Ss. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF VETERINARY MEDICINE - SKOPJE

BOOK OF ABSTRACTS

9th International Scientific Meeting Days of Veterinary Medicine 2022

22 - 25 September 2022
R. of North Macedonia

Ss. CYRIL AND METHODIUS UNIVERSITY IN SKOPJE
FACULTY OF VETERINARY MEDICINE - SKOPJE

BOOK OF ABSTRACTS

9th International Scientific Meeting Days of Veterinary Medicine 2022

Skopje, 2022
R. N. Macedonia

ORGANIZATION COMMITTEES OF 9th INTERNATIONAL SCIENTIFIC MEETING DAYS OF VETERINARY MEDICINE 2022

International Scientific Committee

President

Prof. Dr. Lazo Pendovski, Ss. Cyril and Methodius University in Skopje, R. N. Macedonia

Members

Prof. Alen Slavica,
University of Zagreb, Croatia
Prof. Andrej Kirbis,
University of Ljubljana, Slovenia
Prof. Artur Niedzwiedz, University of Wroclaw, Poland
Prof. Bogdan Aminkov,
University of Forestry Sofia, Bulgaria
Prof. Breda Jakovac Strajn
University of Ljubljana, Slovenia
Prof. Danijela Horvatek Tomić,
University of Zagreb, Croatia
Prof. Danijela Kirovski,
University of Belgrade, Serbia
Prof. Dean Jankulovski,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Dine Mitrov,
Ss. Cyril and Methodius
University in Skopje, R. N. Macedonia
Dr. Dobrila Jakić-Dimić,
Scientific Veterinary Institute of Serbia, Serbia
Prof. Drago N. Nedić,
Veterinary Institute of the Republic of Serbia, Serbia
Dr. Elizabeta Dimitrieska-Stojkovikj, PhD,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Assoc. Prof. Florina Popovska-Percinikj,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Güven Kaşikçi,
Istanbul University, Turkey
Prof. Halil Selçuk Biricik,
University of Afyon, Turkey
Prof. Jože Starič,
University of Ljubljana, Slovenia
Prof. Jozef Laurincik, DrSc, Prof.H.C.,
Constantine the Philosopher University in Nitra, Slovakia
Prof. Kaspars Kovalenko,
Latvian University of Life Sciences and Technologies, Latvia
Prof. Marko Samardžija,
University of Zagreb, Croatia
Prof. dr. Aleksnadar Dodovski,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Milorad Mirilović,
University of Belgrade, Serbia
Prof. Muhamed Smajlović,
University of Sarajevo,
Bosnia and Herzegovina
Prof. Nenad Turk,
University of Zagreb, Croatia
Prof. Plamen Trojachanec,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Rizah Avdić,
University of Sarajevo,
Bosnia and Herzegovina
Prof. Serhat Alkan,
Istanbul University, Turkey
Prof. Tolga Kahraman,
Istanbul University, Turkey
Prof. Radmila Markovikj,
University of Belgrade, Serbia
Prof. Dragan Shefer, University of Belgrade, Serbia
Prof. Toni Dovenski,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Velimir Stojkovski,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Dr. Verica Milosevic, PhD,
University of Belgrade, Serbia
Dr. Vesna Z Djordjevic, PhD,
Institute of Meat Hygiene and Technology, Serbia
Prof. Vladimir Petkov,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Vlatko Ilieski, Ss. Cyril and Methodius
University in Skopje, R. N. Macedonia
Prof. Misho Hristovski,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia
Prof. Zehra Hajrulai-Musliu,
Ss. Cyril and Methodius University in Skopje, R.N.Macedonia

Local Organizing Committee

President

Asst. Prof. Dr. Miroslav Kjosevski, Ss. Cyril and Methodius University in Skopje, R. N. Macedonia

Members

Prof. Igor Ulchar
Assoc. Prof. Igor Djadjovski
Assoc. Prof. Irena Celeska
Assoc. Prof. Iskra Cvetkovikj
Assoc. Prof. Kiril Krstevski
Assoc. Prof. Ksenija Ilievska
Assoc. Prof. Nikola Adamov
Assoc. Prof. Radmila Chercheva Nikolovska
Prof. Romel Velev
Assoc. Prof. Sandra Mojsova
Prof. Slavcho Mrenoshki
Asst. Prof. Elena Atanaskova Petrov
Asst. Prof. Martin Nikolovski
Asst. Prof. Mirko Prodanov
Asst. Prof. Risto Uzunov
Dr. Aleksandra Angeleska, PhD
Dr. Aleksandar Cvetkovikj, PhD
Dr. Biljana Stojanovska Dimzoska, PhD
Dr. Branko Angjelovski, PhD
Dr. Igor Esmerov, PhD
Dr. Katerina Blagoevska, PhD
Dr. Ljupcho Mickov, PhD
MSc, Viktor Denkovski

all from the Faculty of Veterinary Medicine -Skopje (Ss.Cyril and Methodius University in Skopje, R. N. Macedonia)

Clinical Workshops - Chairs

Prof. Dr. Ksenija Ilievska, Ss. Cyril and Methodius University in Skopje, R. Macedonia

Dr. Tomislav Nikolovski, DVM - Executive Director of the Veterinary Chamber of the R.N. Macedonia

