

Establishment of *Salvia officinalis* L. Hairy Root Cultures for the Production of Rosmarinic Acid

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Shoots of *Salvia officinalis*, a medicinally important plant, were infected with *Agrobacterium rhizogenes* strains ATCC 15834 and A4 which led to the induction of hairy roots in 57% and 37% of the explants, respectively. Seven lines of hairy roots were established in WP liquid medium under light and dark conditions. The transformed nature of the root lines was confirmed by polymerase chain reaction using *rolB* and *rolC* specific primers. Transformed root cultures of *Salvia officinalis* showed variations in biomass and rosmarinic acid production depending on the bacterial strain used for transformation and the root line analyzed. Both parameters (growth and rosmarinic acid content) of ATCC 15834-induced lines were significantly higher than the A4-induced lines. The maximum accumulation of rosmarinic acid (about 45 mg g⁻¹ of dry weight) was achieved by hairy root line 1 (HR-1) at the end of the culture period (45–50 days). The level was significantly higher than that found in untransformed root culture (19 mg g⁻¹ of dry wt).

Key words: *Agrobacterium rhizogenes*, Hairy Root Cultures, Rosmarinic Acid