

Studies on Fungal Pathogens Isolated from Oral Cavity of Camel (*Camelus dromedarius*) on Bordered Local Government Areas of Sokoto State

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Abstract: This study was carried out to determine the fungal pathogens which isolated from oral cavity of camel in bordered Local Government Areas of Sokoto State. Fourty (40) samples of camel oral cavity were collected from camel herds in Illela, Gada, Gudu and Sabon Birni Local Government Areas in Sokoto and were analyzed using microbial culture, fungal staining and microscopic features. The results of the study revealed that all the fourty samples of camel oral swab collected and analyzed were positive for fungal growth. The fungal pathogens isolated from the oral swab samples were *Aspergillus flavus* (20), *Mucor spp.* (12) and *Candida tropicalis* (08), which is classified in to (30) species of mould and (10) species of yeast. The study shows that fungal pathogens present in the oral cavity of camel were mainly mould with least occurrence of yeast. Consequently, is recommended that public and National awareness campaign that involves the raising of standard of living and hygiene mostly in the rural areas can help to educate the herders on the dangers associated with Oro-fungal thrush of camels.

Keywords: Camel, Fungi, Bordered LGAS and Oral cavity.

INTRODUCTION

Dromedary camels (*Camelus dromedarius*) named in 1758 by Swedish zoologist Carl Linnaeus are multi-purpose livestock, domesticated for their adaptation to survive, reproduce, and produce milk and meat in hot arid environments [1]. In Nigeria camels are mostly found in the arid zone and sudan savannah area with an estimated population of 87,830 with Sokoto and Borno having 43,960 and 26,682 respectively. Niger state has 496 making the three states the highest in that order [2]. Camel compared to other animals have been reported to be less subjected to several diseases, through information on several aspects on the health status of camels are not well recognized. In spite of this, it has been reported that camels are subjected to various type of microbial infectious including fungal diseases [3].

Fungi are eukaryotic organisms and everywhere in the environment, and can cooperate with plants, animals or humans, establish symbiotic, commensally, latent or pathogenic relationship [4]. Fungal diseases are often caused by fungi that are in the

environment. Most fungi are not dangerous, but some types can be harmful to human health (U. S department of health and human service). Fungal diseases will show if the immune system of the host is delicate [5]. The diagnosis is not easy since clinical beginning is diverse and depends on the host, treatment is difficult since number of available drugs is limited, and prevention is accessible for some fungi and only for some animal's species [6].

Camels is becoming a fast rising topic for research, although many research works have been conducted on camel but have focused on milk, urine, and skin diseases of camel. There is little or no information on the fungal pathogens present in camel oral cavity (swab). Thus studies on the fungal pathogens isolated from oral cavity of camel remains imperative.

The result of this study will provide a baseline for further researches on the area of fungal pathogens associated with camels. This research will serve as a tool to design control strategies, eradicate or prevent

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these pathogens from infected camels. The aim of study to isolate fungal pathogens in the oral cavity of camels in bordered LGAs of Sokoto State.

MATERIALS AND METHODS

The study was conducted in bordered Local Government Areas (LGAS) of Sokoto State, Bordered LGAS comprises of Illela, Gada, Gudu, Tangaza and Sabon Birni Local government that shares bordered with Niger Republic. Sokoto state is located at latitude 13.05N 05 15E and longitude 13,083N 5.250E of the equator. It lies in the extreme North West of Nigeria, near the confluence of the Sokoto River and Rima River, and falls within the Sudan Savannah ecological zone. It is populated with various categories of people some of which are peasant farmers, traders and artisans. The dominant ethnic groups are Hausa/Fulani. As of 2006 National census, it has a population of 4,277,60 people [7].

Study Design

The study was a cross sectional study undertaken on forty traditionally managed one humped camels (Dromedary) in the four selected herds in bordered LGAs of Sokoto State for purposive sampling method.

Sample Collection

Ten Swab samples each oral cavity of camels were collected from four herds in Illela, Gada, Gudu and Sabon Birni LGAS using forty sterile swab sticks. Securely, all samples were capped, and labeled then they were transported to Microbiology Laboratory of Umaru Ali Shinkafi Polytechnic Sokoto, Nigeria for analyses.

