

# Preliminary observations on bovine cutaneous nocardiosis and dermatophilosis in the subhumid climate of Southern Nigeria

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OYEKUNLE (M. A.), OJO (M. O.). Observations préliminaires sur la nocardiose cutanée bovine et la dermatophilose en climat subhumide du Sud Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1988, 41 (4) : 347-351.

L'existence de dermatoses bovines causées par *Nocardia* sp. et *Dermatophilus congolensis* en climat subhumide a été recherchée. L'isolement des ces germes pathogènes a montré que *D. congolensis* comptait pour 8,3 p. 100 et *Nocardia* sp. pour 30,6 p. 100 dans les dermatoses étudiées. Les 61,1 p. 100 restants étaient causés par d'autres agents. Les auteurs émettent l'hypothèse que la nocardiose cutanée est plus courante que la dermatophilose dans cet environnement. *Mots clés* : Bovin - Nocardiose - Dermatophilose - Dermatose - *Nocardia* - *Dermatophilus congolensis* - Nigeria.

## INTRODUCTION

Skin infection in animals can be produced by many agents and lead to economic loss.

Among them, VAN SACEGHEM (13) first described *Dermatophilus congolensis* (*D. congolensis*) as « dermatose contagieuse du bétail au Congo Belge » (now Zaire). Since then the disease has been reported in many countries including Nigeria (12) where it was regarded as second most important bacterial disease in cattle next to contagious bovine pleuro-pneumonia (CBPP) (4). During field survey ODUYE (10) reported that *D. congolensis* accounted for about 50 p. 100 of all bovine skin diseases followed by demodectic mange. Thus any bovine skin infection in which demodectic mange is not suspected is assumed to be caused by *D. congolensis*.

Skin infection caused by *Nocardia* sp. though reported (2, 7, 11) has not received the desired attention in Nigeria. It is then necessary to determine the extent of involvement of *Nocardia* sp.

This communication therefore compares the occurrence of bovine skin infection caused by *Nocardia* sp. with *D. congolensis* infection.

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## MATERIALS AND METHODS

Scabs were collected from 72 cases encountered between September 1985 and July 1986. Samples were collected with sterile forceps into sterile universal bottles from the following places.

### 1. Abattoirs :

- . Lafenwa - Abeokuta
- . Ijebu - Igbo
- . Bodija - Ibadan

### 2. Fulani herds :

- . Imeko

### 3. Teaching and Research Farms :

- . University of Ibadan (UI)
- . Institute of Agricultural Research and Training (IART), Ibadan

TABLE I Locality and breeds of cattle from which samples were collected.

Locality	Number of animals with skin infection	Breeds
Imeko	34	White Fulani
Lafenwa - Abeokuta	12	White Fulani
Ijebu-Igbo	6	White Fulani
Bodija Ibadan	10	White Fulani
University of Ibadan farm	4	Cross between Ndama and Brown Swiss
University of Ibadan farm	2	Ndama
I.A.R. & T., Ibadan	4	White Fulani

## Lesions

At the three abattoirs and the Fulani herds, most of the cattle had lesions on the neck, chest and back. In some of the cases, the lesions extended to the rump and belly. Scabs were collected from either the back or chest of these animals. At the University of Ibadan

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farm, two heifers had lesions on their shoulders with one of them having an enlarged prescapular lymph node. One bull had lesion on the scrotum while three cows had lesion on the entire fore and hind legs. At the IART, Ibadan, one cow had lesion on the shoulder area and chest while the remaining three cows had their lesions on the inguinal region.

At UI and IART, Ibadan, scabs were collected from the animals at the respective location of the lesions.

### Impression smear

A small portion of the scabs was ground into fine suspension with about 0.5 ml of sterile distilled water and thin smears were prepared from this on microscopic slide and stained with Giemsa or Gram.

### Isolation of the pathogens

The remaining scabs were cultured on blood agar (Oxoid CM 55) and brain heart infusion agar (Oxoid CM 375) according to the method described by ABUSAMRA (1) except polymixin B sulphate was not added to the media. Human or sheep blood was used in preparing the blood agar.

Film preparations from culture were made and stained with Giemsa, Gram and Ziehl-Nelsen according to the method described by COWAN (3).

## RESULTS

From the 72 cases of bovine skin infection studied 22 (30.6 p. 100) were caused by *Nocardia* sp. and 6 (8.3 p. 100) caused by *D. congolensis* (Table II). The two organisms were not isolated from the same skin lesions (Table III). The two N'Dama cattle at University

of Ibadan were among the 4 (Table II) that were found to be infected with *Nocardia* sp.

