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-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
Moreover, the effect of silver nanoparticles on the expression of antibiotic resistance genes (i.e., E. coli) was noticeable toxic effect of AgNPs on E. coli. World Vet. J. cats. Phenotypic and molecular identification, antibiotic susceptibility testing, and double-disk synergy test were carried out for the identification of ESBL producing Klebsiella spp. cells which was investigated using SEM. It can be concluded that silver nanoparticles have a promising antibacterial activity and could be considered an applicable alternative for the control of ESBL producing bacteria. Khalil OA, Enbaawy MI, Salah T, Mahmoud H and Ragab E. The present study aimed to explore the inhibitory effect of silver nanoparticles on Extended Sulfonamide-resistant Enterobacteriaceae (ESBL). World Vet. J. 17, 514-524. ESBLs E. coli and Klebsiella spp. Isolated from Pet Animals. 514-524.

Keywords: Nanoparticles have been extensively used as an applicable and safe alternative to antibiotics. Research Paper looking into the antibacterial effect where the minimum inhibitory concentration of AgNPs for ESBL producing E. coli, Klebsiella spp. was 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli. The susceptibility of Salmonella spp. was 29% in sampled birds. The highest antibiotic susceptibility level of Salmonella spp. was 62.1% to colistin, followed by kanamycin (55.2%), and ciprofloxacin (48.3%). 96.6% of Salmonella spp. were confirmed as ESBL producers. In conclusion, pigeons as carriers of antibiotic-resistant Salmonella spp. were investigated in Bangladesh. Different bacteriological and biochemical tests were used for the isolation and identification of Salmonella spp. Bupasha ZB, Begum R, Karmakar S, Akter R, Bayzid M, Ahad A and Sarker MS.

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Canine parvovirus (CPV) infection is a global infectious and contagious viral disease of canine, which causes severe gastrointestinal illness resulting in high morbidity and mortality. The overall prevalence of CPV infection in dogs was reported as 59.7%. Dogs between 0–12 months of age were most affected. Dogs that died were not vaccinated, but the CPV infection was widespread in vaccinated dogs as well. The higher prevalence was noticed in summer (77.1%) followed by spring (55.5%). The most affected breeds were German shepherd (26.7%), Doberman (23.07%), and Griffon (16.6%). Among different risk factors, age, seasonal variations, and vaccination status were risk factors in the prevalence of CPV disease. 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 Central Tanzania. The study found that CBPP is a seasonal problem in the region, with more cases reported between August to December. The disease was reported by 10 Local Government Authorities (LGAs) in the Central Zone over the past five years. A total of 56, 426, and 11147 cases were reported as deaths, and the cattle at risk were reported through 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 were reported through Event Mobile Application (EMA-i) reports submitted to the zone. The study also revealed that there was a clear temporal pattern of CBPP occurrence, with more cases being reported between August to December.

The study recommended the strengthening of control measures against this disease in the Central Zone. This conclusion was based on the parameters obtained during the study, which showed that CBPP was a seasonal problem in Central Tanzania. Therefore, the present study concluded that CBPP is a seasonal problem in Central Tanzania and recommended the strengthening of control measures against this disease.
Identifying the Virulent Factors of Clostridium perfringens Locally Isolated from Different Species.


The factors influencing the risk of C. burnetii seropositivity in horses:

- Contact with animals
- Housing
- Presence of ticks

Coxiella Burnetii infection was significantly higher in horses that were in contact with small ruminants (RR: 15.6). The univariate analysis of risk factors for Coxiella Burnetii infection in horses (

- Breed
- Housing
- Presence of ticks

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, natamycin) and combination of nisin and lysozyme had the most significant reduction of aerobic spore-forming bacteria.

