

Abstract

In Africa staple cereal foods are often eaten along with the African Leafy Vegetables (ALVs) rendering meals rich in micronutrients. To increase the mineral micronutrient value, it is imperative to intensify their cultivation given their under-utilized diversity, neglect until needed, slow rate of incorporation into crop value chains for lack clear micronutrient nutrition driven agenda. As a way of focusing on their ionomic nutraceutical attribute potential, the first objective was to investigate accession ionome differentials on the basis a soil mineral criterion. The second objective was to determine a method for variation assessment of ionomic micronutrient dense variants in key Kenyan local vegetables. Four ALVs species constituting 25 accessions were collected in short season rains of 2003 from north and souther stretch of western Kenya and in early Long rains of 2004 from south eastern Kenya. A stratified sampling design organized had three collection points per farm; on three farms per site; and at three sites per phyto-region. ALV samples together with accompanying soils were Energy Dispersive X-ray fluorescence (XRF) analysed. The data were used, first, for ionomically differentiating populations by way of singling out respective element influenced accession differentials (SELIACDs). Second, elements were jointly resolved into multi-element influenced accession differentials (MELIACDs). Agro-edaphic effects on population ionome niching were assessed using analysis of variance and graphical aids. Geometric means were generated and awarded nutrametric merit scores to allow for nutrametric grading of accessions. Results suggest a great deal of ionomic phenotypic plasticity among the local vegetable accessions as a function at scale of farm, site and/or region soils. The SELIACD method was useful for piecemeal separation of accession on a single element basis but which method would require the development of a selection index with a certainty of a significant genetic gain at the onset. The joint MELIACD and the nutrametric grading methods are proposed as a promising basis for prebreeding tool prioritization given the XRF-analytic novelty and the emerging interest in ALV nutraceutical cropping.