

Identification of coffee cultivars (*Coffea arabica* L.) by quantitative and qualitative traits

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INTRODUCTION

The phenotypic identification are a common and cheap method to distinguish variation based on the observation of the morphological differences in different parts of the plant such as the size and the shape of the leaf, the plant form, the color of the shoot tip, the characteristics if the fruit, the angle of branching and the length of the internodes (De Vienne *et al.*, 2003). The identification of quantitative characteristics allows to determinate the homogeneity for seed reproduction or in the standardization of a productive plantation.

MATERIALS/ METHODS

For the morphological characterization the descriptors established by the IBPGR were used, in the observations the qualitative morphological descriptors such as: leaf shape, fruit shape, seed shape and seed color have the same events for the cultivars evaluated so they were discarded for data analysis. Measurements were made for Plant height, stem diameter, leaf length and leaf width, plagiotropic branch length, internodes length, number of new and productive nodes, among others. 30 plants were measured in 35 *Coffea arabica* cultivars. A multivariate analysis was performed, the data were filtering and analysis performed with the aid of the language and environment for statistical computing R (R Core Team, 2016).

RESULTS/ DISCUSSION

With the data collected, the number of variables that contribute more variance to have a greater differentiation between cultivars was determined. Out of 20 quantitative and qualitative variables analyzed, they contribute 37% of the variance between the main components 1 and 2. When analyzing the variables that contribute most to increase the variance, it was determined what characteristics contribute the most to the variance with 84% between the components main 1 and 2, among them the vigor of the plant (height / stem diameter), width x length of the leaf, width of the leaf, length of the leaf, diameter of the stem and the length of the plagiotropic branch. In addition, it was determined that the analyzed variables are directly influenced to the crop management, when comparing these variable in conditions in full sun, shade and pruning.

CONCLUSION / PERSPECTIVE

Determining what quantitative characteristics can be measured in coffee plants to determine the identification of the cultivar is based mostly on the measurement of the leaves in a given and management. The adaptive capacity of coffee plants makes it difficult to identify cultivars that must be accompanied by a discard complemented with qualitative characteristics (color of the sprout and fruit, tolerance to diseases, bearing of the plant).

REFERENCES • R Core Team (2016) R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. Available at <https://www.T-project.org/>. Da Vienne, D., S. Santoni and M. Falque, • 2003. Main Sources of Molecular Markers. In: Molecular Markers in Plant Genetics and Biotechnology, Vienne, D.D. Science Publishers nc., Plymouth, K., Pp: 3-41.

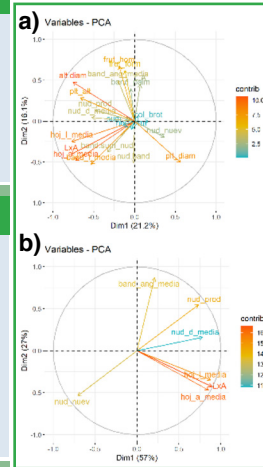


Figure 1: a)PCA all variables, and b) PCA selected variables

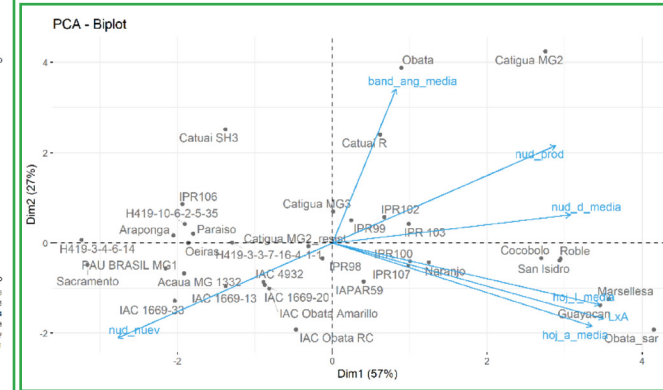


Figure 2: Biplot with 35 *Coffea arabica* cultivars