

## Prevalence of *Rota virus*, *Escherichia coli* O157:H7 and *Cryptosporidium spp.* in feces of buffalo in Babil governorate

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### Abstract

The aim of present study to determine the prevalence of *rotavirus*, *Escherichia coli* O157:H7 and *Cryptosporidium spp.* in feces of buffalo in Babil governorate. Fecal samples were collected from (30 male, 50 female and 50 calves) of buffalo during the period of October 2013-March 2014. The percentage of infection with *Rota virus* was 10% in male, 8% in female and 12% in calves. The rate of isolation of *E.coli* O157:H7 was 10% in male, 8% female and 2% in exanimated calves. The oocysts of *Cryptosporidium spp.* was identified in feces of 13.3% of male, 12% of female and in 6% of calves. As a result of this study it can be concluded that buffalo serve as good reservoirs of most important enteropathogens and consider a potential source of infection to both domestic animals and human.

**Key words:** *Rota virus*, *Escherichia coli* O157:H7, *Cryptosporidium spp.*, buffalo, fecal sample.

### انتشار فايروس الدوار – الاشريشيا القولونية H7: 157 O وطفيلي الخبيئات في براز الجاموس في محافظة بابل

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### الخلاصة

الهدف من الدراسة الحالية تحديد انتشار فايروس الدوار – الاشريشيا القولونية H7: 157 O وطفيلي الخبيئات في براز الجاموس في محافظة بابل . جمعت عينات البراز من (30 ذكر ، 50 انثى ، 50 عجل) خلال الفترة من تشرين الاول 2013 – اذار 2014. كانت نسبة الاصابة بفايروس الروتا 10% في الذكور ، 8% في الاناث و 12% في العجول. سجلت نسبة عزل الاشريشيا القولونية H7: 157 O في الذكور 10% ، في الاناث 8% وفي العجول 2% . شخصت ايكياس طفيلي الكربتوسبورديوم في براز 13,3% من الذكور ، 12% من الاناث وفي 6% من العجول. نستنتج من الدراسة ان الجاموس يعمل كخازن جيد لأغلب الممرضات المعوية ويعد مصدر خمج فعال لكل من الحيوانات والانسان .  
الكلمات المفتاحية: فايروس الدوار ، الاشريشيا القولونية H7: 157 O ، طفيلي الخبيئات ، الجاموس ، عينات البراز .

### Introduction

A various of infectious agents including *Cryptosporidium spp.*, many serotypes of *E. coli* and *Rota virus* have been considered as important causes of diarrheal diseases of most animals specially, calves (1). *Rota virus* is recognized as the most important viral etiological agent of sever diarrheal illness in human, young animals, birds worldwide (2, 3) and many mammalian species. The group A *Rota virus* is the more frequently isolated in the case of *Rota* viral diarrhea, the virus

has been recorded in buffalo calves of many countries like India (4), Turkey (5) and Iraq (6). *E. coli* O 157: H7 are zoonotic pathogens associated with food illness around the world, this serotype belongs to the Enterohaemorrhagic *Escherichia coli* (EHEC) group and consider the most important food-born and water-born pathogens worldwide (7). Several studies have shown that the gastrointestinal tract of domestic ruminants is a natural reservoir of

EHEC 0157 (8, 9). Cattle, especially young animals have been implicated as a principle reservoir of EHEC serotypes and the well – publicized out breaks of infection with *E.coli* 0157:H7 in animals and human (10). In the later studies, *E-coli* O157:H7 was detected in fecal samples of water buffalo in Italy (11), Turkey (12) and in Iran (13). In other hand *Cryptosporidium* an intracellular apicomplexan protozoan (14) of mammals, birds, reptiles and fishes (15), from general public and veterinary field view point, this protozoa has great important due to its importance against environmental and physiochemical condition (16). This apicomplexan protozoan parasite has been detected in water buffalo in Italy (17), Spain (18), Egypt (19) and in Turkey (5). The aim of this study was to investigate the frequency of occurrence of *Rota virus*, *E. coli* 157:H7 and *Cryptosporidium* in buffalo feces (calves and adults) in Babil governorate.

