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

_beta_lactamase (TEM, SHV, SHVll)

Antibiotic resistance strains of _E. coli_ and _Klebsiella_ spp. were isolated from the samples collected from dogs and cats. Phenotypic and molecular identification, antibiotic susceptibility testing, and double-disk test were performed to identify the bacterial isolates. SEM was used to observe the morphology of the bacterial cells. It was concluded that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the control of ESBL-producing bacteria.

**Keywords:** _E. coli_, _Klebsiella_, ESBL-producing bacteria, silver nanoparticles, antibiotic susceptibility testing, Scanning Electron Microscope (SEM).

Results revealed that 23 isolates (19.16%) were resistant to ciprofloxacin, followed by colistin (62.1%), kanamycin (55.2%), and gentamicin (48.3%). 96.6% of the isolates were classified as multidrug-resistant and harbored 2 genes. In conclusion, pigeons as carriers of antibiotic-resistant _Salmonella_ spp. may pose a health risk to other birds and humans.

**ABSTRACT**

**Research Paper**

In the current study, the prevalence of antibiotic resistance and some antibiotic-resistant genes in _Salmonella_ spp. isolated from apparently healthy pigeons in the live bird market, namely Riazuddin Bazar in Chattogram city, Bangladesh, was investigated. A total of 100 cloacal swab samples were collected aseptically from pigeons. Different bacteriological and biochemical tests were used for the isolation and identification of _Salmonella_ spp. may pose a health risk to other birds and humans. The prevalence of ESBL-producing _E. coli_ and _Klebsiella_ spp. was reported as 0.15 mg/ml and 0.3 mg/ml, respectively. Consequently, the expression of resistance genes (i.e., _blaTEM_, _blaSHV_, _blaSHVll_, and _blaCTX_)


Rabbits are considered an important and healthy source of animal protein all over the world. Coccidiosis in rabbits has two forms, namely hepatic and intestinal. Affected animals indicated the symptoms of diarrhea, reduced appetite, dehydration, and weight loss as well as liver and kidney damage. Prevention and control are achieved by adopting hygienic measures and using different anticoccidial drugs. The use of natural alternatives for the prophylaxis of coccidiosis is of great interest to modern medicine.
Sarcocystis Macroscopic Sarcocysts of Domestic Sheep and Goats in Soran City, Erbil, Iraq. The cysts contained numerous merozoites and banana-shaped bradyzoites. The Sarcocystis mitochondrion, subterminal nucleus, and several amylopectin granules. The partial analysis of esophagi, and respectively, cross-infection may also occur between them and the host specificity of these species were most closely related to naturally infected domestic sheep and goats using the molecular method, as well as ultrastructural and molecular characterization of Sarcocystis species derived from esophagi, and S. medusiformis. 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. This study aimed to identify species isolated from macroscopic sarcocysts from goats, sheep, and cattle.

Brucellosis is a worldwide zoonotic disease which is now considered endemic in most parts of Egypt. An alarming problem among residents of the New Valley Governorate. Thus, reducing the prevalence of this infection was also at a higher level among individuals aged 23-33 years old (33.6%). The prevalence of this infection was also at a higher level among individuals aged 23-33 years old (33.6%). The prevalence of this infection was also at a higher level among individuals aged 23-33 years old (33.6%).
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, meaning that it is easily transmitted from one dog to another. 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.

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. 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, the season, the higher prevalence was noticed in summer (77.1%) followed by spring (55.5%), 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 infection. 

Microbiological Studies on Naturally Present Bacteria in Camel and Buffalo Milk. The aim of current study was to isolate and identify naturally occurring probiotic strains in camel milk and urine. Lactobacilli strains that were found in both camel milk and camel urine, were also found in buffalo milk. All isolated Lactobacilli from buffalo milk, camel milk, and also camel urine presented variable degrees of 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 isolated strains were identified by using 16S rRNA multiplex Polymerase Chain Reaction analysis, which was performed following DNA extraction from the isolated bacteria. Buffalo and camel Lactobacilli were different in their difference in antioxidant biomarkers as well as nuclear abnormalities and comet parameters. Thiobencarb Herbicide. Thiobencarb which is a carbamate herbicide is used for managing undesirable weeds during rice cultivation in Egypt. This study was designed to investigate the adverse effects of a field dose of thiobencarb on Nile tilapia and ameliorating the role of the low dose of S-methyl cysteine (SMC). Experimental fishes were divided into four groups; first group was reared on a feed containing 200 mg of SMC/Kg only. Fishes were sacrificed at the end of the experimental course (two months) and sampling was carried out. Catalase, Glutathione S Transferase activities, Glutathione reduced, and Malondialdhyde levels were assayed. Thiobencarb resulted in DNA damage, oxidative stress and histopathological changes. 


ABSTRACT

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 archives of Central Zone Veterinary Centre (CZVC) for the past five years in the forms of weekly, monthly, and slaughterhouse reports, as well as Event Mobile Application (EMA-i) reports submitted to the zone. The present study found that out of 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease in the past five years. Moreover, 56, 426, and 11147 cases were reported as deaths, and the cattle at risk, 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 study suggests that CBPP control can be achieved only if CBPP diseases are monitored and reported on a timely basis.

