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## Evaluation of Chickpea Landraces

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**Abstract:** Ninety-four lines of chickpea (*Cicer arietinum* L.) landraces were evaluated for thirteen characteristics on Experimental Farm of Faculty of Agriculture in Dicle University in Diyarbakır, Turkey in 2000 season. There was a wide range of variation for all characters, except seed length. For yield/plant ranged from 4.92 to 15.76 g/plant and the CV% was 24.25%. Yield/plant was correlated positively with plant canopy height, number of branches/plant, pods/plant and seeds/plant, but this characters were non-significantly correlated with seed length, width and roughness, rachis length, width and leaflets width. The high positive correlation was found between seed characteristics and leave characteristics.

**Key words:** Chickpea, *Cicer arietinum* L., leave characteristic, seed characteristics

### INTRODUCTION

The chickpea (*Cicer arietinum* L.) most probably originated in an area of present-day south-eastern Turkey and adjoining Syria<sup>[1]</sup>. In Turkey, its grown in 625 000 ha with annual production of about 595 000 tones. The 16% of Turkey's production comes from the Southeast Anatolia. Chickpeas are the second most important pulse crop in Southeast Anatolia of Turkey, next to lentils. Chickpeas of the region are consist of mixed population with small seeds and plant height. Little information is available on the range of variability for different characters and their associations in indigenous land races of region chickpeas, therefore the present study was undertaken.

### MATERIALS AND METHODS

The present study was carried out on Experimental Farm of Faculty of Agriculture at Dicle University in Diyarbakır. The experiment of material collected previously as populations from South-eastern Anatolia Region which has continental climate, in 1998. Each populations were attained as a line and the lines were sown in Randomized Complete Block Design with three replications in 1999. According to desirable characters, several plants were selected within lines and harvested. A total ninety-four chickpea lines (*Cicer arietinum* L.) were evaluated in spring sowing (end of February to beginning of March) in 2000 season. Seeds of each plant sown manually in one row plot 2 m long and with 45 cm inter-row spacing and each row received as a line. Leaf related with characters measures made of at vegetative phases. At maturity, five plants were selected at random from each lines and made of biological yield/plant,

yield/plant, plant height, number of basal primary branches, number of pods/plant and number of seeds/plant. Seeds related with characters measures made of three week or eight week after harvested. Analysis of variance was calculated with means of thirteen agronomic and morphologic characters by MSTATC programme.

### RESULTS AND DISCUSSION

The variability observed in different characters were given in Table 1 which shows a remarkable variation in number of seed/plant, yield/plant, numbers of pods/plant and leaflets width. The variability was less than 20% for the remaining characters.

Biological yield/plant had positive correlation yield/plant, plant canopy height, number of basal primary branches, pods/plant and seeds/plant, but biological yield/plant had negative correlation with for rest characters. Between biological yield/plant and yield/plant correlation showed that biological yield is a important character determining the seed yield.

A wide range variation for seed yield/plant and this character was correlated positively with plant canopy height, number of basal primary branches, pods/plant and seeds/plant. This result showed that the tall plants tend to have higher yield potential and basal primary branches, pods/plant and seeds/plant contributed to seed yield<sup>[2-4]</sup>. This character was non significant correlated with seed length, width and roughness, rachis length and width and leaflets width. The data obtained may suggest that small leaf and seed size lines are likely to be low yielding (Table 1).

