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BOOK OF ABSTRACTS



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P29 – Antioxidant activities of Bulgarian Golden root – endangered medicinal species

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Rhodiola rosea L. (golden root, rose root or arctic root) is a yellow-flower herbaceous perennial plant. It is a species of cool temperature distributed in the sub-arctic areas of the northern hemisphere (North America, Greenland, Iceland, Scandinavia) and high mountains of Asia (the Altai, the Tien-Shan, and the Himalayas) and in Europe (Central Europe and the Balkan peninsula) at an altitude of more than 1800 m. The species is endangered and is included in the Red Book of Bulgaria. It is protected by law in other countries (e.g. UK, Finland, Russia, Mongolia), too. *Rhodiola* is a multipurpose medicinal herb with adaptogenic properties. Its radix and rhizome extracts increase the body's nonspecific resistance and normalize body functions; provoke antidepressant, anticancer, cardio protective and central nervous system stimulating effects. In this study we were searching for *in vitro* cultivation conditions stimulating bioactive substances production. That is why calli were chosen which have been cultivated on media varying in phytoregulators' nature and concentrations. Total phenolic/flavonoid content and radical scavenging activity was determined in these calli. Antioxidant properties were influenced by the composition of the cultivation media. In this study a good correlation was obtained between the scavenging activity of DPPH radical with, both, the total phenolic content and the total flavonoid content in studied extracts. In our experiments a relation between the callus colour /structure/texture and the secondary metabolite amounts is not profound. Despite the low accumulation of phenolic and flavonoid compounds in the calli of Bulgarian *R. rosea* the presence of these metabolites indicates the possibility for production of biologically active substances by non differentiated cells. This could be a basis for *in vitro* metabolic engineering and biotransformation for alternative production of valuable substances by rose root.



P30 – Chemical composition and antibacterial activity of essential oil from *Seseli rhodopeum*

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Seseli rhodopeum Vel. is a Bulgarian endemic species with limited distribution in West and Central Rhodopes. It is included in the Red book of Bulgaria as a rare species. Essential oils of some *Seseli* species have been found to exhibit antimicrobial and antifungal activity. The objective of this study was to investigate chemical composition and antibacterial activity of the essential oil obtained by hydrodistillation from the aerial parts of *S. rhodopeum*. The yield of the essential oil was 0.7% w/w. Thirty six components in concentration over 0.1%, representing 99.9% of the oil, were identified. The oil was characterized by a high amount of monoterpene hydrocarbons (84.7%), while sesquiterpene hydrocarbons were only 7.3%. Oxygenated terpenoids were also in relatively low concentrations (7.9%). Sabinene was the principal component and reached 51.3%. α-Pinene (11.8%) and β-phellandrene (10.3%) were also dominant compounds, while germacrene-D, the main sesquiterpene, was found in moderate concentration (4.3%). Terpinen-4-ol (2.9%) was the main oxygenated monoterpene. Hexenylvalerate and hexenyltiglate in addition to cryptone, α- terpineol, δ-elemene and α-copaene, were registered in traces. Sabinene, α-pinene and β-phellandrene were reported as main components of *S. buchtormense* oil from flower heads. Sabinene in concentration over 50% has been found so far only in the fruit oil of *S. globiferum*. The antibacterial activity of the oil was tested against a set of five reference strains of Gram-positive and Gram-negative bacteria on Müller-Hinton agar. Moderate activity was obtained against *S. aureus* ATCC 27853.

P31 – Flavonoid glycosides and free radical scavenging activity of two Bulgarian *Alchemilla* species

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The commercial drug "Herba Alchemillae" (Lady's mantle) is an aggregate of closely related species with a wide use in traditional medicine. Seven *Alchemilla* species were found in the drug collected in Bulgaria. Among them, *A. mollis* (Buser) Rothm. (Rosaceae) and the Bulgarian endemic *A. achtarovii* are critically endangered species included in the Bulgarian Red Book. Successful cultivation of these species has been conducted for the last 15 years in Bulgaria. However, the literature survey revealed no data concerning detailed phytochemical study and antioxidant activity of *A. mollis* and *A. achtarovii*. Aerial parts of cultivated *A. mollis* and *A. achtarovii* were extracted with MeOH and then separated into petroleum ether, $CHCl_3$, EtOAc and H_2O layers. The antioxidant activity of the extracts was evaluated using DPPH assay. It was found that ethyl acetate extracts of both species possessed the highest radical scavenging activity and they were subjected to Sephadex LH-20 CC. Further, flavonoid containing fractions were purified by RP-18 CC to give individual compounds. Three different types of glycosides – kaempferol, quercetin and gossypetin were identified by spectral methods. *cis*-Tiliroside, *trans*-tiliroside, hyperoside, isoquercitrin and miquelianin were found in both investigated species. In addition, guaijaverin trifolin and variabiloside G were isolated from *A. achtarovii*, while rhodiolgin and gossypetin-7-O-rhamnoside-3-O-galactoside were found in *A. mollis*. It should be noted that gossypetin-7-O-rhamnoside-3-O-galactoside is a new natural compound.