

Genetic Diversity, Nirs, Fruit Biochemical Analyses and Cup Testing in Cultivated *Coffea canephora* Pierre from Different Districts in Uganda

P. ALUKA¹, P. MUSOLI¹, P. CUBRY², F. DAVRIEUX³, F. RIBEYRE³, B. GUYOT³, F. DE BELLIS², F. PINARD⁴, D. KYETERE¹, J. OGWANG¹, M. DUFOUR², T. LEROY²

¹NARO-CORI P.O. Box 185 Mukono Uganda

²CIRAD-CP, UMR T52 PIA, TA 80/03 Avenue Agropolis 34398 Montpellier Cedex 5 France

³CIRAD-CP, UPR Quality of perennial products TA 80/16 Rue JF Breton
34398 Montpellier Cedex 5 France

⁵Coffee Agroforestry Systems CIRAD-ICRAF, United Nations Av. Gigiri,
PO Box 30677 00100 Nairobi, Kenya.

SUMMARY

Research for genetic improvement still lacks adequate core germplasm for improving *C. canephora* quality, consequently farmers lose more of their incomes particularly in severe world coffee price crisis. Also the great range of variation within the Ugandan *C. canephora* has clearly been recognised but no attempt, however, has been made to differentiate the components at DNA level. In our study, samples were collected as seed and cuttings from farms Kawanda germplasm collection. Species diversity was evaluated using Sequence Repeats (SSR), Near Infra Red spectroscopy, (NIRS), biochemical titrations and cup testing after roasting. Controls were from known genetic diversity groups of *C. canephora*. A diversity tree was constructed with SSR polymorphism by Neighbour Joining (NJ) analyses from dissimilarity matrix. DNA results pointed out three major groups of farm trees with one group constituting of entries from closely located districts and controls a distinct group of their own. Four groups were derived from NIRS analyses of fruits with Erecta types forming own group and collections from mainly one district comprising another. Ugandan genotypes were also noted to have high sucrose and fat content with cup test analysis confirming that Ugandan robustas are better than most other robustas. No significant difference between NIRS and biochemical analysis for caffeine offer opportunity for analysing samples from more districts and Kawanda collection using NIRS because it is fast and cheaper. Use of DNA, NIRS, biochemical and cup test analyses in correlation with the environmental information offer opportunity for selecting entries with good quality that will promote sustainable development of the coffee growing areas by generating a reliable market.