CV% for plant canopy height was low<sup>[3]</sup>. Plant canopy height was correlated strongly and positively seed length,

Table 1: Mean, range, coefficient of variation for thirteen characters in landraces chickpeas

Traits	Minimum	Maximum	Mean	Variance	CV%
Biological yield/plant	11.59	34.18	21.03	15.560	18.74
Seed yield/plant	4.92	15.76	9.48	5.300	24.25
Plant canopy height	24.00	37.00	29.19	10.851	11.28
Basal primary branches	2.80	6.00	4.25	0.414	15.16
Pods/plant	15.40	63.20	28.89	72.008	29.37
Seeds/plant	13.80	98.70	28.53	160.748	44.44
Seed length (mm)	5.92	10.80	9.21	0.742	9.36
Seed width (mm)	3.40	8.34	7.24	0.646	11.11
Seed roughness (mm)	3.00	8.00	6.73	0.589	11.41
Rachis length (cm)	4.20	9.90	6.44	0.890	14.67
Rachis width (cm)	1.80	4.30	2.93	0.191	14.92
Leaflets length (cm)	0.90	2.00	1.45	0.040	13.89
Leaflets width (cm)	0.41	1.80	0.74	0.026	21.91

Table 2: Correlation coefficient among different pairs of characters in chickpeas

Traits	Y/P	PLHT	BPB	PP	SP	SL	SWd	SR	RL	RWd	LL	LWd
BY/P	0.626**	0.222**	0.243**	0.449**	0.334**	-0.225*	-0.102	-0.170	-0.108	-0.114	-0.125	-0.157
Y/P	-	0.233*	0.347**	0.443**	0.250**	0.066	0.041	0.137	-0.099	-0.171	-0.217*	-0.089
PLHT		-	-0.105	-0.204*	-0.208*	0.333**	0.366**	0.334**	0.384**	0.421**	0.251**	0.369**
BPB			-	0.565**	0.502**	-0.323**	-0.250**	-0.323**	-0.259**	-0.241*	-0.135	-0.270**
PP				-	0.927**	-0.611**	-0.605**	-0.614**	-0.485**	-0.454**	-0.319**	-0.503**
SP					-	-0.705**	-0.749**	-0.751**	-0.514**	-0.484**	-0.282**	-0.474**
SL						-	0.856**	0.848**	0.469**	0.460**	0.301**	0.523**
SWd							-	0.898**	0.475**	0.422**	0.231*	0.400**
SR								-	0.488**	0.469**	0.246*	0.504**
RL									-	0.736**	0.609**	0.513**
RWd										-	0.689**	0.607**
LL											-	0.570**

BY/P: Biological yield/plant (g) Y/P: Yield/plant (g) PLHT: Plant canopy height (cm), BPB: Basal primary branches, PP: Number of pods per plant SP: Number of seeds per plant, SL: Seed length, SWd: Seed width, SR: Seed roughness, RL: Rachis length, RWd: Rachis width LL: Leaflets length, LWd: Leaflets width, \* and \*\* significant at the 0.05 and 0.01 levels, respectively

seed width and seed roughness, rachis length and width, leaflets width and length. This result indicating that tall plants tend to have bigger plant habit and seed size<sup>[5]</sup>, this character was correlated negatively with pods/plant and seeds/plant.

Branches/plant was strongly and positively correlated with pods/plant and seeds/plant, this character was significant but negatively correlated with seed length and seed roughness, seed width, rachis length and leaflet width. It was concluded that the higher branch plants had lower leave and seed size characteristic.

A wide range of variation, measured coefficient of variation (%), was observed for pods/plant<sup>[3]</sup>. Pods/plant was strongly and positively correlated with seeds/plant, but traits such as seed length, width and rough, rachis length and width were negatively correlated with this character.

A wide range variation was observed for seeds/plant, it was concluded that there was enough variation for this character among the genotypes. This character was negatively correlated with seed length, width and rough, rachis length and width, leaflet length and width. When seeds/plant increase, leave and seed size decrease.

The least variability was found for seed length, seed width and rough, rachis length and width, leaflet length. High positive correlation was found between seed length. Seed width had enough variation among

genotypes. The high positive correlation was found between seed characteristic and leave characteristic, this finding indicated that large leave plants had large seeds. Rachis length and width were showed high correlation with both leaflet length and width, that is, large leaves bearing large leaflets (Table 2).

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