### Morphological characteristics of *Nocardia* sp. and *D. congolensis*

Filaments were demonstrated from the impression smears of scabs from skin lesions. Stained preparations from cultures of the two pathogens showed that both were Gram positive non acid fast filamentous organisms. However, the filaments of *Nocardia* sp. tend to be longer with coccoid forms occasionally observed surrounding them (Fig. 1). The hyphae of *D. congolensis* are septate with coccoid forms always surrounding the filamentous form (Fig 2). The length of filaments in both organisms were variable.

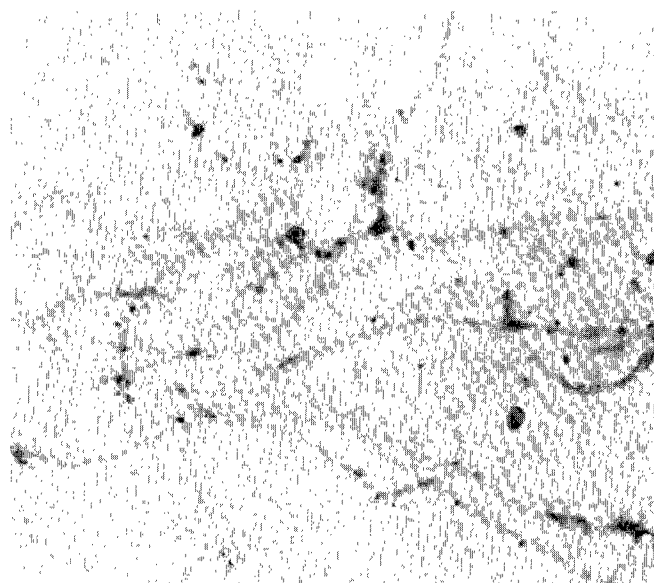


Fig. 1 : Branching filaments of *Nocardia* sp. isolated from bovine skin infection ; 48 h culture on blood agar in 10 per cent carbon dioxide. Giemsa. x 1,000 .

TABLE II Comparison of occurrence of skin infection caused by *Nocardia* sp and *D. congolensis*.

Locality	Number of animals with skin infection	Number of animals with skin nocardiosis	P. 100 with skin nocardiosis	Number of animals with <i>Dermatophilus</i> infection	P. 100 with <i>Dermatophilus</i> infection
Imeko	34	11	32.35	1	2.94
Lafenwa-Abeokuta	12	3	25.0	1	8.33
Ijebu-Igbo	6	2	33.33	—	0
Bodija-Ibadan	10	2	20.00	—	0
U.I. Farm	6	4	66.67	—	0
I.A.R. & T., Ibadan	4	—	0	4	100
Total	72	22	30.56	6	8.33

TABLE III Distribution of lesions in 72 cases of bovine skin infection.

Location of lesion	Type of lesion	Number encountered	Nocardiosis cases	Dermatophilosis cases	Other causes
Shoulder	Exudative plus enlarged prescapular lymph node	1	1	—	—
Shoulder	Crusts and scabs	1	1	—	—
Scrotum	Crusts and scabs	1	1	—	—
Fore and hind limbs	Crusts and scabs	3	1	—	2
Shoulder and chest	Crusts and scabs	1	—	1	—
Inguinal region	Crusts and scabs	3	—	3	—
Neck, chest and back	Crusts and scabs	46	14	2	30
Neck, chest back, rump and belly	Crusts and scabs	16	4	—	12
	Total	72	22	6	44
	P. 100		30.6	8.3	61.1



Fig. 2 : Hyphae of *D. congolensis* with dispersed cocci (48 h culture on blood agar in 10 p. 100 carbon dioxide. Giemsa. x 1,000).

### Physiological characteristics of *Nocardia* sp. and *D. congolensis*

The *Nocardia* sp. and *D. congolensis* seemed to have the same growth requirements. They both grew well on blood agar and brain heart infusion agar incubated at 37 °C in about 10 p. 100 carbon dioxide enriched atmosphere for 48 h. The two organisms produced  $\beta$ -haemolysis on human and sheep blood agar plates but the *Nocardia* sp. produced more pronounced haemolysis with sheep blood agar. After the primary isolation the *Nocardia* sp. grew well on blood agar, brain heart infusion and nutrient agar incubated aerobically at 37 °C for 24 h. *D. congolensis* produced motile zoospores whereas *Nocardia* sp. were not motile.

