BOOK OF ABSTRACTS

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tified, representing 97.9% of the total oil. The essential oil was characterized by the high presence of sesquiterpenes (54.9%), of which sesquiterpene hydrocarbons and oxygenated sesquiterpenes are represented with 22.9% and 32%, respectively. The dominant components were (*E*)-caryophyllene (11.19%), caryophyllene oxide (10.79%), 1,3,8-*p*-menthatriene (6.53%), and *τ*-muurolol (6.45%). Other compounds (aliphatic hydrocarbons, aliphatic aldehydes and alcohols, aliphatic acids and their esters and aldehydes, aromatic esters and aliphatic acids, alkyl aromatic alcohols, aryl esters of aromatic acids) represent 14.1% of the essential oil. (*E*)-Caryophyllene and germacrene D are dominant components of the essential oils in most of *Centaurea* species. However, the essential oil composition of *Centaurea* species shows a wide range of variability, especially in main compounds. Since the biosynthesis of *Centaurea* essential oil is not influenced by environmental conditions, future investigation of volatile components of *Centaurea* species from Balkan Peninsula will be directed to their taxonomic validation.

Keywords: *Centaurea melanocephala*, *Asteraceae*, essential oil

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Secondary metabolite production in differentiated and non-differentiated plant cell tissue and organ cultures of *Inula britannica*

PP4-13

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Inula britannica is a biregional element (Euro-Siberian and Irano-Turanian regions), widely distributed in Western Europe and Turkey, extending eastward to China through Iran and Pakistan. It is an important plant species used in Traditional Chinese Medicine (TCM) and Kampo Medicines. Along with *Inula japonica*, it is known as 'Xuan Fu Hua' in TCM. The anti-inflammatory, anti-bacterial, anti-hepatitic, and anti-tumor activities of extracts and isolated compounds of the species have been established. Shoot cultures were initiated from surface sterilized explants of the plants collected in Bulgaria. Then, different types of *in vitro* cultures of the plant were developed. Plant growth regulators and vitamin modification treatments in the shoot cultures of the plant led to the development of *in vitro* culture systems for targeting sesquiterpene lactones and phenolic and flavonoids production. The development of conventional genetically non-modified roots in liquid culture led to an enhancement of the production of polyphenolics, as compared with the roots of the whole *in vitro* grown plant. Light regime, as compared to dark growth conditions, and NAA, as compared to IBA were shown to enhance polyphenolic production in the root cultures of *Inula britannica in vitro*. The present findings might further be used for the targeted scale-up delivery of different phytopharmaceuticals in the different types of *I. britannica in vitro* culture systems.

Keywords: *Inula britannica* tissue culture, different *in vitro* culture types, sesquiterpene lactones, polyphenolics production

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