



Tropentag, October 11-13, 2006, Bonn

“Prosperity and Poverty in a Globalised World—  
Challenges for Agricultural Research”

## Diversity in Nutritional Quality of Cowpea (*Vigna unguiculata*) and Lablab Bean (*Lablab purpureus*) as Leafy Vegetables

JEREMIAH MAGESA<sup>1</sup>, RAY-YU YAN<sup>2</sup>, BRIGITTE L. MAASS<sup>1</sup>

<sup>1</sup>Georg-August-University Göttingen, Department of Crop Sciences: Agronomy in the Tropics, Germany

<sup>2</sup>AVRDC (The World Vegetable Center), Nutrition and Analytical Laboratory, Taiwan

### Abstract

African indigenous vegetables play a significant role in maintaining the nutritional well-being of the rural population in Sub-Saharan Africa. They may cover the daily requirements of proteins, minerals and vitamins because of their great nutritional value. These vegetables are also an important sector for employment and can provide cash income for resource-poor farmers due to their short production cycles and relatively little management required in cultivation. This study aims at assessing nutritional variation among genotypes of cowpea and lablab bean for vegetable use, following agronomic evaluation and assessment of consumers' acceptability of the same germplasm in collaboration with The World Vegetable Center's Regional Center for Africa (AVRDC-RCA) in Tanzania. This research was carried out in a greenhouse at University of Göttingen within the collaborative project 'Promotion of Neglected Indigenous Vegetable Crops for Nutritional Health in Eastern and Southern Africa' (ProNIVA). To further assess nutritional quality of these species, 41 cowpea and 20 lablab bean genotypes were evaluated. Young leaves from plants grown in the greenhouse under semi-controlled conditions were used as well as young leaves from plants grown in pots under sunlight conditions. The latter was performed with selected genotypes in order to observe their response to outdoor conditions regarding nutritional quality. Leaf samples were freeze-dried, oven-dried or sun-dried. Standard laboratory procedures, such as Near Infrared Reflectance Spectroscopy (NIRS), High Performance Liquid Chromatography (HPLC) and Atomic Absorption Spectrophotometry (AAS) were applied to determine nitrogen, vitamin A, and minerals. The collected data was subjected to correlation analysis to determine interdependence of traits. Multivariate statistics were also applied for establishing groups of genotypes that have similar combination of traits. Results from this research have shown that environments had stronger effects on nutrient composition than accessions or species. This draws attention on the need to standardise environmental factors for the search of qualitatively promising genotypes.

**Keywords:** Atomic Absorption Spectroscopy, African vegetables, genetic resources, HPLC, *Lablab purpureus*, NIRS, underutilised crops, *vigna unguiculata*