Bacteriological Studies on *Escherichia Coli* Infection in Rabbits

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Abstract

A total number of 125 diseased rabbits collected from different farms in Port said Governorate during the period from January 2016 till March 2017 showing clinical signs of colisepticaemia ,with average age of 1-2 month were examined, 625 collected samples from liver, Intestine ,spleen, kidney and Heart blood (30.4%,29%,8.7%,17.4% and14.5%) were positive for *E.coli* respectively. These isolates were further characterized by polymerase chain reaction. *E.coli* was isolated in 525 of the 625samples (84%). The isolated *E.coli* strain were found to belong to O stereotypes in order of frequency O 153, O 125, O 27,O158 and Untypable (28%,16%,24%,12% and 20) isolates respectively. Based on PCR, All examined *E.coli* were positive100 %(5/5) for *phoA* virulence gene, while 60 %(3/5) of the tested *E.coli* isolates were positive to *eaeA* gene while 20 %(1/5) of the tested *E.coli* isolates were positive to *Tsh* gene,while all tested isolates gave negative electrophoresis of Shiga-Like Toxin gene (*stx1 and stx2).*

Introduction

Rabbit is one of the best white meats available on the market today because it has high percentage of easily digestible protein. Rabbits are easy to raise and can be produced by all strata of our society under good management and using modern farming techniques.*E. coli* is usually present in the alimentary tract of healthy rabbits, and does not normally cause diarrhea. However, enteropathogenic strains can be transferred from the doe to her kits through fecal contact ***(Okerman, 1994)***. Certain serotypes of this bacterium have acquired some virulence-associated genes that enable them to cause intestinal or extra-intestinal disease. Those serotypes that cause enteric infections are generally called diarrheagenic *E. coli* strains, and their pathogenesis is associated with a number of virulence attributes, which vary according to pathotype ***(Xia et al., 2010)***. Enteropathogenic *E. coli* (EPEC) is the only known class of *E. coli* in rabbits which induces acute intestinal pathology marked by inflammatory lesions of the gut where these *E. coli* are strictly located ***(Licois, 2004).*** Recent identification of pathogenic

E.coli strains needs to detect factors that determine the virulence of these organisms; also it has become possible to detect pathogenic genes in bacterial isolates, allowing the rapid diagnosis of pathogenic *E.coli*. PCR methods using single primer sets have been reported ***(Oswald et al, 2000).***

Aim of work:

Due to the rising incidence of outbreaks associated with *E.coli* infection in growing rabbits. It depends greatly on investigating the causative agents, eliminating them to ensure safety and to protect public health from microbial contamination according to the following points were done:

1. Isolation of *E.coli* from rabbits.
2. Biochemical characterization of *E.coli* isolates from rabbits.
3. Serological identification of isolated strains of *E. coli.*
4. PCR for detection of some virulence genes (*phoA ,eaeA , tsh and stx1,2).*

Material and Methods

Samples:

A total number of 125 diseased rabbits collected from different farms in Portsaid Governorate during the period of work from Junuary 2016 till March 2017. 625 collected samples were taken from liver, heart blood, spleen, kidney and intestine (125 of each).

Bacteriological isolation and identification of *E.coli*:

Isolation and identification of *E.coli* were determined according to **Koneman et al., (1997), Cruickshank et al., (1975) and john et al. (1970).**

Serotyping of *E.coli* isolates: The diagnostic *E.coli* antisera sets (**Denka Seiken Co. LTD, Tokyo, Japan for antisera)** were used for identification.

Molecular Identification of *E.coli* Isolates:

A total of 5 presumptive samples of *E.coli* by cultural, morphology and biochemical characteristics, were tested by specific primer employing PCR assay which was more sensitive in the confirmation of the isolates.

Extraction of DNA: It was done according to QIAamp DNA mini kit instructions

Preparation of PCR Master Mix used for cPCR

Oligonucleotide primers used in cPCR

Oligonucleotide Primers used to amplify *E.coli* and its virulence genes are listed in Table (1)

Cycling conditions of cPCR : Temperature and time conditions of the primers during PCR are shown in **Table (2)**.

