

Serbian Plant Physiology Society

Institute for Biological Research „Siniša Stanković”, University of Belgrade

1<sup>st</sup> International Conference  
on Plant Biology  
20<sup>th</sup> Symposium of the  
Serbian Plant Physiology Society

*Programme and Abstracts*



Hotel PATRIA, Subotica, June 4-7, 2013



# 1<sup>st</sup> International Conference on Plant Biology

## 20<sup>th</sup> Symposium of the Serbian Plant Physiology Society

### Subotica, June 4-7, 2013

#### Organization Committee

Ana Marjanović-Jeromela (president), Marina Putnik-Delić, Marija Perić, Jelena Savić, Gordana Danilović

#### Scientific Committee

Zsófia Bánfalvi (Gödöllő, Hungary)	Miroslav Nikolić (Belgrade, Serbia)
Michael Blanke (Bonn, Germany)	Slobodanka Pajević (Novi Sad, Serbia)
Borut Bohanec (Ljubljana, Slovenia)	Dejana Panković (Novi Sad, Serbia)
Milan Borišev (Novi Sad, Serbia)	Adisa Parić (Sarajevo, Bosnia & Hercegovina)
Kalina Danova (Sofia, Bulgaria)	Pavle Pavlović (Belgrade, Serbia)
Judith Dobránszki (Nyiregyháza, Hungary)	Đurđina Ružić (Čačak, Serbia)
Dejan Dodig (Belgrade, Serbia)	Jan Rybczyński (Warszaw, Poland)
Hrvoje Fulgosi (Zagreb, Croatia)	Aneta Sabovljević (Belgrade, Serbia)
Sonja Gadzovska-Simić (Skopje, Macedonia)	Ana Simonović (Belgrade, Serbia)
Alena Gajdošová (Nitra, Slovakia)	Radmila Stikić (Belgrade, Serbia)
Irina Holobiuc (Bucharest, Romania)	Angelina Subotić (Belgrade, Serbia)
Zorica Jovanović (Belgrade, Serbia)	Zlatko Šatović (Zagreb, Croatia)
Ana Marjanović-Jeromela (Novi Sad, Serbia)	Aleksej Tarasjev (Belgrade, Serbia)
Ivana Maksimović (Novi Sad, Serbia)	Eleni Tsantili (Athens, Greece)
Brigitte Mauch-Mani (Neuchâtel, Switzerland)	Dragan Vinterhalter (Belgrade, Serbia), president
Nevena Mitić (Belgrade, Serbia)	Dominik Vodnik (Ljubljana, Slovenia)
Václav Motyka (Prague, Czech Republic)	Branka Živanović (Belgrade, Serbia)
	Snežana Zdravković-Korać (Belgrade, Serbia)

#### Publishers

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

#### Editor

Dragan Vinterhalter

#### Technical editor

Slavica Klarić

#### Photograph in front page

Ljubinko Jovanović

#### Graphic design & tehcnical editing

Lidija Maćej

#### Printed by

Makarije, Belgrade

#### Number of copies

250  
Belgrade, 2013

CIP - Каталогизacija y publikaciji  
Народна библиотека Србије, Београд

581 (048)

INTERNATIONAL Conference on Plant Biology (1; 2013; Subotica)

[Programme and Abstracts] / 1st International Conference on Plant Biology [and] 20th Symposium of the Serbian Plant Physiology Society, Subotica, June 4-7, 2013; [organized by] Serbian Plant Physiology Society [and] Institute for Biological Research „Siniša Stanković“, University of Belgrade; [editor Dragan Vinterhalter]. - Beograd: Serbian Plant Physiology Society: Institute for Biological Research „Siniša Stanković“, 2013 (Beograd: Makarije). - 174 str. ; 24 cm

Tiraž 250. - Registar.

