



The Balkan Botanical Congress is an international meeting that has been held nearly every three years, since 1997. It brings together botanists from around the world who perform research on plants in the widest sense, as well as scientists who are engaged in the plant sciences and their applications. We were honored to host such an extraordinary scientific event this year in Serbia.

The 7th Balkan Botanical Congress – 7BBC 2018 took place in Novi Sad from September 10th to 14th 2018. The Congress was organized by the University of Novi Sad, Faculty of Sciences, Department of Biology and Ecology and the “Andreas Wolny” Botanical Society, along with the great help of 7 co-organizers and more than 30 supporters and sponsors. It truly was not possible to happen without exceptional help of our co-organizer - the Institute for Nature Conservation of Vojvodina Province who made this congress not only possible, but totally awesome.

7BBC 2018 placed a special emphasis on plants of the Balkan Peninsula and covered various research fields. The Congress was organized into ten sessions: Plant Anatomy and Physiology, Plant Taxonomy and Systematics, Plant Molecular Biology and Genetics, Floristics, Vegetation and Phytogeography, Conservation Botany and Plant Invasions, Phytochemistry and Plant Resources, Agronomy and Forestry, Botanical Collections and History, Ethnobotany and Cryptogam Biology. These topics were elaborated through five plenary lectures given by eminent scientists, as well as in the form of introductory lectures, oral and poster presentations. With an overall number of 387 abstracts presented on the very latest of botanical science, we shared knowledge, expertise and novel ideas. We welcomed nearly 400 scientists to Novi Sad, and we believe that we succeeded in our joint endeavor to make new networks and new connections among botanists. We hope that we contributed to advancements in the wide and beautiful field of botany, ranging from fundamental botanical research to applied botany.

It is our great pleasure to publish this Abstract Book in Botanica Serbica, in the same year that this international journal, a renamed continuation of the Bulletin of the Institute of Botany and Botanical Garden Belgrade, celebrates its 90 year jubilee. On behalf of the Scientific and Organizing committee of 7BBC 2018 we would like to express our gratitude to all contributors, colleagues and sponsors for taking part in the 7th Balkan Botanical Congress, as well as for their efforts and contributions to its successful realization.

Goran Anačkov and Lana Zorić,
Co-presidents of the Scientific Committee of the 7 BBC
and guest editors of Botanica Serbica 42 (supplement 1).

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Sessions:

The 7th Balkan Botanical Congress consists of plenary lectures, introductory lectures of each session, as well as oral and poster presentations on the following topics:

Sessions 1. Plant Anatomy and Physiology

Sessions 2. Plant Taxonomy and Systematics

Sessions 3. Plant Molecular Biology and Genetics

Sessions 4. Floristics, Vegetation and Phytogeography

Sessions 5. Conservation Botany and Plant Invasion

Sessions 6. Phytochemistry and Plant Resources

Sessions 7. Agronomy and Forestry

Sessions 8. Botanical Collections and History

Sessions 9. Ethnobotany

Sessions 10. Cryptogam Biology

Poster presentation 30 06 23

IMPACT OF EXTRACTION PARAMETERS ON BIOLOGICAL POTENTIAL AND COMPOSITION OF BILBERRY EXTRACTS

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Bilberry has long tradition of medical use, both conventional and alternative, due to its beneficial effect on human health. As oxidative stress has started to have an emerging role in pathogenesis of various diseases, antioxidant potential of bilberries' extracts has come to focus lately. The aim of this study was to examine how different extraction methods affect the effectiveness of extraction of bioactive compounds from bilberry's fruit, as well as to determine antioxidant activity of the analyzed extracts. Investigated extracts were prepared by methanol maceration method, decoction making and infusion making methods. The total amount of phenols was determined by Folin-Ciocalteu method. Total amount of flavonoids was determined by spectrophotometry analysing flavonoid-metal complex forming. The amount of total anthocyanins was determined spectrophotometrically developing the color of antocyanins with hydrochloric acid solution. Antiradical activity of the analyzed extracts was tested on the synthetically prepared DPPH radical (1,1-diphenyl-2-picrylhydrazyl radical). The highest amount of the total phenols is present in decoction, whereas the highest amount of flavonoids and anthocyanins is present in methanol extract. DPPH test showed significant antioxidant potency of all examined extracts, among which decoction has the highest potency. The extraction conditions affect the bilberry's extract composition and antioxidant activity. Yielded results imply that there is the need for further investigation in order to determine detailed chemical composition and isolate the most active compounds responsible for antioxidant potential.

KEYWORDS: bilberry, methanol extract, infusion, decoction, chemical composition, antioxidant activity

Poster presentation 31 06 18

CONTENT OF ANTHOCYANINS IN ARONIA MELANOCARPA FRUIT INFLUENCED BY DIFFERENT SOLVENT SYSTEMS

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Lately, there is an increased interest for berries of *Aronia melanocarpa* fruits because of their potential health effects. Numerous studies have shown its significant impact on protection role against cardiovascular disease, and the reduction of cancer risk. The high biological activity of chokeberry is associated with its chemical composition, rich in different antioxidants, especially polyphenolic components. The dominant polyphenols of chokeberry are anthocyanins and their abundance is approximately 25% of total polyphenols. However, anthocyanins are greatly unstable and susceptible to degradation and polymerization, and therefore their utilization is limited. The aim of this work was to determine total monomeric anthocyanins content (TMAC) and degradation/polymerization of anthocyanins using three different solvent systems: 100% methanol (MeOH), 80% MeOH and 50% ethanol (EtOH). Monomeric anthocyanins were measured by the pH-differential method and the anthocyanin content was expressed as cyanidin-3-glycoside (C3G), while the anthocyanin degradation indices were determined by measuring several absorbencies of samples at different wavelengths, which has been treated with sodium bisulfite and expressed as percent polymeric color (PPC). The obtained results for TMAC were: 1.314 mg/g C3G (100% MeOH), 1.465 mg/g C3G (80% MeOH) and 0.661 mg/g C3G (50% EtOH). Percent of polymeric color for different solvent was 7.52% (100% MeOH), 32.93% (80% MeOH) and 46.41% (50% EtOH), respectively. According to exhibited results, it can be concluded that anthocyanins composition and degradation process of *Aronia melanocarpa* fruit differ and depend on the choice of adequate solvent. Results indicate that the most appropriate solvent for extraction of monomeric anthocyanins was 80% MeOH, while the 100% MeOH solvent demonstrated the greatest protective properties against the degradation of the anthocyanins, confirmed by the lowest measured PPC.

