coefficients of dry leaf yield per plant with above component traits was higher than that of corresponding phenotypic correlation coefficients. Further, days to flower and 100 seed weight were negatively correlated with dry leaf yield per plant. As number of branches per plant and fresh leaf yield showed positive association with dry leaf yield per plant,

selection for improvement of dry leaf yield based on these components would be effective in improving the yield.

Table 1. Genotypic (G) and phenotypic (P) correlation coefficient among seven characters in Senna

Character	Plant height (cm)	No. of br./ plants	Leaf area (cm ²)	100 seed wt. (g)	Fresh leaf yield/ plant	Leaf yield/ plant
No. of days to flower	G -0.93**	-1.34**	0.30	0.73**	-0.46	-0.79**
	P 0.02	-0.08	-0.17	-0.14	-0.20	-0.25
Plant height (cm)		G 0.65**	0.30	0.13	0.34*	0.29
		P 0.22	0.09	-0.07	0.05	0.07
No. of br./ plant			G 0.09	0.07	0.44**	0.79**
			P 0.12	-0.06	0.12	0.10
Leaf area (cm ²)				G -0.07	0.27	0.24
				P 0.08	-0.07	-0.06
100 seed wt. (g)					G -1.06**	-1.07**
					P -0.16	-0.18
Fresh leaf yield/plant						G 1.09**
						P 0.95**

* Significant at =0.05%, **Significant at = 0.01 %

Path coefficients showing direct and indirect effects of characters on dry leaf yield per plant are listed in Table 2. Path coefficient analysis showed that fresh leaf yield had highest direct effect on dry leaf yield per plant followed by branch number per plant. Direct effects of other characters were negligible. However, plant height and leaf area had indirect effects on dry leaf yield through fresh leaf yield per plant. Hence, simultaneous selection for higher number of branches and fresh leaf yield can be practiced to improve, dry leaf yield per plant.

Reference

1. Lal R. K., Mishra H. O., Singh S. P. Sharma S. and Sharma J. R. 1992. Choice and improvement of superior genetic stocks of Senna (*Cassia anagustifolia*). Int. J. Phamacognosy, 30: 56-60.

Table 2. Genotypic path coefficient showing direct (bold) and indirect effects of various traits on leaf yield per plant in Senna

Character	No. of days to flower	Plant height (cm)	No. of br./ palnts	Leaf area (cm ²)	100 seed wt. (g)	Fresh leaf yield/plant	Genotypic corr. leaf yield/plant
No. of days to flower	-0.04	0.04	0.06	-0.01	-0.03	0.02	-0.79
Plant height (cm)	0.48	-0.51	-0.33	-0.15	-0.06	-0.17	0.28
No. of branches per plant	-0.83	0.43	0.62	0.05	0.04	0.27	0.79
Leaf area (cm ²)	-0.02	0.02	0.01	0.08	-0.01	0.02	0.24
100 seed wt. (g)	0.03	0.01	0.03	-0.01	0.04	-0.04	-1.08
Fresh leaf yield per plant (g)	-0.46	0.33	0.44	0.27	-1.06	0.99	1.09