

# **THIRD INTERNATIONAL SYMPOSIUM ON GREEN CHEMISTRY FOR ENVIRONMENT, HEALTH AND DEVELOPMENT**

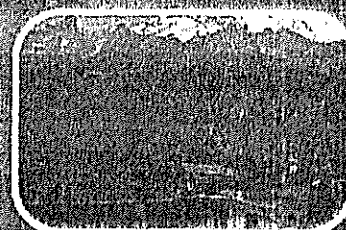
**Organized by:**



**Society of Ecotoxicology and Environmental  
Safety (SECOTOX)**



**Department of Planning and Regional Development  
University of Thessaly, Greece**



**In Collaboration with:**

**Dept. of Chemistry, Aristotle University of Thessaloniki  
Dept. of Food Technology, TEI of Thessaloniki  
Hellenic Green Chemistry Network**

**Under the aegis of:**

**Municipality of Skiathos**

**Skiathos, October 3-5, 2012**

# **Book of Abstracts and Symposium Programme**

## **THIRD INTERNATIONAL SYMPOSIUM ON GREEN CHEMISTRY FOR ENVIRONMENT, HEALTH AND DEVELOPMENT**

### **Organized by:**

Society of Ecotoxicology & Environmental Safety (SECOTOX)

&

Department of Planning and Regional Development,

University of Thessaly, Greece

### **In Collaboration with:**

Dept. of Chemistry, Aristotle University of Thessaloniki,

Dept. of Food Technology, TEI of Thessaloniki,

Hellenic Green Chemistry Network

### **Under the aegis of:**

Municipality of Skiathos

**Skiathos, October 3-5, 2012**

**Book of Abstracts and Symposium Programme**

**«Third International Symposium on Green Chemistry for  
Environment, Health and Development»**

**Skiathos, October, 3-5, 2012**

**ISBN 978-960-6865-53-4**

**Grafima Publ.**

62-68, D. Gounari str.

TK 54635, Thessaloniki

Tel. : 2310-248272

email: [grafima@grafima.com.gr](mailto:grafima@grafima.com.gr), [grafima@gmail.com](mailto:grafima@gmail.com)

[www.grafima.com.gr](http://www.grafima.com.gr)

**Organizing committee**

Kungolos A., UTH (Greece)  
Poulos C., Univ. of Patras (Greece)  
Samaras P., TEI of Thessaloniki (Greece)  
Schramm K.-W., Helmholtz Centre Munich (Germany)  
Sikalidis C., AUTH (Greece)  
Zouboulis A., AUTH (Greece)  
Emmanouil C., BPI (Greece)  
Kipouros S., UTH (Greece)  
Manakou V., UTH (Greece)  
Papaoikonomou A., UTH (Greece)  
Sakellariou S., UTH (Greece)  
Trifona Panagopoulou V., UTH (Greece)  
Tsiridis V., UTH (Greece)

**International scientific committee**

Abeliotis K., Harokopio University (Greece)  
Achilias D., AUTH (Greece)  
Albanis T., Univ. of Ioannina (Greece)  
Anastas P. T., Yale University (USA)  
Blaise C., Environment Canada (Canada)  
Collins T., Inst. of Green Chemistry (USA)  
Clark J., University of York (UK)  
Dogan- Saglamtimur N., Nigde University (Turkey)  
Fiedler H., UNEP Chemicals Branch DTIE (Switzerland)  
Fochtman P., Institute of Organic Industry (Poland)  
Gaidatzis G., DUTH (Greece)  
Gidakos E., TUC (Greece)  
Giesy J., Univ. of Saskatchewan (Canada)  
Hansen P.-D., Tech. Univ. of Berlin (Germany)  
Holoubek I., Masaryk Univ. (Czech Republic)  
Hungerbühler K., ETH (Switzerland)  
Jastorff B., Univ. of Bremen (Germany)  
Jiang G., Chinese Academy of Sciences (China)  
Ivask A., NICPB (Estonia)  
Karagiannis V., TEI of West Macedonia (Greece)  
Koch W., GDCh, (Germany)  
Kontaridis D., University of Patras (Greece)  
Komnitsas K., TUC (Greece)  
Kusui T., Toyama Univ. (Japan)  
Lappas A., CERTH (Greece)  
Lenoir D., Gesellschaft Deutscher Chemiker (Germany)  
Lerf A. W., Meithner Institute (Germany)  
Mantzavinos D., TUC (Greece)  
Manusadzianas L., Institute of Botany (Lithuania)  
Maraboutis P., Eco-Efficiency Ltd. (Greece)