ISBN 978-86-912591-2-9 (SPPS)

1. Vinterhalter, Dragan [уредник] 2,  
Serbian Plant Physiology Society, Symposium (20; 2011; Subotica)

а) Ботаника - Апстрактни

COBISS.SR-ID 198527484



The leaves of *S. aegyptiaca* were collected from plants growing in the Botanical Garden „Jevremovac“, Faculty of Biology, University of Belgrade. The seeds were obtained from the Seed bank in Tripoli, which were collected on Western Mountain in Libya. Micromorphological and histochemical analyses of the trichomes of *S. aegyptiaca* were carried out using scanning electron microscopy and light microscopy.

The narrow linear-elliptical leaves bear numerous non-glandular unbranched trichomes and two types of glandular trichomes – peltate and capitate, on both leaf surfaces. The peltate trichomes are much more abundant on the abaxial leaf side, while the capitate trichomes are distributed on both leaf surfaces. The peltate trichomes consist of the basal epidermal cell, very short stalk cell with cutinized lateral walls and large round head of eight secretory cells arranged in a circle. Capitate trichomes can be divided into two types – short stalked and long stalked trichomes. The results of histochemical analysis showed that secreted compounds in the glandular trichomes of *S. aegyptiaca* are of heterogeneous composition, containing lipids and polysaccharides. Peltate and long stalked capitate trichomes store secretory products of lipophilic nature in their subcuticular space. Short stalked capitate trichomes accumulate the secretion products, mainly containing polysaccharides, within the glandular cell. The secretions of the glandular trichomes may be involved in the chemical defense of plants, or can be helpful in pollination process. Detailed studies of morphology, anatomy and ultrastructure could be useful in interpretation of their functions. Projects No. 173015 and 173029 supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia.

## Chemical composition, antioxidant and antigenotoxic activities of *Cotinus coggygia* stem extract

Sanja Matić<sup>1</sup>, Snežana Stanić<sup>1</sup>, Desanka Bogojević<sup>2</sup>, Slavica Solujić<sup>3</sup>, Milan Mladenović<sup>3</sup>, Nevena Stanković<sup>3</sup>, Vladimir Mihailović<sup>3</sup>, Jelena Katanić<sup>3</sup>, Mirjana Mihailović<sup>2</sup>  
(sanjamatic@kg.ac.rs)

<sup>1</sup> University of Kragujevac, Faculty of Science, Department of Biology and Ecology, Radoja Domanovića 12, 34000 Kragujevac, Serbia

<sup>2</sup> Department of Molecular Biology, Institute for Biological Research „Siniša Stanković“, University of Belgrade, Bulevar despota Stefana 142, 11060 Belgrade, Serbia

<sup>3</sup> University of Kragujevac, Faculty of Science, Department of Chemistry, Radoja Domanovića 12, 34000 Kragujevac, Serbia

The plant *Cotinus coggygia* Scop. (family Anacardiaceae) is commonly used in folk medicine for the treatment of various illnesses, such as diarrhea, paradontosis, gastric and duodenal ulcers. Different parts of this plant have been subjected to pharmacological evaluation for their potential antihemorrhagic, wound-healing, anti-inflammatory, and antimicrobial activity. The present study was undertaken to investigate the phenolic content according to the Folin-Ciocalteu procedure, while the spectrophotometric method with aluminium chloride was used for the determination of total flavonoids. The phenolic and flavonoid composition of extract were determined by the HPLC method. Antioxidant activity was quantitatively determined using a DPPH radical scavenging assay. To examine the antigenotoxic potential using the comet assay, Wistar rats were treated with 100 mg/kg body weight of pyrogallol, which possesses a potent ability to generate free radicals and induce oxidative stress. The content of total phenols and flavonoids was 3.78 mg of gallic acid/g of dry plant material and 8.29 mg of rutin/g of dry plant material, respectively. HPLC analysis showed that myricetin was the dominant compound (511.5 µg/g), while hydroxyl derivatives of cinnamic acids (chlorogenic, caffeic, coumaric, ferulic and rosmarinic acid) were identified in the extract in varying amount. The neutralisation of DPPH radicals was up to 95%, while the maximum inhibition concentration is approximately 125 µg/ml. The dose of 500 mg/kg body weight of the extract, that display no genotoxic activity, and its main flavonoid compound myricetin, in equivalent amount as present in the extract, were applied intraperitoneally either 2 or 12 h prior to pyrogallol. As measured by the decrease in total score and tail moment, the DNA damage in liver was reduced by the extract and myricetin.



