



# First Scientific Meeting of the Global Cassava Partnership GCP-I



Cassava:  
Meeting the Challenges  
of the  
New Millennium

Institute of Plant Biotechnology for Developing Countries  
IPBO, Ghent Univ.  
21-25 July 2008, Ghent, Belgium

**S5-5: Hurtado<sup>1</sup>, Paula; Ospina<sup>1</sup>, Cesar; Marin<sup>1</sup>, Jaime; Buitrago<sup>1</sup>, Charles; Castelblanco<sup>1</sup>, Wilson; Correa<sup>1</sup>, Ana; Alfonso<sup>4</sup>, Paola; Barrera<sup>1</sup>, Edgar; and Gutierrez<sup>1</sup>, Janneth; Fregene<sup>1</sup>, Martin; Hearne<sup>2</sup>, Sarah; Ferguson<sup>2</sup>, Morag; Alves<sup>3</sup>, Alfredo; Fortes-Ferreira<sup>3</sup>, Claudia and De Vicente<sup>4</sup>, Carmen**

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### **Assessment of the Diversity in Global Cassava Genetic Resources Based on Simple Sequence Repeat (SSR) Markers**

Understanding the existing genetic diversity and its distribution within and among individuals, populations, species and gene pools is crucial for an efficient management of germplasm collections and also use of plant genetic resources. Simple sequence repeats (SSR) markers were employed to genotype a composite germplasm set of cassava representing a sub-set, 3,000 accessions, of global cassava genetic resources held in germplasm banks at CIAT, IITA, and EMBRAPA. Genotyping activities were performed at CIAT and IITA and statistical analysis were done based on the generated datasets allowing up to 20% of missing data in each genotype. CIAT and IITA data sets, composed by 2494 and 2575 respectively, were separately analyzed and then both datasets were joined to perform a single analysis. Genetic diversity estimation and population structure were assessed using DARWIN version 5.0 (Perrier et al, 2003), STRUCTURE version 2.0 (Pritchard et al, 2000a), GENEPOP version 4.0 (Rousset, 2008) and SAS version 2.0. Results of cluster analysis, unweighted neighbour joining multidimensional scaling and PCoA revealed a clear separation between accessions from Africa and the rest of the world. American accessions shows a high genetic diversity and a separation of some Guatemalan accessions from other Latin American samples. In African accessions a substructure was detected separating some Nigerian accessions from the rest of Africa. The results confirm findings from previous studies that show how global cassava germplasm diversity is structured by region.

### **S5-6: Hershey<sup>1</sup>, Clair H. and Debouck<sup>2</sup>, Daniel**

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### **A Global Conservation Strategy for Cassava and Wild *Manihot* Species**

The Global Crop Diversity Trust is supporting a series of regional and crop-based studies to ensure that the genetic resources of the crops most important to humankind are securely conserved in perpetuity. The goal of the crop strategies is to identify and assess the existing ex situ collections, by an evaluation of the holdings, the services provided and the needs of the genebanks in personnel, operations and capital equipment. Most countries where cassava is important maintain ex situ field collections, which are vulnerable to the risks of soil, weather and biotic constraints. Many countries also have *in vitro* collections, though most of these are incomplete. Insufficient trained personnel and facilities were most often cited in surveys as constraints for conservation. CIAT and IITA maintain large regional collections, but there are still many accessions in national collections that are not safely duplicated. Most genebanks have basic passport information, but many have not been fully characterized or evaluated for useful traits. Internet access to documentation and evaluation should be developed. Few programs distribute germplasm internationally, using techniques available for virus-indexing and *in vitro* culture for safe interchange. *Ex situ* collections of wild *Manihot* represent less than half the known species. Many populations are at risk in their natural environments due to habitat destruction and climate change. Secure ex situ conservation requires further research on seed physiology and the species-specific needs for *in vitro* growth. A critical update on the taxonomic status of the genus is stalled and needs renewed support. The strategy outlines efficient and effective research collaboration and support to provide a high level of security for cassava and wild *Manihot* conservation.