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## Investigation of Genetic Variability among Twenty Sesame (*Sesamum indicum* L.) Venezuelan Cultivars Using Amplified Fragments Length Polymorphisms (AFLP)

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### Abstract

Sesame (*Sesamum indicum* L.) is one of the most ancient crops. It is grown in tropical and subtropical areas on 6.5 million of hectares worldwide. Sesame seeds are highly nutritive and they are used for direct consumption and as an oil source of excellent quality. Venezuela is the 7<sup>th</sup> exporter worldwide, producing 30,000 t per year. Many cultivars have been released, however little information about the genetic variability among them has been investigated, and only information about morphological characterisation is available. The aim of this study was to determine the genetic variability among sesame Venezuelan cultivars using amplified fragment length polymorphism (AFLP). 20 cultivars were used to perform AFLP using 8 primer combinations. Jaccard's similarity coefficients and Unweighted Pair Group Method with Arithmetic Mean (UPGMA) were used in cluster analysis. Principal coordinates analysis was also performed. Genetic variability among cultivars was compared with non-commercial accessions from Venezuelan germplasm bank to know how much of the available genetic variability has been used in breeding programs. A high level of polymorphism was obtained. Of the 457 bands recorded, 87% were polymorphic. Cluster analysis grouped 18 cultivars in two clusters, both including cultivars obtained from single populations. Principal coordinates analysis showed a continuous variation along the biplot, displaying high variability among three cultivars that come from a population formed by 50 accessions with different geographic origin. Similar results were obtained when 2 cultivars that come from a single cross were compared. This result indicates that Venezuelan breeding programs based in population formed by many accessions do not differ too much in genetic variability affecting the yield from populations resulting from single crosses. This suggests that a detailed study of one pair of parents to form one population could be more successful than to use many accessions to obtain genetic variability for selection. The comparison of genetic variability among cultivars with the variability within germplasm bank revealed that only part of the available variability has been used in sesame breeding so far. This finding implies that germplasm bank represents a potentially valuable, unexploited source of genes for improving the yield of Venezuelan cultivars.

**Keywords:** AFLP, cultivars, plant breeding, plant genetic resources, sesame