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Table (1): *Oligonucleotide primers sequences Source:*

Target gene	Primers sequences	Amplified segment (bp)	Reference
phoA	CGATTCTGGAAATGGCAAAAG	**720**	**Hu *et al.*, 2011**
	CGTGATCAGCGGTGACTATGAC		
eaeA	ATG CTT AGT GCT GGT TTA GG	**248**	**Bisi-Johnson *et al*., 2011**
	GCC TTC ATC ATT TCG CTT TC		
Tsh	GGT GGT GCA CTG GAG TGG	**620**	**Delicato *et al*., 2003**
	AGT CCA GCG TGA TAG TGG		
stx1	ACACTGGATGATCTCAGTGG	**614**	**Dipineto *et al.*, 2006**
	CTGAATCCCCCTCCATTATG		
stx2	CCATGACAACGGACAGCAGTT	**779**	
	CCTGTCAACTGAGCAGCACTTTG		

Target gene	Primary den.	Sec. den.	Ann.	Ext.	Final ext.
phoA	94˚C 5 min.	94˚C 30 sec.	55˚C 45 sec.	72˚C 45 sec.	72˚C 10 min.
eaeA	94˚C 5 min.	94˚C 30 sec.	51˚C 30 sec.	72˚C 30 sec.	72˚C 7 min.
tsh	94˚C 5 min.	94˚C 30 sec.	54˚C 45 sec.	72˚C 45 sec.	72˚C 10 min.
Stx1,2	94˚C 5 min.	94˚C 30 sec.	58˚C 45 sec.	72˚C 45 sec.	72˚C 10 min.

Table (2): *Cycling conditions of the different primers during cPCR*

DNA Molecular weight marker

Agarose gel electrophoresis: (Sambrook et al., 1989)

Results & Discussion

Prevalence of *E.coli* isolated from diseased rabbits.

A total of 125 rabbit, *E.coli* recovered in 105 rabbit with percentage 84% as shown in Table (3).

Seasonal incidence of *Escherichia coli* infection in diseased rabbits: as shown in (Table 4)

Incidence of *E.coli* isolated from different organs of diseased rabbits: as shown in Table (5) Serotyps of *E.coli* recovered from diseased rabbits: as shown in Table (6)

Genotypic characterization of *E.coli* (Conventional Polymerase chain reaction (cPCR) for detection of virulence genes:

A total of five presumptive samples of *E.coli* by cultural, morphology, biochemical and serological characteristics, were tested by specific primer employing PCR assay which was more sensitive in the confirmation of the isolates as shown in Table (7):

Detection of attaching and effacing gene (*eae*A gene): As shown in **Figure (1)** Lane 1, 3, 4, isolates gave positive electrophoresis of attaching and effacing gene (*eae*A gene) with a specific band at 248 base pair.

Detection of temperature sensitive hemagglutinin gene (*tsh*):as shown in Figure (2) Lane1 isolate gave positive electrophoresis of temperature sensitive hemagglutinin gene (*tsh*) with a specific band at 620 base pair.

Detection of alkaline phosphatase gene (*PhoA)*:

As shown in Figure (3) all tested isolates gave positive electrophoresis of alkaline phosphatase gene (*PhoA*) with a specific band at 720 base pair.

Detection of Shiga-Like Toxin gene (*stx1 and stx2):* as shown in Figure (4) all tested isolates gave negative electrophoresis of Shiga-Like Toxin gene (*stx1 and stx2*) with a specific band at 779 and 614 base pair respectively.

E. coli is a normal component of rabbit digestive flora and it does not always exert direct pathogenic activity in rabbits. Stress or other pathogen may trigger its overgrowth in the gut environment, which can be resulted in diarrhea or death ***(Milon., 1996).*** Regarding to prevalence of *E. coli* isolated, the obtained data in Table (3) revealed that percentage of *E. coli* isolation from diseased rabbits was 84%. Similar close rates also were recorded by ***(Johnson et al., 2005b; Claudie et al., 2009; Lyhs et al.,2012; Eid and Erfan, 2013 and Peer et al., 2013)*** who recovered *E. coli* in 92%, 75%, 94.5%, 80% and 84% of the tested samples respectively while lower rates were recorded by ***(Sharada et al., 2010; Hasan et al.,2011; Literak et al., 2013 and Radwan et al., 2014)*** who isolated *E. coli* with percentages of 44.61%, 36.20%, 35.74% and 41.5% respectively. Concerning, seasonal prevalence of *Escherichia coli* infection in rabbits,Summer season was found to be the most

