



Genetic divergence among Brazilian garlic cultivars based on morphological characters and AFLP markers

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ABSTRACT. Outside its centers of origin, garlic propagates only asexually. Since asexual reproduction leads to the absence of meiotic recombination, the main garlic cultivars available for cultivation have arisen from the accumulation of somatic mutations in early cultivars. Thus, it is common for a single clone to have different names in different regions. This study aimed to evaluate the genetic diversity of 20 garlic cultivars by using morphological characters and amplified fragment length polymorphism (AFLP) markers to identify possible duplicate cultivars. We assessed 28 morphological characters related to the leaves, bulbs, and bulbils of the garlic plant and divided them into two categories: quantitative and qualitative (14 characters each).

For molecular marker-based analysis, we used three AFLP primer combinations. Genetic divergence was calculated using the Jaccard coefficient; the cultivars were grouped using unweighted pair-group mean analysis. The average genetic divergence detected using the morphological characters was 2.30 (range, 0.45-4.70). Plant height and coat adhesion exhibited the highest divergence among the cultivars. The average genetic diversity based on AFLP data was 43% (range, 0-79%). Dendrograms derived from both techniques divided the cultivars into two groups: noble and semi-noble. Together with the divergence within groups, the correlation between morphological and molecular data suggested that the cultivars in the noble group had greater phenotypic stability than those in the semi-noble group. Analysis of Jonas and Quitéria cultivars using these two techniques revealed only slight differences, suggesting that these cultivars may be clones or have a high degree of kinship.

Key words: *Allium sativum* L.; Clones; Genetic divergence; Molecular markers