KEYWORDS: *Aronia melanocarpa*, polyphenols, anthocyanins, extraction, solvent, degradation index

Poster presentation 32 06 20

CHEMICAL COMPOSITION OF VOLATILE COMPOUNDS OF EIGHT GERANIUM L. SPECIES FROM VLASINA PLATEAU

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The Vlasina plateau shows significant floristic diversity counting 956 species of which 91 may be categorized as endangered in the flora of Serbia. The genus *Geranium* is present in the flora of this region with few species and they are the subject of our research. The chemical composition of volatile compounds of aerial and underground parts of eight *Geranium* L. species (*G. macrorrhizum* L., *G. phaeum* L., *G. sanguineum* L., *G. robertianum* L., *G. palustre* L., *G. pyrenaicum* Burm. f., *G. columbinum* L. and *G. lucidum* L.) collected in flowering stage from Vlasina plateau (Serbia) was examined. The samples of volatile fraction were obtained by steam distillation and analyzed using GC-FID and GC-MS. The cluster analysis revealed the separation of volatile compounds of *Geranium* species to two clusters. The aerial and underground parts volatiles of *G. macrorrhizum* were separated from the other species, based on the high sesquiterpenes content (92.3% and 94.6%), mostly germacrene (73.3%) in the aerial and δ -guaiene (76.8%) in the underground parts. The volatile fractions of other species were mainly composed of sesquiterpenes (10.8-61.8%), diterpenes (12.9-43.0%) and fatty acids and their derivatives (6.6-21.6%). The exception was the fraction of the underground parts of *G. phaeum* which was predominantly made by fatty acids and their derivatives (76.6%). In the volatile fraction of *G. palustre* aerial parts β -selinene (18.6%) and (*E*)-caryophyllene (15.7%) prevailed. Hexadecanoic acid (15.4%), germacrene D (15.4%), (*E*)-caryophyllene (10.6%), phytol (10.4%) and caryophyllene oxide (10.2%) were the most abundant compounds in volatile fraction of *G. pyrenaicum* aerial parts, while phytol (13.2%) and (*E*)-caryophyllene (9.5%) in the volatile fraction of *G. lucidum* aerial parts. Hexadecanoic acid and phytol were dominant compounds in the volatile fraction of aerial parts of *G. sanguineum* (21.1% and 17.8%), *G. robertianum* (12.5% and 19.3%), *G. phaeum* (7.3% and 41.4%) and *G. columbinum* (14.5% and 29.5%). Volatiles of aerial parts of *G. robertianum* were also characterized by (*E*)-caryophyllene (8.0%) and caryophyllene oxide (7.4%), while the volatiles of *G. sanguineum* contained β -bisabolene (5.2%). The volatiles of *G. palustre* aerial parts have been studied for the first time. The chemical characterization of volatile compounds of *Geranium* species may possibly have chemotaxonomic importance and is significant for further research of Vlasina plateau native flora.

KEYWORDS: *Geranium*, Vlasina plateau, volatile fraction, GC-FID, GC-MS

Poster presentation 33 06 25

CHEMICAL PROFILE OF BLACK CUMIN SEED OILS AND EXTRATCS

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The chemical composition of essential oil (NS-HD), fixed oil (NS-SH), methanol (NS-SM) and water (NS-RW) extracts of black cumin (*Nigella sativa* L.) seed were evaluated. The volatile constituents of essential and fixed oils, as well as fatty acid profile in fixed oil were determined via gas chromatography-mass spectrometry (GC/MS) technique. Phenolic acids and flavonoids were determined in methanol and water extracts of *N. sativa* seed by UHPLC-UV/Vis method. Essential oil showed the presence of eleven compounds representing 80.92% of the total amount. The major component of the essential oil was *p*-cimene (46.18%), followed by α -thujene (8.68%), longifolene (7.32%), and thymoquinone (6.77%). Analysis of the fixed oil resulted in the identification of nineteen compounds representing 97.13% of the total amount; and linoleic acid (45.29%), oleic acid (23.33%), *p*-cimene (9.26%) and thymoquinone (7.33%) were found as the main components. Nine fatty acids were identified in the fixed oil. The extract was consisted of four saturated fatty acids (24.43%) and five unsaturated fatty acids (75.57%). Linoleic acid (24.58%), oleic (14.11%) and eicoseic acid (12.00%) were the major components. Eight phenolic acids (gallic, 4-hydroxybenzoic, chlorogenic, vanillic, caffeic, ferulic, sinapinic, and rosmarinic acid) were found in water and methanol extracts. Vanillic acid was the main component of both extracts (5.79 μ g/g for NS-SM, and 4.63 μ g/g for NS-RW). Regarding the flavonoids profile, quercetin was identified only in NS-SM extract.

KEYWORDS: *Nigella sativa* L., volatile compounds, fatty acids, phenolic acids, flavonoids