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.

Campylobacter fetus subspces 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 subspces 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 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 subspces. 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 subspces against different tested antibiotics. The results of this study can be used to implement molecular surveillance of Campylobacter fetus subspces and conduct further studies on the resistance mechanism in these subspces.

Keywords: Broad-specificity multidrug efflux pump, Campylobacter fetus subspces, Genome analysis, Methyltransferase gidB, Multidrug resistance.
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.
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
Nanoparticles have been extensively used as an applicable and safe alternative to antibiotics, threatening problem due to the enormous increase in multi-drug-resistant bacteria. E. coli ESBL-producing spp. was confirmed as ESBL producing. Silver nanoparticles indicated a promising antibacterial effect where the minimum inhibitory concentration of AgNPs for ESBL producing K. pneumonia spp. was reported as 0.15 mg/ml and 0.3 mg/ml, respectively. Consequently, the expression of K. pneumonia ESBL producing bacteria was measured as 0.31 mg/ml, and 0.62 mg/ml for ESBL-producing E. coli. Despite the presence of modern antibacterial drugs, bacterial infections are still a major threat due to the development of resistance. Antibacterial activity is a promising alternative to control of ESBL producing bacteria. Hence, the antibacterial potential of silver nanoparticles was tested for their in vitro antibacterial potential.

In Vitro Investigation of the Antibacterial Effect of Silver Nanoparticles on Escherichia coli and Klebsiella pneumoniae

Bapasha ZB, Begum R, Karmakar S, Akter R, Bayzid M, Ahad A and Sarker MS.

In vitro investigation of the antibacterial effect of silver nanoparticles on ESBL-producing E. coli and Klebsiella spp. isolated from apparently healthy pigeons in a live bird market in Chattogram, Bangladesh. This study was designed to investigate the antibacterial potential of silver nanoparticles against ESBL-producing E. coli and Klebsiella pneumoniae spp.

In conclusion, pigeons as carriers of antibiotic-resistant Salmonella spp. should be considered in risk assessment of antibiotic resistance. The susceptibility test is an essential step to define the antimicrobial spectrum of the bacterial isolate. Further studies are necessary to explore the potential of silver nanoparticles as an alternative treatment of ESBL-producing bacteria and the risk of antibiotic resistance in pigeons.

Keywords: Salmonella, Antimicrobial resistance, Silver nanoparticles, Antimicrobial susceptibility testing.
Macroscopic Sarcocysts of Domestic Sheep and Goats in Soran City, Erbil, Iraq. To the authors' knowledge, this is the first time the presence of sarcocysts has been investigated in Soran City, Erbil, Iraq. Microscopic and molecular analysis were conducted to determine the prevalence of sarcocysts and their species in domestic sheep and goats. 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 esophagi, and the isolated species were investigated for their morphological and ultrastructural characteristics. A total of 1000 esophagi were collected from sheep and goats and examined for the presence of sarcocysts. Macroscopic sarcocysts were detected in 9.1% (91/1000) of the esophagi. The species of Sarcocystis were identified molecularly by 18S rRNA gene sequence analysis. Moreover, the prevalence of brucellosis was 0% in cattle, sheep, and goats while it was 23.9% in humans. Considering the human occupation, the 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, prevalence and potential risk factors of parvovirus infection in dogs residing in Egypt. A total of 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 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 infection. Identification of the potential risk factors associated with the disease may be helpful to construct the ideal preventive measures.

**Keywords:** Canine parvovirus, Egypt, Epidemiology, Prevalence, Risk factors


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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 archived information of Central Zone Veterinary Centre (CZVC) for the past five years. Moreover, 56, 426, and 11147 cases were reported as deaths, and the cattle at risk were 19, 506, and 43, 423, 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 found that out of 14 Local Government Authorities (LGAs) in the Central Zone, 10 reported the disease in the past five years. This extensive study must be carried out, since the parameters obtained during the study were recommended the strengthening of control measures against this disease in the central zone of Tanzania. In order to be able to assess the actual burden of the disease on-site, research recommended the strengthening of control measures against this disease in the central zone of Tanzania.
Identifying the Virulent Factors of Clostridium perfringens Locally Isolated from Different Species


Abstract

The objective of this study was to identify the virulent factors of Clostridium perfringens locally isolated from different animal species of different localities in Egypt. Samples were collected from different animal species of different localities in Egypt. Samples were subjected to isolation and identification (morphologically and biochemically) for obtaining Clostridium perfringens. The PCR was carried out to elucidate the virulence factors. It was highly recommended to be used in the preparation of enterotoxemia and necrotic enteritis vaccines as they are more virulent strains.

Results

Out of 135 intestinal samples, 26 isolates (19.25%) were positive for Clostridium perfringens. The PCR was carried out to elucidate the virulence factors. It was indicated that all the 26 isolates 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.

Conclusion

The study demonstrates the ability of Clostridium perfringens to produce many virulence factors. In the current study, 135 intestinal samples were collected from different animal species of different localities in Egypt. Samples were subjected to isolation and identification (morphologically and biochemically) for obtaining Clostridium perfringens. The PCR was carried out to elucidate the virulence factors. It was highly recommended to be used in the preparation of enterotoxemia and necrotic enteritis vaccines as they are more virulent strains.