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Nisin (25 mg kg⁻¹)</th>
<th>Lysozyme (100 mg kg⁻¹)</th>
<th>Natamycin (40 mg kg⁻¹)</th>
<th>Nisin + Lysozyme (25 mg kg⁻¹ + 100 mg kg⁻¹)</th>
</tr>
</thead>
<tbody>
<tr>
<td>T1</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
</tr>
<tr>
<td>T2</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>Nisin (25 mg kg⁻¹)</td>
</tr>
<tr>
<td>T3</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>Lysozyme (100 mg kg⁻¹)</td>
</tr>
<tr>
<td>T4</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>Natamycin (40 mg kg⁻¹)</td>
</tr>
<tr>
<td>T5</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>Nisin + Lysozyme (25 mg kg⁻¹ + 100 mg kg⁻¹)</td>
</tr>
<tr>
<td>T6</td>
<td>No additives</td>
<td>No additives</td>
<td>No additives</td>
<td>Nisin (25 mg kg⁻¹) + Lysozyme (100 mg kg⁻¹)</td>
</tr>
</tbody>
</table>

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 significantly reduced the microbial spoilage in low-salt soft cheese.
Incidence of Appendicular Bone Fracture in Dogs and Cats: Retrospective Study at
Appendicular bone fractures in small animal practice constitute a major challenge facing
among 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
fracture cases and this incidence correlated with some predisposing factors (including breeds,
sex and age). Macroscopic examination of radiographs and clinical records for 350 cases were
reviewed. This study aimed to evaluate the prevalence of appendicular bone fractures among
dogs and cats treated at a referral veterinary teaching hospital, faculty of veterinary
medicine, Cairo University, and some private pet clinics in Cairo district, Egypt to identify and
determine the prevalence of appendicular fractures arising from trauma in dogs and cats treated
from January 2017 to January 2020, and emphasizing the information that characterized the
research was to conduct a green synthesis of Ag-NPs using the cell-free supernatant of
Lactobacillus brevis bacteria, while those synthesized from plasma membrane and cell wall. In conclusion, the biosynthesized Ag-NPs have applications as antimicrobial agent.
Lactobacillus plantarum
ABSTRACT
Urinary Bladder Stone Removal Surgery in Sulcata tortoise (Geochelon sulcata) with
plastron is an appropriate osteotomy technique, especially for the immediate opening of the
urinary bladder. Radiographic results revealed that there was a radiopaque urinary
calculi in the urinary bladder. Clinical signs and radiographic examination indicated urinary
loss of appetite, and lameness. Using the UV-visible spectrophotometer, the biosynthesis of silver nanoparticles was examined and imaged by a transmission electron microscope that indicated damage to the plasma membrane and cell wall. In conclusion, the biosynthesized Ag-NPs have applications as antimicrobial agent.
Lactobacillus brevis

ABSTRACT
The biosynthesis of silver nanoparticles (Ag-NPs) is a new methodology in nanotechnology with many potential applications. In this study, we aim to perform the biosynthesis of Ag-NPs using the cell-free supernatant of Lactobacillus brevis (ATCC® 10536™) and L. plantarum (ATCC® 10231™). The effect of these nanoparticles on Candida albicans (ATCC® 10231™) and Escherichia coli (ATCC® 27853™) was examined and imaged by a transmission electron microscope that indicated damage to the plasma membrane and cell wall. In conclusion, the biosynthesized Ag-NPs have applications as antimicrobial agent.
Unsaturated Fatty Acids in Giant Prawn (Pangasius spp.)

ABSTRACT

The distribution of fatty acids in the Pangasius fish is high in unsaturated fatty acids, especially omega-3 fatty acids, which are beneficial for human health. The use of lysine in commercial feed indicated significant decreases in the content of saturated fatty acids, MUFA, and PUFA in pangasius. The treatment was done by adding lysine with different doses including P0 (0%), P1 (1.2%), P2 (2.2%), P3 (3.2%). Each treatment was repeated five times. The main parameters studied were water quality, MUFA, and PUFA. The results showed that the use of lysine in commercial feed indicated significant decreases in the content of saturated fatty acids, MUFA, and PUFA in pangasius.

Keywords: Lysine, essential amino acid, saturated fatty acids, unsaturated fatty acids.

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.