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 reproduction 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-N7)-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
Synergy tests were carried out for the identification of ESBL producing Klebsiella. Antibiotic resistance genes were downregulated in both bacteria species and there was a synergist in both samples. The minimum bactericidal concentration of ESBL-producing E. coli was reported as 0.15 mg/ml and 0.3 mg/ml, respectively. Consequently, the expression of antibiotic resistance genes (i.e., tet, bla, sul, tet) was assessed as well as their effect on the structural integrity of the bacterial cells using Scanning Electron Microscope (SEM). Results revealed that 23 isolates (19.16%) (E. coli, Klebsiella) were confirmed as ESBL producing. Silver nanoparticles indicated a promising antibacterial effect where the minimum inhibitory concentration of AgNPs for ESBL producing E. coli was found sensitive to ciprofloxacin, followed by colistin (62.1%), kanamycin (55.2%), and gentamicin (48.3%). 96.6% of isolates were sensitive to ciprofloxacin, followed by both sulfamethoxazole-trimethoprim and tetracycline (86.2%). In contrast, 65.5% of isolates were resistant to ampicillin, followed by both sulphonamides and tetracycline (86.2%).

Keywords: Silver nanoparticles, Antibiotic resistance, Klebsiella, E. coli, ESBL, Antibiogram, Antibiotic resistance genes, Pigeons, Prevalence, Salmonella.
## ABSTRACT

Bradyzoites were characterized by possessing a double-membrane pellicle and consisted of a subterminal nucleus, numerous micronemes, and two rhoptries. The mitochondrial conoid was located in one of the apices. The species isolated from macroscopic sarcocysts from sheep and goats were identified as *Sarcocystis medusiformis* and *Sarcocystis gigantea* respectively. Cross-infection may also occur between them and the host specificity of these *Sarcocystis* species is questionable.

Macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The species were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the infection prevalence in humans and animals in the region of study may include restriction of the marketing the raw milk and enhancing public health awareness.

## Keywords:
- *Sarcocystis*
- *S. medusiformis*
- *S. gigantea*
- Cross-infection
- Host specificity

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## ABSTRACT

Research Paper

Polymorphism Association of Pituitary Positive Transcription Factor-1 Gene with Body Productivity. This research was conducted to detect Single Nucleotide Polymorphism in the exon 6 Pituitary Positive Transcription Factor-1 gene and its association with the bodyweight growth 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. Day Old chick hatched were maintained during 49 days, the bodyweight on the 49th day was measured every seven days, DNA was isolated by Chelex 5% method, Pituitary Positive Transcription Factor-1 gene fragment was amplified by PCR, and the fragment was sequenced. The DNA sequence was aligned using Clustal omega software to gain Single Nucleotide Polymorphism.

The Single Nucleotide Polymorphism was analyzed using the Pearson correlation test between the Polymorphism points and chicken body weights of 49-days-old chickens. The conclusion was 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 but it was found in the first filial broiler chicken.

## Keywords:
- Polymorphism
- Pituitary Positive Transcription Factor-1 gene
- Body productivity
- Breeding between Female F1 Broiler and Male Pelung.

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## ABSTRACT

Brucellosis, Cattle, Complement fixation test, ELISA, Human, Rose Bengal test, New Valley Governorate, Egypt. A cross-sectional study was carried out from December 2018 to February 2020 to determine the prevalence of brucellosis in the New Valley Governorate. 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 further analyzed by complement fixation test, enzyme-linked immunosorbent assay (ELISA). The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans with no significant difference. Considering the human occupation, abattoir workers were the most predominant group of people at risk (33.3%), followed by farmers (31.25%) and animal keepers (20.6%) while the lowest prevalence was demonstrated in housewives where the prevalence was 18.8%.

Furthermore, men (26.11%) were more inclined to be inflicted, whereas women (22.5%) were at a lower risk. The prevalence of infection in EL Kharga district was 29.4%, in El Quseir district was 9.6%, and in El Basha district was 23.9%. The prevalence in males was 26.11% while in females was 22.5%. The highest prevalence was in the age range of 15-24 years (34.06%) followed by 25-34 years (23.4%). Moreover, the prevalence of human brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans, with no significant difference. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans with no significant difference. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans with no significant difference. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans with no significant difference. The prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans with no significant difference.

