

Caffeine, Phenol and Protein Analyses of Thirty-seven Clones of Nigerian Robusta Coffee (*Coffea canephora* Pierre ex. Froehner)

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SUMMARY

A study was carried out to characterise thirty-seven *Coffea canephora* clones using three biochemical characteristics, namely caffeine, phenol and protein contents. The phenol and caffeine contents were determined following extraction while protein was studied by polyacrylamide gel electrophoresis (PAGE) of floral bud. The clones were planted using the Fisher blocks, in which five plants of each clone were established in contiguous rows. Data were collected in three replicates. Characterisation data were analysed using analysis of variance and mean separation was done using Duncan's Multiple Range Test. Phenol content in the berry pulp of the clones ranged from 2.56% to 15.63%. The average percent of phenol in the berry pulp was 9.51, which was significantly higher ($p < 0.05$) than what was obtained in the leaves (4.54). The coefficient of variation for pulp phenol was high (35.26), thus indicating that, rapid selection for favourable phenol percentage is feasible. The high level of phenol found in some of the clones studied may be valuable in breeding for resistance to some major diseases and insect pests of coffee. Caffeine content among the clones ranged from 1.10% to 1.53% on dry matter basis (dmb). Clone C36 is high yielding and relatively low in caffeine content, hence it is a suitable clone that could be included in any breeding programme for low caffeine coffee in Nigeria. All the Niaollou (M) clones had high caffeine content. There were differences in the mobility and intensity of protein bands in thirty-three clones; four clones – E1, M36, T155 and T921 had no bands, suggesting that these clones have low protein content. In terms of bands' mobility, there were three categories: the fast (6.0-9.0 cm), the intermediate (3.0-5.9 cm) and the slow bands (0.1-2.9 cm.). The three categories of band occurred at four different levels of intensities: very thick, thick, thin and faint. Majority of the "T" clones showed thin and faint bands. The variation in the protein banding patterns of the different *C. canephora* clones observed in this study provides further information on the existing genetic diversity of the coffee clones in addition to that provided by agro-botanical characters.

Keywords: Caffeine, phenol, protein, *Coffea canephora*, Nigeria