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Genetic Parameters, Correlation and Path Analysis for Seed Yield and Morphological Characters in Niger [*Guizotia abyssinica* (l.f.) Cass.]

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ABSTRACT

Twelve niger genenotypes grown in a randomized block design with three replications in kharif 2014-15 and 2015-16 field experiment were conducted at JNKVV, ZARS, AICRP On Niger, Chhindwara, M.P. The highest magnitude of GCV was obtained for number of capitula/plant (15.73) followed by number of productive branches/plant (10.94), plant height (6.78) and seed yield/plot (6.13) and Low values of GCV was estimated for days to maturity (0.87) and days to 50 percent flowering (1.0) indicating the presence of lower genetic variability for these traits. Days to 50 percent flowering had significant positive correlated with days to maturity. Number of productive branches/plant had significantly positive correlated with number of capitula/plant, plant height days to maturity and seed yield/plot. Seed yield per plot positively correlated with number of productive branches/plant[7] (Khuntey et al., 2015), number of capitula per plant, plant height and days to maturity at genotypic level and negatively was days to 50 percent flowering. So these traits like number of productive branches per plant, number of capitula per plant should be given priority during selection in yield improvement programme. Path analysis revealed that the significantly positive associations of number of productive branches per plant, number of capitula per plant, plant height and days to maturity for seed yield were due to high positive direct and indirect.

Key words: *Correlation and Path, Genetic Parameters, Niger.*

INTRODUCTION

Niger deeds contain about 40% edible oil with fatty acid composition of 70-80% linoleic acid, 7-8 % palmitic and steric acids, and 5-8% oleic acid[4]. Niger is an important oil seed crop, the seed which is pale yellow with nutty taste and pleasant odour. Its keeping quality poor due to high content of unsaturated fatty acids. The oil of niger crop is very deficient in India. It is suitable for rainfed condition.

The present investigation assess the which character is directly and indirectly positively correlated to seed yield/plant.

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These characters that are associated with grain yield must be given top priority during selection process in breeding. the high heritability is coupled with high genetic advance could be beneficial bfor crossing species with self ncompability machenism, variability exists for morphological characters[8]. However, these characters are not discrete and hence complicate the niger important programmes. The study of amount of such genetic variability including the important economic traits in niger can be achieved through mass selection. Path analysis of yield components brings out the relative importance of their direct and indirect influence and helps in understanding their association with seed yield. Thus the present study was aimed at gathering information on existing genetic variability, nature and magnitude of association among seven attributes in twelve niger genotypes.

MATERIALS AND METHODS

Twelve niger genenotypes grown in a randomized block design with three replications in kharif 2014-15 and 2015-16 field experiment were conducted at JNKVV, ZARS, AICRP ON Niger, Chhindwara, M.P. Each genotype was sown in ten rows of 4m length with the spacing of 30cm within rows and 10cm between plants. Observation were taken on 10 randomly selected plants in each entry were taken up for recording data on plot basis for days to 50 percent flowering, number of productive branches/plant, number of capitulla/plant, plant height (cm), days to maturity, 1000 seed weight (g) and seed yield/plot (g).

The phenotypic and genotypic coefficient of variability were computed according to the method suggested by Burton[2]. Heritability and genetic advance were estimated as per Johnson *et al*[6]. The phenotypic and genotypic correlations were calculated as per the method described by Al jibouri *et al*[1]. Path coefficient analysis was carried out with genotypic correlations following the method of Dewey and Lu[3].

RESULT AND DISCUSSION

Analysis of Variance:

Analysis of variance revealed highly significant differences among for all the characters. Estimation of genotypic coefficient of variation indicates the performance of higher amount of genetic variability among the cultivars. The highest magnitude of GCV was obtained for number of capitula/plant (15.73) followed by number of productive branches/plant (10.94), plant height (6.78) and seed yield/plot (6.13) which indicated the performance of high amount of genetic variability in these traits. Low values of GCV was estimated for days to maturity (0.87) and days to 50 percent flowering (1.0) indicating the presence of lower genetic variability for these traits. The results are in agreements with the findings of Sahu and Patnaik[9] and Thakur and Reddy[10].

