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 527 -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
The present study aimed to explore the inhibitory effect of silver nanoparticles on Extended-

Production of ESBL (Extended-spectrum beta-lactamase) is a major concern in the field of antibacterial resistance. The use of silver nanoparticles as an alternative to conventional antibiotics has gained attention due to their potential antimicrobial activity. This study investigated the inhibitory effect of silver nanoparticles on Extended-spectrum beta-lactamase (ESBL)-producing bacteria, with a focus on E. coli and Klebsiella species. The minimum inhibitory concentration (MIC) for silver nanoparticles was measured as 0.31 mg/ml for E. coli and 0.62 mg/ml for ESBL-producing E. coli. Despite the presence of modern antibacterial drugs, bacterial infections are still a major public health concern. The effect of silver nanoparticles on the expression of antibiotic resistance genes (i.e., blaCTX) was assessed, and there was a downregulation of these genes in both bacteria species. Moreover, the structural integrity of the bacterial cells was evaluated using Scanning Electron Microscope (SEM). Results revealed that 23 isolates (19.16%) were found to be multidrug-resistant and harbored antibiotic-resistant genes. The resistance rate was highest for ampicillin (93.1%), followed by both sul and gentamicin (48.3%). The expression of antibiotic resistance genes was downregulated in both bacteria species, indicating a positive effect of silver nanoparticles on the reduction of antibiotic resistance. In conclusion, pigeons can act as carriers of antibiotic-resistant bacteria, and silver nanoparticles hold promise as an alternative treatment for such infections, with potential for further research into their efficacy and safety.
To the authors' knowledge, this is the first time the isolate of S. moulei, for the presence of sarcocysts. Macroscopic sarcocysts were isolated from the infected sheep and goats. The cysts contained numerous merozoites and banana-shaped bradyzoites. The bradyzoites were characterized by possessing a double-membrane pellicle and consisted of a conoid in one of the apices, numerous micronemes, two rhoptries, as well as a long, convoluted absorbable conoid. Phylogenetic analysis was conducted using PCR products of partial 18S rRNA gene. The analysis revealed that the identified isolate was most closely related to S. medusiformis. The ultrastructure of the sarcocysts was investigated by both scanning and transmission electron microscopy. The macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The results of electron microscopy indicated the characteristic features of the macroscopic sarcocysts.
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 parovirus test. Age, breed, season, and vaccination of each dog were recorded to study the prevalence of CPV. 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 (53.3%). The lowest prevalence of CPV was reported in dogs above 6 months of age (20%). The maximum prevalence was noticed in non-descript dogs (48.5%) followed by German shepherd (44.8%), and Golden retriever (42.7%). Age and seasonal variations are risk factors in the prevalence of CPV. The prevalence was the highest in spring (66.7%) and summer (89.6%) followed by autumn (48.3%) and winter (48.3%). The prevalence of CPV in exotic breeds, such as Doberman, Shitzu, and Poodle, was higher (66.7%) than that found in common breeds (57.1%). Breeds reported to be at a higher risk of CPV infection were young, unvaccinated puppies and exotic breeds. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.
The present study found that out of 14 Local Epidemiological Assessment of Contagious Bovine Pleuropneumonia in Central Zone Veterinary Centre (CZVC) for the past five years in the central zone of Tanzania. In order to be able to assess the actual burden of the disease on-site, research recommended the strengthening of control measures against this disease in the years. Moreover, 56, 426, and 11147 cases were reported as deaths, and the cattle at risk of Contagious Bovine Pleuropneumonia (CBPP) were 12,498 and 32,397 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 the disease with a peak in the dry season. The results indicated that the prevalence of CBPP was lower compared to the situation on-site.

Keywords: Contagious Bovine Pleuropneumonia, Prevalence and distribution, Tanzania.

Effect of L-Carnitine and Yeast Chromium Supplementation on Productive Performance of Pekin and Sudani Duckling Breeds

The present study aimed to evaluate the effect of L-carnitine and Yeast chromium supplementation on the productive performance of Pekin and Sudani duckling breeds. A total number of 450 both unsexed Pekin and Sudani ducklings (225 per each breed) one-day-old were investigated in the current study. The experimental period lasted 12 weeks of age. Experimental ducklings were randomly divided into the 5 equal treatments with 90 ducklings (45 Pekin and 45 Sudani ducklings in each treatment). Each experimental treatment was randomly divided into 3 equal replicates of 30 ducklings (15 ducklings in each breed). The five experimental treatments were as follows: the first treatment was the control with basal diets, while treatments 2, 3, 4, and 5 received basal diets supplemented with 150 mg L-carnitine/kg, 300 mg L-carnitine/kg, 400 mg L-carnitine/kg, and 600 mg L-carnitine/kg respectively. The results indicated that growing duckling weight gain, feed intake, and feed conversion ratio. The relative weight of carcass quality and weight of lymphoid organs significantly increased with supplemented diets. Therefore, both L-carnitine and Yeast chromium supplementation on the productive performance of Pekin and Sudani duckling breeds. A total number of 450 both unsexed Pekin and Sudani ducklings (225 per each breed) one-day-old were investigated in the current study. The experimental period lasted 12 weeks of age. Experimental ducklings were randomly divided into the 5 equal treatments with 90 ducklings (45 Pekin and 45 Sudani ducklings in each treatment). Each experimental treatment was randomly divided into 3 equal replicates of 30 ducklings (15 ducklings in each breed). The five experimental treatments were as follows: the first treatment was the control with basal diets, while treatments 2, 3, 4, and 5 received basal diets supplemented with 150 mg L-carnitine/kg, 300 mg L-carnitine/kg, 400 mg L-carnitine/kg, and 600 mg L-carnitine/kg respectively. The results indicated that growing duckling weight gain, feed intake, and feed conversion ratio. The relative weight of carcass quality and weight of lymphoid organs significantly increased with supplemented diets. Therefore, both L-carnitine and Yeast chromium supplementation on the productive performance of Pekin and Sudani duckling breeds.
Identifying the Virulent Factors of *Clostridium perfringens* Locally Isolated from Different Species