Mitrakas M., AUTH (Greece)  
Nugegoda D., RMIT (Australia)  
Okamura H., Kobe Univ. (Japan)  
Okay O., Istanbul Tech. Univ. (Turkey)  
Parlar H., Tech.Univ. Munich (Germany)  
Persoone G., Gent Univ. (Belgium)  
Romanowska-Duda Z., (Poland)  
Sheldon R., Delft University of Technology (Netherlands)  
Sutthivaiyakit P., Kasetsart Univ. (Thailand)  
Torres J.P., Univ. of Rio de Janeiro (Brazil)  
Triantafyllidis K., AUTH (Greece)  
Tsakalof A., UTH (Greece)  
Tsiropoulos N., UTH (Greece)  
Tundo P., Ca' Foscari University (Italy)  
Twardoska I., Polish Academy of Sciences (Poland)  
Vasseur P., Univ. de Metz (France)  
Wadhia K., Alcontrol Laboratories (UK)  
Xenidis A., NTUA (Greece)

# Antimicrobial properties, antioxidant activity, genotoxic examination, cytotoxicity and phytochemical screening of species *Onosma aucherianum*

**P.Z. Mašković<sup>1\*</sup>**, S. Solujić<sup>2</sup>, M. Radojković<sup>3</sup>, M. Cvijović<sup>1</sup>, J. Mladenović<sup>1</sup>, G.A. Đoković<sup>1</sup> and V. Kurćubić<sup>1</sup>

<sup>1</sup>Department of Chemistry and Chemical Engineering, Faculty of Agronomy, University of Kragujevac, Cara Dušana 34, 32 000 Čačak, Serbia

<sup>2</sup>Faculty of Science, University of Kragujevac, Radoja Domanovića 12, 34 000 Kragujevac, Serbia

<sup>3</sup>Department of Biotechnology and Pharmaceutical Engineering, Faculty of Technology, University of Novi Sad, 21 000 Novi Sad, Serbia

Address correspondence to: **Pavle Mašković**, Faculty of Agronomy, University of Kragujevac, Cara Dušana 34, 32 000 Čačak, Serbia, E-mail: pavlem@tfc.kg.ac.rs

## Abstract

This study was aimed at evaluating the antioxidant activity and efficacy of the ethanolic extract of the plant species *Onosma aucherianum* DC in inhibiting the development of selected fungi and bacteria. The highest susceptibility to the ethanolic extract of *O. aucherianum* among the bacteria was exhibited by *B. subtilis* and *S. aureus* (MIC = 15.62 µg/ml). Among the fungi, *A. niger* (MIC = 15.62 µg/ml) showed the highest susceptibility. Total phenolic, flavonoid, condensed tannin and gallotannin contents were 90.26 mg GA/g, 35.24 mg RU/g, 74.65 mg GA/g and 31.74 mg GA/g, respectively. Total antioxidant capacity was 78.45 µg AA/g. IC<sub>50</sub> values were determined for each measurement: 21.45 µg/ml for DPPH free radical scavenging activity, 36.46 µg/ml for inhibitory activity against lipid peroxidation, 99,11 µg/ml for hydroxyl radical scavenging activity and 45.91 µg/ml for chelating ability. Results of Allium anaphase-telophase genotoxicity assay revealed that the ethanolic extract of *Onosma aucherianum* at concentrations of 31.5 mg/l and below does not produce toxic or genotoxic effects. Ethanol extract of plant species *Onosma aucherianum* to all three cell lines proved to be a potent inhibitor of cell growth (*Hep2c*, *RD*, *L2OB*). Rosmarinic acid was found to be the dominant phenolic compound of the extract. This is the first report of chemical constituents, genotoxic, cytotoxic, antioxidant and antimicrobial activities of this species.

**Keywords:** antimicrobial activity, antioxidant activity, genotoxic examination, cytotoxic activity, *Onosma aucherianum* DC, HPLC analysis, phenolic compounds