

An Incidental Finding of *Dermatophilus congolensis* in a Sheep: A Case Report from Shivamogga, Karnataka

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Abstract

A six-month-old, male sheep (Tiruchy black breed) reared under an extensive system was presented to the Veterinary Clinical Complex, Veterinary College Shivamogga, with the complaint of limping, nasal discharge, and poor growth. On clinical examination the sheep was anaemic, suffering from helminthic infection and exudative dermatitis with crusts observed over the ear pinnae, muzzle, nasal planum, scrotum, fetlock, and pastern regions of limbs. The scabs were stained to demonstrate characteristic hyphae composed of branching filamentous rods that divide into transverse and longitudinal coccoid cells (Coccoid form) resembling 'tram-track'. The recent heavy and prolonged rainfall in this region may have created a conducive hot humid environment causing Dermatophilosis in sheep which may be exacerbated by concurrent helminthic infection and profound anaemia in sheep. Adequate treatment was given and control measures were undertaken to mitigate the spread of the disease.

Keywords: Dermatophilosis, *Dermatophilus congolensis*, Rainfall, Sheep, Tram-track,

Introduction

Dermatophilosis is a skin infection caused by *Dermatophilus congolensis*, a gram-positive bacterium, that causes disease in several domestic (cattle, sheep, goats, pigs, horses, camels, dogs, etc.) and wild animals (elephants). It is zoonotic. The disease is prevalent in all areas of the world but can be epizootic in tropical and subtropical areas of the world where it can result in considerable economic loss (Samui *et al.*, 1990). It may occur in acute, subacute, chronic, and latent forms, either in a generalized form or as localized lesions in different body sites (Chitra *et al.*, 2017). Clinically it must be differentiated from ringworm, staphylococcal dermatitis/folliculitis, scabies, pediculosis, fleece rot, and contagious echthyma (orf).

Dermatophilus congolensis is not highly invasive, however, they invade skin when the barrier of the skin is broken by abrasive terrain or thorny and spiny forage and feedstuffs, insect bites, especially in the sparsely wooded areas of the body. Colonization of organisms is favoured by prolonged rainfall followed by a hot humid environment (Radostits *et al.*, 2007). Hence, it is known as rain scald/ rain rot. The infective pathogens (zoospores) on multiplication invade the epidermis causing epidermal inflammation, exudative dermatitis with crusts, matting of hair coat forming spikes or lumps (lumpy wool condition, paintbrush lesions) that dry to form scabs (bottleneck scabs). These scabs can be easily peeled off leaving granular or often bleeding surfaces (Tresamol and Saseendranath, 2014). The skin wound may get contaminated to produce micro abscesses or myiasis. The infection can be mechanically transmitted by contact with infected animals and passively by vectors (ectoparasites).

In routine clinical practice, Dermatophilosis in sheep is unusual and may go unnoticed. Hence, one such incidental finding of Dermatophilosis in sheep was identified and discussed in detail.

Case History and Clinical Examination

A six-month-old, male sheep (Tiruchy black breed) reared under an extensive system was presented to the Veterinary Clinical Complex, Veterinary College Shivamogga, with the complaint of weakness, limping, nasal discharge, and poor growth. On clinical examination, the sheep were found to be weak, anaemic (pale conjunctival mucous membrane) with mild tick infestation. The rectal temperature was 100.9⁰F. Watery nasal discharge and exudative dermatitis with crusts projecting from the skin were observed over the ear pinnae, muzzle, nasal planum, scrotum, and near fetlock and pastern regions of the limbs. There was no pruritus. Based on the clinical signs it was suspected to be Dermatophilosis in sheep.

Materials and Methods

The faecal sample, blood sample, and impression smears from the undersurface of the moistened scabs were collected from the infected sheep to identify the underlying cause. The faecal sample was processed by direct and sedimentation methods to rule out any helminthic infection causing poor growth and whole blood was subjected to an automatic haematological analyzer to assess the anaemic status. The crust-like lesions were easily removed and processed by moistening them with normal saline, then smeared on a slide. The smear was fixed with methanol and stained using Giemsa stain. To identify the bacterium, slides were viewed under oil immersion of the microscope. Based on the results obtained the treatment was advised to the farmer to curb the condition.

