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VARIABILITY PATTERN IN PSYLLIUM

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Phenotypic and genotypic coefficient of variability, heritability in broad sense and genetic advance as percentage of mean were studied for ten quantitative characters in 39 genotypes of isabgol (*Plantago ovata* Forsk). Number of spikes per plant and biological yield had high estimates of genotypic coefficient of variation, heritability and genetic advance as percentage of mean. which suggests that direct selection for these traits would be fruitful in the improvement of this crop. Heritability estimates was highest in 1000 seed weight and lowest in spike length.

Key words : Psyllium, *Plantago ovata*, variability, heritability, genetic advance

Psyllium popularly known as isabgol (*Plantago ovata* Forsk.) is an important cash crop of western Rajasthan and northern Gujarat has a great commercial and medicinal importance due to its thin, rosy white, light membranous coating on the seed. Most of the *isabgol* is exported which bring in sizeable foreign exchange annually. India continues to hold monopoly in the production and trade of *isabgol* in the world. Isabgol offers better prospects for intensive cultivation in arid-sandy to sandy-loam type of soil. It is non-exhaustive crop having low fertility requirement (Kalyanasundaram *et al.*, 1982). Despite its importance, there is lack of research efforts on the improvement of this crop. Kalyanasundram and Dalal (1981) reported association between seed yield and some of the component traits. objective. In the present study, attempt was made to investigate the genetic variability, genetic advance (as percentage of mean) and heritability of seed yield and its component traits.

MATERIALS AND METHODS

The experiment was laid out in randomized block design with 39 entries, replicated 3 times at Mandor (Jodhpur), during *rabi* season 1993-94. Each plot consisted of 4m long rows with a spacing of 30cm between rows and 10 cm between plants. Ten plants of each entry in each replication were used for recording data on days to flowering, days to maturity, plant height, of tillers per plant, spikes per plant, spike length, 1000 seed weight, biological

yield, harvest index and seed yield. Mean values of each genotype were used for statistical analysis. Genotypic and phenotypic coefficient of variation (Burton, 1951), heritability in broad sense (Johnson *et al.*, 1953) and genetic advance (Lush, 1949) were estimated.

RESULTS AND DISCUSSION

Characterwise estimates of genotypic and phenotypic coefficient of variation, heritability in broad sense and genetic advance as percentage of mean are presented in Table 1. The PCVs were observed to be invariably higher

Table 1. Estimate of genetic parameters for 10 characters in isabgol

Character	Range	Mean ± SEm	Genotypic variance	Phenotypic variance	GCV (%)	PCV (%)	Heritability (%)	GA	GA as % of mean.
Seed yield/plot (kg)	0.86-14.6	1.16 ± 0.07	0.02	0.03	12.33	16.66	53.96	0.21	18.53
Days to flowering	60-69	63.51 ± 0.74	4.32	5.90	3.27	3.82	73.22	3.66	5.76
Days to maturity	108-117	112.30 ± 0.74	5.00	6.67	1.99	2.30	75.88	3.98	3.59
Plant height (cm)	27.46 - 39.06	33.38 ± 1.10	9.44	13.09	9.20	10.83	72.11	5.37	16.10
No.of tillers/plant	4.26-7.93	5.55 ± 0.40	0.66	1.15	14.64	19.36	57.31	1.26	22.86
No.of spikes/plant	27.80-55.20	40.25 ± 0.95	54.40	57.16	18.32	18.78	95.17	14.82	36.83
Spike length (cm)	17.26 - 23.53	20.43 ± 0.92	1.38	3.97	5.76	9.75	34.86	1.42	7.00
1000 Seed weight (g)	1.37-2.14	1.72 ± 0.01 ± 0.01	0.03	0.03	11.11	11.16	95.55	0.39	22.75
Biological yield /plot (kg)	2.50 - 4.81	3.94 ± 1.08	39.90	43.41	16.00	16.69	91.91	6.05	31.66
Harvest index (%)	18.26 - 34.72	23.61 ± 0.93	11.52	14.13	14.75	16.33	81.54	6.31	27.43

than the corresponding GCVs for all the characters studied. The number of spikes per plant exhibited maximum genetic variation (18.32%) followed by biological yield (16.0%) and harvest index (14.75%), whereas seed yield per plot exhibited moderate genotypic coefficient of variation (12.33%), suggested that the selection for these traits would be much effective. Swarup and Chaugale

(1962) suggested that GCV alone is not sufficient for determination of the amount of heritable variation, which can be found out with greater accuracy when heritability in conjunction with genetic advance is studied. The percentage of heritability was heighest for 1000 seed weight (95.55gm). This high magnitude revealed that the trait influence very less by the environmental fluctuation. Such character could be improved directly through selection. The character like spike length showed least heritability (34.86) explained suggesting highly susceptibility to the environmental changes. Johnson *et al.* (1955) suggested that heritability and genetic advance when calculated together are more useful for predicting the resultant effect of selecting the best individual than heritability or genetic advance alone. High heritability estimates coupled with high genetic advance as percentage of mean were noticed in number of spikes/plant and biological yield. But 1000 seed weight showed high heritability and moderate genetic advance as percentage of mean. Such values of high heritability and genetic advance may be attributed to the action of additive genes (Panse, 1957). Kalyanasundram and Dalal (1981) reported that no.of spikes per plant, biological yield and 1000 seed weight are the important component traits of seed yield and hence selection for these characters would be more fruitful in future breeding improvement programme.

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