Table 1: Genetic parameters for yield and yield attributing traits in Niger

Characters	Mean	Coefficient of variation		Heritability	Genetic Advance	Genetic Advance as % of Mean
		GCV	PCV			
X1	50.43	1.02	1.76	0.336	0.617	1.22
X2	8.25	10.94	13.54	0.652	1.503	18.20
X3	32.70	15.73	18.63	0.713	8.948	27.35
X4	96.83	6.78	7.63	0.789	12.01	12.40
X5	98.70	0.87	1.09	0.640	1.418	1.43
X6	4.52	1.40	3.90	0.129	0.047	1.03
X7	689.23	6.13	12.40	0.244	43.064	6.24

Genotypic and Phenotypic Correlation:

In general, genotypic correlation was higher in magnitude than their respective phenotypic correlation, indicating that selection for the correlated characters could give a better yield response than would be expected the basis of phenotypic correlations.

Days to 50 percent flowering had significant positive correlated with days to maturity. Number of productive branches/plant had significantly positive correlated with number of capitula/plant, plant height days to maturity and seed yield/plot. The estimates of genotypic and phenotypic correlation coefficient for different characters. Seed yield per plot positively correlated with number of productive branches/plant[7], number of capitula per plant, plant height and days to maturity at genotypic level and negatively was days to 50 percent flowering. So these traits like number of productive branches per plant, number of capitula per plant should be given priority during selection in yield improvement programme. The present result was in agreement with Goyal and Kumar[5], Thakur and Reddy[10] and Khuntey *et al*[7].

Table 2: Estimation of phenotypic and genotypic correlation coefficient between yield aits component for niger pooled result

Characters	P/G	X 1	X 2	X 3	X 4	X 5	X 6	X 7
X 1	P	1.0000	-0.2845	-0.3176	-0.339	0.3343	0.0917	-0.3767
	G	1.0000	-0.8418	-0.7590	-0.6796	0.3923	-0.5019	-0.9804
X 2	P		1.0000	0.7035	0.4616	0.2162	0.0338	0.4161
	G		1.0000	0.8231	0.4925	0.1710	-0.0959	1.270
X 3	P			1.0000	0.2716	-0.0441	-0.0314	0.3101
	G			1.0000	0.3058	-0.1690	-0.1152	1.1679
X 4	P				1.0000	-0.0561	0.1534	0.1360
	G				1.0000	-0.1417	0.4141	0.1950
X 5	P					1.0000	-0.1717	0.1137
	G					1.0000	-0.5418	0.0252
X 6	P						1.0000	0.1003
	G						1.0000	-0.6424

Path Analysis:

Path analysis revealed that the significantly positive associations of number of productive branches per plant, number of capitula per plant, plant height and days to maturity for seed yield were due to high positive direct and indirect effect via., number of productive branches per plant, respectively. So number of productive branches per plant due to emphasis may be given in yield improvement.

Table 3: Genotypic path coefficient of various yield and its component traits

Character	X 1	X 2	X 3	X 4	X 5	X 6	X 7
X 1	**0.3317**	-0.2792	-0.2518	-0.2254	0.1301	-0.1665	-0.9804
X 2	-2.2867	**2.7164**	2.2360	1.3377	0.4645	-0.2606	1.2718
X 3	0.7426	-0.8054	**-0.9785**	-0.2992	0.1654	0.1127	1.1679
X 4	0.3116	-0.2258	-0.1402	**-0.4586**	0.0650	-0.1899	0.1950
X 5	-0.4856	-0.2117	0.2092	0.1754	**-1.2380**	0.6708	0.0252
X 6	0.4060	0.0776	0.0932	-0.3350	0.4383	**-0.8089**	-0.6424

X1 : Days to 50% flowering
X2 : Number of productive branches/plant
X3 : Nunber of capitula/plant
X4 : Plant height (cm)
X5 : Days to maturity
X6 : 1000 Seed weight (g)
X7 : Seed yield (g)

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