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# Isolation of *Clostridium perfringens* from Fecal Sample of Zoo Animals in Iraq

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## Abstract

In this study the isolated *Clostridium perfringens* from fecal samples of zoo animals of Al-zawraa Zoo of Baghdad city. A total of 170 fecal samples was aseptically collected from different mammalian species of apparently healthy animals for the isolation and identification of bacterial flora. All the collected samples were inoculated in sheep blood agar media and incubated anaerobically in an anaerobic jar with the gas bag for the study of their cultural properties. Gram's staining, motility test and biochemical tests were also performed for the proper diagnosis of the isolated bacteria.

**Keywords:** *Clostridium perfringens*; Zoo animals; Fecal samples

## Introduction

Visitor people went to the zoo with their children for entertaining purposes as well as educational [1] although visitor become contact with some animals like monkey, sheep, goat, blue peafowl, zebra foal especially by children and these association make them at risk due to transmission of many zoonotic bacterial diseases like *E. coli* O157:H7, *Salmonellosis*, *Yersinia*, *Campylobacter*, *Mycoplasma* and *Clostridium* spp. [1-4].

*Clostridium perfringens* is a commensal in the animals gastrointestinal (GI) tract without being associated with disease, as soil and feedstuffs seem to be natural habitats for these organisms [5] although this bacteria is responsible for a spectrum of diseases. *C. perfringens* enterotoxin (CPE) is thought to be an important virulence factor in animals with *C. Perfringens*-associated diarrhea [6-8]. In contrast, surveys of *C. perfringens* shedding by wild animals are still rare and mainly limited to a few studies in wild animals so the aim of the present investigation was to identify and characterize the *Clostridium perfringens* in fecal samples of healthy Zoo animals.

## Materials and Methods

### Fecal sample

A total of 174 fecal sample from zoo animals were collected aseptically with wide mouth container and transport the fecal material to zoonotic diseases laboratory in college of veterinary medicine of baghdad university.

### Isolation of *Clostridium perfringens*

One gm of fecal material diluted by adding 9 ml of sterilized normal saline then one loopful was plated on sheep blood agar and incubated at 37°C for 24 hrs under strict anaerobic conditions (Anaerobic Jar with a gas pack system). The presumptive detection of isolated bacteria was carried out by Gram staining, capsule staining and cultural characteristics of bacteria in special fluid media such as F Robinson Cooked meat medium, the confirmed test is performed by the detection of motility and gelatin liquefaction.

## Results

### Isolation and identification of *Clostridium perfringens* from fecal samples

*Clostridium perfringens* isolated and identified from all collected

fecal samples of wild animal as shown in Table 1. The *Clostridium perfringens* identified by its characteristic growth on blood agar its appear  $\beta$ -haemolytic colonies with double zone of haemolysis was observed Figures 1 and 2.

## Discussion

*Clostridium perfringens* is a part of the normal intestinal flora of humans and animals [9-12], Although under certain conditions, *C. perfringens* becomes harmful and caused a disease therefore this is the first report for isolation and identified of, *C. perfringens* in wild zoo animal in Iraq. The positive *C. perfringens* results from wild zoo animals suggesting that *C. perfringens* is commonly part of the microbiota of



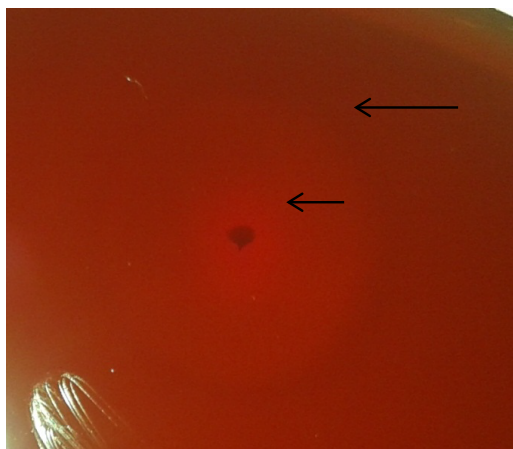
**Figure 1:** *Clostridium perfringens* on sheep blood agar appear gray colony, flat round,  $\beta$ -haemolytic colonies.

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**Figure 2:** *Clostridium perfringens* single isolated colony showed double zone of hemolysis.

Animal species	Number of fecal samples	<i>Clostridium perfringens</i>
Bear	10	+
Deer	9	+
Pony	7	+
Lion	22	+
Elk	8	+
Dog	8	+
Horse	12	+
Wildcat	5	+
Zebra	5	+
Siberia monkey	9	+
Ostrich	3	+
Baboon monkey	9	+
Kangaroo	1	+
wolf	5	+
Camel	9	+
Fox	6	+
Porcupine	5	+
lama	6	+
goat	8	+
jaguar	7	+
chicken	6	+
Hyena	8	+

**Table 1:** Isolation of *Clostridium perfringens* from fecal samples of different species of wild animals.

these animals, as would be suspected. From the data of the present study, the distribution of *C. perfringens* among wild zoo animals needed additional studies must be carried out with specific primers to detect *C. perfringens* types and its toxins.

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