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Dermatophilosis (Cutaneous Streptothricosis) in Kafue Lechwe (*Kobus leche kafuensis*)

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ABSTRACT: Extensive dermatitis caused by *Dermatophilus congolensis* was identified in two kafue lechwe (*Kobus leche kafuensis*) in Lochinvar National Park of Zambia. The lesions were characterized by thickening of the skin, crusts, and nodule formation. Almost all parts of the body were affected. Histologically there was an exudative dermatitis with acanthosis, parakeratosis, hyperkeratosis, and an exudate rich in neutrophils. This is the first known report of dermatophilosis in lechwe.

Key words: *Dermatophilus congolensis*; Kafue lechwe; *Kobus leche kafuensis*; Zambia.

Dermatophilosis is an exudative dermatitis caused by *Dermatophilus congolensis*, which affects a wide variety of animals, both wild and domesticated and occasionally humans. The disease commonly affects cattle, sheep, goats and domesticated equines in many parts of the world, often creating severe economic problems (Stewart, 1972; Yager and Scott, 1992). The disease also has been reported in the pig, cat, dog, donkey, and buffalo (*Syncerus caffer*) (Losos, 1986). The only non-mammalian host so far encountered are the Australian bearded lizards (*Amphibolurus barbatus*) (Montali et al., 1975) and marble lizard (*Calotes mystaceus*) (Anver et al., 1976). Human cases also have been reported (Dean et al., 1961). Our objective was to describe cutaneous streptothricosis in two free-living Kafue lechwe.

The Kafue lechwe (*Kobus leche kafuensis*), a medium size antelope, is found only in Kafue flats of Zambia. Lechwe are semi-aquatic in nature and prefer swamps and wetland habitat feeding on grass and water plants (Howard et al., 1984). Lochinvar National Park (16°03'S, 27°17'E) has an area of 480 km² and is a flood plain on the southern side of the Kafue river, a major habitat for Kafue lechwe. The other major wildlife in the park are zebra (*Equus*

burchelli), buffalo (*Syncerus caffer*), wildebeest (*Connochaetes gnu*), kudu (*Tragelaphus strepsiceros*) and oribi (*Ourebia ourebi*). Domesticated animals, especially cattle, also enter the park for about 4 to 5 mo every year to share grazing and drinking of water during the dry season.

During September and October 1989, 92 adult lechwe were shot in a World Wide Fund for Nature sponsored study into the use of lechwe meat by local communities. The lechwe were examined for external and internal abnormalities to certify meat for public consumption. Two of the 92 lechwe had extensive skin lesions. The skin of the two lechwe showing cutaneous thickening, crusts and nodule formation was examined thoroughly. The surface of the skin was covered by exudative debris. The skin and hair felt greasy and had a dirty whitish-yellow coloration. There was little loss of hair and lesions were not visible until the carcass was examined closely. Almost all parts of the body were affected and characterized by exudative dermatitis. The paint brush lesion consisting of focal matting of hair by exudate was observed. Lesions ranged from small nodule-like formations to large areas with extensive accumulation of crusts. The lesions around the mouth, ear, hindlimb, forelimb, and tail resembled papillomas. Free nodular crusts also were entangled between hairs. Upon palpation the skin felt rough and when scabs were removed they took some hairs with them. Both carcasses were very emaciated. External lymph nodes were enlarged. Fibrosis of liver, enlarged thickened bile ducts full of trematodes resembling *Fasciola gigantica*, and the presence of mature amphistomes in the rumen were noted internally in both animals. Pieces of the skin and crusts from the two lechwe,

which were suspected of having mange, were evaluated further.

Skin scrapings containing crusts and purulent exudate were soaked in distilled water, smeared on glass slides and stained with Giemsa and Gram's stain (Carter and Cole, 1990). Two forms of organisms were noticed. One had hyphae 1 μm in width with transverse bands and the other had large structures measuring 3 to 5 μm in width. Degenerating neutrophils and epithelial cells were seen. No mange mites were seen in a skin scraping dissolved in 5% potassium hydroxide and examined microscopically.

