

### 1.47 Genetic characterization and relationships of Ugandan wild, feral and cultivated *Coffea canephora* (Robusta) for future sustainable use

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The ability of crops to adapt to environmental changes such as the predicted climate change strongly depends on the genetic variation that exists within the crop. In Uganda, coffee contributes 20-25% to foreign trade, and its production sustains about 8 million Ugandans. *Coffea canephora* contributes about 75% of the coffee production. Despite this fact, Uganda's coffee sector is threatened by the escalating effects of climate change majorly, drought, erratic rainfall patterns and pest and disease pressure. Fortunately, Uganda is a center of origin for the highly diverse *Coffea canephora*. This study sets out to: (i) determine the level of genetic diversity within and between wild, feral and cultivated populations; (ii) identify most diverse populations and their relationships with other known African diversity groups<sup>1,2</sup>. 210 Ugandan accessions were collected from 7 wild forests, 2 research stations, and from feral fields. A reference set from other African groups was added for comparison. A set of 19 SSR markers was used to genotype all individuals. Population structure and diversity were analyzed using classical genetic parameters and clustering approaches. The wild Ugandan accessions could be split into two major genetic groups, one including north-western and western forests and one with the southern and central forests. Cultivated populations and populations in south and central forests had higher allelic richness than other populations. In comparison to other known African *C. canephora* diversity groups, Ugandan sub-populations form distinct genetic diversity group. The substantial genetic diversity within and between wild, cultivated and feral Uganda's *C. canephora* populations and other known African *C. canephora* genetic groups reveals high potential for adaptive traits for improving resilience of the crop to production constraints, especially effects of climate change and variability, and emerging pests and diseases.

#### References

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