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Association coefficient analysis in grain amaranth (*Amaranthus hypochondriacus* L.)

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18 germplasm accessions of grain amaranth (*Amaranthus hypochondriacus* L.) were carried out to estimate the association analysis among traits during *rabi* 2015-16 at research farm of IGKV, Raipur (C.G.) Seed yield / plant showed the highest significant positive association with panicle width, number of leaves /plant and number of panicles / plant. Grain weight /panicle was found to significant but negative association with number of leaves/ plant. Hence, direct selection for these traits may be advantageous for selecting the high yielding genotypes in the available germplasm accessions of grain amaranth.

Keywords: association, amaranth, yield components

Introduction

Grain amaranth also known as Rajgira, Chaulai and Ramdana. It is one of the few multipurpose crop which can supply grains of high nutritive quality as a food and animal feed. The dry matter of amaranth grain contains a substantial quantity of protein with adequate amount of essential amino acids such as lysine and methionine. The seeds of grain is a rich source of iron, calcium, magnesium and zinc as well as vitamin riboflavin and ascorbic acid, niacin, thiamine and other micro elements. Amaranth is an important pseudo-cereal crop of the hills and plains grown as the sole crop. It is also cultivated as inter crop with maize. An efficiency of selection in programme mainly depends on the role of environment and degree of association of component characters. Study of character association has considerable use in plant breeding because selection for one trait may bring about simultaneous effect on other. Hence, an attempt was made to estimate the association among characters of grain amaranth.

Materials and Methods

The present experiment was conducted at Research farm of IGKV, Raipur during *rabi* 2015-16. The experiment was conducted in Randomized Complete Block Design with three replications with eighteen germplasm accessions of grain amaranth. Each accession was sown in two rows plots. Each plot consisted of two row of 4 m length with row to row and plant distance being 45 cm x 15 cm, respectively. Fertilizer was applied at the rate of 60:40:20:20 NPKS kg /ha. Other agronomical practices were followed to raise a good crop. Observations on various characters were recorded on five competitive random plants from each plot in each replication. Association analysis was done according to Robinson *et al* (1951) ^[2].

Results and Discussion

Association studies revealed that seed yield / plant showed the highest significant positive correlation with panicle width (0.738) followed by number of leaves /plant (0.338) and number of panicles / plant (0.307) (Table-1). Days to maturity and plant height were found positive association with number of leaves /plant (0.312) respectively. Moreover, grain weight/ plant was found to significant and negative correlation (- 0.488) with number of leaves / plant. Rest of the traits showed non-significant correlations among them. Hence, direct selection for panicle width, number of panicles / plant, number of leaves /plant and plant height may be advantageous for selecting the high yielding genotypes in grain amaranth free the available germplasm accessions. Similar findings is in agreement with the results reported by Rana *et al* (2005) ^[3] and Buhroy *et al* (2017) ^[1] for number of leaves/ plant and plant height.

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Table 1: Genotypic (G) and phenotypic (P) association coefficients for seed yield and its components in grain amaranth

S. N.	Characters		Days to maturity	Plant height (cm)	Panicle width (cm)	Grain weight / panicle (g)	No. of panicles /plant	No. of leaves / plant	Seed yield / plant (g)
1	Days to maturity	G	-	-0.240	-0.012	-0.124	0.155	0.770**	0.205
		P	-	-0.200	-0.066	-0.134	0.145	0.312*	0.139
2	Plant height (cm)	G		-	0.240	-0.244	0.145	0.312*	0.139
		P		-	0.015	-0.203	0.027	0.031	0.145
3	Panicle width (cm)	G			-	0.136	0.174	-0.171	0.738**
		P			-	0.094	0.145	-0.075	0.717**
4	Grain weight / panicle (g)	G				-	0.118	-0.488**	0.227
		P				-	0.108	-0.160	0.209
5	No. of panicles / plant	G					-	-0.142	0.307*
		P					-	-0.049	0.283*
6	No. of leaves / plant	G						-	0.338*
		P						-	0.084
7	Seed yield / plant (g)	G							-
		P							-

*Significant at 5 % level

**Significant at 5 % level*

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