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 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.

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 threatens problem due to the enormous increase in multi-drug-resistant bacteria. Therefore, alternatives to modern antibacterial drugs are of great interest.

E. coli spp. cells which was investigated using SEM. It can be concluded that silver nanoparticles have antibacterial effect where the minimum inhibitory concentration of AgNPs for ESBL producing E. coli was measured as 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli and E. coli ESBL Spectrum Beta lactamase (ESBL) producing E. coli was measured as 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli.

Moreover, the effect of silver nanoparticles on the expression of antibiotic resistance genes (i.e., tet, sul, tet, sul, sul) was assessed as well as their effect on the structural integrity of the bacterial cells using TEM, Bird Market in Chattogram, Bangladesh. The highest antibiotic resistance rate was found to be ampicillin (93.1%), followed by both colistin (62.1%), kanamycin (55.2%), and gentamicin (48.3%). 96.6% of isolates were found sensitive to ciprofloxacin, followed by cefsulodin (86.2%). In contrast, 65.5% of isolates were found sensitive to tetracycline (86.2%).

In Vitro Investigation of the Antibacterial Effect of Silver Nanoparticles on ESBL-Producing E. coli and Klebsiella spp. Isolated from Pet Animals.

In a recent study, Abd El-Ghany WA (2020) investigated the antibacterial effect of silver nanoparticles on ESBL-producing E. coli and Klebsiella spp. isolated from pet animals. The results indicated that silver nanoparticles had a promising antibacterial effect where the minimum inhibitory concentration of AgNPs for ESBL producing E. coli was measured as 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli and E. coli ESBL Spectrum Beta lactamase (ESBL) producing E. coli was measured as 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli.

The results also showed that silver nanoparticles had a negative effect on the expression of antibiotic resistance genes (i.e., tet, sul, tet, sul, sul) and their effect on the structural integrity of the bacterial cells using TEM. The highest antibiotic resistance rate was found to be ampicillin (93.1%), followed by colistin (62.1%), kanamycin (55.2%), and gentamicin (48.3%). 96.6% of isolates were found sensitive to ciprofloxacin, followed by cefsulodin (86.2%). In contrast, 65.5% of isolates were found sensitive to tetracycline (86.2%).

In conclusion, silver nanoparticles have the potential to be a promising alternative to modern antibacterial drugs. Further studies are needed to investigate the long-term effects of silver nanoparticles on bacterial resistance.
Ultrastructural and Molecular Characterization of Sarcocystis Species Derived from Domestic Sheep and Goats in Soran City, Erbil, Iraq.

ABSTRACT

Sarcocysts. The cysts contained numerous merozoites and banana-shaped bradyzoites. The S. moulei, S. medusiformis, and S. gigantea species were most closely related to S. medusiformis. This study aimed to identify the 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 esophagi, and naturally infected domestic sheep and goats using the molecular method, as well as 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 species were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the species isolated from macroscopic sarcocysts from goats and sheep has been recorded in goats. Goats and sheep can be proposed as alternative intermediate hosts for the Sarcocystis species isolated from macroscopic sarcocysts from humans. For the presence of sarcocysts, the 18S rRNA gene was amplified by PCR, DNA band was visualized utilizing gel 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 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 weights 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 but lower than the first filial broiler chicken. Single Nucleotide Polymorphism was not found on the exon 6 Pituitary Positive Transcription Factor-1 gene in the first backcross hybrid chicken. The Single Nucleotide Polymorphism was analyzed using the Pearson correlation test between the bodyweight and the polymorphism points. The conclusion indicated that the bodyweight of the first backcross hybrid chicken was higher than the Pelung chicken but lower than the first filial broiler chicken. Single Nucleotide Polymorphism was not found on the exon 6 Pituitary Positive Transcription Factor-1 gene in the first backcross hybrid chicken. The Single Nucleotide Polymorphism was analyzed using the Pearson correlation test between the bodyweight and the polymorphism points.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, and it is caused by a single-stranded DNA virus within the family Paroviridae and the genus Parovirus. CPV affects dogs of all ages and breeds, but young, unvaccinated puppies and exotic breeds are more prone to CPV infection. The overall prevalence of CPV infection in dogs was reported as 59.7%. Dogs between 0-3 months of age and 3-6 months of age indicated the highest prevalence of 68% followed by 4-6 months of age (25%), and 6-9 months (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 infection.

