

# The Impact of Camel's Urine on *E. coli* Isolated from Human Faeces in Nyala City Educational Hospital - Sudan

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**Abstract:** Camels urine has numerous uses, which are beneficial for man. There is little information about the antimicrobial effects of camels urine on a pathogenic *E.coli* infecting human. The aim of this work was to study antimicrobial activity of camel urine against *E. coli* isolated from human faeces. Isolation and identification of *E.coli* were done by using enrichment media, selective media and biochemical test. Disc diffusion technique was used to assess the antibacterial effect of camel urine on *E.coli*. Five samples of camel urine were tested for their antimicrobial activity using Mueller Hinton Agar. The Results proved that camel urine at low concentrations ( $1:10, 10^2, 10^3$ ) has no significant inhibitory effect on the growth of *E. coli*, while inhibition was obviously recorded after using high concentration. The study concluded that camel's urine is effective against *E. coli* and can be used as an alternative for treatment of various infections caused by Enterobacteria and some gram positive bacteria.

**Keywords:** Camel urine, *E.coli*, Antimicrobial, Disc diffusion, Nyala

## 1. Introduction

Camel name gives two species of mammals which are members of the family camelidae in the order Artiodactyla. These are the bacterian camel (*Camelus bactrianus*) and the Arabian or dromedary camel (*C. dromedarius*) (Nowalk, 1991).

According to FAO, (1991) statistics with camel population of 4-5 millions heads, Sudan is the second country in the world after Somalia. Both countries, however own 70% of the camel population in Africa. Camels in the Sudan are mainly found in the northern part in the desert and semi-desert areas of western Sudan, Red sea state and Eastern Sudan (Faye *etal.*, 2011) and (Ahmadani, 2001).

Darfur states is estimated as 759,000 Km<sup>2</sup> of which 397,000 Km<sup>2</sup> were in North Darfur, 287,000 Km<sup>2</sup> in western Darfur and 75,000 Km<sup>2</sup> in South Darfur (Central Bureau of Statistics, 2003).

Nyala is the capital of both Nyala province and south darfur state in western Sudan. It lies about 900 Km south west of Khartoum, the capital of Sudan, just East of longitude 24°:53' and latitude 12°:04' North. Roughly 205 Kilometers East of the border with the republic of Chad (fig) (Water Resources Assessment Program in Sudan, 1985) (WAPs-2, 1985). The town is an important urban and commercial center in Darfur. In addition to the above mentioned facts Nyala is a market center for South Darfur agricultural and forest products it's also a large livestock market and center for vaccination of animal (Nada, 20210).

Camel urine is a liquid by-product of metabolism in camels. Urine from camels has been used in the Arabian Peninsula for medicinal purposes for centuries, being a part of ancient Bedouin practices, not as claimed as part of Islamic principle (JB, 2013). Camel urine is one of the traditional antimicrobial agents which are used from ancient time in different communities for the treatment of so many diseases, such as parasitic infection (Fasciolosis) (Khogali *etal.*, 2006). Several studies had proved that camels urine has a lethal effect on bacteria, it also has a significant antimicrobial activities against some pathogenic microbes infecting human such as *Staphylococcus aureus*, *pseudomonas aeruginosa*, fungus, yeast and bacteria, *E. coli* and other pathogenic microbes (Al Talhi and AL Bashan .2006). (Chakrabort, 1998) claimed that Camels urine may also be used to treat the digestive system and some cases of cancer.

The curative potentiality of camel urine was stated by the prophetic texts and confirmed by modern science. Chemical analysis found that camel urine contains a large amount of potassium, as well as albumen and magnesium. Camel drinks four times only during the summer and once during winter, its body preserves sodium, sodium causes it not to urinate a great, sodium keeps water in camel's body for an extended period of time (Ohaj, 1998).

## 2. Material and Methods

### Camel urine samples collection and preservation:-

Samples of camels urine were collected from "souk elmawshi" with ages range from 4 -5 Years fed on the different plants. The urine samples were collected in sterile containers and kept in a box containing ice packs and stored at 4°C.

**E. coli isolation**

The samples of stool were collected into sterilized containers from Nyala Education Hospital, and were examined as follows:-

- 1) The samples were cultured in blood agar medium, incubated at 37 °c for 24h and examined for bacterial growth.
- 2) Mixed cultures in blood medium were purified on selective medium MacConkey agar medium and examined for the growth of pink colonies.
- 3) Plates of EMB agar medium were streaked by means of sterilized loop from colonies showing pink and incubated at 44°C for 24h.
- 4) For further confirmation of the presence of *E. coli* metal-green shiny colonies were sub cultured into media for IMViC test. (Nada *et al.*, 2021).

**Tube dilution methods**

Tube 1 contains 10ml of concentrated camel urine , 1ml was transfer from tube 1 to tube 2 contain 9ml distill water , shake well, and from tube 2 (1ml) is transfer to tube 3 (9ml dill. water, shake well and from tube 3(1ml) is transfer to tube 4 (9ml dill. Water) (Jamal *et al.*, 2019).

**3. Results**

A total number of five camels urine samples collected from Al mwashi market in Nyala town –South Darfur were examined for the antimicrobial activity against *E. coli*. isolated from human feces. The age of the camels range between 4-6 years. Data obtained in this work are presented in (table1) It show the inhibition zones of different concentrations of camels urine against *E. coli*.

