STRUCTURE AND COMPOSITION OF DEVELOPING COTTON FIBERS

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Abstract

Universal Attenuated Total Reflectance Fourier Transform Infrared (UATR-FTIR) spectroscopy and Thermogravimetric Analysis (TGA) were used to investigate the structural changes of cotton (*Gossypium hirsutum* L.) fibers as a function of developmental programming. The presence of noncellulosic compounds (wax, protein, hemicelluloses, pectic substances, amino acids, etc.) was evident from FTIR spectra of fibers at 10, 14, 17, and 20 dpa (day post-anthesis). The vibration corresponding to the noncellulosic compounds disappeared at 36 dpa. Furthermore, independent TGA analysis supported the results obtained with FTIR, showing that the transition from primary cell wall synthesis to secondary cell wall synthesis occurs at or around 20 dpa. This study is the first to report on the use of the UATR-FTIR and TGA to elucidate structural changes during cotton fiber development.

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