



MEDITERRANEAN GROUP OF PESTICIDE RESEARCH



PLANT PROTECTION SOCIETY OF SERBIA

Supported by the Ministry of Education, Science, and Technological  
Development of Serbia

Organize

**Annual MGPR Meeting 2012**

**and**

**International Conference on Food and Health Safety:  
Moving Towards a Sustainable Agriculture**

**BOOK OF ABSTRACTS**

**Belgrade (Serbia)**

**11 - 12 October 2012**

Zbornik rezimea radova sa Annual MGPR Meeting 2012 and  
International Conference on Food and Health Safety:  
Moving Towards a Sustainable Agriculture  
Beograd, 11 - 12 October 2012

Izdavač:  
Društvo za zaštitu bilja Srbije  
11080 Beograd 80, Nemanjina 6; p.fah 123  
E-mail: [plantprs@eunet.rs](mailto:plantprs@eunet.rs)  
Internet: [www.plantprs.org.rs](http://www.plantprs.org.rs)

Za Izdavača:  
Prof.dr Goran Delibašić, predsednik Društva

Međunarodni standardni broj knjige /  
International Standard Book Number

ISBN 978-86-83017-22-5

Tiraž:  
100 primeraka

Realizacija: LEX Print, Beograd

**Place:** The Annual MGPR Meeting 2012 and International Conference on Food and Health Safety: Moving Towards a Sustainable Agriculture, Belgrade, Hotel MOSKVA - Hall BALKANSKA.

**Official language:** English

**Organizing Committee**

**Chairperson:** LAZIĆ Sanja, University of Novi Sad, Faculty of Agriculture, Serbia

**Members:**

- ANGIONI Alberto, Mediterranean Group for Pesticide Research, Italy
- BURSIĆ Vojislava, University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia
- DELIBAŠIĆ Goran, Plant Protection Society of Serbia, Belgrade, Serbia
- IGNJATOVIĆ ĆUPINA Aleksandra, University of Novi Sad, Faculty of Agriculture, Serbia
- SAVČIĆ PETRIĆ Snežana, Plant Protection Directorate of Republic of Serbia, Belgrade, Serbia
- ŠPIROVIĆ Bojana, University of Belgrade, Faculty of Agriculture, Belgrade, Serbia
- VUKOVIĆ Gorica, Institute of Public Health of Belgrade, Serbia

**Scientific Committee**

**Chairperson:** MOJAŠEVIĆ Milica, University of Belgrade, Faculty of Agriculture, Belgrade, Serbia

**Members:**

- AIT OUBAHOU Ahmed, Complexe Horticole d'Agadir, Institut Agronomique et Vétérinaire Hassan II, Dept. Horticulture, Enseignement/Recherche, Morocco
- ANASTASSIADES Michelangelo, CVUA, Stuttgart, Germany
- ANGIONI Alberto, University of Cagliari, Department of Toxicology, Food and Environmental Unit, Italy
- GEBARA, Amir, Instituto Biologico, São Paulo, Brazil
- GAŠIĆ Slavica, Institute of Pesticides and Environmental Protection, Belgrade, Serbia
- IVANOVIĆ Miroslav, Syngenta, Serbia
- JOVAŠEVIĆ-STOJANOVIĆ Milena, Vinča Institute of Nuclear Sciences, Belgrade, Serbia
- KAYA Ummuhan, AIR Alasehir Analytic Private Food Control Laboratory, Turkey
- LENTZA-RIZOS Chaido, Ex National Agricultural research Foundation, Greece
- LAZIĆ Sanja, University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia
- MATOVIĆ Vesna, University of Belgrade, Faculty of Pharmacy, Belgrade, Serbia
- MARČIĆ Dejan, Institute of Pesticides and Environmental Protection, Belgrade, Serbia
- MENKISSOGLU-SPIROUDI Urania, Aristotle University of Thessaloniki, Faculty of Agriculture, Pesticide Science Laboratory, Greece
- MONTOYA Angel, Inter-University Research Institute for Bioengineering and Human Centered Technology, Universitat Politècnica de València, Spain
- OBRADOVIĆ Aleksa, University of Belgrade, Faculty of Agriculture, Serbia
- TANOVIĆ Brankica, Institute for Pesticides and Environmental Protection, Belgrade, Serbia
- VALVERDE Antonio, University of Almeria, Pesticide Residue Research Group, Spain

**General Secretary**

Ivanka Kraus, Plant Protection Society of Serbia, Belgrade, Serbia



## V.15. MICROWAVE-ASSISTED SOLVENT EXTRACTION AND REVERSED-PHASE LIQUID CHROMATOGRAPHY WITH DIODE ARRAY DETECTION FOR SCREENING SULFONYLUREA HERBICIDES IN SOIL SAMPLES

Grahovac Nada<sup>1</sup>, Suturović Z.<sup>2</sup>, Sekulić P.<sup>1</sup>, Šunjka Dragana<sup>3</sup>, Jakšić S.<sup>1</sup>

<sup>1</sup>Institute of Field and Vegetables Crops, Novi Sad, Serbia

<sup>2</sup>University of Novi Sad, Faculty of Technology, Novi Sad, Serbia

<sup>3</sup>University of Novi Sad, Faculty of Agriculture, Novi Sad, Serbia

nada.grahovac@nsseme.com

Sulfonylurea compounds are characterized by high herbicidal activity allowing low-dose rates for the control of many grasses and broadleaf weeds in the agriculture of crops. This feature means, however, that under persistent conditions (e.g. high pH of soil, little rainfall and poor microbial activity) remaining low concentrations of these analytes can still affect the growth of susceptible plants. Hence, in order to control carry-over from one growing season to the next, productive sensitive and selective methods are required for the determination of residues of sulfonylurea herbicides in soil.

A screening method has been developed for the determination of sulfonylurea in various types of soils. Methodology is based on the use of microwave assisted solvent extraction (MASE) for fast and efficient extraction of the analytes from the soils and reversed-phase liquid chromatography (LC) with UV detection at 230 nm for the instrumental analysis of uncleaned extracts. Four types of soils, including sand and clay with a range in organic matter content of 1.45-4.39% and seven sulfonylurea herbicides (nicosulfuron, tritosulfuron, tribenuron-methyl, prosulfuron, rimsulfuron, oxasulfuron, triasulfuron) were selected as matrices and analytes, respectively. The method developed included the selection of suitable MASE and LC-UV conditions. MASE conditions were established providing efficient extraction without degradation of the analytes, furthermore selectivity can be enhanced by limiting the coextraction of interferences. Selected MASE conditions, including mixture dichloromethane-acetonitrile as the extraction solvent, provided a complete extraction of the analytes from soil samples. Method validation was performed by analysing freshly spiked soil samples with sulfonylurea and samples with aged residues at levels between 20 and 50 mg/kg. Depending on the spiked level and the type of spiked sample recoveries were obtained between 70-100% with relative standard deviations between 5 and 10%.

Evaluation of the data set with principal component analysis revealed that the parameters increase of organic matter content of the soil samples and aged residues negatively effect the recovery of the analytes. The benefits of MASE, shorter extraction times, reduction of solvent consumption, improved selectivity and the possibility of processing 24 samples simultaneously, make this technique a good alternative to conventional extraction procedures.

Acknowledgments: