Research Paper

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

Tshipamba ME, Lubanza N and Mwanza M.

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 5'-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, cytotoxic 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.

Abdel-Halim A, Mohamed FR, Elmenawey MA, Gharib HB.


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
Despite the presence of modern antibacterial drugs, bacterial infections are still a major threat, especially due to the emergence of multi-drug-resistant bacteria. ESBL-producing bacteria are one of the major concerns due to their resistance to a wide range of antibiotics.

For instance, Enterobacteriaceae species, such as Escherichia coli, Klebsiella pneumoniae, and Salmonella spp., are often associated with ESBL-producing bacteria. The minimum inhibitory concentration (MIC) and minimum bactericidal concentration (MBC) for these bacteria can vary depending on the antimicrobial agent used.

Silver nanoparticles have been studied as an alternative to antibiotics due to their antibacterial properties. In a study, the MIC and MBC of silver nanoparticles for ESBL-producing E. coli and K. pneumoniae were found to be 0.15 mg/ml and 0.3 mg/ml, respectively. These concentrations showed a significant decrease in the number of bacteria, indicating a promising effect.

The expression of ESBL-producing genes is a major concern as it threatens the control of these infections. In a study by Khalil OA et al., the prevalence of ESBL-producing E. coli and K. pneumoniae in pets was confirmed using specific primers.

The use of natural alternatives, such as silver nanoparticles, in the control of ESBL-producing bacteria is gaining attention. These nanoparticles have demonstrated a noticeable toxic effect on bacteria, while maintaining their biocompatibility.

The paper advises researchers and clinicians to consider the potential of silver nanoparticles in the control of antibiotic-resistant bacteria, highlighting the need for further research to understand their mechanism of action and potential side effects.
naturally infected domestic sheep and goats using the molecular method, as well as S. medusiformis Sarcosystis Swar isolated species. A total of 1000 esophagi were collected from sheep and goats and examined for the presence of sarcocysts. Macroscopic sarcocysts were isolated from the infected hosts for respectively, cross-infection may also occur between them and the host specificity of these 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 mitochondrion, subterminal nucleus, and several amylopectin granules. The partial analysis of the 18S rRNA gene presented that all isolates produced bands of expected sizes on gel electrophoresis. The findings from the phylogenetic analysis revealed that the identified isolates were S. medusiformis and S. moulei, respectively.

The prevalence of human brucellosis in the New Valley Governorate. In conclusion, brucellosis is an alarming problem among residents of the New Valley Governorate. Thus, reducing the prevalence in humans and animals in the region of study may include restriction of the marketing the raw milk and enhancing public health awareness.

Brucellosis is a worldwide zoonotic disease which is now considered endemic in most parts of the world. In Egypt, various studies have been carried out to investigate the seroprevalence of brucellosis in humans and livestock residing in different governorates of Egypt. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans located in New Valley Governorate, Egypt. A total of 1254 animals (673 cattle, 348 sheep, and 233 goats) and 523 human serum samples were examined for brucellosis using Rose Bengal test (RBT) and then randomly selected sera (15 from cattle, 7 from sheep, 3 from goats, and 45 from humans) were examined using a commercial enzyme linked immunosorbent assay to compare and detect the sensitivity and specificity of RBT. The prevalence of brucellosis in humans and animals in the region of study may include restriction of the marketing the raw milk and enhancing public health awareness.

To the authors' knowledge, this is the first time that the prevalence of human brucellosis in the New Valley Governorate has been recorded in goats. Goats and sheep can be proposed as alternative intermediate hosts. The potential for cross-infection may also occur between them and the host specificity of these isolates was examined using the molecular method, as well as the phylogenetic analysis revealed that the identified isolates were S. medusiformis and S. moulei, respectively.

Breeding between Female F1 Broiler and Male Pelung.

The Single Nucleotide Polymorphism was analyzed using the Pearson correlation test between the bodyweights of 49-days-old chickens with the polymorphism points. The conclusion indicated that the bodyweight of the first backcross hybrid chicken was higher than the Pelung chicken. The Single Nucleotide Polymorphism was found on the exon 6 Pituitary Positive Transcription Factor-1 gene in the first backcross hybrid chicken. Procedures of the research included crossbreeding female first filial broiler chicken with male Pelung chicken to obtain first backcross hybrid chickens. Single Nucleotide Polymorphism in the Pituitary Positive Transcription Factor-1 gene was amplified by PCR, DNA band was visualized utilizing electrophoresis, and the PCR product was sequenced using Sanger method. The DNA sequence was aligned using Clustal omega software to gain Single Nucleotide Polymorphism. The conclusion indicated that the bodyweight of the first backcross hybrid chicken was higher than the Pelung chicken. The Pituitary Positive Transcription Factor-1 gene is closely related to chicken growth and productivity. This research was conducted to detect Single Nucleotide Polymorphism in the Pituitary Positive Transcription Factor-1 gene with Body Weight Traits in BC1 Hybrid Chicken (Gallus gallus gallus Linnaeus, 1758) from Crossbreeding between Female F1 Broiler and Male Pelung. The Single Nucleotide Polymorphism was analyzed using the Pearson correlation test between the bodyweights of 49-days-old chickens with the polymorphism points. The conclusion indicated that the bodyweight of the first backcross hybrid chicken was higher than the Pelung chicken. The Pituitary Positive Transcription Factor-1 gene is closely related to chicken growth and productivity. This research was conducted to detect Single Nucleotide Polymorphism in the Pituitary Positive Transcription Factor-1 gene with Body Weight Traits in BC1 Hybrid Chicken (Gallus gallus gallus Linnaeus, 1758) from Crossbreeding between Female F1 Broiler and Male Pelung.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, and 3 months of age indicated the highest prevalence of 68% followed by 4-6 months of age 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 456 dogs between 0-7 months of age were presented from different parts of Egypt for veterinary examination and 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 (26.7%) and 7 months and above (20.8%). The maximum prevalence was noticed in non-descript dogs (48.5%) followed by German (34.3%), Doberman (23.07%), and Griffon (16.6%). Among different risk factors, age and seasonal variations are risk factors in the prevalence of CPV infection. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.
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 (EMA-i) reports submitted to the zone. The present study found that out of 14 Local Keywords: pattern of CBPP occurrence, with more cases being reported between August to December. In respect, 3.8%, 13%, and 0.5% were reported as CBPP prevalence, case fatality lower compared to the situation on-site.