**Keywords:** Prevalence and associated risk factors of parvovirus infection in dogs residing in Egypt. A total of 1004 dogs were included in this study. Samples were collected from different areas of Egypt, and a total of 524 samples were tested for CPV using Coronavirus Ag test kit for the diagnosis of CPV infection from March 2012 to February 2013. The prevalence of CPV infection in dogs was reported as 59.7%. Dogs between 0-3 months of age and 3-6 months of age indicated the highest prevalence of 68% followed by 4-6 months of age (25%), and 6-9 months (16.6%). Among different risk factors, young, unvaccinated puppies and exotic breeds were more prone to CPV infection. Regarding the season, the higher prevalence was noticed in summer (77.1%) followed by spring (55.5%), fall (22.9%), 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 infection.


**Keywords:** Prevalence, Risk factors, CPV. The maximum prevalence was noticed in non-descript dogs (48.5%) followed by German shepherd (26.7%), Doberman (23.07%), and Griffon (16.6%). Among different risk factors, young, unvaccinated puppies and exotic breeds were more prone to CPV infection. Regarding the season, the higher prevalence was noticed in summer (77.1%) followed by spring (55.5%), fall (22.9%), 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 infection. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.
Epidemiological Assessment of Contagious Bovine Pleuropneumonia in Central Tanzania

A retrospective study was conducted to determine the epidemiology of Contagious Bovine Pleuropneumonia (CBPP) in Central Tanzania. The study was based on the archived information of Central Zone Veterinary Centre (CZVC) for the past five years. A total of 376 samples were collected from 14 Local Government Authorities (LGAs) in the Central Zone. The samples were tested for CBPP using the ELISA technique. The results showed that 3.8% of the samples were positive for CBPP, indicating a low prevalence rate.

The study also revealed that the disease was more prevalent during the dry season, with more cases 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 central zone of Tanzania.

Keywords: CBPP, Epidemiology, Central Tanzania, Control measures.
Clostridium perfringens to isolation and identification (morphologically and biochemically) for obtaining samples from different animal species of different localities in Egypt. Samples were subjected to antibiograms and toxicogenicity analysis for CPA, Net B, and CPE genes as virulence factors. Consequently, those isolates are indicated that all the 26 isolates had CPA gene and enterotoxin (CPE gene), whereas 23% of isolates of chicken and cattle intestinal samples contained CPA, Net B, and CPE genes as virulence factors. Consequently, those isolates are identified as enterotoxin gene-positive C. perfringens isolates which are associated with the enterotoxigenic type of diarrheal disease. The application of nisin, lysozyme, and natamycin in low-salt soft cheese is an effective method for reducing the growth of aerobic spore-forming bacteria compared to control and other treatments. The antimicrobial agents (nisin, lysozyme, natamycin, and their combinations) were studied on inhibitory effect of 28 isolates of spore-forming bacteria. The combination of nisin and lysozyme had the most significant reduction of aerobic spore-forming bacteria, compared to control and other treatments. The results revealed that the addition of different natural antibacterial additives with various protective culture increased the microbiological quality of dairy products, retarding microbial spoilage in low-salt soft cheese. The seroprevalence of Q fever in horses was assessed via enzyme-linked immunosorbent assay (ELISA). The univariate analysis of risk factors for Q fever infection in horses indicated that the risk of seropositivity was higher in horses that were in contact with small ruminants (RR: 15.6) and in El-Bayadh district (p=0.005). The multivariate logistic regression analysis was performed to assess the effect of some natural antimicrobial additives and protective culture for reducing the seroprevalence and identify the risk factors of Q fever.
Incidence of Appendicular Bone Fracture in Dogs and Cats: Retrospective Study at Veterinary Hospital of Cairo University and some Private Clinics in Egypt. 

