Abstract
Micronutrient malnutrition is one of the most serious health challenges facing vast sectors of Africa’s population and other regions. Dietary improvement through biofortified food crops is probably the most effective and sustainable strategy for reducing micronutrient deficiencies. A regional breeding program was initiated in 2003 to develop and disseminate micronutrient dense bean varieties. The specific objectives were: (i) to characterize the variation of grain iron (Fe) and zinc (Zn) concentration, and (ii) identify lines which could be fast-tracked as mineral dense lines for cultivation by farmers in regions with severe Fe and Zn malnutrition. More than 2849 accessions were collected from eastern and Central Africa and 1,412 accessions screened for Fe and Zn concentration by perchloric acid-nitric wet digestion. Results showed that considerable genetic variation exists to facilitate improvement of iron by more than 80% and zinc by more than 50%. Grain iron concentration varied from 40 to over 100 ppm. Zinc concentration varied from 18 to over 50 ppm. Genotypes with high levels of iron included Maharagi Soja, Gofta, AND 620, MLB 49 89A, HRS 545, Nakaja, VCB 87013, Nain de Kyondo, TY 3396-13, PVA 8, Nguaku Nguaku, Urugezi, Lib 1, Roba-1 and Mwamafutala. Results showed that bean leaves have ten times more iron than grain. Enhanced utilization of mineral dense beans can significantly contribute to alleviation of micronutrient deficiencies and promote better human health and productivity. Kenya became the first country in the region to formally release biofortified bean varieties in December 2008.