Research article

Recovering cultivation-based identification of *Escherichia coli* from poultry in Al-Diwaniyah, Iraq

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Abstract

Aiming at *Escherichia coli*-based identification, the current work was intended to recover this microorganism from chickens affected by avian pathogenic *Escherichia coli* (APEC). To perform this an investigation from July to November -2015, 200 chicken-gut-based specimens were collected from different locations in Al-Diwaniyah City, Iraq. The affected chickens first investigated for macroscopic lesions such as on the external surface of the lungs that belonged to the affected birds. Gut-related parts such as duodenum suffered characteristic features of inflammation-based signs. Then, samples were cultivated on media agars for recovering APEC, detecting of infection rate, identifying active antimicrobial agents for better treatment. The sick chickens suffered various health problems such as intestinal inflammation and air sacculitis. Using MacConkey, TBX agar, and API-20E, the results showed the presence of these pathogenic microorganisms in the infected parts of these chickens.

Keywords: *Escherichia coli* (APEC), chickens

Introduction

One of the most important and risky diseases that affect poultry around the world is colibacillosis which is induced by Avian pathogenic *Escherichia coli* (APEC) (1). The disease could initiate a form in which septicemic features appear on the affected animals and human as a problematic issues to the health of these hosts (2). These bacteria have the infection-based dissemination to affect parts and organs of the affected bird bodies out of the intestine (3). It has been explained that some APEC-based strains may have the affinity to attack certain wide range of animals and human causing specific diseases in these hosts (4–6). According to certain studies that have been done on specific laboratory animals, some bacteria that belong to pathogenic types of *E. coli* such as APEC may induce zoonotic illnesses to humans (7). Focusing on *Escherichia coli*-based identification and finding the antimicrobial agents of choice, the current work was intended to recover this microorganism from chickens affected by avian pathogenic *Escherichia coli* (APEC) from different locations in Al-Diwaniyah, Iraq.

Materials and Methods

Ethical approval

The Animal Ethical Committee of Veterinary Medicine College, University of Al-Qadisiyah, Iraq, has approved the present study under permission No: 402

Cultivation of bacteria
First, specimens were inoculated from stock in broth media to freshen the bacteria overnight at 37°C. After that, the growths were cultivated on macConkey agar for overnight at 37°C. Then these growths were cultivated on eosin methylene blue (EMB) agar and TBX for overnight at 37°C (8,9).

Clinical signs to be noticed

The disease is characterized by certain signs such as starvation, dehydration, fevers, and decreased weight (10). For postmortem examination, air sacculitis, pericarditis, perihepatitis, and peritonitis represent the active features of this disease in poultry.

Results

The results brought 3 enteropathogenic and 100 other-classified isolates of *E. coli*. According to the morphological recognition on EMB, MacConkey, and TBX agar, the results primarily identified the isolated microorganisms to belong to Enterobacteriaceae that were *E. coli*. To go deeper and identify the strains involved, API 20-based detection was made to perform this process and recognized these strains as shown in figure 1.

![Figure 1: E. coli morphology on media agar. A. EMB. B. TBX](image)

The criteria here are (+++), (+++), (+ - +), (- - +), (++), (+++), and (- + (oxidase-ve)). These are transformed into (1,0,4), (1,0,4), (0,0,4), (0,0,4), (1,0,4), and (1,2,4) that represent (55445723), a code that shows comparison to *Escherichia coli* in the manufacturer's booklet.

![Figure 2: API-20E-based bands for differentiating confirmation of Enterobacteriaceae](image)

(0,0,4), (1,0,4), and (1,2,4) that represent (55445723), a code that shows comparison to *Escherichia coli* in the manufacturer's booklet.

Discussion

The disease, avian colibacillosis, is well-known as a major illness that affects poultry industries in many different regions of the world leaving birds with dangerous health problems. The main characteristics features of these problems are manifested by air sacculitis, pericarditis, perihepatitis, and peritonitis. The disease is, according to world studies, considered as a zoonotic disease especially some strains of *E. coli*. The current work attended to isolate pathogenic *E. coli* from poultry affected by this disease. Here, 200 chickens were used to isolate this bacterium from. Utilizing API 20E packet, we were able to identify strains of *E.coli* that affected these birds. This test was able to recognize the current influential isolates that infected these chickens in the current investigation (11,12). For certainty, these isolates represent pathogenic strains as they showed multidrug resistance against the common used antimicrobial agents in field such as ceftriaxone and amoxiclav, and these agree with the previously performed work (13). Part
of this work was the activities of ciprofloxacin and nalidixic acid that give an indicator for the biosecurity of knowing the pathogenic strains of *E. coli* (13). Gentamicin also showed activities against these strains of the isolated *E. coli* (13). Moreover, doxycycline revealed 66% activities against the isolated pathogenic *E. coli*, and this agrees with (14). The current investigational work gives valued information about the pathogenicity of the *E. coli* strains that infect chickens and the reliability of the tests that were used to perform this research in Al-Diwaniyah, Iraq.

References


10-AE MA Kutkat, S Nagwa. Effect of *Lactobacillus acidophilus* on controlling of clostridium perfringens and *E. coli* infections in native breed chickens, J Egypt Vet Med Assoc. (2002). https://scholar.google.com.eg/citations?user=7SXz0o kAAAAJ&hl=ar#d=gs_md_cita d&p=&u=%2Fcitations%3Fview_op%3Dview_citati on%26hl%3Dar%26user%3DSXz0okAAA J%26c itation_for_view%3DSXz0okAAAAJ%3AMXK_k JrxJIC%26tzom%3D3%26180 (accessed May 9, 2018).


12-NA Campbell, JB Reece, Biology, Benjamin Cummings, (2002).
