Study on production of transgenic UP-eucalyptus (Eucalyptus urophylla x Eucalyptus pellita) for increasing fiber length

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Woody plants are important resources for paper productions, strategies for improvement of their properties are of considerable interest. The UP hybrid eucalyptus plants have fast-growth, good tolerance, and wide adaptability in different locations which have not shown yet in previously such as material of eucalyptus transgenic lines. The xylem transcription factor EcHB1 gene related to fiber elongation in the Eucalyptus camaldulensis. The aim of this project is to produce hybrid eucalyptus UP plants (Eucalyptus urophylla x Eucalyptus pellita) with improved fiber length; at the same time improve gene transfer efficiency. The target gene EcHB1 was isolated and cloned successfully into pGWB2 combination vector, and then transferred to the hybrid eucalyptus lines through Agrobacterium tumefaciens. The presence of the EcHB1 gene in transgenic lines was determined by PCR and Southern Blot techniques. The specific expression of EcHB1 protein was identified by Western Blot technique. In particular, the fiber expression of the transgenic UP eucalyptus lines has been evaluated about 10% increase compared to the control. Furthermore, the efficiency of transgenation was improved by causing damage to the stem and leaf materials before initiating gene transfer which showed an increase in the transgenation efficiency of between 6.7 - 32.3%. Thus, the results of the project have improved the process of gene transfer for higher transgenation efficiency and created a high-yielding UP hybrid transgenic line with longer wood fibers. Keywords: EcHB1, Eucalyptus, fiber elongation, transgenic.

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