### DISCUSSION

The various centres where scabs were collected may represent what is obtainable throughout Ogun and Oyo States of Nigeria. For example, Imeko is the major centre where cattle are reared in Ogun State. Cattle slaughtered at Ijebu-Igbe and Lafenwa-Abeokuta abat-

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toirs came from different parts of Ogun State. Also, the Bodija-Ibadan abattoir is the largest abattoir in Oyo State and cattle slaughtered there came from all over Oyo State. Thus, the information provided by this study can be generalised for the two states.

The method ensures better isolation of the pathogens because of the grinding and powdering of the scabs which release the organisms (14). The non-inclusion of polymixin B sulphate in the media to suppress contaminants will not significantly affect the ratio of dermatophilosis to nocardiosis because these observations from routine examination of samples for diagnostic purposes showed that the growth requirements of *Nocardia* sp. and *D. congolensis* seemed to be the same. Since they were both cultured under the same environmental and nutritional conditions, the inhibiting effects of contaminants on the growth of the two pathogens on culture, if any, would be the same.

In the previous study of normal bacterial flora of bovine skin conducted by LLOYD (6) and NWUFOR (8), *Nocardia* sp. and *D. congolensis* were not reported to be present. Therefore, their presence in the infected skins under study may implicate them as the causative agents. Isolation of *Nocardia* sp. from bovine skin infection is also in agreement with similar result obtained by OLUBUNMI (11) but contrary to their view, White Fulani cattle are not resistant to the disease because most of the isolates in the present study were obtained from this breed. Furthermore, this study shows that *Nocardia* sp. can infect N'Dama cattle which are generally known to be resistant to *Dermatophilus* infection.

Unlike dermatophilosis, the environmental conditions which favour the initiation and development of cutaneous nocardiosis have not been determined in Nigeria. However, these results indicate that cutaneous nocardiosis accounts for 30.6 p. 100 while dermatophilosis accounts for 8.3 p. 100 of bovine skin infec-

tion encountered. It will be interesting therefore if further investigation is carried out to strengthen the present finding especially in the Northern States of Nigeria where, according to LLOYD (5) the highest number of Nigerian cattle are found.

The ratio of dermatophilosis to nocardiosis obtained in this study suggests that in cattle, skin nocardiosis may be more common than dermatophilosis. Similarity between the lesions of bovine cutaneous nocardiosis and dermatophilosis has been recognised (9, 10) and mixed infection was not observed in this study. Therefore the over 50 p. 100 of bovine skin infection attributed to *D. congolensis* by ODUYE (10) may not be due to *D. congolensis* alone but with *Nocardia* sp. suggesting that diagnosis of *Dermatophilus* infection based on clinical observation with demonstration of filaments in smear and skin section alone (10) cannot be a reliable method.

## CONCLUSION

This investigation demonstrates that cutaneous nocardiosis is present in Nigeria and may have a higher occurrence than dermatophilosis. There is also a need to always confirm the diagnosis of either disease with cultivation. The species of *Nocardia* sp. involved in bovine skin infection in Nigeria need to be determined.

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OYEKUNLE (M. A.), OJO (M. O.). Preliminary observations on bovine cutaneous nocardiosis and dermatophilosis in the subhumid climate of Southern Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1988, 41 (4) : 347-351.

The occurrence of bovine skin infection caused by *Nocardia* sp. and *Dermatophilus congolensis* in a subhumid climate was investigated. Isolation of these pathogens showed that *D. congolensis* accounted for 8.3 p. 100 and *Nocardia* sp. 30.6 p. 100 of skin infection studied. The remaining 61.1 p. 100 was caused by agents other than the two pathogens. It is suggested that skin nocardiosis is more common than *Dermatophilus* infection in this environment. *Key words* : Cattle - Nocardiosis - Dermatophilosis - Skin infection - *Nocardia* - *Dermatophilus congolensis* - Nigeria.

OYEKUNLE (M. A.), OJO (M. O.). Observaciones preliminares sobre la nocardiosis cutánea bovina y la dermatofilia bajo el clima subhúmedo del sur Nigeria. *Revue Élev. Méd. vét. Pays trop.*, 1988, 41 (4) : 347-351.

Se buscó la existencia de dermatosis causadas por *Nocardia* sp. y *Dermatophilus congolensis* en bovinos bajo un clima subhúmedo. El aislamiento de dichos germenos mostró que *D. congolensis* causaba 8,3 p. 100, *Nocardia* sp. 30,6 p. 100 y otros germenos patógenos 61,1 p. 100 de las dermatosis estudiadas. Se sugiere que la nocardiosis del pellejo es más generalizada que la dermatofilia en este medio ambiente. *Palabras claves* : Bovino - Nocardiosis - Dermatofilia - Dermatosis - *Nocardia* - *Dermatophilus congolensis* - Nigeria.

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