important season that influenced diarrhea in rabbits. (92.8%) during summer compared to 86.5% ,80%, 76% during spring, autumn and winter seasons respectively table (4). This result agreed to some extent with ***Habeeb et al. (1997)*** who showed that, the highest incidence rate of *E.coli* was 18% in summer season, while no isolation of *E.coli* was recorded during winter season. Similarly. ***Hussein (2015)*** *stated* that out of 192 rectal fecal swabs collected from diseased rabbits at different seasons, 84 isolates of *Escherichia coli* were recovered and the highest incidence in summer season by percentage 56.9%. In the present study 345 isolates, 105(30.4%) from liver, 100 (29%)from intestine ,60(17.4%) from kidney,50(14.5%)from heart blood and 30(8.7%)from spleen (Table 5). Also***, El-Tabiy (1998)*** reported that out of 150 diseased rabbits, 146(26.4%) from intestine, 141(25.5%) from liver, 136 (24.6%) from heart blood and 130(23.5. %) from spleen. Concerning, serological serotyping, 25 *E. coli* isolates recovered from diseased rabbits were belonged to 4 different O serotype groups besides untypable one. The most prevalent serogroup was O153 (28%) followed by O27 (24%), untypable (20%), O125 (16%) and O158 (12%) **(Table 6).**Similar finding has been reported by ***Saad, (1994) and Alshimaa, (2007)*** isolated *E. coli* O125 from weaned rabbits. Also, ***Aisha and Youseif (1999)*** isolated 0128, O125, O158 and untyped strain ***Shahin et al., (2011)*** isolated *E. coli* serogroup O158 from diarrheic rabbits. ***Hussein (2015)*** reported that isolated *E. coli* strain from diarrheic rabbit were belonged to O stereotypes in order of frequency O158, O125, O27 and Untypable (20%, 13.33%, 13.33% and 6.67%) isolates respectively.

Out of 25 *E. coli* serotyped isolates, only 5 different serotyped isolates were subjected to PCR for detection of virulence genes *(eaeA, tsh, phoA and stx1, 2)* ,Results of PCR analysis showed that isolated *E. coli* (O153, O185 and O27) strains presented (*eaeA*) gene, with percent 60% of the screened isolates Table(8) and Figure (1). While *tsh* gene present in *E. coli* O153 with percentage 20% Figure (2). but *phoA* gene present in all of the screened isolates (O153,O125, ,O158, O27 and untyped serogroup) with percentage 100% Figure (3). No one contain Shiga-like Toxin1 and 2 producing *E. coli* strain *(stx1 and stx2)* Figure (4). The results come in agreement with the previously reported by ***blanco et al., (1996)*** they showed that rabbit O26 strains presented the *eaeA* gene but not any of verotoxin encoding gene. The results are in accordance with the previously reported by ***Sabry and Mohamed, (2009)*** reported that *E. coli* O26 and O55 isolated from rabbits displayed (*eaeA*) gene and no one produce Shiga-like Toxin**.** While ***Alton et al., (2012)*** reported that, fecal

culture examination of 20 rabbits yielded 48 *E. coli* isolates, 83% of which were *eaeA* positive**.**

Concerning, *tsh* gene, ***Ashraf et al., (2014)*** detected *eaeA* and *tsh* genes in three serogroups of *E. coli* (O55,O125 and O146) while stx2 virulence gene was detected in two serotypes (O55 and O125). ***Hussein (2015)*** carried out PCR assay for *E. coli* serotypes (O158, O128, O125, O20, O27, O18 and O148) to detect *eaeA* and *tsh* genes. It was found that 100 %(7/7) of tested *E. coli* isolates carry *eaeA* virulence gene, and 87.8 %(6/7) of the tested *E. coli* isolates were positive to *t*sh gene.In another study by ***Hagedorn et al. (2011)*** who reported that, although tsh gene associated with the bird, it was also found in 46% of *E. coli* isolated from a dog with diarrhea, which leading the authors to propose that, this gene would be a better source tracking marker from faeces of other animals.

Concerning *phoA* gene, ***Ke Xin Yu and Kwai Lin Thong (2009)*** reported that all *E. coli* strains isolated from environmental water showed positive result for the presence of *phoA* gene, thus confirming their identity as *E. coli*. While ***Wei et al. (2013)*** given that (86.2%) of isolates recovered from infected ducks were positive for *E. coli PhoA* gene. Most of the isolated *E. coli* serotypes are usually associated with many cases of food borne outbreaks.