Secretariat of the Meeting

Dr. Ana Angelovski, PhD; Dr. Aleksandar Janevski, PhD, DVM; Dr. Marija Ratkova, PhD, DVM; Dr. Ljupcho Angelovski, PhD, DVM; Monika Dovenska, DVM; Todor Novakov, DVM; Zagorka Popova; Ljubica Rashic, DVM; Aleksandar Trajchovski, DVM; Dimitar Bozinovski, DVM; Filip Trojachanec, DVM; Miroslav Jovanovski, DVM; Jane Vlahov, DVM; Sara Georgievska, DVM; Larisa Shakjiri, DVM; Ivan Matevski, DVM; Boris Dimitrievski, DVM; Ana Galevska, DVM; Ena Dobrikj, DVM; Gordana Arsova, DVM; Dushica Trajkovska, DVM; m-r Stefan Jovanov; Tome Nestorovski
all from the Faculty of Veterinary Medicine -Skopje (Ss.Cyril and Methodius University in Skopje, R. N. Macedonia)

Financial Secretariat

m-r Ana A. Ordanovska, MSc
m-r Milica Tosevska Apostolova, MSc
m-r Maja Menkova, MSc

IT, DTP and Web Support

m-r Viktor Denkovski, MSc

Editors

Asst. Prof. Dr. Miroslav Kjosevski
Prof. Dr. Lazo Pendovski
Prof. Dr. Florina P. Percinic
Asst. Prof. Dr. Martin Nikolovski
Monika Dovenska, DVM

Published by:

Faculty of Veterinary Medicine – Skopje,
Lazar Pop Trajkov 5/7, 1000 Skopje
Tel: ++389 2 3240 700 Fax: ++ 389 2 3114 619
www. fvm.ukim.edu.mk

CIP - Каталогизација во публикација
Национална и универзитетска библиотека "Св. Климент Охридски", Скопје

636.09(062)(048.3)

INTERNATIONAL scientific meeting (9 ; 2022 ; Skopje)
Book of abstracts : 9th International scientific meeting days of veterinary medicine 2022, Skopje, 2022 R. N. Macedonia / [editors Miroslav Kjosevski ... и др.]. - Skopje : Faculty of veterinary medicine, 2022. - 177 стр. ; 25 см

Други уредници: Lazo Pendovski, Florina P. Percinic, Martin Nikolovski, Monika Dovenska. - Регистар

ISBN 978-9989-774-38-6

а) Ветеринарна медицина -- Зборници -- Апстракти

COBISS.MK-ID 58134021

P30

VALIDATION OF UHPLC-MS/MS METHOD AFTER MODIFIED QUECHERS SAMPLE PREPARATION FOR MONITORING OF PESTICIDE RESIDUES IN BOVINE MILK ACCORDING TO EC/2018/555

Elizabeta Dimitrieska-Stojkovikj*[1], Aleksandra Angeleska[1], Dushica Koceva[1], Biljana Stojanovska-Dimzoska[1], Goran Stojković[2], Gordana Ilievska[1], Risto Uzunov[1], Zehra Hajrulai-Musliu[1]

[1]Ss Cyril and Methodius University from Skopje, Faculty of veterinary medicine-Skopje, Institute for food, Lazar Pop-Trajkov 5-7, 1000 Skopje, North Macedonia
[2]Ss Cyril and Methodius University from Skopje, Faculty of natural sciences and mathematics, Institute for chemistry, Arhimedova br. 5, 1000 Skopje, North Macedonia

The EU Regulation EC/555/2018 has foreseen implementation of monitoring program for selected pesticide residues in bovine milk, aimed for further dietary exposure assessment. Therefore, since 2019 the required pesticide substances were introduced into the National Residue Control Program for animal origin food in North Macedonia. For this purpose, UHPLC-MS/MS method was optimized and validated after modified QuEChERS (quick, easy, cheap, effective, rugged, and safe) sample preparation. The MS/MS method was optimized for 19 pesticide substances and metabolites: carbaryl, carbofuran, fenvalerate, indoxacarb (carbamate pesticides), cypermethrin, deltamethrin, bifenthrin permethrin (pyrethroids), malathion, parathion, diazinone, dichlorvos, chlorpyriphos, chlorpyriphos-methyl, pyrimiphos-methyl (organophosphates), famoxadone, fipronil, including metabolites fipronil sulfone, fipronil sulfide. For each compound the two most sensitive MRM transitions were selected for further determination. Analysis was performed on Waters UHPLC-MS/MS system consisted of H-class UHPLC and Xevo TQ-S micro triple quadrupole detector, in ESI+ and ESI- mode. Chromatographic separation was performed on C18 column with 100 mm length and 1.7 µm particle diameter, using gradient elution with water and methanol, both modified with formic acid and ammonium formate (0.1 % v/v and 5 mmol/L, respectively), at flow rate of 0.45 mL/min. The optimized method was validated according to DG SANTE Document 2017/11813. Validation parameters were linearity, limit of quantification (LOQ), precision, accuracy, and matrix effect. The determined LOQs from the concentration level at which S/N ratio was higher than 1:10, were in the range 1.0 – 8.3 µg/L, and were equal or below the MRL values for the pesticides of interest. Linearity was determined in the range 1-100 µg/L, obtaining five-level calibration curves with correlation coefficients ≥0.99 for all tested analytes. Method precision was tested at two concentration levels - 10 and 50 µg/kg), except for carbofuran, for which the target levels were 1 and 10 µg/kg. The calculated relative standard deviation (RSD) ranged from 6.3 to 15.5 %. The method accuracy, estimated from the recovery at two concentration levels, was in the range 73.8 – 107.3 %. Matrix effect did not have significant influence on the analyte signal suppression or enhancement, thus solvent

standards could be used for calibration. The method performance characteristics were satisfactory according to the SANTE document requirements (LOQ ≤ MRL, precision ≤20 %, and recovery 70-120 %). With this, it was proven that the proposed method was suitable for analysis of the defined scope of substances, even for pyrethroids, for which gas chromatography was considered to be a more appropriate analysis technique.

Key words: pesticide residues, monitoring, bovine milk, UHPLC-MS/MS, validation