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Evaluation of nutraceutical properties of finger millet genotypes from mid hills of northwestern Himalayan region of India

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Finger millet *Eleusine coracana* L., commonly called Ragi, is a rich source of phytochemicals and have number of health beneficial effects. The present study evaluated the total antioxidant activity (TAA), condensed tannins (CT), micronutrient content (Fe & Zn), diphenyl-1-picrylhydrazyl (DPPH) and 2,2′-azinobis-3-ethylbenzothiazoline-6-sulfonic acid (ABTS) radical scavenging activity, ferric reducing antioxidant power (FRAP) and phenolic compounds in 35 finger millet genotypes. The assayed genotypes showed 0.91-0.99 mg/g CT, 23.79-56.51 mM/kg TAA, 1.76-44.47 µM/g DPPH scavenging activity, 44.14-88.09 µg/mL ABTS activity, 100-463.53 µM FRAP value, 37.04-69.13 ppm Fe and 28.94-46.77 ppm Zn. HPLC analysis showed that gallic, tannic, ferulic, caffeic and o-coumaric acid to be major polyphenols in all genotypes. Principal component analysis (PCA) revealed significantly higher CT, TAA with relatively good amount of Fe and Zn in VL *Ragi* 146, VL *Mandua* 352, VL 336, VL 373, VL 325, VL 351, GPHCPB 7, GPHCPB 3, GPHCPB 52 and VR 708 genotypes. Agglomerative hierarchical cluster analysis classified the 35 genotypes into two clusters; Cluster I had higher CT, TAA, FRAP, DPPH, ABTS, while cluster II recorded higher Fe and Zn. This study clearly demonstrated the nutraceutical properties with higher antioxidant potential of identified genotypes, which can be suitably deployed for nutritional security, particularly in developing countries.

Keywords: ABTS, Condensed tannins, DPPH, *Eleusine coracana*, FRAP, nutritional security, Polyphenols, Principal component analysis (PCA), Ragi, Total antioxidant activity (TAA)