Research Paper

Genome Analysis of Antimicrobial Resistance Genes and Virulence Factors in Multidrug-Resistant Campylobacter fetus Subspecies Isolated from Sheath Wash.

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ABSTRACT

*Campylobacter fetus* subspecies are mostly characterized by reproductions problems in cattle and sheep. This study aimed to study the genetic profile and assess the genes mechanism of resistance and their virulence factors using genome sequence analysis. A total of 59 confirmed *Campylobacter fetus* subspecies based on molecular assays and DNA sequencing were subjected to antimicrobial susceptibility test against 14 antibiotic agents representing the five classes of antibiotics using the disc diffusion method. In addition, sequencing the genome of all strains induced complete resistance against all tested antibiotics. The results of the antimicrobial test indicated that 54.4% had a resistance profile, 26.3% were intermediate, while 19.3% were observed to be susceptible. The Whole Genome Sequencing (WGS) result revealed the presence of different genes, such as Broad-specificity multidrug efflux pump and 16S rRNA (guanine-7-N-7-methyltransferase (gidB), efflux pump conferring antibiotic resistance (MacA and MacB), protein-altering cell wall charge conferring antibiotic resistance (PgsA), which have never been reported in *Campylobacter fetus* subspecies. The WGS also revealed the presence of genes that involved in colonization, adhesion, motility, and invasion, such as type IV secretion system protein (VirD4), S-Layer, cytolethal distending toxin (A, B, and C), *Campylobacter* invasion antigen (CiaB), and fic domain protein (fic) were among important CDS. The presence of these uncommon genes explains the resistance of *Campylobacter fetus* subspecies against different tested antibiotics. The results of this study can be used to implement molecular surveillance of *Campylobacter fetus* subspecies and conduct further studies on the resistance mechanism in these subspecies.

**Keywords:** Broad-specificity multidrug efflux pump, *Campylobacter fetus* subspecies, Genome analysis, Methyltransferase gidB, Multidrug resistance.
Research Paper

Impact of In-Ovo Injection of Folic Acid and Glucose on Hatchability and Post-Hatching Performance of Broiler Chicken.

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ABSTRACT

The present study was designed to investigate the impact of in-ovo injection of folic acid and glucose on hatching eggs from 55 weeks old broiler breeders. A total number of 900 hatching eggs were collected from Arbor Acres broiler breeders, then, eggs were divided into 6 groups including 1) Negative Control (non-injected, NC), 2) Dry Punch Control (pricked without injecting any solution, DPC), 3) Positive Control (eggs were injected with 0.5 mL normal saline, PC), 4) Folic Acid group (eggs were injected with 0.2 mg/ egg folic acid, FA), 5) Glucose group (eggs were injected with 125 mg/ egg glucose, Glu), and 6) Folic Acid with Glucose group (eggs were injected with 0.2 mg folic acid with 125 mg/ egg glucose, FA+Glu). Each treatment was divided into five replicates of 30 eggs each. Eggs were injected into the albumen under the air sac. After in-ovo injection, the eggs were stored for four days before hatching. After hatching, the chickens were reared in groups according to the treatments. All treatments were divided into 10 replications of 9 chickens in each. In-ovo injection with folic acid decreased the albumen pH significantly to 9.19 after 4 days of injection, while the negative control was 9.43. Hatching quality was severely affected by all in-ovo injection treatments, but no significant differences were found between the treatment groups concerning the hatchability of fertile eggs. Injection treatments had no significant effect on the growth rate or the production number in any of the weeks. Injection of folic acid and (FA+Glu) significantly increased chickens’ body weight at two and four weeks of age. Also, the dressing percentage when using folic acid and (FA+Glu) was significantly increased to 72.1% and 72.5%, respectively, compared to the positive control group (68.3%). In conclusion, our data suggested that in-ovo injection with a mixture of folic acid and glucose (0.2 mg folic acid+ 125 mg/ egg glucose) could be used to enhance carcass characteristics. Further studies should be conducted to find the effects of in-ovo injection folic acid and glucose on different incubation days and at different sites of injection.

Keywords: Broilers, Folic Acid, Glucose, Hatchability, In- Ovo injection, Old breeders, Post-hatch