**Table 1:** Diameter of inhibition zones of *E. coli* growth produced by camels urine after 24h.

Zone of inhibitions(in mm)				
samples	10 ml(basic concentration)	1:10	1:10 <sup>2</sup>	1:10 <sup>3</sup>
1	0.5	0.2	0.1	0.1
2	0.8	0.6	0.2	0.1
3	0.6	0.4	0.2	0.1
4	0.7	0.4	0.3	0.1
5	0.4	0.2	0.1	0.1

The results presented in table (2) show that there is a significant correlation between the concentrated camel’s urine (Conc.) and its one fold diluted (1:10) which indicates the non growth of *E. coli* in term of P- value less than 5%,. It is clear from the P-value that the sample of camels urine with concentrations (10<sup>2</sup>and 10<sup>3</sup>) has no effect on bacterial growth p-value is greaterthan5%.

**Table 2:** Show correlation confession between the concentrated urine sample (10ml) and(1:10),(1:10<sup>2</sup>),(1:10<sup>3</sup>) (v/v) diluted urine on growth of *E. coli* isolated from human feces

Decision	p-value	correlation confession value	Dependent variable
Sig. correlation	.015	0.945*	basic concentrated urine sample versus one fold diluted sample 1:10ml (v/v)
Non –Sig. correlation	.139	0.756	basic concentrated urine sample and the1:10 <sup>2</sup> ml(v/v) diluted urine samples
Non –Sig. correlation	.242	0.643	basic concentrated camel urine sample and1:10 <sup>3</sup> ml(v/v) dilute urine sample.

In table ( 3) the mean of inhibition zones (10ml, 1:10,10<sup>2</sup>and 10<sup>3</sup>) of *E. coli* isolated from human feces equals 0.60, 0.36, 0.18 respectively

**Table 3:** Show the mean of inhibition zones as performance of concentrated and diluted camel urine (10ml, 1:10ml, 10<sup>2</sup>ml and 10<sup>3</sup>(v/v) ) of *E. coli* isolated from human faeces

The mean of inhibition zonesof <i>E. coli</i> corresponded to (10ml, 1:10ml, 10 <sup>2</sup> ml and 10 <sup>3</sup> v/v)of urine samples.			
Dependent variable			
Concentration of samples	Mean	No. of samples	Std. Deviation
basic con. 10ml	0.6000	5	0.15811
Diluted con.1:10ml (v/v)	0.3600	5	0.16733
Diluted con.1:10 <sup>2</sup> ml (v/v)	0.1800	5	0.08367
Diluted con.1:10 <sup>3</sup> ml (v/v)	0.1000	5	0.00000
Total	0.3100	20	0.22688

Data obtained in table 4 show the mean of inhibition zones of *E. coli* isolated from human feces after 24 h (camel 1,5) equal’s 0.22 and 0.20. But the mean of inhibition zones after 24 h (camel 1, 5) of *E. coli* (camel 1,5) equal’s 0.425 ,0.326 and 0.375 respectively.

5	0.2000	4	0.14142
Total	0.3100	20	0.22688

**Table 4:** Show the mean of inhibition zones of *E. coli* isolated from human feces after 24 h

dependent variable			
Camels No.	Mean	N	Std. Deviation
1	0.2250	4	0.18930
2	0.4250	4	0.33040
3	0.3250	4	0.22174
4	0.3750	4	0.25000

**4. Discussion**

Antimicrobial effect of five samples of camel urine was tested against *E. coli* isolated from human feces. The highest effect of camel’s urine on *E. coli* was shown by undiluted concentration while the lowest effect shown by lower diluted sample (1:10<sup>3</sup>) concentration (tale (3). This result is in agreement with Jamal *et al.*, (2019) who found undiluted urine of camel (100%) concentrated was found to be

bactericidal for all the isolated tested and the diluted urine sample (1:10,1:10<sup>2</sup>,1:10<sup>3</sup>) were of less effect.

High antimicrobial activity was observed versus *E. coli* after 24 h of incubation and manifested by a large diameter of inhibition zones. Our result is in agreement with Ahamed *et al.*,(2008) who found that *S. aureus*, *E. coli*, *Salmonella* Sp. and *P. aeruginosa* proved to be sensitive to camel urine.

The results of the present work are in disagreement with study done by Al Bashan(2011) who reported that, regarding antimicrobial activity of camel urine with 25,50,100% concentration, no growth inhibition zones were observed after 24 h of incubation. This can be due to the difference of nutrition of camels in Sudan ( Umbass, and Barism).

Similar result were obtained by Al Talhi and AL Bashan (2006) who recorded that significant antimicrobial activities against some pathogenic microbes infected human such as *S. aureus*, *E. coli*, Sp. and *P. aeruginosa* and other pathogenic microbe.

## 5. Conclusion

The results in our present study showed that camel's urine is effective against *E. coli* and can be used as an alternative for treatment of various infections caused by Entero-bacteria and some gram positive bacteria.

## 6. Authors' contributions

N.A.E conceived the idea and supervised the work. M.S.K designed the study and review the draft manuscript.H.H.A carried the practical and technical work. All authors wrote final version of the manuscript. All authors read and approved the final manuscript.

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