Incidence of Appendicular Bone Fracture in Dogs and Cats: Retrospective Study at
Appendicular bone fractures in small animal practice constitute a major challenge facing
researchers, practitioners, and pet owners. This study aimed to determine the prevalence of
appendicular fractures arising from trauma in dogs and cats treated at a referral veterinary
hospital over a 3-year period. The hospital records were reviewed, and a total of 500 cases were
examined. The fractures were classified based on their anatomical location, type, and
incidence. The study found that femoral fractures were the most common, followed by
tibial fractures. Male dogs and cats showed a higher incidence of fractures compared to
females. The study also highlighted the importance of identifying predisposing factors such as
breeds, age, and gender in the prevention and management of appendicular fractures.
The Effects of Dietary Supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids in Giant Prawn (Macrobrachium rosenbergii) Meat.

On the other hand, in the data analysis stage, the researchers used ANOVA and continued with Duncan's test. Based on the results, the study notes that the administration of cod liver oil in the feed of giant prawn increased the content of unsaturated fatty acids significantly.

The best ratio was found in treatment 4 at a dose of 12%. Therefore, it is concluded that the provision of nutrients for feed related to fatty acids in the diet plays an important role in aquaculture activities.

The presence of feed plays an important role in aquaculture activities. This is due to the effect of physiologically relevant heat stress on the developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities. The deleterious effect of heat stress on cumulus-oocytes complexes (COCs) competence is well recognized in different livestock species. Therefore, the present study aimed to investigate the effect of heat stress on developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities.

The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5°C for 24 hours of IVM. The maturation severely reduced extrusion of polar body, cleavage, and blastocyst rates. The existence of feed plays an important role in aquaculture activities. This is due to the content of pangasius fatty acids.

The content of pangasius fatty acids is higher than in marine fish, since marine fish have a lower saturated fatty acid composition than freshwater fish. The present research, an experimental method with completely randomized design was used. In the present research aimed to determine the effects of adding lysine essential amino acid to commercial feed on fatty acid contents.

Key words: Lysine essential amino acid, Saturated fatty acids, Unsaturated fatty acids.
ABSTRACT

The contamination of goat milk with pathogenic fungi can cause health hazards for the consumers either they consume it raw or even in the processed form. Since there are few studies concerning yeasts in raw goat milk, the present study aimed to determine the prevalence of yeasts and isolate *Candida albicans* from raw goat milk samples. Also, this study determined the distribution of virulence genes and the antifungal susceptibility profile of *Candida albicans* isolates. A total of 30 goat milk samples (collected from free-grazing goats) were mycologically examined. The confirmed *Candida albicans* isolates were subjected to PCR assay to detect the virulence genes (SAP4, RAS1, ALS1, HWP1, and PLB1). Also, antifungal sensitivity testing was performed against the commercially available antifungal agents and probiotics (*Lactobacillus acidophilus* and *Lactobacillus plantarum*). The mycological examination revealed that 14 out of 30 (46.7%) goat milk samples were positive for yeasts and only 4 (13.3%) isolates were confirmed as *Candida albicans*. The results from the PCR assay showed that RAS1 and ALS1 were found in 4 (100%) isolates, HWP1 and SAP4 were found in 2 (50%) isolates, while PLB1 was not detected in tested *Candida albicans* isolates (0%). Antifungal sensitivity testing results showed that ketoconazole gave the best activity against *Candida albicans* isolates, followed by fluconazole, nystatin, and itraconazole. All isolates were resistant to terbinafine. Moreover, both *Lactobacillus acidophilus* and *Lactobacillus plantarum* showed antifungal effects against *Candida albicans*, but *Lactobacillus plantarum* was more effective than *Lactobacillus acidophilus*. Antifungal resistance is a major problem that can lead to failure of candidiasis treatment. Regular antifungal sensitivity testing and searching for an alternative bio-eco-friendly approach for proper control and treatment of candidiasis are strongly needed to prevent treatment failure and emergence of resistant isolates.

Keywords: Antifungal sensitivity testing, *Candida albicans*, Goat milk, Virulence genes, Probiotics.