



Genetic control and estimation of genetic parameters for seed-coat darkening of carioca beans

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ABSTRACT. The maintenance of the light color of the grains of carioca beans is a requirement for the development of new cultivars of common beans because it enables the storage of grains for long periods so that they may be traded at a proper opportunity. Crosses of cultivar BRSMG Madrepérola, which presents slow grain darkening, were made to 10 elite lines presenting normal darkening to obtain information about the genetic control of the trait and estimates of phenotypic and genotypic parameters. Progenies at the tegument generations F_3 and F_4 and their parents were evaluated at the locations of Santo Antônio de Goiás and Ponta Grossa at 71, 106, and 155 days of storage for seed-coat darkening using a rank of scores ranging from 1 (very light colored grains) to 5 (very dark colored grains). Genotypic and phenotypic variances and broad-sense heritabilities were estimated for each population. The segregation ratios were subjected to the chi-square test to establish the genetic control. Some populations did not present consistent patterns of genetic control, while others presented monogenic or double-recessive digenic segregation, indicating that the trait is controlled by few genes. Six segregant populations were identified

with both low means for darkening and high expected gain under selection. Despite the strong environmental influence on the expression of the traits and the occurrence of the genotype by environment interaction, the estimates of genotypic and phenotypic parameters indicate the possibility of successful selection to develop lines with slow seed-coat darkening.

Key words: *Phaseolus vulgaris* L.; Storage, Slow darkening; Genotype by environment interaction