



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

BOOK OF ABSTRACTS

**“Days Of Veterinary Medicine”
10th International Scientific Meeting
and
2nd European Conference on
Veterinary and Medical Education 2024**

22-25 September 2024,
Republic of North Macedonia

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O14**THE ROLE OF SHELTER DOGS IN THE ECOLOGY OF ANTIMICROBIAL RESISTANCE: ESBL AND AMPC-PRODUCING *ESCHERICHIA COLI* IN NORTH MACEDONIA**

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The occurrence of extended-spectrum beta-lactamase (ESBL) and AmpC-producing *Escherichia coli* (*E. coli*) in animals is a public health concern due to the potential transmission to humans. This study investigates the role of dogs from three animal shelters in North Macedonia as potential reservoirs of antimicrobial resistance (AMR) in *E. coli* by assessing the prevalence of ESBL- and AmpC-producing isolates. Fecal samples were collected from 77 dogs and *E. coli* was successfully isolated from 73 (94.8%). Additionally, a questionnaire was conducted to collect information about the antimicrobial use policies in the shelters. The fecal samples were cultured on blood agar and coliform agar for 24 hours and incubated aerobically at 37°C. Identification of suspect colonies was done by MALDI-TOF MS. Antimicrobial susceptibility testing of the *E. coli* isolates was performed using the broth microdilution method with Sensititre™ plates (Thermo Scientific, USA). The results were interpreted according to EUCAST guidelines using epidemiological cutoff values (ECOFF) as described in the Commission Implementing Decision 2020/1729. The EUVSEC3 Sensititre™ plate was used for initial broad-spectrum susceptibility testing. Isolates showing resistance to cefotaxime and ceftazidime on the EUVSEC3 panel (28.8%, 21/73) were further tested with the EUVSEC2 Sensititre™ plate for ESBL/AmpC confirmation. Nineteen out of the 21 isolates tested (90.5%) were confirmed as ESBL producers, with one of the isolates also demonstrating AmpC production. A high level of resistance was observed among the isolates, with sulfamethoxazole exhibiting resistance in 72.6% (53/73) of isolates, tetracycline in 53.4% (39/73), trimethoprim in 53.4% (39/73), and ampicillin in 56.2% (41/73). Colistin resistance was detected in 6.8% (5/73) of isolates. One shelter reported a particularly concerning practice of simultaneous administration of amoxicillin, ceftriaxone, trimethoprim-sulfamethoxazole and enrofloxacin concurrently for three days. These findings reveal concerning antimicrobial practices in shelters, which pose significant risks for the emergence and spread of multidrug-resistant pathogens. The detection of colistin resistance among these isolates is particularly alarming, as colistin represents a last-resort antibiotic for treating severe infections caused by multidrug-resistant Gram-negative bacteria. In conclusion, this study underscores the critical role of shelter dogs in North Macedonia as reservoirs of antimicrobial resistance in *E. coli*, particularly highlighting the high prevalence of ESBL and AmpC-producing isolates.

Keywords: colistin, multidrug-resistant bacteria, EUVSEC3, antimicrobial practices