

Antisense Inhibition of Caffeic Acid 3-O-Methyltransferase (COMT) in Transgenic Sugarcane (*Saccharum* spp.)

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Sugarcane is the most important crop used for bioenergy production in Brazil. The high sucrose content is used for sugar and ethanol production. Therefore it is expected to increase the production of ethanol using the bagasse and trash from the field. Studies on second generation ethanol is also focus on biomass suitable for the industrial process in order to develop technologies for high yield and low lignin content plants to make feasible the use of most of the cell wall as a carbon source. Thus, the main objective of this work was to produce transgenic sugarcane showing antisense inhibition of the enzyme caffeic acid 3-O-methyltransferase (*COMT*), which is a one of the enzyme in the lignin biosynthesis. Immature leaf roll discs of the varieties RB 835486 and SP80-3280 were co-transformed with *nptII* gene as selectable marker and an antisense fragment of *COMT* (*COMT-AS*), both controlled by the maize *ubi1* promoter. After bombardment the leaf discs were transferred to regeneration medium which consisted of the MS salts supplemented with BAP (0,5 mg/l) and NAA (0,1 mg/l) and geneticin (30 mg/L), in the light for 3 days prior transfer to MS medium with the selective agent. Sugarcane transformation was confirmed on 50 plants by PCR after 40-45 days on selective medium. Results of Real Time RT-PCR revealed that *COMT* expression levels were down regulated in 75% of transgenic plants of cultivar SP80-3280 (24 plants) and 50% of plants of cultivar RB 835486 (8 plants). In both varieties, the lowest levels of expression were up to 16 times less compared to the control not transformed. Molecular and biochemical analyses are in process to verify the effects of *COMT* suppression in these transgenic sugarcanes.

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