

Serbian Plant Physiology Society

Institute for Biological Research "Siniša Stanković", University of Belgrade

**2<sup>nd</sup> International Conference  
on Plant Biology**

**21<sup>st</sup> Symposium of the Serbian  
Plant Physiology Society**

**COST ACTION FA1106  
QUALITYFRUIT Workshop**

***Book of Abstracts***



Petnica, 17-20 June 2015

2<sup>nd</sup> International Conference on Plant Biology • 21<sup>th</sup> Symposium of the Serbian Plant Physiology Society • COST ACTION FA1106 QUALITYFRUIT Workshop  
PETNICA SCIENCE CENTER 17-20 JUNE, 2015

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**Publishers**

Serbian Plant Physiology Society  
Institute for Biological Research „Siniša Stanković“, University of Belgrade,  
Bulevar despota Stefana 142, 11060 Belgrade, Serbia

**Editor**

Branka Uzelac

**Technical editor**

Branislav Šiler

**Photograph in front page**

Danijela Mišić

**Graphic design & prepress**

Lidija Mačej

**Printed by**

Makarije, Belgrade

**Number of copies**

250

Belgrade, 2015

CIP - Каталогизacija у публикацији  
Народна библиотека Србије, Београд

581(048) I

INTERNATIONAL Conference on Plant Biology (2 ; 2015 ; Petnica)  
[Book of Abstracts] / 2nd International Conference on Plant Biology [and] 21th Symposium of the Serbian Plant Physiology Society [and] COST Action FA1106 QualityFruit Workshop, Petnica, June 17-20, 2015 ; [organized by] Serbian Plant Physiology Society [and] Institute for Biological Research "Siniša Stanković", University of Belgrade ; [editor Branka Uzelac]. - Belgrade : Serbian Plant Physiology Society : Institute for Biological Research "Siniša Stanković", 2015 (Belgrade : "Makarije"). - 203 str. : ilustr. ; 24 cm

Tiraž 250. - Registar.

ISBN 978-86-912591-3-6 (SPPS)

1. Društvo za fiziologiju biljaka Srbije. Simpozijum (21 ; 2015 ; Petnica)

2. COST Action FA1106 QualityFruit. Workshop (2015 ; Petnica)

a) Ботаника - Апстракт  
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*

PP4-7

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Plants contain high amounts of polyphenols, which are very potent natural antioxidants. *Cuscuta campestris* is a nonspecific parasitic plant of 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:H<sub>2</sub>O (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, Fe<sup>2+</sup>-chelating ability, Fe<sup>3+</sup>-reducing power and inhibition of lipid peroxidation. Maximum level of total phenol content (102 mg GAE g<sup>-1</sup>), the highest total antioxidant activity (26.59 µg AA g<sup>-1</sup>), DPPH (IC<sub>50</sub> = 889.36 µg mL<sup>-1</sup>) and ABTS (IC<sub>50</sub> = 185.65 µg mL<sup>-1</sup>) scavenging activities; reducing power (IC<sub>50</sub> = 0.615 µg mL<sup>-1</sup>), chelating activity (IC<sub>50</sub> = 9.48 µg mL<sup>-1</sup>) and inhibitory activity against lipid peroxidation (IC<sub>50</sub> = 71.56 µg mL<sup>-1</sup>) were found in methanol:H<sub>2</sub>O extract. Maximum levels of total flavonoid content (56.10 mg RUE g<sup>-1</sup>) and flavonols (6.51 mg QUE g<sup>-1</sup>) 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

PP4-8

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*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-

tract. 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<sup>-1</sup> 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<sup>-1</sup> and total flavonoids content was 40.99 mg REs g<sup>-1</sup>. The MIC values indicate that *D. lamarckii* exhibited good antibacterial properties against *Pseudomonas fluorescens* (MIC 1.25 mg mL<sup>-1</sup>), *Escherichia coli* and *Azobacter chroococum* (MIC 10 mg mL<sup>-1</sup>). The extract exerted excellent antifungal activity against *Phialophora fastigiata* (MIC 2.5 mg mL<sup>-1</sup>). 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

PP4-9

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*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<sup>-1</sup> 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 derivatives 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).