IDENTIFICATION OF ASSOCIATION BETWEEN SSR MARKERS AND FIBER TRAITS IN AN EXOTIC GERMPLASM POPULATION DERIVED FROM MULTIPLE CROSSES AMONG GOSSYPIUM TETRAPLOID SPECIES

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Abstract

Cotton germplasm needs to be enhanced in order to meet the needs of modern textile industry in USA and international competition. An exotic germplam population derived from multiple crosses among tetraploid species was used to identify association between SSR markers and fiber traits. Two hundred and sixty inbred lines were grown under three environments in 2005 and 2006. These lines were evaluated for their agronomic performance and fiber properties. Tremendous genotypic variance was identified among the inbred lines for these traits. Genotypic variation for yield components and fiber properties were great relative to genotype x environment. DNA was extracted from these lines and screened for polymorphic SSR primers. Eighty-eight SSR loci were screened among the lines. Population structure was analyzed using STRUCTURE software. More than half of lines grouped into six groups. Genetic differentiation among the groups was highly significant based on Fst values. Association was analyzed with the information on population substructures. Some major QTLs were identified associated with yield components and fiber properties. The effects of population substructures were different among fiber related traits.