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(22nd SPPS Meeting)

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Wounding alters gene expression of secoiridoid glucosides metabolic pathway in leaves of common centaury

PP2-24

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Common centaury (*Centaurium erythraea* Rafn) is rich in secoiridoid glucosides (SG's): sweroside, swertiamarin and gentiopicrin. These glycosides are believed to be a part of dual defense system in which the SG's are bio-activated by hydrolytic enzymes. Upon tissue disruption, SG's are released from storage compartments and hydrolyzed via β-glucosidase to yield unstable and highly reactive aglycones. This two-component system provides plants with an immediate chemical defense against herbivore-induced wounding of leaves. Plants react to mechanical damage by activating a set of genes, the products of which are involved in defensive functions. Current study was conducted in order to determine how wounding affects the expression of SG metabolic pathway genes. Gene expression patterns of five SG biosynthetic pathway-related genes (*CeGPPS*, *CeGES*, *Ce8HG0*, *CeIS*, and *Ce7DLGT*) and of β-glucosidase (*CeBglu*) were examined in a time-dependent manner to determine the molecular mechanisms underlying wounding-induced changes in SG metabolism. Gene expression results were correlated with SG profiles in centaury shoots. The relative expression of *CeGES*, *Ce8HGO* and *Ce7DLGT* showed an increasing trend, reaching maximum at 24h/48h after wounding. Interestingly, two enzymes of the pathway with opposite functions, Ce7DLGT catalyzing the glycosylation reaction, and CeBglu having role in deglycosylation, showed opposite gene expression profiles. In conclusion, severe changes in gene expression profiles in response to wounding might lead to the reprogramming of SG metabolism in centaury leaves, and thus alter its defense strategies against herbivores.

Keywords: *Centaurium erythraea*, gene expression, mechanical injury, secoiridoid glucosides, UHPLC-MS/MS analysis.

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The investigation of sugar beet responses to drought at the Institute of Field and Vegetable Crops, Novi Sad

PP2-25

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Drought is the prime abiotic factor that limits sugar beet (*Beta vulgaris* L.) production in Serbia and other regions where the crop is not usually irrigated. As increased irrigation is not an economically viable solution, the most effective one is development of varieties adapted for successful growth in drought-prone environments. Within the framework of ongoing projects, in Institute of Field and Vegetable Crops Novi Sad (IFVCNS) research was performed with the aim to select drought tolerant sugar beet genotypes, improve production under water deficit conditions, and clarify the physiological processes of drought tolerance in sugar beet. Genotypic diversity for