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"Spectroscopy as a recent technique in diagnosis of multi drug resistant E. coli causing endometritis in cattle in comparison of other traditional methods"

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Abstract

Objective: The objectives of this study were to determine the presence of some virulence and antibiotic resistant genes of *Escherichia coli* isolated from vaginal discharge samples from cattle with clinical endometritis. Also, to evaluate the performance of MALDI-TOF-MS analysis under real routine laboratory conditions.

Materials and Methods: A total of 138 vaginal discharge samples were collected from Holstein cows suffered from post-partum endometritis for bacteriological examination and serotyping identification. The antibiotic sensitivity test was carried out for *E. coli* strains by using VITEK 2 automated system. All different *E. coli* strains were chosen for genotyping characterization of some virulence and antibiotic resistant resistance genes by using PCR. Finally, MALDI-TOF-MS technique was applied for all variant *E. coli* strains to confirm its identification.

Results: A total of 93(67.4%) *E. coli* isolates were obtained by examination of 138 samples. *E. coli* serotypes which obtained were O126, O55, O26, O86a, O63, O119, O111, O15, O114 and O142. The results of antibiotic sensitivity test revealed that, Ampicillin / Sulbactam, Piperacillin / Tazobactam, Ceftazidime, Ceftriaxone, Cefepime, Meropenem, Ciprofloxacin, Levofloxacin and Nitrofurantoin were the most effective antibiotics against all *E. coli* strains (100%). On the other hand, *E. coli* isolates resisted the action of Ampicillin, Amoxicillin / clavulanic acid, Tetracycline and Streptomycin (100%). The genotyping characterization of *E. coli* resistance and virulence genes by using PCR proved that, all strains harbored *phoA, fimH, blaTEM* & *aadA1*. And only O55, O86a, O111, O114 & O142 harbored *eaeA*. On the other hand, *kpsMII* & *ibeA* genes didn't detected within any strains. MALDI-TOF-MS technique confirmed the isolates of *E. coli* with interpretation high confidence and performed the dendrogram for all *E. coli* strains according to the similarities of peaks which observed within each *E. coli* spectrum.

Keywords: endometritis - *E. coli* - VITEK2- MALDI-TOF-MS – virulence - dendrogram

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