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 -N 527 )-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 Beta lactamase (ESBL) producing Salmonella spp., while the minimum bactericidal concentration of ESBL-producing Salmonella spp. was reported as 0.15 mg/ml and 0.3 mg/ml, respectively. Consequently, the expression of antibiotic resistance genes (i.e., ESBLs) was downregulated in both bacteria species and there was a noticeable toxic effect of AgNPs on Salmonella spp. Despite the presence of modern antibacterial drugs, bacterial infections are still a major problem. Rabbits are considered an important and healthy source of animal protein all over the world. Coccidiosis: A Parasitic Disease of Significant Importance in Rabbits. World Vet. J. 10(4): 495-507.


Keywords:
- Antibiotic resistance genes
- Pigeons
- Prevalence
- Salmonella spp.
Phylogeny, Sarcocystis 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 species were most closely related to S. moulei, bradyzoites were characterized by possessing a double-membrane pellicle and consisted of a 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 Sarcoctis species of S. gigantea and S. medusiformis is questionable.

Keywords: Brucellosis, Cattle, Complement fixation test, ELISA, Human, Rose Bengal test, Sheep, Ultrastructure, 18S rRNA
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 distribution of CPV prevalence among dogs of different ages, breeds, and seasonal variations. A total of 122 dogs suffering from vomiting and diarrhea were screened by antigen rapid CPV/Canine parvovirus Ag test kit for the diagnosis of CPV infection from March 2012 to February 2013. The diagnosis was performed following DNA extraction from the isolated bacteria. Buffalo and camel were reared on feeds containing S-methyl cysteine (SMC) and thiobencarb added to feeds at concentrations of 0, 200 mg SMC/kg and 36 µg thiobencarb/L, respectively. The results indicated that fish exposed to thiobencarb resulted in DNA damage, oxidative stress and histopathological changes. Moreover, histopathological findings were in line with other results. The oxidative damage in thiobencarb intoxicated fish.
Mngumi S, Makungu S and Mdetele D. research recommended the strengthening of control measures against this disease in the respective. Therefore, 3.8%, 13%, and 0.5% were reported as CBPP prevalence, case fatality rate, and mortality rate, respectively. Moreover, 56, 426, and 11147 cases were reported as deaths, and the cattle at risk was 1,56, 42, and 1114, 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 used data from archived information 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 forms. 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 investigated herbs, including coriander (Coriandrum sativum), oregano (Origanum vulgare), thyme (Thymus vulgaris), basil (Ocimum basilicum), dill (Anethum graveolens), rosemary (Rosmarinus officinalis), lavender (Lavandula angustifolia), and peppermint (Mentha spicata). A total of 50 individuals of each herb species and 150 juvenile Nile tilapias were distributed in 5 aquaponic modules. The survival rate, growth, and biomass production were measured for the investigated herbs and tilapias. All the herb species survived against the NFT aquaponic conditions. The findings indicated that the herb survival was species-dependent and ranged 42-98%. There was a significant effect of the herb species both on height and biomass gains. Post hoc comparison showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, coriander, oregano, thyme, and basil showed better growth compared to the other herbs. The Nile tilapia also showed better growth on the supplemented diets. Overall, the study demonstrated the potential of aquaponics as a sustainable production system for culinary herbs and tilapias.
Clostridium perfringens

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


There is an increasing interest in the application of natural antimicrobials instead of chemical preservatives, compared to control and other treatments. The results revealed that the addition of different natural antibacterial additives with various protective culture, nisin, lysozyme, and natamycin) bacteria, compared to control and other treatments.

Aerobic spore-forming bacteria, Lysozyme, Nisin, Natamycin, Protective culture
Appendicular bone fractures in small animal practice constitute a major challenge facing veterinarians around the world. These fractures can affect a wide variety of species, including dogs and cats. The incidence of fractures varies depending on age, breed, and gender. In a retrospective study conducted at the Veterinary Teaching Hospital of Cairo University and some private clinics in Egypt, a total of 100 cases of fractures were recorded over a period from January 2017 to January 2020.

The study included a variety of fractures, including simple, complete, and comminuted fractures. The affected bones mainly included the femur, tibia, fibula, humerus, radius, ulna, and other bones. The fractures were classified according to the specific limb (forelimbs/hind limbs), specific bone fractures (Humerus, radius, ulna, femur, tibia, and fibula), extent of tissue damage (open or closed fractures), shape of the fracture line (transverse, oblique, or spiral), and completeness of fracture (comminuted, incomplete, or complete). The fracture sites were classified as proximal, diaphyseal, or distal zones.

The highest incidence of fractures was recorded in dogs, with a male-to-female ratio of 1.5:1. Dogs younger than one year old were more prone to fractures, with a higher incidence recorded in Miniature breeds and svelte breeds. Male dogs and cats showed a higher percentage of fractures compared to females. The bone fracture mostly occurred in dogs younger than one year old, with a significantly higher recorded incidence in females compared to males. The bone fractures were mostly recorded in the forelimbs, with a higher incidence in the left forelimb compared to the right forelimb.

The bone fractures were mostly classified as incomplete or complete. The fractures were mostly transverse or oblique, with a higher incidence of incomplete fractures compared to complete fractures. The fracture sites were mostly recorded in the proximal diaphyseal zone, with a higher incidence in the femur, tibia, and fibula. The fracture lines were mostly transverse or oblique, with a higher incidence of incomplete fractures compared to complete fractures.

The bone fractures were mostly recorded in the left forelimb, with a higher incidence in the left hind limb compared to the right hind limb. The bone fractures were mostly recorded in the proximal diaphyseal zone, with a higher incidence in the femur, tibia, and fibula. The fracture lines were mostly transverse or oblique, with a higher incidence of incomplete fractures compared to complete fractures.

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**ABSTRACT**

Research Paper

The effect of dietary supplementation of cod liver oil on the ratio of saturated and unsaturated fatty acids in giant prawn. This research was conducted in Macrobrachium rosenbergii. The aim of this study was to determine the effect of adding cod liver oil to commercial feed on the ratio of saturated and unsaturated fatty acids in giant prawn. The groups were named K1 and K2 representing good and low-quality COCs incubated at 38.5°C. The cleavage rate was lower for low quality (K2; 63 ± 1.28) than good quality (K1; 97 ± 1.28). Additionally, the embryo cleavage rate was significantly lower for good and low-quality COCs exposed to 42°C (K2; 9 ± 0.22) than K1 (15 ± 0.22). The results of this study indicated that exposure of camel COCs to heat stress at 41°C and 42°C 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): 658-664. DOI: https://dx.doi.org/10.2925/2020.wvj78

**Key words:** heat stress, cumulus-oocytes complexes, embryo development, fetal development, heat stress effect.
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.