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Government Authorities (LGAs) in the Central Zone, reported the disease in the past five [Full text-this extensive study must be carried out, since the parameters obtained during the study were [image]Epidemiological Assessment of Contagious Bovine Pleuropneumonia in Central [image]Archived information of Central Zone Veterinary Centre (CZVC) for the past five years in the [image]ABSTRACT

Mngumi S, Makungu S and Mdetele D. Tanzania. In order to be able to assess the actual burden of the disease on-site, A retrospective study was conducted to determine the epidemiology of Contagious Bovine [image]Conclusions

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The factors influencing the risk of *C. burnetii* seropositivity in horses.

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<th>Risk Factor</th>
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The factors influencing the risk of *C. burnetii* seropositivity in horses.
Incidence of Appendicular Bone Fracture in Dogs and Cats: Retrospective Study at Veterinary Hospital of Cairo University and Some Private Clinics in Egypt.

ABSTRACT

Appendicular bone fractures in small animal practice constitute a major challenge facing veterinarians. The objective of the present study was to determine the prevalence of appendicular fractures arising from trauma in dogs and cats treated at the veterinary orthopedic surgeons concerning affected limb and bone as well as the extent of tissue damage, site, and shape of the fracture line. Therefore, this retrospective study was designed to provide descriptive data at referral veterinary teaching hospital, faculty of veterinary medicine, Cairo University, and some private pet clinics in Cairo district, Egypt to identify and evaluate their antibacterial and antifungal activities. The production of Ag-NPs was recorded the maximum activity against Escherichia coli (ATCC® 10536™). Ag-NPs synthesized from Lactobacillus brevis (ATCC® 35218™). Ag-NPs synthesized from Lactobacillus brevis (ATCC® 10231™). The effect of these nanoparticles on the biosynthesized Ag-NPs indicated an absorption peak at 410 nm. The transmission electron microscope was used for the determination of the size and morphology of the nanoparticles. Nanoparticles appeared in spherical or polyhedral form, poly-dispersed and their diameter ranged from 5 to 40 nm. The X-ray diffraction analysis exhibited the crystalline nature of the Ag-NPs synthesized from Lactobacillus brevis. The antibacterial effect of Ag-NPs was more potent against Gram-negative bacteria Pseudomonas than Gram-positive bacteria Staphylococcus aureus. The antifungal effect of Ag-NPs was more potent against Candida albicans than Cryptococcus neoformans. The results obtained in the present study indicate that these nanoparticles can be highly recommended as antibacterial and antifungal agents.
The Effect of Dietary Supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids in Pangasius Fish Meat

ABSTRACT

The research was conducted experimentally with a completely randomized design. The treatments were given as follows:

- Control (K1): Good quality COCs incubated at 38.5°C for 7 days post parthenogenetic activation.
- K2: Low-quality camel COCs incubated at 38.5°C for 7 days post parthenogenetic activation.
- K3: Low-quality camel COCs exposed to 41°C for the first 6 hours of IVM.
- K4: Low-quality camel COCs exposed to 42°C for the first 6 hours of IVM.
- K5: Good quality COCs exposed to 41°C for the first 6 hours of IVM.
- K6: Good quality COCs exposed to 42°C for the first 6 hours of IVM.

The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5°C for 7 days post parthenogenetic activation. K3 and K4 represent good and low-quality COCs exposed to 41°C and 42°C during the first 6 hours of IVM. Finally, K5 and K6 represent the groups of good and low-quality COCs exposed to 42°C for 7 days post parthenogenetic activation.

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 physiologically relevant heat stress on the developmental competence of in vitro matured COCs of Camelus dromedaries with different qualities.

The results of this study indicated that heat stress at 42°C resulted in significantly lower rates of development compared to good quality COCs. The cleavage rate was lower for low quality (K2; 63 ± 1.28) than good quality COCs (K1; 53 ± 1.85). The percentages of oocytes that developed to the blastocyst stage were lower for K2, K3, K4, K5, and K6 than K1. Moreover, the blastocyst rate was lower for K2 (9 ± 0.22) than K1 (15 ± 0.22).

Keywords: Camelus dromedaries, Embryo development, Heat stress, Oocyte maturation.
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.