



Genetic diversity in tetraploid switchgrass revealed by AFLP marker polymorphisms

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ABSTRACT. Switchgrass (*Panicum virgatum*) is a perennial warm-season grass native to North America that has been identified as a dedicated cellulosic biofuel crop. We quantified genetic diversity in tetraploid switchgrass germplasm collected at Oklahoma State University and characterized genetic relatedness among the collections from distinct regions. Fifty-six tetraploid accessions, including seven upland and 49 lowland genotypes from throughout the US, were examined. The amplified fragment length polymorphism (AFLP) procedure was utilized to generate DNA profiling patterns that were scored visually. Sixteen selective AFLP primer combinations were used to amplify 452 polymorphic bands. The accessions' genetic similarity coefficients, UPGMA (unweighted pair-group method with arithmetic averaging) cluster analysis and principle coordinate analysis, were performed. The upland and lowland accessions clustered according to ecotypes, with one exception (TN104). Genetic similarity coefficients among the accessions ranged from 0.73 to 0.95. Analysis of molecular variance (AMOVA) was performed, showing significant differences between the upland and lowland genotypes. The *trnL* marker confirmed that TN104 was a lowland genotype, but the *trnL* marker identification of upland and lowland genotypes was not consistent with the AFLP analysis in two germplasms (Miami and AR4).

Key words: Switchgrass; *Panicum*; AFLP; Germplasm; *trnL* (UAA); Biofuel