Media Preparation

Fourty grams (40) of Sabouraud Dextrose Agar (SDA) medium was weighed using a weighing balance and dispensed in to a clean conical flask. 1000ml of distilled water was also weighed using

measuring cylinder and dispensed in to conical flask containing the media, shaken well to mix. The mixture was heated on Bunsen burner for proper dissolving of the media. The media was then placed in the Autoclave to attain sterility for 15minutes at 121°C. After autoclaving the media was allowed to cool to temperature of about 40°C. Chloramphenicol was added to inhibit the growth of bacteria. Fourty sterile petridishes were properly labeled and 25g of the sterilized media was dispensed in to each. The media was allowed to gel and then the samples were inoculated. The inoculated petri-dishes were rapped with aluminium foil and incubated at 25°C for 72hours.

Fungi Staining and Microscopy

Lactophenol cotton blue stain was used for staining and microscopic identification of fungi. Fourty clean slides were well labeled alphabetically also indicating the site of collection. A drop of lactophenol cotton blue stain was placed on the center of the clean slides and a fragment of the colony from the site of inoculation was picked using inoculating needles. The picked colony were emulsified in lactophenol cotton blue stain at the center of the slide and covered using a sterile clean cover slip. The slides were examined under (x100) magnification, for the presence of characteristic hyphae and spores structures. Identification of the fungi was done morphologically using macro and microscopy morphological features comparing with Atlas of Mycology [8].

RESULTS

Out of forty swab samples of camel oral cavity collected and analyzed in this study all 100% were positive for fungal growth. The fungal pathogens isolated from the oral cavity were *Aspergillus flavus* (20), *Mucor* spp. (12) and *Candida tropicalis* (8), which are classified in to (30) species of mould and (10) species of yeast. The study shows that fungal pathogens present in oral cavity of camel swab were mainly mould with lest occurrence of yeast.

Table-1: Prevalence of Pathogenic Fungi in Camel Oral Cavity

Fungi	Number of species	Number isolated	Percentage of occurrence (%)
Mould	3	40	80
Yeasts	1	10	20
Total	4	50	100

Table 2: Frequency of Occurrence of Fungi Isolated from the Oral Cavity Swab of Camel.

Organisms	Occurrence	Frequency of occurrence (%)
<i>Aspergillus</i> spp	20	50
<i>Mucor</i> spp	12	30
<i>Candida</i> spp	8	20
Total	40	100

The table above shows the frequency of occurrence of the fungal species isolated from the oral cavity of camels. *Aspergillus* spp was ranked highest with the frequency of occurrence 20 (50%) while *Candida* spp showed the least prevalence of 8 (20%).

DISCUSSION

The results obtained from this study indicated that all the forty swab samples of camel oral cavity collected and analyzed were positive for fungal growth. The fungal pathogens isolated from the oral cavity swab samples are *Aspergillus flavus* (20), *Mucor* spp. (12) and *Candida tropicalis* (8), which are classified in to (30) species of mould and (10) species of yeast. The study shows that fungal pathogens present in oral cavity of camel swab were mainly mould with least occurrence of yeast.

This is similar to the findings of Choubisa [9] in India. Desert camels are least afflicted with fungi and bacteria pathogens, and they can survive without need to drink water for more than 30 days. This can be caused by fungi and bacteria, which invade the pulp cavity and cause further degradation of organic matrix [10]. The poor oral/dental health has been found to be associated with poor prehension, improper mastication and early culling, resulting in unthriftiness, loss of condition and poor performance at work, decreased nursing, milk and meat production.

Similarly this study showed the frequency of occurrence of the fungal species isolated from the oral cavity of camels as *Aspergillus* spp 20 (50%), *Mucor* spp revealed 12 (30%) and *Candida* spp showed the least prevalence of 8 (20%). The finding is similar to that of [11] who reported highest prevalence of *Aspergillus* and *Candida* specie in broken teeth of camel.

CONCLUSION

Evidently, the results generated from this study have shown that species of *Aspergillus*, *Mucor* and *Candida* were the fungi associated with the oral cavity of camels it is therefore recommended that Proper hygiene should be observed in camel herds and veterinarians should regularly visit camel herders to enlightened them on the dangers of microbial infections

associated with camels with the views to preventing camels from contracting infections and promoting camels production.

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