HEMIGOSSYPOL, A CONSTITUENT IN DEVELOPING GLANDED COTTONSEED

Tanya A. Wagner
Jinggao Liu
Robert D. Stipanovic
Lorraine S. Puckhaber
Alois A. Bell
Southern Plains Agricultural Research Center
Agricultural Research Service
U. S. Department of Agriculture
College Station, TX

Abstract

Gossypol is a dimeric sesquiterpenoid first identified in cottonseed, but found in various tissues in the cotton plant including the seed. From its first discovery, it was assumed that hemigossypol was the biosynthetic precursor of gossypol. Previous studies established that peroxidase (either from horseradish or from cottonseed) converts hemigossypol to gossypol. However, hemigossypol has never been identified in healthy cottonseed. In a temporal study using HPLC and LCMS, hemigossypol was identified in the developing cotton embryo and was shown to coincidently accumulate with gossypol and with δ-cadinene synthase and 8-hydroxy-δ-cadinene synthase, genes involved in the biosynthesis of hemigossypol. Taken together with previous experiments, this establishes hemigossypol as the biosynthetic precursor of gossypol.