

Winged Bean (*Psophocarpus tetragonolobus*): Genetic Diversity Evaluation through Chemometric analysis

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Abstract—The evolved and modern food habits of human being is dependent on only few major cultivated food crops. In the present scenario when we talk about food and nutritional security it is important that we bring diversity to our food habits which should be beyond confines. Winged bean is a potential underutilized crop which is considered as “one species supermarket” as all of its parts are nutrient rich and edible. This crop species can contribute to an increase in crop diversity within agricultural systems, to improve human diets, and to support more sustainable food production systems. Thus with the objective of exploring diversity of nineteen winged bean genotypes based on antioxidant analysis was done to identify the potent source of antioxidant and to find out the pattern of grouping of genotypes based on chemometric analysis. Two chemometric techniques (PCA and AHC) were implied to find out the pattern of variation available for antioxidant potentiality as well as to find out the best performing genotypes. The phenol content ranged from 48.4 to 143.5 (maximum in AMBIKA-II-1) mg GAE/100 gFW, and total flavonoids content ranged from 9.1 to 37.0 mgCE/100G FW (maximum in MWBS-16-26). The genotypes AMBIKA-WB-II-1, AMBIKA-13-4 B and MWBS-16-26 were identified superior based on their overall total phenolics, total flavonoids and antioxidant activities.

Keywords: Winged bean, Phenolics, Flavonoids, Antioxidant, Chemometric analysis.