

ISOLATION OF *DERMATOPHILUS CONGOLENSIS* IN CATTLE IN GARKAWA TOWN OF MIKANG LOCAL GOVERNMENT AREA OF PLATEAU STATE, NIGERIA

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Abstract

Dermatophilosis is one of the most common bacterial infections of cattle. The study was to determine incidence and isolation of dermatophilosis in cattle in Garkawa town Plateau state Nigeria. A total of 404 cattle were observed in five cattle herds in Garkawa town. Of the 404 cattle, 45(11.10%) skin scabs were collected and processed by direct examination and culture for the presence of *Dermatophilus congolensis*. 41(10.10%) of the skin scabs were positive of *D. congolensis*. Skin scabs were only found in adult 41(91.10%). Females 34(97.10%) were significantly ($P < 0.05$) higher than their males 07(70.0%) counterpart also white Fulani were the most affected with 41(91.10%) where no sample was recorded in other crosses. Majority of samples were found in the chest 11(91.7%) and least in the scrotum 05(100%). The study revealed that dermatophilosis is endemic in the study area. Therefore, further study should be conducted to determine the source of infection, its natural habitat and also proffer solution on how to prevent its further occurrence.

Key words: Dermatophilosis, skin, isolation, cattle, Lesions

Introduction

Dermatophilosis is a contagious zoonotic skin disease caused by "*Dermatophilus congolensis*" members of aerobic actinomycete (Dalis *et al.*, 2010). The disease was first reported by von-soceghem (1915) in cattle in the Belgian Congo (Jafari shoorijeh *et al.*, 2008). The disease is a common skin infection of cattle and other large animals caused by *D. congolensis*. Moist environmental conditions predispose to contagious infection by *D. congolensis*. It affects a wide variety of animals and occasionally humans, the disease is commonly seen in cattle, sheep, horses and rarely in dogs and cats, where it is commonly called *cutaneous streptotrichosis*, *mycotic dermatitis* and rain scald in cattle, sheep and horses respectively, although other local names exist including senkobo skin disease in Central Africa, kirchi in Nigeria, and Saria in Malawi. Dermatophilosis is the name common to the disease in all species (Radostits *et al.*, 2007). Rain and snow that wet hair coats and cause matting present the greatest opportunity for infection. In addition to moisture, physical damage to the skin is necessary because *D. congolensis* is thought not to be able to invade healthy skin. Depending on the region and time of year, external parasites such as flies and lice may sufficiently injure skin and help spread the infection. Other sources of skin injury include abrasions from scratching, rubbing or licking, and moist dermatitis that develops under wet matted hair. The bacterium prefers moist areas and requires the integrity (i.e., barrier) of the skin to be impaired. Thus damaged skin with scabs and crusts on the face and ears are sites of colonization by *D. congolensis* in younger animals. Colonization begins by invasion of flagellated zoospores that penetrate the epidermis and reach the level of the basement membrane, in which they transform to a filamentous structure. Denthe, (2013) Damage to the cutaneous barrier system can also be caused by other invasive bacteria, fungi, or external parasites such as mites and ticks (Gofwan *et al.*, 2019). The aim of this work was to determine the incidence and isolation of clinical dermatophilosis in cattle in Garkawa town Mikang Local Government Area of Plateau state, Nigeria

Materials and Methods

Study Area

The study was conducted in Garkawa town of Mikang local Government Area (LGA) of plateau state, Nigeria. Garkawa is a town in mikang LGA located at the eastern part from the local Government head quarter (Tunkus) and it is bounded to Langtang North LGA by the north and Shendam LGA by the south. Garkawa town is one of the commercial centre in southern Plateau which attracts traders from within and outside the state. It has a minimum annual rainfall of 131.83 cm and a maximum annual rainfall of 171.83 cm. The temperature varies from 11°C to 30°C with the hottest month

usually around April. The people are engage in farming, keeping livestock and trading.(Gofwan et al, 2019)

Samples Collection

Samples were collected from five different cattle herds in Garkawa town, purposive sampling techniques was used where a total of 404 cattle were observed, 45 skin scabs or lesions suspected to be dermatophilosis were removed from individual cattle. The samples were transferred into a sterile container and properly labelled and bacteriological examination were conducted in the dermatophilosis research laboratory centre of National Veterinary Research Institute (NVRI) Vom Plateau state

Preparation of media used for the Isolation:

All purpose and enriched media were used for the isolation and preservation of Isolates for Identification which includes 10% sheep blood agar and peptone broth respectively.

Direct Microscopy was used to identify *D. congolensis*. The samples collected were pulverized and suspended in distilled water in bijou bottles and incubated at 37°C for 45 minutes under 10% CO₂. A loop–full from each suspension were used to make smear on a clean glass slide. It was then air dried and gram stained. The slides were examined under the microscope at x 100 magnification for the presence of *D. congolensis* positive samples revealed branching filaments containing zoospores as adopted by Denthe, (2013)

Sample processing/ Inoculation

The samples collected was processed for bacterial culture using the methods of Haalstra (1965) with slight modification by incorporating polymixin B. Briefly, the sample were pulverized and suspended in distilled water in bijou bottles and incubated at 37°C for 45 minutes under 10% CO₂. A loop – full from each suspension was then inoculated on 10% sheep blood after containing 1000 IU/ml polymixin B. the plates were incubated at 37°C for 48 – 72 hours under microaerophilic conditions. Small golden yellow colonies that pits on the media were considered positive. These colonies were then sub-cultured and the pure Isolates from the secondary culture were then incubated into peptone broth in duplicates and kept for further studies.

