

## Developmental flowering and growth regulated proteins in cottonwood (*Populus deltoides*)

Young-Min Kang<sup>1,2</sup>, Cetin Yuceer<sup>1</sup>, Myung-Suk Choi<sup>2</sup>

<sup>1</sup>Department of Forestry, Mississippi State University, USA.

<sup>2</sup>Division of Forest Science, GyeongSang National University, Korea

TEL: +82-1-55-751-5493, FAX: +82-1-55-751-6405

### Abstract

Classical tree breeding and genetic engineering require sexual reproduction for development of pedigreed offspring in eastern cottonwood (*Populus deltoides*). However, most breeding efforts are only in the third and/or fourth generation of genetic selection due to the long duration of the juvenile phase by developing methods to stimulate precocious flowering is needed to accelerate tree improvement. Two CONSTANS-LIKE (COL) genes, PdCO1 and PdCO2, were isolated from eastern cottonwood. PdCO1 is unique among all the characterized CONSTANS-LIKE genes in the plant kingdom in that the deduced protein sequence contains a putative signal peptide with a potential transmembrane helix at the N-terminal end. The expression of both genes in the leaf increased dramatically from March to April and decreased on May. The increased expression coincided with morphological changes occurring in the axillary meristem of the subtended bud and with increased abundance of PdCO1 and PdCO2 proteins in the leaf. As cottonwood passes through a long juvenile phase before flowering, it may be insensitive to environmental stimuli that regulate floral induction until they have attained the appropriate developmental stage. Thus, a complex genetic network likely monitors both the developmental state of the cottonwood trees and environmental signals.

### References

1. Sezen UU, Chazdon RL, Holsinger KE., Genetic consequences of tropical second-growth forest regeneration (2005), *Science*, 11(5711):891.

### **Acknowledgement**

This work was supported by the Korea Research Foundation Grant funded by the Korea government (MOEHRD):(KRF-2005-215-F00004).