Result and Discussion

Dermatophilosis in sheep in routine clinical practice is unusual and many times it goes unnoticed and underreported due to the self-limiting nature of this disease. However, as this disease has potential zoonotic importance, it is essential to identify the disease and record the incidence in different livestock. The clinical manifestation is most commonly restricted to skin lesions such as erythema, papules, pustules, and exudative dermatitis to form crusts and scabs with or without pruritus. Less commonly other systems like gastrointestinal and respiratory systems may be involved. When such a dermatological disorder is noticed, then Dermatophilosis should be one of the differential diagnoses. In the present study, one such case of naturally infected sheep was presented with exudative dermatitis with crusts over the ear pinnae, on the dorsal as well as ventral surfaces, muzzle, nasal planum, on the scrotal skin and near the fetlock and pastern regions of limbs. The hair over the infected site of the ear pinna was erect and matted in tufts (**Fig 1.a to c**). The crusts were thick, pyramidal with a concave base, black pigmented, and the underlying skin was moist. There were no palpable crusts over the dorsal surface of the body and there was no

pruritus. The sheep was also showing mild upper respiratory tract infection and pale mucous membrane.

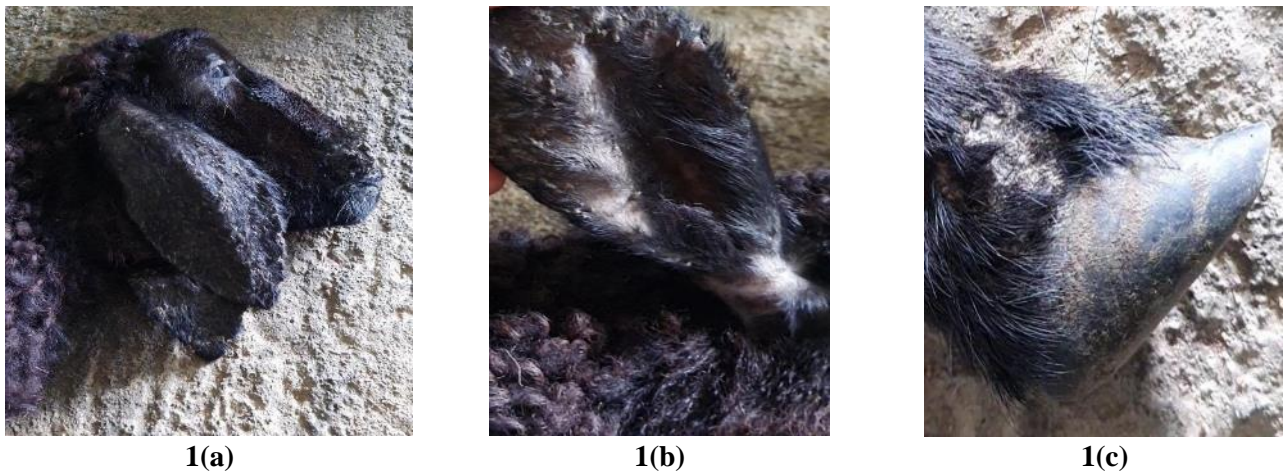


Fig 1: Showing crusts over **a**, ear and muzzle; **b**, in the ventral surface of ear pinna; **c**, pastern region

The faecal sample was found to be positive for helminthic infection with strongylosis (strongyle egg: +++) and moniziosis (*Moniezia expansa* egg: +++) and haematological analysis (Table 1) revealed profound anaemia.

Table 1: Hematological analysis

Sl.no	Parameters	Normal range	Sample value	Indication
1.	Red blood cell count (10^6 /cumm)	9-15	3	Low
2.	Packed cell volume (%)	27-45	8.5	Low
3.	Haemoglobin (g/dl)	9-15	3.6	Low
4.	White blood cell count (10^3 /cumm)	4-12	8.6	Normal
5.	Granulocytes (10^3 /cumm)	0.7-6	5.03	Normal
6.	Total platelet count (10^5 /cumm)	2-8	4.5	Normal

However, the blood smear revealed a negative for haemoprotozoan infection in the sheep. Microscopically, Giemsa-stained impression smears of the moistened scab revealed filamentous, branching actinobacterium with a distinctive morphology. The organism being dimorphic grows as branched filamentous hyphae containing dormant zoospores which are transformed by moisture into the infective stage of motile isolated cocci. The cocci divide into transverse and longitudinal coccoid cells (Coccoid form) i.e., double rows of zoospores resembling ‘tram-track’, confirming *Dematophilus congolensis* infection in sheep (Fig 2).