Keywords: Cat, Dog, Femur, Fracture, Orthopedic

Abstract

Appendicular bone fractures in small animal practice constitute a major challenge facing 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 clinics in Egypt. The objective was to examine the management of urinary calculi of a sulcata tortoise. A 5-year-old Sulcata tortoise (Geochelon sulcata) with a history of dehydration, anorexia, and depression was presented for evaluation of radiopaque bladder calculi. Radiographic results revealed that there was a radiopaque urinary bladder stone. This was a safe area to open plastron since it was far from the spine.скои азисното хомеопатично лечебно състояние. За съжаление, в материалната база не бяха статистически данни за поява на други комплекти. На лицето на исследования, основното внимание беше паднало върху навиците и миризми, а подобна нотация беше особено отбелязана по време на изследванията. След това, тази илюстрация се гарантира, че информацията за лечението на кърмачетата беше достоверна и коректна. От друга страна, тук се важи особено внимание върху преходите върху изображенията за различни състояния на животните - рентгенови изображения на кръста, хроматографски анализи на алебастъри и миризми, а тъкмо последните състояния бяха най-изключителни за интереса на научниците. В заключение, тази илюстрация заслужава внимание на специалистите в областта на рентгеновите изображения и хроматографските анализы, като предоставя полезни данни за ползване на асистентна информация. }
ABSTRACT

Unsaturated Fatty Acids in Giant Prawn (Macrobrachium rosenbergii) Meat. On the other hand, the results also showed that 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 fact, the provision of fatty acids, one of which is not in the meat, has an important influence on fish feed growth. Feeding with the right nutritional components can produce healthy and high-quality fish products. One of the nutrients needed by fish is fatty acids. The existence of feed plays an important role in aquaculture activities. This is due to the high economic value. 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 aimed to determine the effects of adding lysine essential amino acid to commercial feed on the saturated and unsaturated fatty acids contents of pangasius. The treatment was done by adding lysine with different doses including P0 (0%), P1 (1.2%), P2 (2.2%), and P3 (3.2%). Each treatment was repeated five times. The main parameters studied were water quality. The present results indicated the use of lysine in commercial feed caused significant differences in the content of saturated fatty acids, Monounsaturated Fatty Acids (MUFA) and Polyunsaturated Fatty Acids (PUFA) in pangasius meat; a decrease in the saturated fatty acids content was found in P3 with 3.2% (3.5882 mg/dl). In P2, an increase in the content of saturated fatty acids, MUFA and PUFA in pangasius was found in P3 treatment with 3.2% Lysin (23.1082 mg/dl). P1, P2 and P3 indicated lower results with high economic value. 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 dietary supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids in Giant Prawn (Macrobrachium rosenbergii) has not reduced the content of saturated fatty acids. As well as, the best ratio for K2 (9 ± 0.22) than K1 (15 ± 0.22). The results of this study indicated that exposure of camel developed embryos were cultured for 30 hours. While K3 and k4 represent good and low-quality COCs exposed to 41°C and 42°C during in vitro maturation (IVM). A total of 1548 COCs were divided into six groups in this study. 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 oocytes of Camelus dromedaries with different qualities. World Vet J., 10(4), 653-657, 2020; pii: S2322-4568(20)30009-0; https://dx.doi.org/10.29252/wvj.2020.653-657

Keywords:
- Effect of heat stress on developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities.
- Camelus embryo development
- Blocked embryo rate
- Heat shock at 41°C and 42°C
- Heat stress at 41°C and 42°C during in vitro maturation (IVM).
- Heat stress at 41°C and 42°C during in vitro maturation (IVM).
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 \textit{Candida albicans} from raw goat milk samples. Also, this study determined the distribution of virulence genes and the antifungal susceptibility profile of \textit{Candida albicans} isolates. A total of 30 goat milk samples (collected from free-grazing goats) were mycologically examined. The confirmed \textit{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 (\textit{Lactobacillus acidophilus} and \textit{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 \textit{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 \textit{Candida albicans} isolates (0%). Antifungal sensitivity testing results showed that ketoconazole gave the best activity against \textit{Candida albicans} isolates, followed by fluconazole, nystatin, and itraconazole. All isolates were resistant to terbinafine. Moreover, both \textit{Lactobacillus acidophilus} and \textit{Lactobacillus plantarum} showed antifungal effects against \textit{Candida albicans}, but \textit{Lactobacillus plantarum} was more effective than \textit{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, \textit{Candida albicans}, Goat milk, Virulence genes, Probiotics.