

Abstract

Cassava (*Manihot esculenta* Cranz) is an important food security crop for poor rural communities particularly in Africa. However, little is known about variability of critical root nutritional and quality traits of African cassava germplasm. Cassava roots contain low levels of important micronutrients and its quality can be influenced by the levels of cyanogenic glycosides. Roots from fourteen accessions comprising Kenyan local landraces and improved clones were screened for their nutritional traits including the contents of cyanogenic glycosides, protein and the micro nutrients iron and zinc. Trait stability and the effects of the environment on the expression of the nutritional traits were evaluated using various genotype (G) by environment (E) interaction study models. There were significant ($p \leq 0.05$) differences for all the nutritional traits in the three test sites of Baringo, Kericho and Nakuru in Kenya. Contents of cyanogenic glycosides in both roots and leaves, total root proteins, root iron and zinc ranged from 31.8 ppm to 90.8 ppm; 20.8 ppm to 154.4 ppm; 1.15% to 3.47%; 17.81 ppm to 59.69 ppm and 39.39 ppm to 118 ppm, respectively. The sites were also significantly ($p \leq 0.05$) different from each other with the highest cyanogenic content in leaves and roots expressed at the Nakuru site. Regression analysis was used to assess genotype response to environments. Regression coefficients (b_i) obtained ranged from 0.13 to 2.23 for all traits combined indicating wide variability in quality trait among the test germplasm. Analysis for sensitivity to environmental change (SE_i^2) revealed that cassava genotypes differed in their level of sensitivity. The root cyanide trait had the highest mean (SE_i^2) which indicated that it was the least stable quality trait in the cassava germplasm. This implies that the same cassava genotypes will give food of different quality depending on growing environment. The observed values for protein and mineral contents suggest the potential for improving the nutritive value of local cassava germplasm.