

## Molecular Cloning and Characterization of the Actin-depolymerizing Factor Gene in *Gossypium barbadense*

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Sea Island cotton (*Gossypium barbadense* L.) has been highly valued in *Verticillium* wilt resistance and many fiber qualities including fiber length, strength, and fineness. To identify whether it had some special genes in fiber development in comparison with the upland cotton (*G. hirsutum* L.), an actin-depolymerizing factor (ADF) gene was cloned and characterized in this research. A 420 bp open reading frame of the cloned gene, termed *GbADF1*, encoded a protein of 139 amino acids, which included 39.57% nonpolar amino acids, 17.27% acidic amino acids, 15.83% basic amino acids, and 31.92% hydrophobic amino acids. Its molecular weight was about 15 kDa, and pI 5.04. *GbADF1* contained two conserved domains, 6-Ser and the PIP<sub>2</sub>/actin binding site. Its amino acid was similar to the ADF/cofilin family of other plants. Compared to cDNA sequences, the *GbADF1* gene contained one intron near the 3' end in genomic sequence. Semiquantitative RT-PCR results showed that *GbADF1* was a constitutively expressed gene in cotton, and somewhat higher levels were detected in fibers than in trophic tissues. The *GbADF1* was successfully expressed as a fusion protein in *E. coli* BL21 (DE3). The molecular weight was firstly calculated by SDS-PAGE. The structure of *GbADF1* was different from others in higher plants, although the coding sequences of all cloned ADFs were highly conserved.