MOLECULAR GENETIC MAPPING OF THE MAJOR EFFECT PHOTOPERIOD RESPONSE LOCUS IN PIMA COTTON *(GOSSYPIUM BARBADENSE L.)*

L. Zhu
NC State University
Raleigh, NC
V. Kuraparthy
North Carolina State University
Raleigh, NC

Abstract

Photoperiod sensitivity is a major barrier for the introgression of tropical gene pool to be used in the cotton breeding programs in North America. To better understand the molecular genetic processes underlying photoperiod response in Pima cotton, a photoperiod insensitive line Pima S-7 was crossed to a photoperiod sensitive landrace accession NC7018. An F_2 mapping population of 211 individuals was used to establish that a dominant single gene controls the photoperiod sensitivity in *Gossypium barbadense*. Molecular mapping with simple sequence repeat (SSR) markers localized the photoperiod response gene *Gb_Ppd1* into a 3.3 cM region on chromosome 25 genetic map of Pima cotton. Orthologous mapping of the flanking markers with the draft diploid D-genome sequence resolved the photoperiod response gene to a 5.8 Mb region close to centromere on chromosome 10 of *Gossypium raimondii*. In silico mapping of the flowering time candidate genes of the model plants suggested that putative gene *Gorai.010G161200* of *G. raimondii* which has a function involved in photoperiodism was mapped in the genomic region of *Gb_Ppd1*. Identification of closely linked molecular markers and the delineated genomic region in sequenced *G. raimondii* genome will help in the marker assistant selection and molecular isolation of photoperiod response loci in cotton.