## Keywords:
- Brucellosis
- New Valley Governorate
- Egypt
- RBT
- ELISA
- Complement fixation test
- Human occupation
- Risk factors

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## ABSTRACT

Goats, Sheep, Ultrastructure, 18S rRNA. This study aimed to identify the species most closely related to *S. medusiformis* and *S. gigantea* respectively, cross-infection may also occur between them and the host specificity of these *Sarcocystis* species is questionable. The ultrastructure of the sarcocysts was investigated by both scanning and transmission electron microscopy. The macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The species were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the infection prevalence in humans and animals in the region of study may include restriction of the marketing the raw milk and enhancing public health awareness.
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 season, the higher prevalence was noticed in summer (77.1%) followed by spring (55.5%), age, and vaccination of each dog were recorded to study the prevalence of CPV. 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 which was 53.3%. The lowest prevalence of CPV was reported in dogs above 6 months of age (20%). The maximum prevalence was noticed in non-descript dogs (48.5%) followed by German shepherds (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%), 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. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.
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 Central Zone Veterinary Centre (CZVC) for the past five years in the Central Zone,Contagious bovine pleuropneumonia, Prevalence and distribution,

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 were investigated in the current study. The experimental period lasted 12 weeks of age. The results indicated that growing duckling without any adverse effect on carcass quality as well as economic efficiency. L-carnitine, Pekin ducks, Productive Performance, Sudani ducks, Yeast chromium.

We calculated 450 both unsexed Pekin and Sudani ducklings. The investigated herbs included coriander (Coriandrum sativum L.), thyme (Thymus vulgaris L.), oregano (Origanum vulgare L.), basil (Ocimum basilicum L.), dill (Anethum graveolens L.), peppermint (Mentha spicata L.), and basil (Ocimum basilicum L.). 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 each experimental treatment. The investigated herbs, a significant effect of the herb species both on height and biomass gains. Post hoc comparison management could improve plant performance.


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ABSTRACT

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

Clostridium perfringens is a gram-positive bacterium that is widespread in the environment and can cause disease in animals and humans. It is known for its ability to produce many virulence factors. In the current study, 135 intestinal samples were collected from different species, including chicken, cattle, and horses, and were analyzed for the presence of virulence factors. The PCR was carried out to elucidate the virulence factors. It was found that 74% of isolates had CPA gene and 35% contained CPA, Net B, and CPE genes as virulence factors. Consequently, those isolates are highly recommended to be used in the preparation of enterotoxemia and necrotic enteritis vaccines as they are more virulent strains.

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

Incidence of Appendicular Bone Fracture in Dogs and Cats: Retrospective Study at Veterinary Hospital of Cairo University and some Private Clinics in Egypt.

In January 2017, a report of our retrospective study was presented. The study involved 77 dogs, and 24 cats that were referred to the veterinary teaching hospital, faculty of veterinary medicine, Cairo University and some private clinics in Egypt with appendicular bone fractures. Excluding mongrel dogs and cats, the highest incidence of fracture-cases in dogs was recorded more frequently in dogs than cats. In dogs, the most common fractures in the femur, complete transverse distal radial/ulnar fractures. In conclusion, appendicular bone fracture is a common occurrence in dogs and cats. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. In mongrel dogs, and cats as rescued individuals. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen mainly in females. The bone fracture mostly occurred in dogs younger than one-year-old, while those in cats were seen main...
ABSTRACT

The effects of adding lysine essential amino acid to commercial feed on fatty acid contents of Pangasius fish. The present research aimed to determine the effects of adding lysine essential amino acid to commercial feed on the fatty acid contents of Pangasius fish. The use of lysine in commercial feed indicated significant differences in the content of saturated fatty acids, Monounsaturated Fatty Acids (MUFA) and Polyunsaturated Fatty Acids (PUFA) in Pangasius. The lowest content of saturated fatty acids was found in P3 treatment with 3.2% Lysin (23.1082 mg/dl). P1, P2 and P3 indicated lower results than control treatments (P0). The use of lysine in commercial feed caused significant differences in the content of saturated fatty acids, MUFA and PUFA in pangasius.

Key words: Lysine essential amino acid, Saturated fatty acids, Unsaturated fatty acids.

References:


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Soliman MMH, Kandil MM, Elnemr SA and Abuelnaga ASM.


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.