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Diagnosis and management of Dermatophilosis in two cows and four buffaloes

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Abstract

Two cows and four buffaloes were presented with the history of dermatitis of various degrees. Clinical examination revealed thick scabs all over the body with matting of hair. Skin scabs and scrapings were subjected to detailed cultural examination. Microscopical examination of Gram's stained smears of scab material from the lesions revealed characteristic gram positive septate branching filaments with typical tram track appearance suggestive of *Dermatophilus congolensis*. Animals responded to oxytetracycline and tylosin combination and supportive therapy.

Keywords: Dairy cattle, *Dermatophilus congolensis,* Management.

Dermatophilosis is highly contagious zoonotic skin disease of livestock caused by Gram positive bacteria *Dermatophilus congolensis*, with significant economic losses, especially in tropical regions. The disease affects a wide range of hosts including domestic animals like cattle, buffalo, sheep, goats, and horses as well as wild and aquatic animals. Transmission occurs by direct contact with infected animals, asymptomatic carriers or fomites (Adedeji and Adene, 2017). The disease typically presents in acute or chronic forms and often begins with exudative dermatitis, where fluid leaks from inflamed skin and hardens into scabs, leading to matted hair and crusty scabs (Abdullahi, 2001; Loria *et al*., 2005). The study aims to evaluate the efficacy of treatment combination of oxytetracycline and tylosin along with topical povidone-iodide.

Two cows and four buffaloes were presented with clinical signs of thick scabs all over the body. Lesions included vesicles, pustules, matting of hair, thick crusts and scabs (Fig 1). There was reduction in milk yield, anorexia and depression in the affected animals. All other vital signs were normal. Sterile skin scabs and swabs from lesions were collected for laboratory examination. The aseptically collected scabs were crushed and softened in sterile distilled water and smears were prepared on a clean oil-free microscopic slide. The air-dried and heat-fixed smear was then stained with Gram's stain and observed under oil immersion objective of the microscope. The samples were also directly inoculated onto 10% sheep blood agar and Sabourauds dextrose agar. Later, the samples were processed for isolation of *D. congolensis* by modified Haalstra's method (OIE, 2008). The infected scab material was homogenized in sterile Petri dishes with Brain heart infusion (BHI) broth. The suspension was transferred to screw cap vials and incubated for 3 hours at room temperature and then exposed to 5% CO_2 tension for 30 minutes. The motile zoospores at the top layer of the processed sample were transferred on to 10% sheep blood agar using a sterile inoculation loop and incubated at 37 ºC under 5% CO2 tension in a CO2 incubator for 72 hours. The results were recorded after 72 hours of incubation. Further, few drops of the processed sample from the top most layers were examined by simple Methylene blue stain without heat fixation for the presence of motile zoospores. Biochemical reactions *viz*. Catalase test, IMViC tests, Oxidase test, and sugar fermentation tests were performed following standard procedure described by Babul *et al*. (2010).

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Fig 1: Papules and scabs all over body

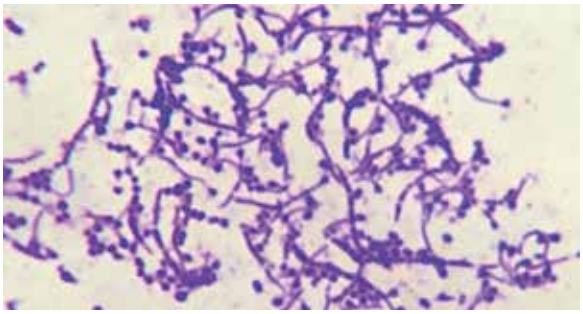

Fig 2: Gram's stain- Filaments showing typical 'tram- track' appearance fragmenting into cocci.

In the present study, dermatophilosis was observed in two cows and four buffaloes. All animals had vesicles, pustules, matting of hair, thick crusts and scabs all over body. Similar observations were made by Tresamol and Saseendranath (2015). Dermatophilus *spp.* primarily infects epidermis layer only with occasional extension into the dermis. Scabs characteristically comprises alternating layers of parakeratotic keratinocytes invaded with branching bacterial filaments and infiltrates of neutrophils in serous exudate. The observation of distinctive ladder pattern of *Dermatophilus congolensis* in stained smears remains a low-cost yet effective diagnostic method. The hot and humid climate, persistently moist conditions, presence of biting flies, ticks and immunosuppression due to stress associated with pregnancy and lactation were implicated as key predisposing factors for the increased incidence of dermatophilosis among dairy cattle (Tresamol and Saseendranath, 2015). Stained smears revealed spherical or ovoid spore like structures. Gram stained smears of swabs inoculated directly on 10% sheep blood agar revealed presence of non hemolytic Staphylococcus *spp.* Well defined actively motile characteristic zoospores were observed in the scab material processed by Haalstra's method. Upon further inoculation on 10% blood agar, gram-positive coccoid structures with branching, septate, and filamentous appearance characteristic of *Dermatophilus.congolensis* were identified (Fig.2). In certain cases, the bacterial filaments divided into two to six rows of cocci, creating the classic tram-track appearance. On biochemical examination, the isolates were found positive for catalase, oxidase and citrate utilization tests. It ferments glucose and produced acid without gas (OIE, 2008). The scab samples were tested negative for parasites and fungi.

In the present study, all the animals were treated with a single intramuscular dose of long-acting oxytetracycline (20 mg/kg body weight), along with tylosin (15 mg/kg for five days) and antihistamines. Topical povidone-iodine was applied directly to the lesions to promote disinfection and aid in the healing process. Signs of healing began within five days, with complete recovery observed within few days in all cases. Similar treatment protocol was practiced by Aydogdu et al. (2021) with uneventful recovery in goats.

As dermatophilosis is a zoonotic disease, it was advised to handle the affected animals with gloves and thorough handwashing with antibacterial soap. History of high humidity and temperature in this region delays wound healing which might be the major predisposing

factor in the present study. Therefore, regular control of ectoparasites, early diagnosis, isolation and treatment of infected animals as well as culling of chronically infected animals that do not respond to treatment are recommended as measures for the prevention and control of the disease in dairy cattle.

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