Short Communication

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

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## 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

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