Data analysis

Data obtained were subjected to chi square analysis to determine the incidence of *D. congolensis* base on herds, Sex, Age, and site of lesion distribution

Results and Discussion

Table 1 shows herd distribution of *D. congolensis* isolates in cattle in Garkawa town. A total of 404 cattle were observed for skin scab or lesions in five different herd in Garkawa town and 45 skin scabs were excised. Of the 45 skin scab 41(91.10) were positive of dermatophilosis after bacterial examination. More of the positive samples were in herd one (1) with 11{100.0%) and least were from herd 3 with 05(100.0%). There were no significant ($P>0.05$) difference in between the herds. The incidence of dermatophilosis in cattle herds in Garkawa town could probably be due to presence of predisposing factors such as biting flies, ticks thorn scratch on grazing field and prolong wetting during the raining season. This finding agreed with the reports of Dalis *et al.*, (2021) that scratches on skin and flies bites can create route for bacteria entry into the skin also (Gofwan *et al.*, 2022) and Siamudaala *et al.*, (2005) reported that spread of the disease occurs by direct contact between animals or through exposure to contaminated surroundings (fomites) or by biting insects (vectors), particularly flies and ticks. Factors that break-down the natural protective barriers of the skin such as prolonged wetting by rain, high humidity, and high temperature allow the bacteria to spread, it has also reported by (Admassu and Alemu, 2011) that prolong wetting of the skin cause emulsification and disruption of the sebaceous film and maceration of the stratum corneum rendering the skin susceptible to infection by *D. congolensis*.

Table 1: Herd distribution of Dermatophilus Isolate in cattle

Herd	No present	No of scab	No infected	%	Chi sq	P-value
H1	94	11	11	100	3.215	0.523
H2	77	08	07	87.5		
H3	68	05	05	100.0		
H4	89	10	08	80.0		
H5	76	11	10	90.9		
Total	404	45	41	91.1		

Table 2 shows Age distribution of *D. congolensis* isolates in cattle. From the 404 cattle observed 345 from adults and 59 were young. Lesions were only observed in adults and none was seen in the young. This shows that adult cattle are more prone to *D. Congolensis* than young ones with 45(91.1%) against 0 infection. This could be that the young are not exposed to pre disposing factors meaning that dermatophilosis is more of an aging disease. This is contrary to the report of Admassu and Alemu, 2011 and Quinn *et al.* (2002) that dermatophilosis is seen in animals of all ages and both sexes.

Table 2: Age distribution of Dermatophilus isolates in cattle

Age	No present	No of scab	No infected	%
Adults	345	45	41	91.1
Young	59	0	0	0.0
Total	404	45	41	91.1

Table 3 shows sex distribution of *D. congolensis* isolate in cattle. 333 female cattle were observed and 35 skin scabs (lesions) were removed, 34(97.1%) of the samples were positive of *D. Congolensis* while only 71 cattle were males and 10 skin scabs were found and of the 10, 07 (70.0%) were positive. *D. Congolensis* in female is significant ($P>0.05$) higher than in the male this implies that females are more prone to *D. Congolensis* than the males which this could be due to reproductive stress. This is in agreement with the report of Gofwan *et al.*, (2019) and Rodostits *et al.*, (2007) also asserted that stress of pregnancy accounted to predispose cows to demertophilosis

Table 3: Sex distribution of Dermatophilus isolate in cattle

Sex	No present	No of scab	No infected	%	Chi sq	P-value
Male	71	10	07	70.0	4.075	0.042S
Female	333	35	34	97.1		
Total	404	45	41	91.1		

Table 4 shows Breed distribution of *D. Congolensis* isolates in cattle. Majority of the breeds observed were white Fulani (399) and only 05 were crosses. The results shows that white Fulani had 41(91.10%) percentage of *D. Congolensis* against other crosses with 0 infection. This implied that white Fulani breed are more susceptible to dermatophilosis than other crosses. This concur with the report of Gofwan *et al.*, (2019) who reported susceptibility in white fulani than other breedst. Dalis *et al.* (2010) also reported that N'dama and muturu breeds are found resistance to dermatophilosis also

Burd *et al.*, (2007) report that certain breeds are believed to have some degree of resistance to the disease.

Table 4: Breed distribution of Dermatophilus Isolates in cattle

Breed	No present	No of scab	No infected	%	Chi sq
White Fulani	399	45	41	91.10	-
Crosses	05	0	0	0	
Total	404	45	41	91.10	

Conclusion

The study revealed the occurrence of *Dermatophilus congolensis* in cattle in Garkawa town. A total of 41(10.10%) were positive of *D. congolensis*. Females had more of positive sample 34(97.10%) to their males counterparts, white Fulani and adults also had more of the positive samples of 41(91.10%) each respectively. Therefore, further study should be conducted to determine the source of infection, its natural habitat and also proffer solution on how to prevent its further occurrence.

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