

## Project Summary

Title	African Nightshade Distribution in Kenyan Agroecologies in Response to Phosphorus and Water Status: Phenolics and related antioxidants profiling
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Purpose	This project seeks to assess the distribution of different African nightshades in responses to water and phosphorus in three varied Kenyan agroecologies.
Project Summary	African leafy vegetables can improve the livelihoods of majority of rural communities who live below poverty line. These vegetables have been neglected or under-utilized for quite a long time despite their rich nutritive value as well as being a potential source of income to rural poor. Lately there has been renewed interest in these African leafy vegetables with some supermarkets placing them

	<p>in their vegetable chain links. African nightshade ranks among the top four preferred indigenous leafy vegetables and provides income to peasant farmers, supply mineral elements and have medicinal value. The health attributes are related to phytochemicals such as phenolic acids and other antioxidants. Phytochemical productions are substantially influenced by environmental and genetic factors and their interactions. The present work examines the role of P and water status in production of these compounds in different accessions of nightshades. We aim to assess whether the protein Competition Model (PCM); that originally focused on intraspecific responses to local-scale environmental variability; may be extended to predict phenolic concentrations among African nightshade species at much broader spatial scales (including three sites: semiarid, lake region and central highlands). We further envisage testing the hypothesis by comparing concentrations of nutrients and phenolic compounds within a number of data sets which contrast plants growing on soils supplying different quantities of phosphorus and environments with different water stress effects and summarize the outcome in a phylogenetic tree (dendrogram). Additionally, at the end of experiment we aim to assign relative significance of the secondary metabolic production to abiotic factor (water and P) and genetic (nightshade accession). The outcome, in collaboration with farmers, particularly women, will help to develop product labels highlighting their phenolic contents (as has been applied in developed economies) and help farmers take advantage of growing market segments.</p>
Country and Specific Location(s)	<p>Region A (Marigat and Pokot- semi arid; with Aridisols) Region B (Kakamega and Kisumu –hot and wet with Alfisols) Regions C (Murang’a and Kirinyaga )</p>
Participating Institutions	<p>Kenyatta University National Museums of Kenya Kenya Agricultural Research Institute (KARI)</p>
Start Date	<p>September, 2012</p>
End date	<p>August, 2014</p>
Amount of Funding	<p>US\$59,990.7</p>

