

Short Communication

## Variability analysis in an underutilized pseudo-cereal grain amaranth (*Amaranthus hypochondriacus* L)

RAJENDRA KUMAR YADAV\*

Department of Genetics and Plant Breeding  
Indira Gandhi Krishi Vishwavidyalaya, Raipur 492012 Chhattisgarh, India  
\*Email for correspondence: yadavrk98@gmail.com

© Society for Advancement of Human and Nature (SADHNA)

Received: 04.05.2024/Accepted: 13.07.2024

### ABSTRACT

Twenty seven genotypes of grain amaranth were evaluated for the variability present in the material for yield and its components. The phenotypic coefficient of variation (PCV) was higher than genotypic coefficient of variation (GCV) for all the characters. High heritability coupled with high genetic advance as per cent of mean was observed for stem thickness, number of panicles per plant, seed yield per plant, plant height, number of leaves per plant, number of primary branches per plant and inflorescence per plant, indicating scope for improvement of the characters of interest through hybridization and selection.

**Keywords:** Grain amaranth; characters; variability; yield components

### INTRODUCTION

Grain amaranth (*Amaranthus hypochondriacus* L) is both nutritious and resistant to environmental factors. It has high dietary fiber content and natural antioxidants, such as phenolic compounds. It is estimated to be grown in about 40-50 thousand hectares with 1,200 kg per ha in India and 2,000 kg per ha in plain zone of Chhattisgarh (Yadav 2016). Due to little information available, it is necessary to estimate the variability in grain amaranth.

### MATERIAL and METHODS

Twenty seven genotypes with five national checks viz BGA-2, RMA-7, GA-5, GA-2 and CG Rajgira-1 were obtained from the All India Coordinated Research Network on Potential Crops, ICAR – National Bureau of Plant Genetic Resources, New Delhi. These were evaluated in randomized block design with 3 replications during rabi season 2021-2022. Each genotype was grown in plot size of 3.0 m x 1.8 m. Observations were recorded on 5 plants from each replication. Genetic variability was worked out as per Singh and Chaudhary (1985).

### RESULTS and DISCUSSION

The high phenotypic coefficient of variation (PCV) and genotypic coefficient of variation (GCV) were observed for number of panicles per plant, inflorescence width, stem thickness, seed yield per plant and number of leaves per plant (Table 1).

Heritability (broad-sense) was observed to be high for all the characters except inflorescence width, petiole length and leaf length. The high heritability coupled with high genetic advance as per cent of mean was noted for the characters stem thickness, number of panicles per plant, seed yield per plant, plant height, number of leaves per plant, number of primary branches per plant and inflorescence length, that indicated additive gene action. Therefore, there is a possibility of further improvement of these characters through simple selection procedure.

Similar results were also reported by Yadav and Sarawgi (2016) for seed yield per plant and inflorescence length and Venkatesh et al (2014) for days to 50 per cent flowering, number of leaves per plant, plant height, inflorescence length and seed yield per plant in grain amaranth.

Table 1. Variability analysis for yield components in an underutilized pseudo-cereal grain amaranth

Character	Mean	Range		Coefficient of variation (%)		Heritability (broad-sense) percentage	Genetic advance as per cent of mean
		Min	Max	GCV	PCV		
Days to 50% flowering	66.20	46.00	82.00	9.16	9.22	98.66	18.73
Days to maturity	134.00	125.00	147.00	4.97	5.30	87.83	9.60
Plant height (cm)	160.67	96.16	196.67	14.02	15.54	81.48	26.08
Stem thickness (cm)	16.15	6.30	22.53	26.38	27.09	94.80	52.91
Number of panicles/plant	44.35	13.00	71.00	35.89	37.23	92.93	71.26
Number of leaves/plant	87.99	36.00	133.00	21.63	24.91	75.39	38.68
Number of primary branches/plant	28.56	21.00	38.00	17.49	20.37	73.69	30.92
Petiole length (cm)	11.84	5.93	16.07	18.40	22.35	67.72	31.18
Leaf length (cm)	15.09	8.67	18.00	12.02	15.29	61.78	19.46
Inflorescence length (cm)	36.99	27.47	46.70	12.14	13.05	80.82	22.48
Inflorescence width (cm)	11.26	7.10	24.60	26.99	36.05	56.07	41.64
Seed volume (g/10 ml)	9.34	7.63	10.20	7.78	8.08	92.60	15.43
Seed yield/plant (g)	35.11	17.60	52.33	24.54	26.49	85.85	46.84

Min = Minimum, Max = Maximum

## REFERENCES

- Singh RK and Chaudhary BD 1985. Biometrical methods in quantitative genetic analysis. Kalyani Publishers, Ludhiana, Punjab, India, 318p.
- Venkatesh L, Murthy N, Nehru SD and Manjappa 2014. Genetic variability, heritability and genetic advance in grain amaranth (*Amaranthus* spp). Asian Journal of Bio Science **9(1)**: 67-70.
- Yadav RK 2016. Proceedings. Chhattisgarh State Seed Subcommittee, Directorate of Research Services, Indira Gandhi Krishi Vishwavidyalaya, Raipur, Chhattisgarh, India, 3p.
- Yadav RK and Sarawgi AK 2016. Biometrical evaluation of genetic variability in grain amaranth (*Amaranthus hypochondriacus* L). In: Abstracts, National Seminar on Innovative Breeding Approaches for Agricultural Security, 13-14 March 2016, Ranchi, Jharkhand, India.