This work was financially supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia, grants No. III43004, 173020, and III41010.

## Superoxide anion radical scavenging capacity of the diterpene alcohol phytol

Boris Pejin<sup>1</sup>, Aleksandar Savić<sup>1</sup>, Željko Vučinić<sup>1</sup>, Ksenija Radotić<sup>1</sup>, Milena Dimitrijević<sup>2</sup>, Miloš Mojović<sup>2</sup>

(borispejin@imsi.rs, asavic@imsi.rs, milos@ffh.bg.ac.rs)

<sup>1</sup> Department of Life Sciences, Institute for Multidisciplinary Research, University of Belgrade, Kneza Višeslava 1a, 11030 Belgrade, Serbia

<sup>2</sup> University of Belgrade, Faculty of Physical Chemistry, Department of Radiochemistry and Nuclear Chemistry, Studentski trg 12-16, 11158 Belgrade, Serbia

Cardiovascular diseases are the leading cause of death in adults worldwide. Since reactive oxygen species (ROS) are directly linked to cardiovascular diseases antioxidant agents can treat the relevant oxidative pathologies by neutralising ROS, chelating catalytic metals and acting as oxygen scavengers. Preliminary analysis of the moss *Rhodobryum ontariense* volatiles has indicated diterpene alcohol phytol (3,7,11,15-tetramethyl-2-hexadecen-1-ol) as its main chemical constituent (31.95%). Such abundance has not previously been reported in other mosses. Bearing in mind the claims of traditional Chinese medicine that mosses of *Rhodobryum* species (Bryaceae) can cure cardiovascular diseases as crude drugs, the aim of this study was to estimate the anti-superoxide anion radical activity of phytol in *in vitro* conditions, by electron paramagnetic resonance (EPR) and fluorescent spectroscopy (FS), for the aforementioned medicinal reasons. The results have shown a moderate potential of phytol (23% by EPR & 15% by FS) to eliminate superoxide anion radical, although the tested concentration has been 0.1 mM. It can be concluded that further investigations related to this compound could be beneficial for the treatment of cardiovascular diseases, especially since this compound can be freely found in numerous food products. Finally, phytol and/or its derivatives may inspire new therapies in heart medicine that indicating volatiles could be used as bioactive natural products offering additional solutions in this field. This work was supported by the Ministry of Education, Science and Technological Development of the Republic of Serbia (grants No. 173040, III 41005 and III 45012).

## Secoiridoid content and hepatoprotective activity of *Gentiana cruciata* L. root extract

Vladimir Mihailović<sup>1</sup>, Jelena Katanić<sup>1</sup>, Mirjana Mihailović<sup>2</sup>, Danijela Mišić<sup>2</sup>, Slavica Solujić<sup>1</sup>, Katarina Šipovac<sup>1</sup>, Vesna Stanković<sup>3</sup>, Milan Mladenović<sup>1</sup>, Nevena Stanković<sup>1</sup>

(vladam@kg.ac.rs)

<sup>1</sup> University of Kragujevac, Faculty of Science, Department of Chemistry, Radoja Domanovića 12, 34000 Kragujevac, Serbia

<sup>2</sup> Institute for Biological Research „Siniša Stanković“, University of Belgrade, Bulevar despota Stefana 142, 11060 Belgrade, Serbia

<sup>3</sup> University of Kragujevac, Faculty of Medicine, Institute of Pathology, Svetozara Markovića 69, 34000 Kragujevac, Serbia

*Gentiana* plants are best known for their bitter taste that is due to the secoiridoids (e.g. swertiamarin, gentiopicrin, sweroside and amarogentin). Secoiridoid glucosides, gentiopicrin, swertiamarin and sweroside, are present in various traditional medicine preparations and are reported to have hepatoprotective activity. Many