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CHARACTERIZATION OF *HELICHRYSUM STOECHAS* HAIRY ROOT-REGENERATED PLANTS

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Regenerated plants from hairy roots, induced by wild *Agrobacterium rhizogenes* strains, exhibited the typical alterations due to T-DNA gene expression: dwarfing, increased rooting, advanced flowering, increased branching, reduced apical dominance and small leaves (Christey M.C., 2001). These altered phenotypic features show potential applications for plant propagation and for improving secondary metabolites production. *Helichrysum stoechas* (fam. *Asteraceae*) is an aromatic wild species of the Mediterranean region. The plant is an evergreen shrub, growing in arid soil and flowering from May to August. The bright yellow flower heads contain principally essential oils, flavonoids (helichrysin A and B) and tannins. *H. stoechas* has been used in folk medicine because of its antibacterial, antitoxic, diuretic and antiallergic properties. The flowering stems are also used dried as "everlasting flowers".

Tissue cultures from in vivo germinated seedlings of H. stoechas (L.) Moench, provided by the Siena Botanical Garden, were established. Shoot induction was obtained from leaf tissue of micropropagated plant clones, on a medium supplemented with thidiazuron (Giovannini et al., 2003). A. rhizogenes 15834 wild type strain was effective to induce hairy roots in one H. stoechas plant clone (CL 7). Shoots developed spontaneously from hairy roots on hormone-free medium, in light conditions. T-DNA rolC gene was detected by PCR analysis in four hairy root-regenerated plant lines (B, E, M, N), originated from independent transformation events (Amoretti et al., 2003). About twenty rooted plants deriving from each of the hairy root lines E, M and N and from the control were acclimatized in greenhouse. Untransformed plants of clone 7 were used as the source of control. After one year of *in vivo* culture, several cuttings were obtained (October 2004) and cultivated into a cold greenhouse (November 2004). The experiment was arranged in 4 blocks with 15 pots (14 cm diameter) per block and one plant per pot. From the end of April 2005, the following data were collected for each sample: plant height, number and length of primary branches, leaf length and width, onset of flowering and number of flower heads per inflorescence. Data were subjected to analysis of variance (ANOVA). Means were compared by Student-Newman-Keuls multiple range test ($P \le 0.05$). *H. stoechas* hairy root-regenerated plants showed a more compact plant habit (plant height significantly lower by 32% as compared to the control) and early flowering in two lines. Moreover, primary branch length was significantly reduced (42%), whereas the number of primary branches resulted not affected in two lines and significantly higher in one line.

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