

## EFFECT OF *AsOXAI* GENE OVER-EXPRESSION ON TRITERPENE SAPONIN BIOSYNTHESIS IN TRANSGENIC BARREL MEDIC

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Triterpene saponins are a group of bioactive compounds abundant in the genus *Medicago* and studied for their biological and pharmacological properties. In the present paper, we evaluated the effects on the production of triterpene saponins in barrel medic (*Medicago truncatula* Gaertn.) by ectopic expression of a novel *Aster sedifolius* (*AsOXAI*) cDNA, a gene encoding for a beta-amyrin synthase, a key enzyme involved in the triterpene biosynthesis. The presence and the expression of the *AsOXAI* gene in different transgenic lines was demonstrated by Southern blot and RT-PCR analyses, respectively. Transgenic *AsOXAI* plants cultured in growth chamber conditions accumulated in the leaves and roots higher amounts of triterpene saponins than control plants. One out of the four *AsOXAI* transgenic lines showed in the leaves a total content of triterpene saponins significantly improved. In particular, transgenic leaves accumulated significant higher values for bayogenin, medicagenic acid and zanhic acid. The level of the two last compounds, which represent the core of the *M. truncatula* leaf saponins, was respectively 1.7 and 2.1 times higher than that observed for the control line. In addition, the production of bayogenin, hederagenin, soyasapogenol E and 2- $\beta$ OH-oleanolic acid in the *AsOXAI* transgenic roots was significantly improved. Under greenhouse conditions, biomass parameters of transgenic *AsOXAI* plants were similar to those observed in the control plants. Interestingly, transgenic roots overexpressing *AsOXAI* showed a better nodulation when compared to the control line. Segregation analysis is currently under way in order to evaluate inheritance of the transgene in the T<sub>1</sub> generation.