Crusts were washed in sterile distilled water to remove superficial contaminating microorganism inoculated onto 5% sheep blood agar plates (Difco Company, Detroit, Michigan, USA), thioglycollate medium (Nissui Pharmaceutical Company, Tokyo, Japan) and Sabouraud's Agar (Difco Company). The cultures were incubated aerobically and anaerobically at 37 C. Bacterial identification was based on Carter and Cole (1990). A bacterial sensitivity test was conducted using Oxoid antimicrobial susceptibility test discs (Unipath Limited, Basingstoke, Hampshire, England) containing 50 μg chloramphenicol, 300 μg sulfonamide, 25 μg ampicillin, 10 μg penicillin, and 50 μg tetracycline.

Dermatophilus congolensis was isolated from scrapings of both skins of lechwe. Colonies on blood agar were whitish, punctate, and hard; beta hemolysis was evident in 48 hr. Organisms did not grow on Sabouraud's Agar. Branching filaments and coccoid forms of the organisms were Gram-positive and non-acid fast. The isolates were sensitive to tetracycline, penicillin, chloramphenicol, and ampicillin, but resistant to sulfonamide. Samples of affected skin were fixed in 10% formal saline, embedded in paraffin, sectioned at 5 μm thickness and stained with hematoxylin and eosin. The dermatitis was characterized by acanthosis, parakeratosis, hyperkeratosis and exudate rich in neutrophils. A thick scabrous layer of necrotic and cornified

epithelial cells, degenerate neutrophils and coagulated proteinaceous fluid was attached to the surface of the epidermis. Focal accumulations of neutrophils were present in many places between the epidermis and the overlying scab. The long parallel chains and individual coccoid cells characteristic of *Dermatophilus congolensis* were evident in huge numbers, primarily in the stratum corneum, with foci of organisms frequently associated with hair follicles. The hair root usually was intact. Hyphae were predominantly found in the upper epidermis, especially in the stratum corneum and sometimes in the papillary layer of the dermis. There was no histopathological evidence of mange. The definitive diagnosis was based on gross lesions, histopathology, and cultural and morphological characteristic of the organism.

The gross and histopathological lesions were similar to those described in cattle, sheep, goats, deer and other herbivorous animals (Roberts, 1965; Stewart, 1972; Yager and Scott, 1992). In herbivorous animals this organism grows within the epidermis as filaments from which zoospores are formed; subsequent hyphal growth and formation of a new generation of zoospores occurs only in epidermis. Zoospores resist drying and heating but do not survive long in wet environments outside the lesion (Smith and Cordes, 1972).

The lechwe in the present study by virtue of their habit stay either in water, wetlands or around water and get soaked easily (G. S. Pandey, unpubl.). This wetness may have aggravated skin lesions facilitating spread of infection and softening of the skin. In dry crusts the zoospores can survive for a long time whether on the body or on the ground and when crusts become wet the zoospores are released which are infective (Oppong, 1976). Zoospores can be spread between animals by ticks, biting flies, insects, and contaminated pastures (Macadam, 1970; Yager and Scott, 1992).

Dermatophilosis in cattle is widely prev-

alent in Zambia including the area around Lochinvar National Park (Samui and Hugh-Jones, 1990). There is close contact between cattle and lechwe, particularly during the dry season when the availability of water and grazing is restricted. The area around Lochinvar is densely populated with cattle which enter the park, graze and drink water together with lechwe and remain in close contact with them from June to October. During the end of October and November, when the rain starts, the cattle are taken back to their villages.

Ticks and flies are abundant on cattle and are present on lechwe but less numerous. Infected cattle may have contaminated the pasture on the Kafue flat. Infection in lechwe is presumed to have been transmitted from cattle sharing the pastureland. Although lechwe have been culled in Lochinvar for a number of years, there is no past mention of any type of dermatitis. Meat inspection is done rarely; and then only after skinning the carcass so that the inspector has no chance to check the skin for dermatitis. We are not aware of any other published reports of this disease in lechwe. Preventing contact between cattle and wildlife may be necessary to reduce the incidence of dermatophilosis in lechwe and other species.

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