Table (3): *Prevalence rate of E.coli isolated from diseased Rabbits:*

Number of rabbits	Number of +Ve cases	Prevalence of +Ve cases	Number of -Ve cases	Prevalence of -Ve cases
125	**105**	**84%**	**20**	**16%**

+Ve= Positive **-Ve= Negative**

Table (4): *Seasonal incidence of Escherichia coli infection in diseased rabbits*

Season	No. of diseased rabbits	Incidence	
		No. of +ve cases	%
Autumn	35	28	80
Winter	25	19	76
Spring	37	32	86.5
Summer	28	26	92.8
Total	125	105	84%

Table (5): *Incidence of E.coli isolated from different organs of diseased rabbits*

Total No.of Examined samples	liver		Intestine		spleen		kidney		Heart blood		Total No. Of isolates	
	+ve	%	+ve	%	+ve	%	+ve	%	+ve	%	+ve	%
625	**105**	**30.4**	**100**	**29**	**30**	**8.7**	**60**	**17.4**	**50**	**14.5**	**345**	**55.2**

Table (6): *Serotyps of E.coli recovered from diseased rabbits:*

Serotype	Number	Percentage*
O153	7	28%
O125	4	16%
O27	6	24%
O158	3	12%
Untypable	5	20%
Total	25	100%

Table (7): *Genotypic characterization of E.coli (Conventional Polymerase chain reaction (cPCR) for detection of virulence genes:*

Virulence genes	*E.coli* isolates	Percentage
PhoA	5/5	100%
eaeA	3/5	60%
tsh	1/5	20%
Stx1,2	0/5	0%

Table (8): *Distribution of virulence genes among (O) serogroups of diarrheagenic E.coli.*

serogroup	Genes				
	phoA	*eaeA*	*tsh*	*Stx1*	*Stx2*
O153	+	+	+	-	-
O125	+	-	-	-	-
O158	+	+	-	-	-
O27	+	+	-	-	-
Untyped	+	-	-	-	-

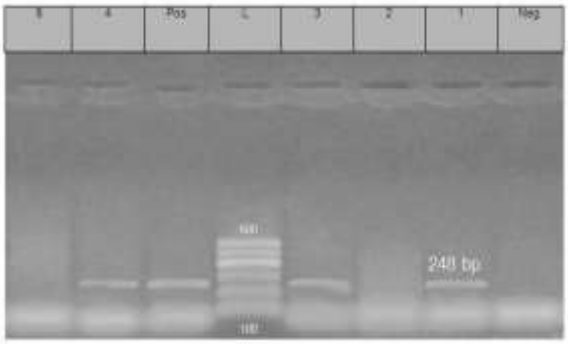
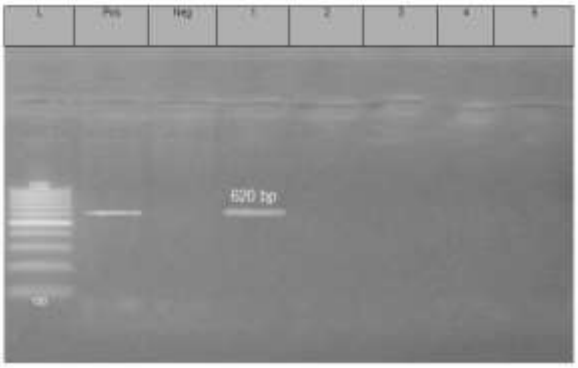


Figure (1): *Agarose gel (1%) electrophoresis showing result of PCR for eaeA gene .*
Lane(1, 3, 4) →positive for eaeA gene with 248 bp band.



Figure(2): *Agarose gel (1%) electrophoresis showing result of PCR for tsh gene.*
Lane1→ positive for tsh gene with 620 bp band.