Keywords: Contagious Bovine Pleuropneumonia, Epidemiological Assessment, Central Zone, Tanzania.
ABSTRACT


Keywords:
Clostridium perfringens, CPA gene, CPE gene, Net B gene

Identifying the Virulent Factors of Clostridium perfringens Locally Isolated from Different Species of Animals

The objective of this study was to assess the effect of some natural antimicrobial additives and protective culture for reducing the growth of aerobic spore-forming bacteria in low-salt soft cheese during the storage period (30 days). The antimicrobial agents (nisin, lysozyme, and natamycin) were studied on the growth of aerobic spore-forming bacteria, compared to control and other treatments. The growth pattern of aerobic spore-forming bacteria gradually decreased in all treatments along the storage period with variable reduction percentages in comparison with control cheese which was in continuous increment. The application of a protective culture, nisin, lysozyme, and natamycin (100 mg kg\(^{-1}\)) was significantly effective in controlling the growth of aerobic spore-forming bacteria. The antimicrobial agents (nisin, lysozyme, and natamycin) were tested for 28 isolates of spore-forming bacteria. Inhibitory effect of the combination of nisin and lysozyme (25 mg kg\(^{-1}\)) was significantly higher in reducing the growth of spore-forming bacteria, compared to control and other treatments.

ABSTRACT


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Identifying the Virulent Factors of Clostridium perfringens Locally Isolated from Different Species

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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 obtained data, it could be concluded that there was a high incidence of the appendicular long bones concerning the different bone fractures with significantly higher records in dogs, femoral, complete oblique diaphyseal tibial/fibular, complete spiral diaphyseal humoral, and femoral, complete transverse distal radial/ulnar fractures. In conclusion, appendicular bone fracture incidence than females. The bone fracture mostly occurred in dogs younger than one-year-old, and incomplete or complete), site (proximal, diaphyseal or distal zones), number (single or compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued animals. Excluding mongrel dogs and cats, the highest incidence of fracture-cases in dogs was recorded in Miniature breeds and svelte breeds for cats. Male dogs and cats showed a higher weight, age, and gender) and causative agents that resulted in different types of appendicular fractures.

The development of plastron formation resulting in the postoperative asymmetrical plastron recorded more frequently in dogs than cats. In dogs, the most common fractures in the femur, tibia/fibula, humerus, and radius/ulna were complete comminuted diaphyseal femoral, complete spiral diaphyseal humeral, and complete transverse distal radial/ulnar fractures. In conclusion, appendicular bone fracture incidence in dogs and cats referred to the veterinary teaching hospital, Cairo University and some private clinics in Egypt showed high incidence (87% in dogs and 71.8% in cats) out of total frontal, lateral, and linear fractures.
The Effect of Dietary Supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids to the Meat of Giant Prawn. This research was conducted experimentally with a completely randomized design. The treatment is given a dose of cod liver oil 0% (control), and treatments 1-4 use 3% dose addition to each treatment. The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5°C for the first 6 hours of IVM. After exposure of COCs to heat stress at 41°C and 42°C during maturation, the COCs were incubated at 38.5°C for 24 hours of IVM. Finally, K5 and K6 represent the groups of good and low-quality COCs exposed to 42°C. 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:S232245682000078-10; DOI: https://dx.doi.org/10.29252/wvj.2020.wvj79

Supplementation of Cod Liver Oil for Giant Prawn

Cod liver oil, Feed, Giant prawn, Saturated fatty acids

Unsaturated Fatty Acids in Giant Prawn (Macrobrachium rosenbergii)

ABSTRACT

The effects of adding lysine essential amino acid to commercial feed on fatty acid parameters were the content of saturated and unsaturated fatty acids in pangasius fish meat. The observed differences in the content of saturated fatty acids, MUFA and PUFA in pangasius. The present results indicated the use of lysine in commercial feed was the content of saturated and unsaturated fatty acids in pangasius fish. In the present research, an experimental method with completely randomized design was used. Pangasius is a medium to very large freshwater shark catfish primarily used for consumption with high economic value. The content of pangasius fatty acids is higher than in marine fish, especially in the MUFA content of 2.2% (5.9630 mg/dl) was found. An increase in the PUFA content was found in P3 treatment with 3.2% (23.1082 mg/dl). P1, P2 and P3 indicated lower results since marine fish have a lower saturated fatty acid composition than freshwater fish. The present results indicated the use of lysine in commercial feed indicated significant differences in the content of saturated fatty acids, MUFA and PUFA in pangasius fish. Therefore, the present research aimed to determine the effects of adding lysine essential amino acid to commercial feeds on the saturated and unsaturated fatty acids contents of pangasius fish. The treatment was done by adding lysine with different doses including P0 (0%), P1 (1.2%), P2 (1.8%), P3 (2.2%) and P4 (2.6%). The treatment was based on the results of this study indicated that heat stress at the cleavage rate was lower for good and low-quality oocytes exposed to heat stress (K2, K3, K4, K5, and K6), compared to good quality COCs of 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 during maturation severely reduced extrusion of polar body, cleavage, and blastocyst rates. 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:S232245682000078-10; DOI: https://dx.doi.org/10.29252/wvj.2020.wvj79

Abattoir ovaries

Bad quality COCs

Recovery of COCs

Good quality COCs

Control at 38.5 C

Heat shock at 41 C

Heat shock at 42 C

-Camelus expansion (%)
-Extrusion of polar body (%)
-Embryonic development
- Cleavage rate
- Blocked embryo rate
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.