2005 Beltwide Cotton Conferences, New Orleans, Louisiana - January 4 - 7, 2005

THE STUDY ON THE RELATION BETWEEN ABNORMAL PLANTLETS MORPHOGENESIS AND ENDO-HORMONES IN AGROBACTERIUM-MEDIATED TRANSFORMATION IN UPLAND COTTON

Fuguang Li, Jianfei Qi, Chaojun Zhang, Chuanliang Liu, Lizhao Geng, Yufen Wang, Fenglian Li and Zhixia Wu

Cotton Research Institute, CAAS,Key Laboratory of Cotton Genetic Improvement, Ministry of Agriculture, P R China

Anyang

Abstract

The *Agrobacterium*-mediated transformation is a main applied method in cotton genetic engineering. Unfortunately, rates of abnormal plantlets usually more than 90% during the regeneration of plantlets, which becomes the bottleneck of cotton transformation and restricts the application in the cotton genetic engineering. In our research, many regeneration plants harboring a fiber improvement gene were obtained via *Agrobacterium*-mediated transformation, which were identified by PCR amplification. In the regeneration, Callus, embryogenic callus, embryoids, abnormal plantlets and normal plantlets, etc, of different upland cotton cultivars were sampled from the same series of media. For analyzing easily, two modes, normal regeneration and abnormal regeneration of the induction of transgenic plantlets, were compared according to their rates of normal plantlets in transformations, the highest as former while the lowest as the later. In order to heighten the rate of normal regeneration plants, they both were measured their hormones fluctuations in the regeneration with two controls, one was the cotton seed developing in field; the other was the germinating of cotton seed in laboratory. Two rules were found in this research. The first, the stage of olivine embryogenic callus and the global embryoid were two key stages during induction of the plantlets. The second, the contents of endo-hormones in the abnormal induction plants were higher than that in the normal induction plants after the stage of global-embryoid. Inferring from those, abnormal induction plantlets were maybe resulted from one factor, the lower contents of IAA and ABA in the stage of global-embryoid and a slowing-down of CKs, thereafter, delaying of the peak ratio of IAA/ABA were possibly the other factor. All these suggest that reducing the content of IAA/CKs after heart-shape embryoid induce a higher rate of normal plant and embryoid induction in upland genetic engineering via *Agrobacterium*-mediated transformation.