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ANATOMICAL BASIS OF HOST PLANT RESISTANCE TO JASSIDS IN *GOSSYPIUM SP.*

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Abstract

The present understanding of host plant resistance to jassid (*Armisca devastans* (Distant)) in cotton appears to be only dense, long and erect trichomes which can provide viable and heritable resistance to them. But, densely pubescent, leaves act as seat to lepidopteran pests (especially *Heliocoverpa armigera*) for laying eggs by providing tactile stimulii. In the present investigation, leaf anatomy of tri-species derivatives (20) and their parent species *G.hirsutum* (AD), *G.barbedense* (AD) and *G.arboreum* (A2) along with representative species in each genome namely, *G.herbaceum* (A1), *G.anomalum*(B), *G.australe* (G.), *G.raimondii* (D), *G.gossypioides* (D), *G.klotztianum* (D), F_1 plant of *G.arboreum* (4x) x *G.hirsutum* (AD) and BC_1F_1 (7 plants) of the same cross were studied through light and scanning electron microscopy along with scoring for jassids incidence. Variability for trichome density and morphology existed in *Gossypium* as revealed by scanning electron micrographs. Significant genetic variability existed for laminar thickness, presence of abaxial and adaxial palisade layers, sucking distance, cortex cell density and xylem vessels. The 'D' genome species and AD tetraploid exhibited dorsiventral leaf anotomy with presence of upper palisade layers. However, partial isobilateral leaf anatomy was noticed with respect to *G.herbaceum, G.arboreum, G.anomalum, G.australe* with varying density and length of palisade present in adaxial surface of leaf lamina. Significant differences were noticed for cortex cell density and sucking distance. The data collected was correlated with jassid incidence. Path analysis of the data revealed more contribution of cortex cell density, lower palisade layer for resistance to jassids than trichome density. There was significant negative association between lower palisade length, cortex cell density and jassid number. There was possibility of interspecific transfer of leaf anatomical traits through distant hybridization and selection. The genomic differences in organization of leaf anatomy in *Gossypium* indicated possibility of creating greater diversity for favorable leaf anatomical features in cultivated cotton. Based on the genome wide data on leaf anatomical features and from the data on introgressed derivatives it has been found possible to develop trichome independent jassid resistant genotypes in cultivated cotton.