

**ELUCIDATION OF THE LINK BETWEEN THE LACINILENE AND GOSSYPOL PATHWAYS IN
ROOTS OF RNAi CYP82D109 COTTON PLANTS****T. A. Wagner****Department of Plant Pathology, Texas A&M University****SPARC-ARS-USDA****College Station, TX****L. S. Puckhaber****SPARC-ARS-USDA****College Station, TX****C. Magill****Department of Plant Pathology, Texas A&M University****College Station, TX****A. A. Bell****J. Liu****SPARC-ARS-USDA****College Station, TX****Abstract**

We have shown that RNAi CYP82D109 plants are more resistant than null segregants (WT) to Fov11 during a root dip assay, and that the RNAi plants become shorter (SAR phenotype), and the lacinilenes are induced in the roots of these infected plants. Thus RNAi CYP82D109 plants demonstrate a link between the gossypol and lacinilene pathways. In this presentation, the roles that these terpenoid defense compounds and hormones play in Fov resistance were explored. Toxicity tests using purified compounds against Fov11 conidia showed that a starting concentration of 100µg/ml of the lacinilene DHC inhibited the growth of Fov11 conidia for 48h. This indicates that DHC is less toxic to Fov11 conidia than the gossypol-related compound dMHG ($ED_{50}=9.1 \mu\text{g/ml}$). Therefore, the increase of lacinilenes in RNAi roots may not fully accounts for the increased resistance. Since the root dip assay involves wounding prior to Fov inoculation, we investigated whether RNAi plants are impaired in jasmonic acid (JA) signaling. Germinating seeds were placed in 100 µM JA or water and the root length was measured after 3 days. JA inhibited the root growth of RNAi and WT plants 25-37% compared to mock-treated seedlings. In a second experiment, RNAi-plants showed a 2X induction of gossypol compounds after watering 3-wk-old plants with 100uM JA compared to mock treated (similar to WT plants), yet gossypol levels remained 90% reduced compared to WT. Lacinilene compounds were not induced by JA in RNAi or WT roots or leaves. Thus, RNAi plants are not impaired in JA signaling, and JA does not induce lacinilenes in RNAi roots. Next, we will test if the application of salicylic acid and ethylene will induce lacinilenes in the roots of RNAi plants. Ultimately, we hope to understand the link between lacinilenes and gossypol with these experiments.