CHARACTERISATION OF FRUIT TRAITS TOWARDS DOMESTICATION OF AN INDIGENOUS FRUIT TREE OF WEST AND CENTRAL AFRICA: A CASE STUDY OF *DACRYODES EDULIS* IN CAMEROON

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A report outlining the main achievements of an expedition to Cameroon.
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The aim of the research was to test the proposition that substantial opportunities exist in Cameroon to improve rural livelihoods through the cultivation of indigenous fruit trees on-farm. It examines these aspects through a case study based on *Dacryodes edulis* (H.J. Lamb), a West African fruit tree found throughout the humid lowlands of Cameroon. The study illustrates the potential for tree domestication of non-timber forest products in the reduction of poverty with potential significance worldwide.

The African plum is widely planted for its highly nutritional pulp, a recognized staple food during its productive season, and more recently for export to neighbouring countries. There was a need to investigate the genetic diversity of the morphological traits by quantifying fruit variation in order for it to reach its maximum potential through multiple trait selection during the tree domestication process.

Research was carried out in three communities in Cameroon using market accessibility, population density, migrant status, ethnic diversity and infrastructure to provide a variation in the socio-economic structure. The detailed and extensive measurements of 8 characteristics of about 2 500 fruits from one hundred and twenty trees of the African plum identified significant variation in various assessments of fruit size and weight. Relationships between traits strongly provided the ability to predict overall fruit size from a small number of traits, such as pulp depth and fruit width for use during future multiple trait selection.

Using the results from this research, the species was classified as 'semi-domesticated' in Cameroon, with the next stage of the domestication process entailing the multiplication of the genetically superior selected as putative cultivars.

The results are unique in that they are the first quantified description of fruit traits that provide a comparative population diversity and differentiation in selected fruit traits across selected sites of the African plum.

By quantifying and confirming the level of morphological variation within the African plum, the potential for domestication has been fortified and thus contributed to the global initiative of reducing poverty in the humid lowlands of West Africa.

The research was an integral part of two larger programmes: (a) Department for International Development (DFID) Forestry Research Programme, and (b) International Centre for Research in Agroforestry (ICRAF) Tree Domestication Programme.

I would like to express my gratitude and formally acknowledge the financial support given to me by the Davis Expedition Fund for my travel to, and my time spent in Cameroon.

The following is a list of publications I hope to release with relation to the above mentioned research:

Waruhiu AN. **Characterization of fruit traits towards domestication of an indigenous fruit tree of West and Central African: A case study of *Dacryodes edulis* in Cameroon.** A dissertation for the degree of Masters of Science, University of Edinburgh.

Waruhiu AN, Kengue J, Tchoundjeu Z, Atangana A, and Leakey (to be published). **Domestication of Dacryodes edulis: characterization of tree-to-tree variation.**

Waruhiu AN, Usoro C, Asaah E, Kengue J, Anegbeh P, Atangana A, Tchoundjeu Z, Ukafor V, and Leakey (to be published). **The combination of multiple traits in *Dacryodes edulis* for the selection of putative cultivars in Nigeria and Cameroon.**