EXPRESSION OF *GOSSYPIUM BARBADENSE* GL_2E GENE, IN *GOSSYPIUM HIRSUTUM* ANNUAL COTTON

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Abstract

One characteristic feature of cotton (*G. hirsutum L.*), is the presence of small, pigment-bearing glands in the plant tissue. Major constituints of these glands are gossypol, a polyphenolic yellow pigment, and other related terpenoide aldehydes. Several researchers have enphasized the importance of gossypol glands as a natural plant resistance mechanisms to certain insect pests. Gossypol has also been mentioned as a toxic substance to human and monogastric animals. Because of that, the presence of this substance in the cotton seed has been considered undesired by the oil and cotton meal industries. A current breeding objective in upland cotton in Embrapa, is the development of cotton lines without gossypol in the seed but with high levels of gossypol in the leaves and flowerbuds. In the literature, there is some information about the inheritance of gossypol gland distribution in the cotton plant. A full compliment in the foliar and floral organs of the cultivated tetraploid cottons is provided by the concerted action of three alleles designated Gl_1, Gl_2 and Gl_3. Gl_1 affects only the stems, petioles and carpel walls, while Gl_2 and Gl_3 affect the cotyledons and leaves as well as those organs affected by Gl_1. Plants homozygous for gl_2 and gl_3 are fully glandless, inclusive the seeds. The Gl_2E gene of *Gossypium barbadense* is dominant and produce a glandless plant and seed as well. In this work, the inheritance of GL_2E gene, when incorporated in the commercial cultivar CNPA Precoce 2, was studied. Cotyledonary leaves from generation F_1; F_2; BC_1 and BC_2 were analyzed 35 days after germination. Segregation in F_2 generation produced ratios (3:1), which confirmed the simple one-gene model. Considering the quantity of glands observed, partial dominance was suggested for the glandless character in this generation. On the other hand, it was observed that the free gossypol content in F_1 seed was very similar to its glandless (GL_2E) parent, showing a complete dominance of this character. This is particularly important when developing glandless cultivars for regions with high levels of natural crossing.

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