TRANSFORMATION OF BARREL MEDIC (MEDICAGO TRUNCATULA L.) WITH THE OXA1 cDNA FROM ASTER SEDIFOLIUS: TOWARDS THE GENETIC MANIPULATION OF TRITERPENE SAPONIN BIOSYNTHESIS

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Triterpene glycoside saponins have a range of different properties, including antimicrobial, insecticidal and allelopathic activity. They also have pharmacological applications such as anticholesterolemic, hemolytic, adjuvant and anticancer agents. Objective of this work is to evaluate the possibility to modify the triterpenoid saponin content in Medicago spp. by genetic engineering. Flower explants of Medicago truncatula (genotype R108) were co-cultivated with EHA105 disarmed A. tumefaciens strain. The cloning vector pG0029OXA1 contained the OXA1 cDNA from Aster sedifolius under the control of the cauliflower mosaic 35S promoter, and the neomycin phosphotransferase II (nptII) gene. OXA1 cDNA encodes for a β-amyrin synthase, a key enzyme involved in biosynthesis of triterpene glycosides. After callus induction and in vitro embryogenesis, putative transgenic plantlets were regenerated and then micropropagated for further analyses. The presence of nptII and OXA1 genes was demonstrated by PCR analysis. Molecular and biochemical characterizations are currently underway.