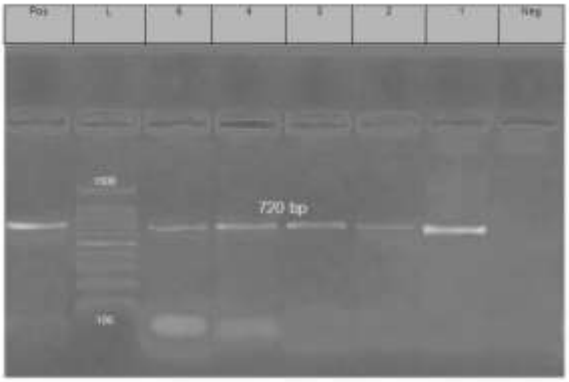


Figure (3): *Agarose gel (1%) electrophoresis showing result of PCR for PhoA gene.*
Lane(1,2,3,4,5)→ positive PhoA gene with 720 bp band.

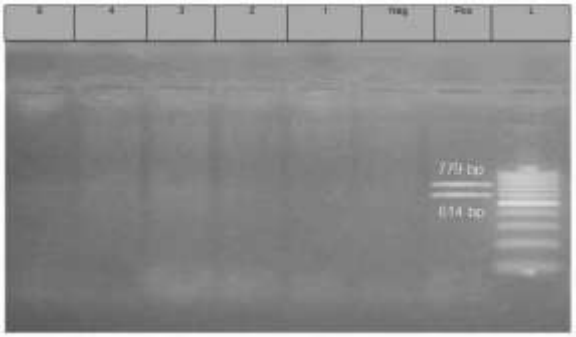


Figure (4): *Agarose gel (1%) electrophoresis showing result of PCR stx1 and stx2 gene .*
Lane (1,2,3,4,5) → negative for stx1 and stx2 genes with 779 and 614 bp band respectively.

References

Aisha, R.A. and Yousief, H.M.Z. (1999): Escherichia coli isolated from chickens and rabbits with special reference to their pathogenicity. J. Egypt Vet. Med. Ass. 59 No(1) 45–59.

Alshimaa, A.M. (2007): Bacteriological studies on enteric m.os in rabbits. Master degree in bacteriology. Vet. Med. Beni-suif Univ.

Alton G. S., Ellen M. B., Nicola M. A.; Parry, C. M.; Madden, A.;García, P. B.;Morgan, K. M. ;Astrofsky and James G. F. (2012): Enzootic Enteropathogenic Escherichia coli Infection in Laboratory Rabbits. Journal of Clinical Microbiology Volume 50 Number 7 p. 2353–2358.

Ashraf,A.Abd El Tawab, Ahmed,A.A.Maarouf,Samir,Hofy and Emad,E.A.El Mougy (2014): Detection of some virulence genes of avian pathogenic E.Coli by polymerase chain reaction .Benha vet.Med.,vol.26,No.2:159-176.

Bisi-Johnson, M.A.; Obi, C.L.; Vasaikar, S.D.; Baba, K.A. and Hattori, T. (2011): Molecular basis of virulence in clinical isolates of *Escherichia coli* and *Salmonella* species from a tertiary hospital in the Eastern Cape, South Africa. Gut Pathogens 2011, 3:9.

Blanco, J.E., Blanco, M., Blanco, J., Mora, A.; BALAGUER,L.; MOURIN,M.; JUAREZ,A.; AND JANSEN,A.;(1996): O Serogroups, Biotypes, and *eae* Genes in *Escherichia coli* Strains Isolated from Diarrheic and Healthy Rabbits. JOURNAL OF CLINICAL MICROBIOLOGY, p. 3101–3107.

Claudie, B.; Fatoumata, D.; Roland, B.; Luke, M.; Edward, T. and Moussa, S. D. (2009): Pathotype and antibiotic resistance gene distributions of E.coli isolates from broiler chickens raised on antimicrobial – supplemented diets. Appl. Environ. Microbiol., 75(22): 6955–6962.

Cruickshank, R.; Duguiel, J.P.;

Marmion, B.P. and Swain, R.H.A. (1975): Medical microbiology. 12th ed. Vol. II Churchill Living stone, Edenburg, London and New York. Des; 5: 895–913.

Delicato, E.R.; de Brito, B.G.; Gaziri , L.C.J. and Vidotto, M.C. (2003): Virulence-associated genes in *Escherichia coli* isolates from poultry with colibacillosis. Veterinary Microbiology 94 (2003) 97–103.

Dipineto, L.; Santaniello, A.; Fontanella, M.; Lagos, K.; Fioretti, A. and Menna, L.F. (2006). Presence of Shiga toxin-producing Escherichia coli O157:H7 in living layer hens. Letters in Applied Microbiology 43 (2006) 293–295.