Keywords:

Clostridium perfringens, PCR, virulence factors, enterotoxemia, necrotic enteritis.
Abo-Soliman AAM, Ahmed AE and Farghali HAMA. The incidence of fracture cases and this incidence correlated with some predisposing factors (including breeds, weight, age, and gender) and causative agents that resulted in different types of appendicular bone fractures. Incidence was compared to cats. The highest records of fracture were in mongrel dogs, and cats as rescued were recorded more frequently in dogs than cats. In dogs, the most common fractures in the femur, diaphyseal radial/ulnar, complete transverse distal radial/ulnar fractures. In conclusion, appendicular bone fractures were better assessed in veterinary orthopedic surgeons concerning affected limb and bone as well as the extent of tissue damage, site, and shape of the fracture line. Therefore, this retrospective study was designed to provide descriptive data at 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 population (breed, age, gender, and animal size). The investigated fractures were classified according to the location (forelimbs, hindlimbs), bone type (diaphyseal, metaphyseal), fracture type (comminuted), and the direction of the fracture line (transverse, oblique or spiral). From the private clinics in Egypt showed high incidence (87% in dogs and 71.8% in cats) out of total veterinary visits. The World Vet. J. recorded 634-637}

Keywords: Antimicrobial Activity, Lactobacillus brevis, Pseudomonas, Nanoparticles, Transmission electron microscope

Lactobacillus plantarum

Silver Nanoparticles

Antimicrobial Activity

Ag-NPs synthesized from Lactobacillus plantarum recorded the maximum activity against Candida albicans and Escherichia coli compared to Gram-positive bacteria (ATCC® 10536™). The biosynthesis of silver nanoparticles (Ag-NPs) is a new methodology in nanotechnology with applications as antimicrobial agents in the medicine and food industry. Research Paper

Escherichia coli

Pseudomonas

Nanoparticles appeared in spherical or polyhedral form, poly-dispersed and their diameter was measured with the help of Transmission electron microscope for the determination of the size and morphology of the nanoparticles. Nanoparticles with a face-centered cubic (FCC) structure. The biosynthesized Ag-NPs were more effective against Gram-negative bacteria (ATCC® 10231™). The effect of these nanoparticles on the bacterial wall and plasma membrane and cell wall. In conclusion, the biosynthesized Ag-NPs have applications as antimicrobial agents. Syame SM, Mansour AS, Khalaf DD, Ibrahim ES and Gaber ES. The biosynthesis of silver nanoparticles (Ag-NPs) is a new methodology in nanotechnology with applications as antimicrobial agents in the medicine and food industry.

Urinary calculi, Cystotomy, Plastron osteotomy, Sulcata tortoise

Keywords: Antimicrobial activity, Lactobacillus brevis, Pseudomonas, Nanoparticles, Transmission electron microscope

Lateral Plastron Osteotomy Technique.

Silver

Lactoba

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The Effect of Dietary Supplementation of Cod Liver Oil on Ratio of Saturated and Unsaturated Fatty Acids in Giant Prawn

ABSTRACT

Marzuki L, Agustono and Rahardja BS.

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 influence. So, this study aims to determine the effect of adding cod liver oil to commercial feed in the ratio of saturated and unsaturated fatty acids to the meat of giant prawn. This research was conducted by adding cod liver oil to commercial feed with the following doses: 0%, 1%, 2%, 3%, 4%, and 5% of cod liver oil. This study was conducted on 150 Macrobrachium rosenbergii grown in a 250-l tank with a CaCl2 parameter water quality. The present results indicated 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 meat; a decrease in the contents of Pangasius Fish.

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


Camelus dromedaries with different qualities. Therefore, the present study aimed to investigate the effect of heat stress on developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities. World Vet. J. 10 (4): 658-664, 2020; pii:S232245682000080-10; DOI: https://dx.doi.org/10.2925/2020.wvj79

Camelus dromedaries with different qualities. Therefore, the present study aimed to investigate the effect of heat stress on developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities. World Vet. J. 10 (4): 665-672, 2020; pii:S232245682000081-10; DOI: https://dx.doi.org/10.2925/2020.wvj80

Camelus dromedaries with different qualities. Therefore, the present study aimed to investigate the effect of heat stress on developmental competence of in vitro matured oocytes of Camelus dromedaries with different qualities. World Vet. J. 10 (4): 673-679, 2020; pii:S232245682000082-10; DOI: https://dx.doi.org/10.2925/2020.wvj81
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 \textit{Candida albicans} from raw goat milk samples. Also, this study determined the distribution of virulence genes and the antifungal susceptibility profile of \textit{Candida albicans} isolates. A total of 30 goat milk samples (collected from free-grazing goats) were mycologically examined. The confirmed \textit{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 (\textit{Lactobacillus acidophilus} and \textit{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 \textit{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 \textit{Candida albicans} isolates (0\%). Antifungal sensitivity testing results showed that ketoconazole gave the best activity against \textit{Candida albicans} isolates, followed by fluconazole, nystatin, and itraconazole. All isolates were resistant to terbinafine. Moreover, both \textit{Lactobacillus acidophilus} and \textit{Lactobacillus plantarum} showed antifungal effects against \textit{Candida albicans}, but \textit{Lactobacillus plantarum} was more effective than \textit{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, \textit{Candida albicans}, Goat milk, Virulence genes, Probiotics.