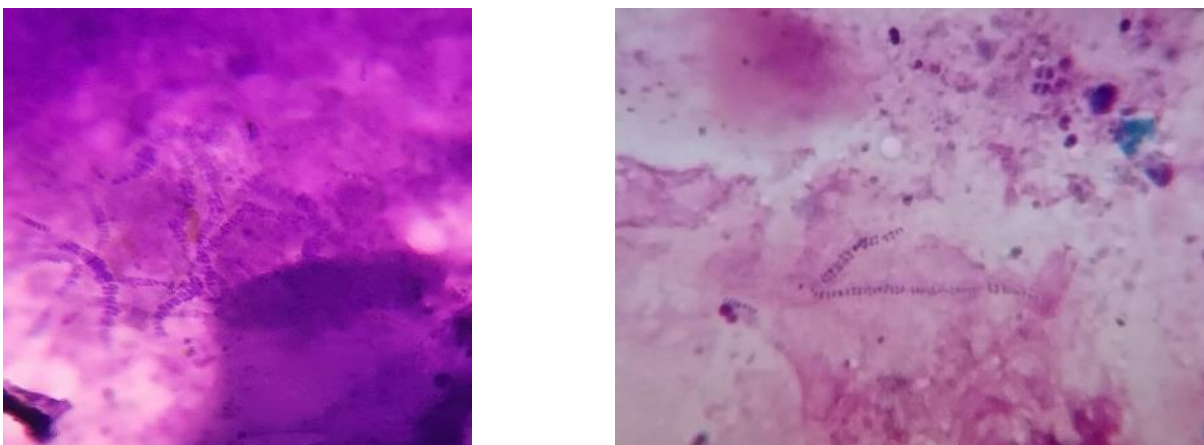


Fig 2: Characteristic ‘tram-track’ appearance of the organism, Giemsa stained under 1000X

This incidental finding of *Dematophilus congolensis* infection in a young male sheep was an index animal recorded at the end of August month of 2022. Heavy and long-standing rainfall and warm temperatures reduce the normal

superficial protective factors of the skin and predispose animals to clinical skin lesions. The hot humid environment created during the period may have favoured the activation of dormant skin zoospores, producing germ tubes containing active multi-flagellated zoospores that invade the epidermis. Further, it is facilitated by the pre-existing anaemic hypoxia in the infected sheep. Here skin lesions on invasion produce epidermal inflammation, serous exudation, and microabscess formation, followed by regeneration that results in the formation of crusts and scabs. The infection may have spread to the upper respiratory tract leading to mild respiratory infection in the sheep.

In order to treat the condition and to curb the further spread of the disease, the sheep were treated with Oxytetracycline (Oxynex®) I/V at 10mg/kg body weight and topical treatment with Oxytetracycline and Gentian violet spray (Alvimycin®) @ thrice a day to the skin lesion was advised. The sheep were then dewormed with Fentas plus® liquid against helminthic infection at 10mg/kg body weight (fenbendazole) P.O. As supportive therapy B-complex (Tribivet®) 1 ml I.M. and 3-D Red 5ml twice a day P.O. was given to combat anaemia. Further, the farmer was advised to deworm all the animals, take care of tick infestation, rest the pasture till complete cure of the herd, and allow for grazing on a different pasture.

Dermatophilosis was first reported in Belgian Congo as dermatose contagieuse (Saceghem *et al.*, 1915). Pal *et al.*, (1995) reported dermatophilosis in buffalo, cattle, goats, antelope, horses, and humans from North and Western parts of India. In recent years, dermatophilosis in livestock was reported as pododermatitis in Kerala (Tresamol *et al.*, 2015), Tamil Nadu (Ananda Chitra *et al.*, 2017) and Andhra Pradesh.

Conclusion

Dermatophilus congolensis is not a very invasive pathogen. However, in the present study, the outcome of clinical disease with exudative dermatitis and crusts over common predilection sites correlates with the recent occurrence of heavy and prolonged rainfall in this area. Along with the conducive micro-environment, helminthic infection, and profound anaemia may have exacerbated the disease in this sheep. Further, Giemsa-stained impression smears made from moistened crusts/scabs are an effective means of diagnosing and differentiating diseases with similar clinical presentation. Oxytetracycline and supportive therapy were administered and the farmer was advised to control the vectors. This case report on Dermatophilosis in sheep appears to be the first time reported from this area and has established its occurrence in sheep.

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Contribution by Authors

Equal contribution

Conflict of Interests

There is no conflict of interest.

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