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Introduction

Coffee (*Coffea arabica* L.) is threatened by biotic and abiotic stresses. Nevertheless, the breeding of Arabica coffee is restricted due to its low genetic diversity. Crop improvement via mutagenesis represents an alternative for increasing genetic variability and facilitating breeding.

Materials/Methods

Coffee seeds cv. Catuai were treated for 8 h with a solution of sodium azide (NaN₃) (0, 50, 75, 100 and 125 mM) and ethyl methane sulfonate (EMS) (0, 80, 160, 240, 320, and 400 mM). The genetic variability induced in coffee plants after mutagenic treatment with sodium azide was determined by RAPD and AFLP analysis.

Conclusion/Perspectives

Coffee breeding programs could use mutagenesis combined with screening methods and molecular markers as an additional tool to induce novel traits and produce new and improved coffee cultivars

References:

César Vargas-Segura, Emanuel López-Gamboa, Emanuel Araya-Valverde, Marta Valdez-Melara, Andrés Gatica-Arias (2019) Sensitivity of seeds to chemical mutagens, detection of DNA polymorphisms using molecular markers and agro-metrical traits in m₁ coffee (*Coffea arabica* L.) generation. J. Crop Sci. Biotech. 2019 (December) 22 (5): 451 ~ 464. <https://doi.org/10.1007/s12892-019-0175-0>

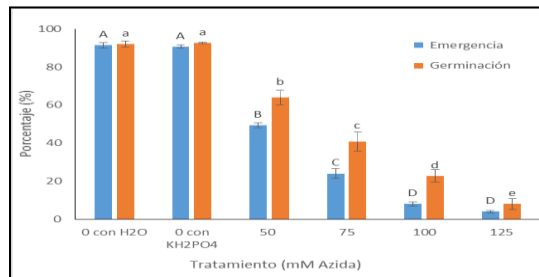
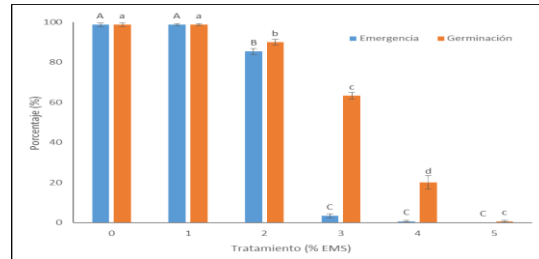


Figure 1. Effect of EMS and NaN₃ concentration on germination and emergence of coffee (*C. arabica* L. var. Catuai) seeds.

Results/Discussion

As the concentration of applied NaN₃ and EMS increased, the germination, seedling height and root length decreased. The LD50 values for NaN₃ and EMS were between 50-75 mM and 160-240 mM, respectively. The analysis revealed that both NaN₃ and EMS induced variability within the DNA regions amplified with AFLP and RAPD markers. Finally, under field conditions, significant differences were noticed with respect to plant height, number of nodes in the orthotropic stem, and number of branches of the M1 mutant (NaN₃ treated) plants compared to the non-mutant plants.

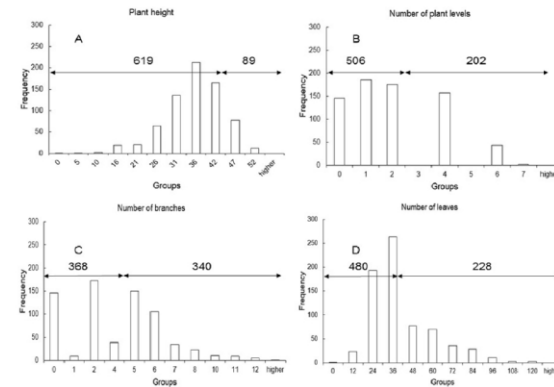


Figure 2. Morphological characterization of the M1 mutant coffee plants (a) height, (b) number of nodes in the orthotropic stem, (c) number of branches, and (d) number of leaves