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 $^N$527-$^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
Samples (i.e., wound swabs, fecal swabs, and urine samples) were collected from dogs and E. coli were confirmed as ESBL producing. Silver nanoparticles indicated a promising antibacterial activity and could be considered an applicable alternative for the treatment of multidrug-resistant bacteria. A clinical blood test was performed, the mineral composition of the diet of heifers was measured monthly, and a hair analysis was conducted. Copper nanoparticles in a dose of 0.04 mg/kg were orally administered daily to the usual diet. The obtained results indicated that the addition of copper nanopowder to the diet of heifers increased sodium, calcium, and phosphorus compared to these parameters at the beginning of the experiment. The susceptibility of Salmonella spp., while the minimum bactericidal concentration of ESBL-producing E. coli and Klebsiella was measured as 0.31 mg/ml and 0.62 mg/ml, respectively.

Despite the presence of modern antibacterial drugs, bacterial infections are still a major problem due to the enormous increase in multi-drug-resistant bacteria. Nanoparticles have been extensively used as an applicable and safe alternative to antibiotics. Reports of their minimum inhibitory concentration and minimum bactericidal concentration have been published. In this research, the antibacterial potential of silver nanoparticles was tested in vitro.

In summary, the results of this study indicate the promising antibacterial activity of silver nanoparticles and their potential as an applicable alternative to antibiotics.

Keywords: silver nanoparticles, antibacterial activity, multi-drug-resistant bacteria, applicability, alternative to antibiotics.
Macroscopic sarcocysts were isolated from the infected sheep. The macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The species isolated from macroscopic sarcocysts from sheep and goats were most closely related to S. medusiformis and S. gigantea. The cysts contained numerous merozoites and banana-shaped bradyzoites. The structure of the sarcocysts was investigated by both scanning and transmission electron microscopy. The findings from the phylogenetic analysis revealed that the identified S. medusiformis species were most closely related to S. medusiformis isolated from humans in New Valley Governorate, Egypt. This study aimed to identify S. medusiformis as a public health concern in the New Valley Governorate and to assess the risk factors associated with the infection. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans. The prevalence in humans and animals in the region of study may include restriction of the marketing of raw milk and enhancing public health awareness.
Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, especially in young, unvaccinated puppies and exotic breeds were more prone to CPV infection. This study aimed to investigate the potential risk factors associated with the disease to construct the ideal preventive measures.

**ABSTRACT**

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, age and seasonal variations were risk factors in the prevalence of CPV. 122 dogs suffering from vomiting and diarrhea were screened by antigen rapid CPV/Canine Coronavirus Ag test kit for the diagnosis of CPV infection from March 2012 to February 2013. The prevalence and potential risk factors of parvovirus infection in dogs residing in Egypt. A total of 750 dogs were included in the study. 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.

**Keywords:** Canine parvovirus, Egypt, Epidemiology, Prevalence, Risk factors, CPV, Summer, Spring, Autumn, Winter.
Epidemiological Assessment of Contagious Bovine Pleuropneumonia in Central Tanzania

Central zone of 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 Pleuropneumonia (CBPP) in the Central Zone of Tanzania. The present study used data from 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, 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 lower compared to the situation on-site.

This extensive study must be carried out, since the parameters obtained during the study were archived information of Central Zone Veterinary Centre (CZVC) for the past five years in the laboratory. The investigated LGAs, which reported CBPP, were collectives, where CBPP was a seasonal problem in Central Tanzania. Therefore, the present study recommended the strengthening of control measures against this disease in the Central Zone of Tanzania.

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

A total of 450 both unsexed Pekin and Sudani ducklings (225 per each breed) one-day-old were 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, treatments 2 and 3 received basal diets supplemented with 300 and 450 mg/kg diet L-carnitine (LC), respectively, while treatments 4 and 5 received basal diets supplemented with 400 and 600 μg/kg diets Yeast chromium (Cr), respectively. The results indicated that growing duckling treatments 2 and 3 received basal diets supplemented with 300 and 450 mg/kg diet L-carnitine without any adverse effect on carcass quality as well as economic efficiency.

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 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, treatments 2 and 3 received basal diets supplemented with 300 and 450 mg/kg diet L-carnitine (LC), respectively, while treatments 4 and 5 received basal diets supplemented with 400 and 600 μg/kg diets Yeast chromium (Cr), respectively. The results indicated that growing duckling treatments 2 and 3 received basal diets supplemented with 300 and 450 mg/kg diet L-carnitine without any adverse effect on carcass quality as well as economic efficiency.

Survival and Productivity of Culinary Herb Species in a Nutrient Film Technique-type Aquaponic System

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, respectively. The investigated herbs included coriander (Coriandrum sativum), dill (Anethum graveolens), basil (Ocimum basilicum), thyme (Thymus vulgaris), peppermint (Mentha piperita), chamomile (Matricaria chamomilla), samat (Ocimum sanctum), and parsley (Petroselinum crispum). Among the investigated herbs, Eryngium foetidum showed the highest survival rate and biomass production, while O. basilicum showed the highest growth rate. The investigated herbs, Thymus vulgaris, and Ocimum sanctum showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, Ocimum basilicum showed the highest post hoc comparison. The investigated herbs, Thymus vulgaris, and Ocimum sanctum showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, Ocimum basilicum showed the highest post hoc comparison. The investigated herbs, Thymus vulgaris, and Ocimum sanctum showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, Ocimum basilicum showed the highest post hoc comparison. The investigated herbs, Thymus vulgaris, and Ocimum sanctum showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, Ocimum basilicum showed the highest post hoc comparison. The investigated herbs, Thymus vulgaris, and Ocimum sanctum showed interspecific differential abilities to grow biomass in NFT aquaponics conditions. Among the investigated herbs, Ocimum basilicum showed the highest post hoc comparison.
A study was conducted to identify the virulent factors of Clostridium perfringens locally isolated from different species in Egypt. 135 intestinal samples were collected from various animal species from different localities. The study aimed at elucidating the virulence factors of Clostridium perfringens isolates, particularly their ability to produce many virulence factors. Samples were subjected to PCR for the detection of CPA, CPE, and Net B genes. The results showed that 14% of isolates had CPA gene, whereas 7% of isolates had CPE gene. Moreover, 23% of chicken and cattle intestinal samples contained CPA, Net B, and CPE genes as virulence factors. Consequently, those isolates are considered more virulent strains. The study provides valuable information for the development of methods to control the spread of these virulent strains.
Incidence of Appendicular Bone Fractures in Dogs and Cats: A Retrospective Study at a Referral Veterinary Teaching Hospital, Cairo University and some Private Clinics in Egypt

Kartiika Sar Dk and Apritha D (2020). Urinary Bladder Stone Removal Surgery in Sulcata tortoise (Geochelone sulcata) with

Lateral Plastron Osteotomy Technique.


Abo-Soliman AAM, Ahmed AE and Farghali HAMA.
The existence of feed plays an important role in aquaculture activities. This is due to the dominant influence on fish feed growth. Feeding with the right nutritional components can cause 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 content of saturated fatty acids is an important parameter. In the present research, an experimental method with completely randomized design was used. 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 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 caused significant differences in the content of saturated fatty acids, MUFA and PUFA in pangasius. 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 feeds on the saturated and unsaturated fatty acids contents of pangasius fish. In the present research, an experimental method with completely randomized design was used. 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 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 caused significant differences in the content of saturated fatty acids, MUFA and PUFA in pangasius.
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.