



Biotechnological development and biological activity of Balkan endemic *Sideritis scardica* Griesb.

GA 2017 – Book of Abstracts

65 th International Congress and Annual Meeting of the Society for Medicinal Plant and Natural Product Research (GA 2017)

September 03–07, 2017, Basel, Switzerland

Chair: Prof. Dr. Matthias Hamburger Prof. Dr. Veronika Butterweck, Basel

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In vitro culture of Balkan endemic medicinal plant *Sideritis scardica* was previously initiated and different approaches for influencing the productivity of polyphenolics have been applied [1]. The present work discusses the spectrophotometric and HPTLC phenolics and flavonoids phytochemical profiling, DPPH radical scavenging activity and lipase and acetylcholinesterase inhibition assay of total methanol extract of plant material of the *in vitro* cultured plant. The following plant growth regulators were added to the control medium: 0.2 mg/L benzyl adenine (BA) + 0.02 mg/L 1-Naphthaleneacetic acid (NAA) (Sm); 0.2 mg/L BA + 0.5 mg/L NAA (Sr_1), 0.2 mg/L BA + 1.0 mg/L NAA (Sr_2), 0.5 mg/L BA + 0.5 mg/L NAA (Sr_3) and 0.5 mg/L BA + 1.0 mg/L NAA (Sr_4). As a general observation all treatments increased significantly the survival rate of explants, as well as polyphenolics productions as compared with the non-treated control. Strong relation between polyphenolic content and radical scavenging capacity were recorded and one probable lipase and 2 – 4 components with acetylcholinesterase inhibition activity were identified. As a result of the work *in vitro* culture systems for optimal biomass production and secondary metabolites yield were selected.

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[1] Koleva P, Petrova N, Krumova S, Velikova V, Aneva I, Evstatieva L, Wolfram E, Danova K (2016) *Planta Med* 2016; 82(S 01): S1-S381

Source:

Danova K, Wolfram E, Pedrussio S et al. Biotechnological development and biological activity of Balkan endemic *Sideritis scardica* Griesb.. *Planta Medica International Open* 2017; 4(S01): 1 - 200. doi:10.1055/s-0037-1608366

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Effect of growth regulators and photoperiod on endogenous phytohormonal levels and polyphenolic production in *Artemisa alba* cell aggregate cultures

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Cell aggregate lines of *Artemisia alba* were selected and developed in liquid cultures: ER_3 [0.1 mg/l *N*⁶-benzyladenine (BA) + 1.5 mg/l indole-3-butyric acid (IBA)] and ER_3_NAA [0.1 mg/l BA + 1.5 mg/l naphthylacetic acid (NAA)], grown in the dark, gyratory shaker, 100 rpm; ER_3_hv and ER_3_NAA_hv were grown in the same conditions, but at 16/8h photoperiod. Spectrophotometric assay of the total phenolic and flavonoid compounds was performed and the samples were also tested by HPTLC analysis with chlorogenic acid, as well as 1,3-, 1,5-, 3,5-, 3,4- and 4,5-dicaffeoylquinic acids, scopoletin and fraxidin-8-glucoside as reference compounds. The analysis showed general similarity in the tested samples. Photoperiod, however seemed to have an influence on glucosylation of the samples. While dark grown suspensions exhibited biosynthesis of both the aglycons (scopoletin and fraxidin) as well as their respective glucosides (scopolin and fraxidin glucoside), the 16/8 photoperiod suspensions produced predominantly the glucosylated derivatives. These data were confirmed also by the UHPLC analysis. 3,5-dicaffeoylquinic acid was the predominant component in all samples. In terms of endogenous cytokinin production, a significant drop of their levels was observed in suspensions, where NAA represented the exogenously added auxin. The latter samples were also characterized by a significant stimulation of polyphenolics, comparable to those produced by the differentiated shoot cultures of the plant. The obtained results are of practical interest for the targeted biotechnological delivery of scopoletin and fraxidin, which represent a higher phytopharmacological potential as compared with their glucosylated derivatives.

Joint Scientific Research Project between the CAS and BAS (BAS-17 – 17).

Source:

Wolfram E, Peter S, Todorova M et al. Effect of growth regulators and photoperiod on endogenous phytohormonal levels and polyphenolic production in *Artemisa alba* cell aggregate cultures. *Planta Medica International Open* 2017; 4(S01): 1 - 200. doi:10.1055/s-0037-1608367

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