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The present study aimed to explore the inhibitory effect of silver nanoparticles on Extended-Spectrum β-Lactamase (ESBL)-producing E. coli and Klebsiella spp. while the minimum bactericidal concentration of ESBL-producing E. coli cats. Phenotypic and molecular identification, antibiotic susceptibility testing, and double-disc control of ESBL-producing bacteria. Noticeable toxic effect of AgNPs on In Vitro Investigation of the Antibacterial Effect of Silver Nanoparticles on E. coli and Salmonella spp. The susceptibility of Salmonella spp. isolated from pigeons in a live bird market, namely Riazuddin Bazar in Chattogram city, Bangladesh. Different bacteriological and biochemical tests were used for the isolation and identification of Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic resistance was observed for gentamicin (48.3%). 96.6% of isolates were classified as multidrug-resistant and harbored antibiotic resistance genes. The results indicated that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant Salmonella spp.
This study aimed to identify and characterize Sarcocystis species isolated from domestic sheep and goats in Soran City, Erbil, Iraq. The prevalence of macroscopic sarcocysts was detected in 9.1% (91/1000) of the esophagi. The cysts contained numerous merozoites and banana-shaped bradyzoites. The hosts for Sarcosystis species were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the investigation of cross-infection may also occur between them and the host specificity of these sarcocysts. The species were most closely related to S. medusiformis. The findings from the phylogenetic analysis revealed that the identified species were most closely related to S. medusiformis.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, especially in dogs infected by three variants of CPV type. This study aimed to investigate the prevalence and potential risk factors of parvovirus infection in dogs residing in Egypt. A total of 122 dogs suffering from vomiting and diarrhea were screened by antigen rapid CPV/Canine Coronavirus Ag test kit for the diagnosis of CPV infection from March 2012 to February 2013. The overall prevalence of CPV infection in dogs was reported as 59.7%. Dogs between 0 and 3 months of age indicated the highest prevalence of 68% followed by 4-6 months of age (20%). The maximum prevalence was noticed in non-descript dogs (48.5%) followed by German young, unvaccinated puppies and exotic breeds were more prone to CPV infection. Regarding age, breed, season, and vaccination of each dog were recorded to study the prevalence of CPV. The highest increase of CPV infection was observed in autumn (25%), and winter (16.6%). Thus, CPV is an infectious and highly contagious viral disease of dogs. Age and seasonal variations are risk factors in the prevalence of CPV and their antibacterial activity against pathogenic bacteria. The aim of current study was to isolate and identify naturally occurring probiotic Lactobacilli strains that were found in both camel milk and camel urine, were also found in buffalo milk, and their antibacterial activity against pathogenic bacteria. Further studies should be conducted with more samples to gain more information in the field of antibacterial activity of probiotic species in buffalo milk, camel milk, and camel urine to investigate their susceptibility to antibiotics. Lactobacilli species in buffalo milk, camel milk, and also camel urine presented variable degrees of Genotoxic effect of thiobencarb and SMC on treated fish was investigated in erythrocytes, gills, and brain was also carried out. The results indicated that fish exposed to thiobencarb resulted in DNA damage, oxidative stress and histopathological changes. S-Methyl Cysteine Protective Effects in Oreochromis Niloticus Fish Contaminated by Thiobencarb Herbicide. World Vet. J. 10 (4): 562-570.
Mngumi S, Makungu S and Mdetele D. Contagious bovine pleuropneumonia (CBPP) in the Central Zone of Tanzania. The present study used data from the archived information of Central Zone Veterinary Centre (CZVC) for the past five years in the Central Zone. Out of 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease. The study found that 56, 426, and 11147 cases were reported as deaths, and the cattle at risk were 3.8%, 13%, and 0.5% respectively. Therefore, 3.8%, 13%, and 0.5% were reported as CBPP prevalence, case fatality rate, and mortality rate, respectively. It was also revealed that there was a clear temporal pattern of CBPP occurrence, with more cases being reported between August to December.

In conclusion, CBPP was a seasonal problem in Central Tanzania. Therefore, the present research recommended the strengthening of control measures against this disease in the area.

A retrospective study was conducted to determine the epidemiology of Contagious Bovine Pleuropneumonia (CBPP) in the Central Zone of Tanzania. The present study used data from the archived information of Central Zone Veterinary Centre (CZVC) for the past five years in the Central Zone. Out of 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease. The study found that 56, 426, and 11147 cases were reported as deaths, and the cattle at risk were 3.8%, 13%, and 0.5% respectively. Therefore, 3.8%, 13%, and 0.5% were reported as CBPP prevalence, case fatality rate, and mortality rate, respectively. It was also revealed that there was a clear temporal pattern of CBPP occurrence, with more cases being reported between August to December. In conclusion, CBPP was a seasonal problem in Central Tanzania. Therefore, the present research recommended the strengthening of control measures against this disease in the area.

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**ABSTRACT**

The Q fever is a worldwide zoonotic disease caused by *Coxiella burnetii* (an obligate intracellular bacterium). This pathogen affects humans, ruminants, equines, carnivores, rodents, and birds. A cross-sectional study was carried out from March 2017 to May 2018 to assess the seroprevalence and identify the risk factors of *C. burnetii* infection in horses (*Equus Caballus*) residing in three districts of Algerian, namely Tiaret, El-Bayadh, and Ghardaia. Serum samples collected from 182 horses were analyzed via enzyme-linked immunosorbent assay (ELISA).

Association of seropositivity with potential risk factors related to animals (e.g., age, gender, breed, housing, and presence of ticks), breeding characteristics (e.g., geographical localization, contact with animals), and environmental characteristics (i.e., presence of water source) was analyzed by univariate and multivariate logistic regression.

An overall seroprevalence of 9.9% (18/182) was obtained. The univariate analysis of risk factors for *C. burnetii* seroprevalence demonstrated higher seropositivity in horses that had contact with small ruminants (*p*=0.004) and dromedaries (*p*=0.002) as well as in those living near a water source (*p*=0.036) and in El-Bayadh district (*p*=0.005). The multivariate logistic regression analysis indicated that the risk of *C. burnetii* infection was significantly higher in horses that were in contact with small ruminants (RR: 15.6). Algeria is endemic for Q fever in horses and prophylactic measures must be taken to reduce/prevent its transmission to animals and humans.

**Keywords:** Algeria, *Coxiella burnetii*, ELISA, Horses, Q fever, Seroprevalence