International Conference Proceedings

LHSSM-22, EABNS-22, DFSET-22, CBENR-22, DLHES-22 & LEMM-22

Nov. 21-23, 2022 Dubai (UAE)

Editors:
Adj. Prof. Dr. L. M. Cardoso
Prof. Dr. Haiu Aurelia
Dr. Y. Thaweesak

International Conference Proceedings

LHSSM-22, EABNS-22, DFSET-22, CBENR-22, DLHES-22 & LEMM-22

Nov. 21-23, 2022 Dubai (UAE)

Agricultural Soil Pollution with Pesticides

Milana Zaric[1,2,3], Florin Crista[4], Ionela Hotea[4], Adina Berbecea[4], Ilinca Imbrea[4] and Isidora Radulov[4]

[1]Institute of Chemistry, Technology and Metallurgy, University of Belgrade, Belgrade, Serbia
[2]Centre of Excellence in Environmental Chemistry and Engineering – ICTM, University of Belgrade, Belgrade, Serbia
[3]Regional Development Agency "Juzni Banat", Pancevo, Serbia
[4]University of Life Sciences "King Michael I" from Timişoara, Timişoara, Romania

Abstract: *Agricultural soil represents one of the most important natural resources for humans. It is used to provide food for the growing population. To protect crops grown on agricultural soil farmers use pesticides. These compounds protect crops from pests. However, pesticides can remain in the environment and therefor soil used for agriculture. Some of the pesticides in use can be toxic to humans. This is why it is important to monitor their presence. The aim of this study is to monitor the presence of more than 250 pesticides in soil samples from Serbia and Romania. The samples were collected at three depths, topsoil level, 20-30 cm and 50-60 cm. Soil samples were homogenized in an ultra-centrifugal mill with a final fineness size of < 1 mm. Pesticides were extracted using QuEChERS. To 5 g of soil 10 mL of water was added to increase the sample moisture. Afterword 10 mL of acetonitrile was added as an extraction solvent and the sample was shaken for 1 minute. Following this, 4 g Anhydrous $MgSO_4$, 1 g Trisodium Citrate, 0,5 g Disodium Citrate and 1 g NaCl were added to the tube and it was shaken as quick as possible. The samples were centrifuged for 5 minutes at 4000 rpm. Then, a clean-up dispersive solid phase extraction step was carried out by adding 10 mL of the supernatant to a 15-mL centrifuge tube that contained 150 mg PSA + 150 mg C18 + 900 mg MgSO4. The samples were again shaken and centrifuged for 5 minutes at 4000 rpm. Then the samples were filtered through a 0.22μm syringe filter into HPLC vials and acidified with formic acid. Analysis was performed on a TSQ Quantis™ Triple Quadrupole Mass Spectrometer. Most of the analyzed pesticides were not detected. This is mainly because most of them are not regularly used by farmers in the sampling areas. Detected pesticides were dependent on the location where the samples were taken. In addition, the depth of the samples also had an influence on the detected pesticides and their concentrations.*

Keywords: *pesticides, soil, LC-MS/MS, pollution, agriculture*