2nd International Conference on Plant Biology
21st Symposium of the Serbian Plant Physiology Society
COST ACTION FA1106 QUALITYFRUIT Workshop

Book of Abstracts

Petnica, 17-20 June 2015
2nd International Conference on Plant Biology • 21st Symposium of the Serbian Plant Physiology Society • COST ACTION FA1106 QUALITYFRUIT Workshop
PETNICA SCIENCE CENTER 17-20 JUNE, 2015

Organization Committee
Marijana Skorić, Jelena Savić, Danijela Mišić, Branislav Šiler, Ana Ćirić, Milana Trifunović, Bojana Banović, Nemanja Stanisavljević, Zviko Jovanović, Jelena Dragičević Maksimović, Stevan Avramov, Aleksandra Dimitrijević, Dunja Karanović

Scientific Committee
Sokol Abazi (Tirana, Albania)
Jules Beekwilder (Wageningen, The Netherlands)
Harro Bouwmeester (Wageningen, The Netherlands)
Mondher Bouzayen (Castanet-Tolosan, France)
Christian Fankhauser (Lausanne, Switzerland)
Hrvoje Fulgosi (Zagreb, Croatia)
Milen Georgiev (Plovdiv, Bulgaria)
James Giovannini (Ithaca, USA)
Giovanni Giuliani (Roma, Italy)
David Honys (Prague, Czech Republic)
Angelos Kanellis (Thessaloniki, Greece)
Miroslav Lisjak (Osijek, Croatia)
Autar Mattoo (Beltville, USA)
Cathie Martin (Norwich, UK)
Roque Bru Martinez (Alicante, Spain)
Václav Motyka (Prague, Czech Republic)
Petr Smýkal (Olovouc, Czech Republic)
Mario Pezzotti (Verona, Italy)
Alain Tissier (Halle, Germany)
Julia Vrebaková (Ithaca, USA)
Jelena Aleksić (Belgrade, Serbia)
Goran Anačkov (Novi Sad, Serbia)
Milan Borišev (Novi Sad, Serbia)
Tijana Cvetić Antić (Belgrade, Serbia)
Bojan Dukud (Belgrade, Serbia)
Dragana Ignjatović Mićić (Belgrade, Serbia)
Zorica Jovanović (Belgrade, Serbia)

Ivana Maksimović (Novi Sad, Serbia)
Vuk Maksimović (Belgrade, Serbia)
Vladimir Mihajlović (Kragujevac, Serbia)
Dragana Miladinović (Novi Sad, Serbia)
Jovanka Miljuš-Dukić (Belgrade, Serbia)
Danijela Miljković (Belgrade, Serbia)
Neda Mimica-Dukić (Novi Sad, Serbia)
Danijela Mišić (Belgrade, Serbia)
Miroslav Mitrović (Belgrade, Serbia)
Nevena Nagi (Novi Sad, Serbia)
Maja Natić (Belgrade, Serbia)
Miroslav Nikolić (Belgrade, Serbia)
Slavica Ninković (Belgrade, Serbia)
Dejan Orčić (Novi Sad, Serbia)
Pavle Pavlović (Belgrade, Serbia)
Ljiljana Prokić (Belgrade, Serbia)
Marina Putnik Delić (Novi Sad, Serbia)
Svetlana Radović (Belgrade, Serbia)
Tamara Rakic (Belgrade, Serbia)
Aneta Saboljević (Belgrade, Serbia)
Marko Saboljević (Belgrade, Serbia)
Jelena Samardžić (Belgrade, Serbia)
Ana Simonović (Belgrade, Serbia)
Marina Soković (Belgrade, Serbia)
Angelina Subotić (Belgrade, Serbia)
Sonja Veljanović Jovanović (Belgrade, Serbia)
Tanja Vujović (Cačak, Serbia)
Snežana Zdravković-Korač (Belgrade, Serbia)
Bojan Zlatković (Niš, Serbia)

Publishers
Serbian Plant Physiology Society
Institute for Biological Research „Siniša Stanković”, University of Belgrade,
Bulevar despot Stefan Stanojević 142, 11060 Belgrade, Serbia

Editor
Branka Uzelac
Branislav Šiler
Danijela Mišić
Lidija Maćej
Makarije, Belgrade
250
Belgrade, 2015

CIP - Katalogizacija u publikaciji
Народна библиотека Србије, Београд
581(048) I
TERNATIONAL Conference on Plant Biology (2; 2015 ; Petnica)

Tiraž 250. - Registar.
ISBN 978-86-912591-3-6 (SPS)
1. Društvo za fiziologiju biljaka Srbije. Simpozijum (2; 2015 ; Petnica)
2. COST Action FA1106 QualityFruit. Workshop (2015; Petnica)
a) Ботаничка - Агросоциологи
COBISS.SR-ID 215711500

Supported by the Ministry of Education, Science, and Technological Development of the Republic of Serbia
Antioxidant activities and total phenol contents of Cuscuta campestris stem collected from Beta vulgaris

Violeta D Jakovljević1, Jasmina M Miličević1, Miroslav M Vrvić2, Sava Vrbičanin3
(jakovljevicvioleta@gmail.com)
1 Institute for Biology and Ecology, Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34 000, Kragujevac, Serbia
2 Department of Biochemistry, Faculty of Chemistry, University of Belgrade, Studentski trg 12-16, 11000 Belgrade, Serbia
3 Faculty of Agriculture, University of Belgrade, Nemanjina 6, 11 080 Belgrade, Serbia

Plants contain high amounts of polyphenols, which are very potent natural antioxidants. Cuscuta campestris is a non-specific parasitic plant of a wide range of commercial host species (alfalfa, sugar beet, onions, potato, tomato, legume, etc.) and its phytoconstituents vary depending on the type of the host. The present study was designed to evaluate the relative contribution of different polyphenols and their antioxidant activities. For this purpose, the total phenolics, flavonoids and flavonols content of C. campestris stem collected from Beta vulgaris were determined in the methanol, methanol:H2O (70:30, w/w), acetone, ethyl acetate and n-butanol extracts. Screening of antioxidant activity of each extract was performed using following assays: DPPH and ABTS free-radical scavenging activity, total antioxidant activity, Fe2+-chelating ability, Fe3+-reducing power and inhibition of lipid peroxidation. Maximum level of total phenol content (102 mg GAE g⁻¹), the highest total antioxidant activity (26.59 µg AA g⁻¹), DPPH (IC₅₀ = 889.36 µg mL⁻¹) and ABTS (IC₅₀ = 185.65 µg mL⁻¹) scavenging activities, reducing power (IC₅₀ = 0.615 µg mL⁻¹), chelating activity (IC₅₀ = 9.48 µg mL⁻¹) and inhibitory activity against lipid peroxidation (IC₅₀ = 71.56 µg mL⁻¹) were found in methanol:H₂O extract. Maximum levels of total flavonoid content (56.10 mg RUE g⁻¹) and flavonols (6.51 mg QUE g⁻¹) were found in ethyl acetate extracts of the plant. The results of the present study revealed that aqueous methanolic extract of C. campestris stem exhibited higher antioxidant activities due to its higher phenolics content. The obtained data would certainly help to ascertain the potency of the Cuscuta stems as potential source of natural antioxidants for food and pharmaceutical industries.

Keywords: C. campestris, antioxidant activity, total phenol content, flavonoids, flavonols

Antimicrobial and antigenotoxic properties of Digitalis lamarckii endemic plant from Turkey

Jelena Katanić1, Sanja Matić2, Tatjana Boroja1, Ramazan Ceylan3, Gokhan Zengin3, Abdurrahman Aktumsek1, Snežana Stanić2, Vladimir Mihailović1
(jkatanic@kg.ac.rs)
1 Department of Chemistry, Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34000 Kragujevac, Serbia
2 Department of Biology and Ecology, Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34000 Kragujevac, Serbia
3 Department of Biology, Science Faculty, Selçuk University, Konya, Turkey

