Molecular markers associated with high Vitamin-C content in guava

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Abstract:

Vitamin-C content (VCC) was evaluated in 74 guava landraces using direct titration method with iodine during two seasons. Results showed that the highest value of VCC was 284.0±1.33, while the lowest VCC was 152.83±1.83 with an average of 221.26±3.17 mg/100g fresh weight. Analysis of variance showed the presence of highly significant differences among the tested landraces, as well as the interaction between landraces and seasons. Data of VCC showed normal distribution with high values of both broad sense heritability (0.97) and genetic advance (78.49) indicating high ability for selection. On the other hand, molecular analysis was performed using two molecular markers, i.e. sequence related amplified polymorphism (SRAP) and inter sequence simple repeats (ISSR) to determine unique and specific bands for high or low VCC. SRAP was more informative than ISSR and was able to generate 12 specific bands. Among these bands, 10 bands were specific for bulked DNA of landraces with high VCC, while the other two bands were specific for low VCC. However, ISSR only showed four bands where all of them were specific for low VCC. Results of this study gave good information for genotype selection for high VCC which could be used in guava breeding programs and/or biotechnological approaches. In addition, the specific bands generated by SRAP might assist in rapid screening for genotypes with high VCC, which could be identified in seedling or graft stage, therefore this would save time in a plant with long juvenile period like guava. Furthermore, these bands would be analyzed by sequencing in subsequent studies to locate related genome regions.

Keywords:

Psidium guajava, Vitamin C content, SRAP, ISSR, Specific marker

Published In:

Journal of Agricultural chemistry and Biotechnology , (3)7 , 49-55