Eid, S. A. S. and Erfan, A. M. (2013): Characterization of E.coli associated with high mortality of poultry flocks. Assiut Vet. Med. J., 59(139): 51-61.

El-Tabiy,A.H.;(1998): Properties of E.coli strains isolated from septicaemic rabbits and chockens.M.V.SC.Thesis .sues canal University.

Habeeb, A.A.M.; Marai, I.F.M.; El-Maghawry, A.M. and Gad, A.E. (1997): Growth rabbits as affected by salinity in drinking water under winter and hot summer conditions of Egypt. Egyptian journal of rabbit science, 7(2): 81-94.

Hagedorn; Charles; Blanch; **Anicet, R.; Harwood**, **and Valerie J. (2011):** Microbial Source Tracking: Methods, Applications, and Case Studies.

Hasan, B.; Faruque, R.; Drobni, M.; Waldenstrom, J.; Sadique, A.; Ahmed, K. U.; Islam, Z.; Parvez, M. B. H.; Olsen, B. and Alam, M. (2011): High prevalence of antibiotic resistance in pathogenic *E.coli* from large- and small-scale poultry farms in Bangladesh. Avian Dis., 55(4):689-692.

Hussein,D.H.,(2015):studies on E.coli causing diarrhea in newly weaned rabbits in ismailia governorate.suez canal university,Egypt**.**

Hu, Q.; Tu, J.; Han, X.; Zhu, Y.; Ding, C. and Yu, S. (2011): Development of multiplex PCR assay for rapid detection of *Riemerella anatipestifer*, *Escherichia coli*, and *Salmonella enterica* simultaneously from ducks. Journal of Microbiological Methods 87 (2011) 64–69.

John, E.B.; Edwin, H.L. and Joseph, P.T. (1970): Manual of Clinical Microbiology. P 675 American society for Microbiology: Williams and Wilkinsco. Bultimore.

Johnson, J. R.; Kuskowski, M. A.; Smith, K.; O'Bryan, T. T. and Tatini, S. (2005): Antimicrobial-resistant and extraintestinal pathogenic E.coli in retail foods. J. Infect. Dis., 191(7):1040-1049.

Ke Xin Yu and Kwai Lin Thong.(2009): Multiplex PCR for Simultaneous Detection of Virulence Genes in Escherichia coli. Malaysian Journal of Science

28 (1): 1-14.

Konemann, E. W.; Allen, S. D.; Janda, W. M.; Schreckenberger, P. C. and Winn, W. C. (1997): Color atlas and textbook of diagnostic microbiology. 5th Ed. J. B. Lippincott Co., 1296- 1395.

Licois, D., (2004):" Domestic Rabbit Enteropathies. Proceeding of the 8th Congress of World Veterinary Rabbit Association (WRSA), puebla, Mixico.7-11 Septamber 2004 pp.385-403.

Literak, I.; Reitschmied, T.; Bujnakova, D.; Dolejska, M.; Cizek Loveless, B. J. and M. H. Saier, J.r. (2013): A novel family of channel-forming, autotransporting, bacterial virulence factors. Mol. Membr. Biol. **14:**113–123.

Lyhs, U.; Ikonen, I.; Pohjanvirta, T.; Raninen, K.; Perko-Mäkelä, P. and Pelkonen, S. (2012): Extraintestinal pathogenic E.coli in poultry meat products on the Finnish retail market. Acta Vet. Scand., 54:64.

Milon,A.(1996):weaned rabbit colibacillosis:amodel for study of enteropathogenic Escherichia coli.World Rabbit Congress,Toulouse,pp:13-22.

Okerman, L. (1994): Diseases of the digestive system. In: Price C. J (Ed), Diseases of Domestic Rabbits. Blackwell Scientific Publications, Oxford. p.71-91.

Oswald, E.; Schmidt, H.; Morabito, S.; Karch, H.; Marches, O. and Csprioli, A. (2000): Typing of intimin genes in human and animal enterohemorrhagic and enteropathogenic *E.coli*: Characterization of a new intimin variant. Infect. Immun., 68: 64-71.

