

**TERPENOID ALDEHYDE ANALYSIS OF A
GOSSYPIUM TOMENTOSUM BC1F1 INTROGRESSION POPULATION**

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Abstract

Natural secondary products of cotton can act as insect toxicants, anti-feedants or attractants, pupation inhibitors, enzyme inhibitors, and protein denaturants. Inheritance has been extensively studied only for gossypol, but other terpenoid aldehydes also affect host plant resistance. Cotton breeding efforts could be enhanced by expanded genetic diversity for terpenoid aldehydes. It has been reported that *G. tomentosum* has a relatively desirable terpenoid aldehyde composition -- this might be advantageous as part of host plant pest resistance. We examined a BC1F1 population (N=150) from a *G. tomentosum* introgression project that is aimed at expanding the germplasm base of Upland cotton, *G. hirsutum*. Herein, we report initial findings on terpenoid aldehyde variation being introduced from a close relative of cultivated cotton, the noncultivated Hawaiian species *Gossypium tomentosum*. Our initial goal has been to survey the population and to identify individuals exhibiting extreme phenotypes with respect to terpenoid aldehyde expression. Our approach was to first survey the population with a relatively crude and affordable technique to identify individuals likely to have the extreme phenotypes, and subsequently to use refined techniques for detailed analysis. Here, we report results from the preliminary survey. Two samples were collected and independently processed per BC1F1 plant to extract the terpenoid aldehydes, which were then separated on TLC plates and then detected by a colorimetric reaction. TLC plates were then digitally imaged. Visual classification and digital measurement methods were used to score results. Analysis revealed detectable levels of H1 and H2 heliocides in 28% of the *G. tomentosum* BC1F1 population, and suggests that digenic inheritance (1:3 ratio) might be involved. Relatively large amounts of heliocides were seen in 7% of the population. This suggests that the highest levels may be tetragenic (1:15 ratio). Additional research is underway to test these TLC values using a more robust analytical system (HPLC), and test the preliminary hypotheses on inheritance. We gratefully acknowledge support from Cotton, Inc., TAES, the Texas Food & Fiber Commission (TFFC), and Texas State Support Committee (TSSC).