### Material and methods

**Animals:** A total of 130 fecal samples were collected from (30 male, 50 female and 50 calves) of buffalo of Babil governorate in Iraq during the period of October 2013-March 2014. **Examination of feces for *Rota virus*:** *Rota virus* was detected in fecal samples of buffalo (calves and adults) by Commercial kit (Latex agglutination test, plasmatic Laboratory Products / United Kingdom). **Examination of feces for *E.coli* O157:H7:** A loop of fecal sample was inoculated on 5% sheep blood agar and Eosin methylene blue agar. After over night incubation at 37 C, the isolated colony were transport by loopful to selective media (CHROM agar 0157), incubated overnight, then (purple colonies) on Chrom agar 0157 were tested for the presence of the 0157 and H7 antigen by Commercial kit (Remel RIM *E.coli* 157:H7, Lenexa Kansas/U.K) Latex agglutination test. **Examination of fecal smears for *Cryptosporidium* oocysts:** A thin and transparent fecal smear was made and left to dry by air then fixed in methanol for 3 minutes, air dried, stain by modified Ziehl-Neelsen staining method and examined at 40 and 100 x objective by following the procedure described by (20).

### Results

The results of present study indicated that 3(10%) of adult male, 4(8%) of adult female and 6(12%) of examined calves were positive for *Rota viral* infection by Latex agglutination test Table (1) and figure (3). The bacteriological analysis of fecal samples by using Chrom agar 0157 and Latex agglutination test of 0157 and H7antigens revealed the presence of *E coli* 0157:H7 in3(10%) of adult male, 4(8%) of adult female and in 1 (2%) of calves Table (2) and figure (1,2). The oocyst of *Cryptosporidium spp.* were identified in feces of 4(13.3%) of adult male, 6 (12%) of adult female and in 3(6%) of calves as is shown in Table (3) and figure (4). The total rates of infection with the three enteropathogens (*Rota virus* – *E. coli* 0157:H7- *Cryptosporidium spp.*) in buffalo were summarized in Table (4), which show that prevalence rate of *Rota virus* and *Cryptosporidium spp.* was 10% for each one while the rate of isolation of *E coli* 0157:H7was (6%).

**Table (1): Percentage of infection of *Rota virus* in diarrheic and non-diarrheic buffalos.**

Age	No. of fecal samples	Positive samples		%
		D	ND	
Adult male	30	1	2	10
Adult female	50	2	2	8
Calves	50	5	1	12

\*D: Diarrheic / ND: Non diarrheic. Differences between proportions were not significant (Chi-square value 0.44 df=2 P=0.80)

**Table (2): Percentage of infection of *E. coli* 157: H7 in diarrheic and non-diarrheic buffalos.**

Age	No. of fecal samples	Positive samples		%
		D	ND	
Adult male	30	0	3	10
Adult female	50	3	1	8
Calves	50	1	0	2

Differences between proportions were not significant (Chi-square value 2.55 df=2 P=0.27)