Peer, F. U.; Ansari, M. M.; Gani, I. A. and Willayat, M. M. (2013): Serotyping and antibiotic sensitivity patterns of *E.coli* isolates obtained from broiler chicks in Kashmir Valley, India. Adv. Anim. Vet. Sci., 1 (2):75–76.

Radwan, I. A.; Salam, H. S. H.; Abd-Alwanis, S. A. and Al-Sayed, M. A. Y. (2014): Frequency of some virulence associated genes among multidrug- resistant *E.coli* isolated from septicemic broiler chicken. International Journal of Advanced Research, Volume 2, Issue 12: 867-874.

Saad, A.E. (1994): Studies on enteritis in rabbits with special emphasis on bacterial agents [PhD Thesis]. [Zagazig (Egypt)]: Zagazig University, Benha Branch.

Sambrook, J.; Fritscgh, E.F. and Mentiates (1989): Molecular coloning. A laboratory manual. Vol 1., Cold spring Harbor Laboratotry press, New York.

Sabry,A.H. and Mohamed,W.A.(2009): Determination of virulence gene Markers and antimicrobial Resistance in Escherichia coli Isolated from Rabbit in Egypt ,south valley university ,global veterinaria 3:260-267.

Sharada, R.; Ruban, S. W. and Thiyageeswaran, M. (2010): Isolation, characterization and

antibiotic resistance pattern of *E.coli* isolated from poultry. Amer. Eur. J. Sci. Res., 5(1): 18-22.

Wei.B , Cha S.-Y., Kang. M. , Park. I.-J. , Moon. O.-K. , Park .C.-K. , and Jang. H.-K. (2013): Development and application of a multiplex PCR assay for rapid detection of 4 major bacterial pathogens in ducks. Poult Sci 92 (5), 1164-1170.

Xia, X.; Meng, J.; McDermott, P. F.; Ayers, S.; Blickenstaff, K.; Tran, T.T.; Abbott, J.; Zheng, J. and Zhao, S. (2010): Presence and characterization of Shiga toxin-producing *Escherichia coli* and other potentially diarrheagenic *E.coli* strains in retail meats. Appl. Environ. Microbiol., 76:1709-1717.

الملخص العربي

دراسات بكتريولوجيه علي عدوي الإشيريشياكولاي في الأرانب

حمزة محمد عيد **نهله طه عبد الجوادايمان محمود زغلول**

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*** قسم صحة الأغذية معهد بحوث صحة الحيوان الدقي فرع بورسعيد - -*

****طبيبة بيطرية*

تم جمع عدد 125من الارانب المريضه التي تعانى من الاسهال متوسط عمرها (1-2)شهر من مزارع متعدده للارانب بمحافظة بورسعيد خلال الفترة من (يناير 2016- حتى مارس 2017) والتى اظهرت عزل الميكروب القولونى الاشيريشيا كولى من 125ارنب بنسبة 84%.تم تجميع 625 عينه من الكبد والقلب والرئه والكلي والامعاء كما بينت النتائج ان اعلي نسبه اصابه كانت بالكبد بنسبه (30.4%) يليها الأمعاء بنسبه (29%) يليها الكلي بنسبه (17.4%) يليها القلب بنسبه (14.5%) واقل نسبه اصابه كانت بالطحال بنسبه (8.7%) .كما بينت النتائج أن أعلى نسبة اصابة حدثت في فصل الصيف بواقع 28/26 بنسبة (92.8%). تلاها فصل الربيع بمعدل 37/32 بنسبة بلغت (86.5٪)، ثم في فصل الخريف 35/28 (80٪)، وأخيرا فصل الشتاء 25/19 (76٪).وباجراء التصنيف السيرولوجى لمعزولات الميكروب القولونى وجد انها تنتمى الى كل من (O153,O125,O27,O158,وعترات غير مصنفة) بنسبة (28% و16% و24% و12% و20%) على التوالى. كما تم اجراء اختبار انزيم البلمرة المتسلسل التعددى للمعزولات الاتية لتحديد بعض الجينات المسئولة عن الضراوة (O153,O125,O27,O158) , وقد اوضحت النتائج وجود جين (*phoA*) فى جميع العترات كما وجد جين(*eae*A) ايضا فى العترات O153 وO158 و O27كما وجد جين(tsh) ايضا في العتره O153 فقط كما اوضحت النتايج عدم وجود جين (stx1,2) في اي من العترات.