

1545 Biochemical Genetic Mechanism of Short Season Upland Cotton Cultivars that express Early Maturity without Premature Senility

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The study was to investigate the genetic basis of biochemical traits associated with the antioxidant system and phytohormones, and cloning of senescence-related genes. Two types of short season cotton, *Gossypium hirsutum*, cultivars were used in the experiments: five premature senescence cultivars (Group A) and five early maturing cultivars without premature senescence (Group B). A cysteine proteinase gene from cotton was isolated by rapid amplification of cDNA ends using polymerase chain reaction (RACE-PCR). CAT, SOD, and POD were higher in the B Group compared with the A Group, whereas the MDA was lower in Group B. Various genetic variances and heritability for these biochemical traits and IAA, ABA, and chlorophyll contents were estimated. The expression of the *Ghcysp* gene in young leaves is insensitive to ABA, H₂O₂, and darkness, which have been reported to accelerate leaves senescence. The short season cotton cultivars without premature senescence have higher yield and good quality. The *Ghcysp* gene is a developmentally regulated, senescence-specific gene. Its expression only occurs during the senescence of the older leaves.