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P02_05

Morphogenesis and developmental patterns affect polyphenolics production and endogenous stress hormones in *Artemisia alba* Tura *in vitro*

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The present work **aims** at the elucidation of the effect of the morphological development of *Artemisia alba* Tura on the production of polyphenolics and the content of endogenous stress hormones *in vitro*.

Material and methods: Plant growth regulators treatments were applied as follows: GAIP_0 – PGR-free control; GAIP_1 - 0.5 mg/l IBA; GAIP_2 - 1.0 mg/l IBA; GAIP_3 - 0.2 mg/l BA + 0.5 mg/L IBA and GAIP_4 - 0.2 mg/L BA + 1.0 mg/L IBA. Total phenolic and flavonoid contents were assayed colorimetrically. The endogenous levels of abscisic acid (ABA) and its catabolites (dihydrophaseic acid, phaseic acid, abscisic acid-glucose ester, neophaseic acid and 9-hydroxy-abscisic acid), jasmonic acid (JA) and jasmonic acid-isoleucine, as well as (SA) salicylic acid were analyzed by LC/MS.

Results: irrespectively of the different concentrations, PGR treatments of *A. alba in vitro* resulted in the development of two main morphotypes. While PGR-free control and IBA treated plants were characterized with the development of both aerial and root tissue, the combined IBA and BA treatments resulted in root inhibition and callusogenesis at the explant base. The root inhibited morphotype displayed elevated polyphenolic levels and a drop of SA and ABA and its pool. On the contrary, the content of JA and its pool were elevated in the latter group of plants. Noteworthy, the observed dependencies were related to the developed morphological type of the plants but not to the concentration of the plant growth regulators applied.

Conclusion: Secondary metabolites production was shown to be affected by the developmental patterns and morphogenesis of *A. alba in vitro*. Such dependencies could be used as a tool for the biotechnological secondary metabolite production of medicinal and aromatic plants without performing genetic transformations.

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Keywords: *Artemisia alba* Tura, *in vitro* morphotypes, endogenous abscisic acid, salicylic acid, jasmonates

P02_06

Changes of antioxidative enzymes during natural regeneration in deciduous forests

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Altitude and location are among the factors that strongly influence the physiology of deciduous trees. As we have previously shown, the common beech and hornbeam underwent some changes in the antioxidant status, non-enzymatic protective mechanisms and pigment content of the leaves, depending on their exposure.

Aim: Two widespread species - *Fagus sylvatica* L. and *Carpinus betulus* L., were investigated in order to determine the impact of these ecological factors during the natural regeneration in deciduous forests, with a special emphasize on the changes in the antioxidative enzyme defense system.