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Presence of certain extended-spectrum beta-lactamase (ESBL) genes in fecal strains of *Escherichia coli* from dogs and the antibiotic sensitivity of the isolates

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Abstract

Escherichia coli (*E. coli*) is a member of the *Enterobacteriaceae* and part of the normal flora in the intestines of both humans and warm-blooded animals. It causes a wide range of infections, both gastrointestinal and extra-intestinal, in humans and animals, including dogs and cats. Dogs and cats are often considered potential reservoirs of *E. coli* strains that can cause intestinal or extra-intestinal infections in humans. Therefore, zoonotic transmission aspects of infection are highly important. The use of certain antibiotics and the selective pressure in the environment contribute to the selection and spread of resistance genes to similar antibiotics, complicating the treatment of many bacterial infections. This study aimed to investigate the presence of certain extended-spectrum beta-lactamase (ESBL) genes in *E. coli* strains isolated from feces of both healthy and diarrheal dogs, and to examine their antibiotic sensitivity. A total of 100 *E. coli* isolates were screened phenotypically for the production of ESBL enzymes using cefotaxime and cefotaxime/clavulanic acid combination disks. The antibiotic sensitivity of the ESBL-producing strains to 12 antibiotics from various classes was evaluated. Furthermore, the presence of the genes *blaTEM*, *blaSHV*, *blaCTX-M-1*, *blaCTX-M-9*, and *blaOXA-1* in the ESBL-producing isolates was assessed using multiplex PCR. The results showed that 31 out of 100 *E. coli* isolates were phenotypically ESBL producers. The *blaTEM* gene was identified as the predominant ESBL gene in 45.2% of the isolates, while the *blaCTX-M-1* gene was found in 25.8%. The highest antibiotic resistance was observed against erythromycin, while the lowest was against meropenem. Additionally, 20 different antibiotic resistance patterns were identified in the isolates. Given the zoonotic aspects of *E. coli* transmission, further epidemiological studies and pre-treatment antibiotic sensitivity profiling are recommended to ensure successful treatment and prevent the spread of ESBL-producing strains.

Key words: Extended, Spectrum Beta, Lactamase, *E. coli*, Antibiotic Sensitivity, Dogs

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