



Introduction

Coffee quality varies along the coffee value production system from bean size, sensory attributes, and biochemical characteristics. The quality of coffee beans is a critical factor during the marketing of coffee and it is a great determinant of price at the coffee auction. Quality is also one of the main factors considered during breeding programs and its importance is regarded as those of disease resistance and productivity. The study aimed at assessing different coffee varieties sourced from different coffee-growing countries and grown in Kenya on their sensory characteristics.

Materials/Methods

Thirty-one (31) coffee varieties from different countries were established in two different sites in Kenya and evaluated for their liquor quality from the harvest of the years 2021 and 2022. The sensory evaluation was carried out using a panel of four trained cuppers. Sensory evaluation was carried out using different descriptors which include flavor, body, balance, acidity, fragrance/aroma, aftertaste, and preference.

A Genotype-vs-Environment interaction (GGE) biplot was used for each site and year combination. A linear model using the effect of Variety, Site, and Year and its interactions, as well as the Cupper to estimate variances and significance testing was conducted.

References:

Marie, L., Abdallah, C., Campa, C. et al. G × E interactions on yield and quality in *Coffea arabica*: new F1 hybrids outperform American cultivars 2020. *Euphytica* 216, 78
 Lingle, T.R. *The Cuppers Handbook. Systematic Guide to the Sensory Evaluation of Coffees flavor*, 2001, Specialty Coffee Association of America, Long Beach, California Fourth edition pp71

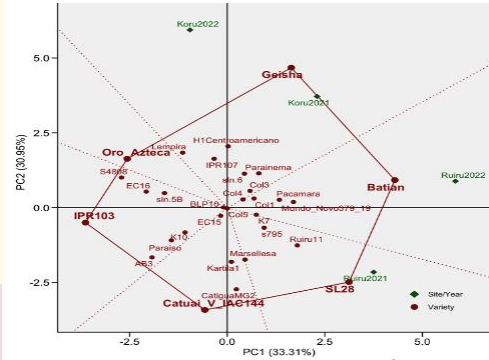


Figure 1: GGE for cup performance of individual coffee genotypes over the two years period across two sites

Table 1: Mean squares for interactions between copper, variety, site, and year

	Df	Sum Sq	Mean Sq	F value	Pr(>F)
Variety	30	367.34	12.245	3.9336	1.32E-10 ***
Site	1	25.71	25.712	8.2599	0.004263 **
Year	1	1.53	1.534	0.4927	0.483114
Copper	5	219.59	43.918	14.109	9.54E-13 ***
Variety:Site	22	389.17	17.69	5.6827	5.40E-14 ***
Variety:Year	28	225.59	8.057	2.5882	2.72E-05 ***
Site:Year	1	39.62	39.621	12.728	0.000403 ***
Variety:Site:Year	20	258.43	12.922	4.1511	1.15E-08 ***
Residuals	411	1279.4	3.113		

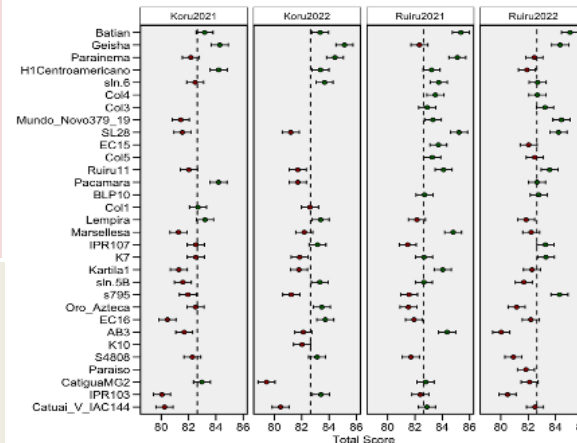


Figure 2: Predicted means for total cupping score per site and year

Results/Discussion

GGE biplot divided the environments into three sectors, one with both years in Kuru, and Ruiru 2021 and 2022 separately (Figure 1). The interaction between the Variety by Site and by Year was highly significant (Table 1). In addition, all the two-way interactions, and the single effect (except Year) were significant. Batian was the overall variety with the highest cupping score across both sites and years, nevertheless, Geisha was especially responsive in Kuru, and SL28 in Ruiru, especially in 2021 (Figure 2). This indicates that the environment had an effect on sensory variations that resulted from the various genotypes evaluated.

Conclusion/Perspectives

The findings are significant for the double and triple interaction to underline the complexity of evaluating cupping quality. Although it is possible to identify high-quality varieties across environments, wider testing and identification of site-specific best performers would be needed to maximize cupping quality.