**Table (3): Percentage of infection of *Cryptosporidium spp.* in diarrheic and non-diarrheic buffalos.**

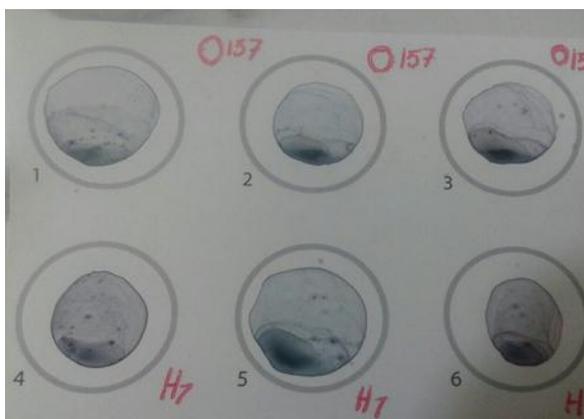
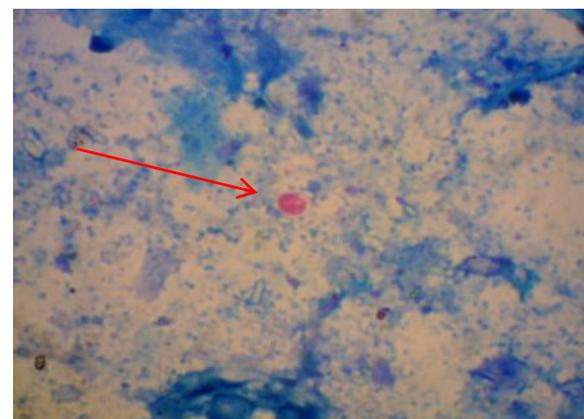
Age	No. of fecal samples	Positive samples		%
		D	ND	
Adult male	30	0	4	13.3
Adult female	50	1	5	12
Calves	50	3	0	6

Differences between proportions were not significant (Chi-square value 1.48 df=2 P=0.47).

**Table (4): Comparison of total proportions for three types of infection.**

Enteropathogens detected	%
<i>Rota virus</i>	13(10%)
<i>E coli 157:H7</i>	8(6%)
<i>Cryptosporidium spp.</i>	13(10%)

Differences between proportions were not significant (Chi-square value 1.61 df=2 P=0.44).

**Fig. (1): Purple colony of *E. coli 157:H7* on Chrom agar.****Fig. (2): Positive results of 0157 and H7 antigen.****Fig. (3): Positive results of *Rota virus* by Latex agglutination test.****Fig. (4): Oocyst of *Cryptosporidium spp.* 40 X**

## Discussion

*Rota virus* was found in 3 (10%) of adult male and in 4 (8%) of adult female, while the virus was detected in 6 (12%) of examined calves is shown in Table (1) and figure (3). The highest rate of infection with *Rota virus* in present study was recorded in calves (5 diarrheic and 1 non diarrheic

calves), this finding in agreement with (21) suggesting that *Rota virus* is one of the more important causative agents in neonatal diarrhea, on the other hand this results is different from those reported in diarrheic calves in Turkey (5) and (22) in India which recorded low percentage of infection 25%

and 11.76% respectively, while the values was similar to those recorded by (4). In Mosul (Iraq) (5) have been detected *Rota* virus in both diarrheic (15.5%) and non diarrheic (4.5) calves. No studies were available about prevalence of *Rota* virus in adult buffalo. *E.coli* O157:H7 was isolated from 3 (10%) of adult male, 4 (8%) of adult female and in 1 (2%) of examined calves Table (2) and figure(1, 2). The highest rate of isolation in present study of *E.coli* O157-H7 was in adult animals, these findings was agree with (12) who confirm that water buffalo like other ruminants, are reservoirs for *E.coli* O157:H7. High and low levels of prevalence have been reported in various isolation studies concerning these bacteria in buffalo like 14.5% in Italy (23), 18.6% in Iran (13) and 3.7% in Turkey (12). Concerning *Cryptosporidium spp.* results revealed that the prevalence rate was: 4 (13.3%) in adult male, 6 (12%) in adult

female and 3 (6%) in calves Table (3) and figure (4). The rate of infection in adult female was lower than results obtained by the previously researcher (24) in Philippine, the prevalence of *Cryptosporidium spp.* in calves was higher than (25) who recorded 3.52% prevalence rate in buffalo calves of India and lower than values reported by (5) in Turkey and (19) in Egypt. The overall prevalence of *Rota virus*, *E. coli* O157:H7 and *Cryptosporidium spp.* in buffalo of Babil were (10%), (6%) and (10%) respectively is shown in Table (4). The results of this study indicates that buffalo (calves and adults) may possibly serve as reservoirs of most important zoonotic enteropathogens and may be a potential source of infection to both domestic animals and human, so more studies should be carrying out to determine the risk and mechanism of prevalence of these important pathogens among buffalo.

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