Digitalis lamarckii Ivanina, (gen. Digitalis, fam. Plantaginaceae) - dwarf foxglove, is a plant species endemic to the rangelands of Turkey. Members of the genus Digitalis are of great medicinal importance as they contain cardiac glycosides, which can increase the force of systolic contractions and regulate heart rhythms. The purpose of this study was to evaluate antimicrobial and antigenotoxic properties of D. lamarckii aerial part ex-
The microdilution method for evaluation of antimicrobial activity of *D. lamarckii* extract was performed on the selected strains of bacteria and fungi. The antigenotoxicity of *D. lamarckii* extract (80 mg mL⁻¹ of food) against ethyl methanesulphonate (EMS, 1 mM) induced genotoxicity was evaluated in vivo in the anterior midgut of *Drosophila melanogaster* using modified alkaline comet assay. The total phenolic and flavonoid contents were also determined. The total phenolic content was 36.60 mg GAEs g⁻¹ and total flavonoids content was 40.99 mg REs g⁻¹. The MIC values indicate that *D. lamarckii* exhibited good antibacterial properties against *Pseudomonas fluorescens* (MIC 1.25 mg mL⁻¹), *Escherichia coli* and *Azobacter chroococcum* (MIC 10 mg mL⁻¹). The extract exerted excellent antifungal activity against *Phialophora fassigiana* (MIC 2.5 mg mL⁻¹). The most resistant fungi were *Candida albicans*, *Aspergillus niger* and *Doratomyces stemonitis*. High significances in the reduction of %DNA in tail (80.3%) were found in the group simultaneously treated with EMS and extract, with an average frequency of selected parameter of 10.17 ± 0.51 that was similar to that of the negative group (8.42 ± 0.70).

**Keywords:** *Digitalis lamarckii*, phenolic content, antimicrobial activity, antigenotoxic potential

This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (III43004 and III41010).

---

**HPLC analysis and in vivo assessment of the genotoxicity and antigenotoxicity of the Filipendula ulmaria methanol extract**

**Jelena Katanić¹, Sanja Matić², Snežana Stanić², Milan Mladenović¹, Nevena Stanković¹, Vladimir Mihalović¹, Tatjana Borja¹, Vuk Maksimović³**

(jkatanic@kg.ac.rs)

¹ Department of Chemistry, Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34000 Kragujevac, Serbia
² Department of Biology and Ecology, Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34000 Kragujevac, Serbia
³ Institute for Multidisciplinary Research, Department of Life Sciences, University of Belgrade, Kneza Višeslava 1a, 11030 Belgrade, Serbia

*Filipendula ulmaria* L. is commonly used in traditional folk medicine in the region of the central Balkans to treat fever, the common cold, arthritis and other inflammatory conditions. The aim of the present study was to determine possible in vivo genotoxicity of extracts (20, 40 and 80 mg mL⁻¹ of food) from the roots and aerial parts in the anterior midgut of *Drosophila melanogaster* using modified alkaline comet assay and protective effect of the highest dose of extract against ethyl methanesulphonate (EMS) induced genotoxicity. HPLC was employed for the identification of the phenolic compounds present in extracts. In both extracts caffeic acid glucosides and procyanidin derivates were identified. In aerial part extract, HPLC analysis showed the presence of catechin, epicatechin, salicylic acid, rutin, hyperoside and several quercetin glucosides. There were no statistically significant differences in total scores between negative and groups treated with *F. ulmaria* root extract, while aerial part extract had weak genotoxic effects depending on the concentration. The percentage reduction in DNA damage was more evident in group treated simultaneously with EMS and root extract (87.5%) and less expressive in group treated with aerial part extract (54.7%). Results of the study provide scientific basis for the use of this plant extract in the future development as antigenotoxic agent.

**Keywords:** *Filipendula ulmaria*, DNA damage, antigenotoxicity, HPLC profiling

This work was financed by the Ministry of Education, Science and Technological Development of the Republic of Serbia (III43004 and III41010).