DIAGNOSIS OF DERMATOPHILUS DERMATITIS AMONG BUFFALOES IN KERALA

P.V. Tresamol, M.R. Saseendranath and K. Vinodkumar

ABSTRACT

The present study reports prevalence of dermatophilosis due to *Dermatophilus congolensis* among buffaloes in Kerala. Five buffaloes presented with skin lesions primarily on the lower limbs, udder and tail were subjected to detailed investigations to identify the etiological factors. Skin swabs and scabs were collected from the lesions under sterile conditions and were subjected to direct microscopical and cultural examinations. Direct microscopical examination of Giemsa and Gram's stained smears of scabs revealed typical tram track appearance of *Dermatophilus congolensis*. Culture of skin scabs in sheep blood agar yielded typical greyish beta haemolytic adherent colonies. The isolates were further confirmed by morphological appearance and biochemical reactions. Direct microscopical examination of skin scrapings yielded negative results for fungal elements and mites. This forms the preliminary report of dermatophilosis among buffaloes in Kerala.

Keywords: *Dermatophilus congolensis*, prevalence, buffaloes, Kerala

INTRODUCTION

Dermatophilosis is an exudative, pustular dermatitis that affects domestic, aquatic and wild animals and man, caused by *Dermatophilus congolensis*. It is an economically important disease which causes considerable loss in terms of skin damage, reduced meat and milk production, culling or death of affected animals and costs of control and treatment (Zaria, 1993). It has been reported by the Food and Agricultural organization (FAO) to be one of the four major bacterial diseases which affect cattle and other animals in the tropical and subtropical regions (Hashemi Tabar *et al*., 2004). Diagnosis of the condition is by demonstration of typical tram track appearance of the organism in stained skin scabs and confirmation by isolation and identification of organisms. This disease is of worldwide occurrence but more prevalent in tropical and subtropical countries. The disease is a chronic dermatitis and could occur in any part of the body and occasionally become generalised. Accurate diagnosis and early treatment are found to be useful for better clinical recovery from the condition. There are few reports of Dermatophilosis among buffaloes from India (Pal, 1995; Sharma *et al*., 1992). The present study forms the first report of dermatophilosis from buffaloes in Kerala.

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MATERIALS AND METHODS

Five Murrah buffaloes presented with dermatological problems during 2011 were included in the study. Detailed clinical examination of these animals was carried out and type of lesions was recorded. Skin scabs and scrapings and impression smears from lesions were collected under sterile conditions for laboratory examination. Small pieces of skin were taken from the underside of the scabs and softened in few drops of distilled water on a clean microscopic slide; a smear was made and stained with Giemsa and Gram's stains (Quinn *et al*., 1994). The impression smears taken from the lesions were also stained with Giemsa's stain and Gram's stain and examined under the oil immersion objective of microscope. The skin scrapings were also subjected to direct microscopical examination using 10 percent potassium hydroxide to rule out fungal elements and mites.

Isolation of *D. congolensis* was carried out using Haalstra's technique (Haalstra, 1965). Skin scabs were minced with a sterile scalpel blade and placed in glass bottles. One millilitre of sterile water was added to each specimen. The bottles were allowed to stand open for three and a half hours at room temperature. Then the opened bottle was transferred to candle jar, with a candle was burned within the jar to obtain 10 to 20 percent carbon dioxide tension. Under CO_2 tension the motile zoospores if present, were chemotactically attracted to the surface of the distilled water. After 15 minutes, the bottle was carefully removed and a loopful taken from the water surface was seeded on blood agar plates and incubated at 37°C in 20 percent carbon dioxide for 24 to 48 h. The plates were examined for colonies of *D. congolensis* (Quinn *et al*., 1994).

The isolates were stained by Gram's method and the preliminary tests were done based on it. The morphological, cultural, biochemical and sugar fermentation tests of the isolates were determined as per the methods described by Cowan (1974).

RESULTS AND DISCUSSIONS

Detailed clinical examination of animals revealed characteristic exudative dermatitis lesions with formation of scabs, crusts and fissures with matted hair at their bases, suggestive of dermatophilosis (Figure 1). Similar types of lesions were described by most of the workers irrespective of the species of the animals affected (Koney, 1996; Gitao *et al*., 1998; Wabacha *et al.,* 2007). All the animals had lesions on the lower limbs, three had lesions on the udder (Figure 2) and two had lesions on the tail (Figure 3). One of the animals had severe generalised lesions involving all these areas (Figure 4).

Microscopical examination of Giemsa or Gram's stained smears of the scab material from the lesions revealed characteristic Gram positive septate branching filaments which were longitudinally as well as transversely divided to form spherical or ovoid cocci in multiple rows, with typical 'tram-track appearance' suggestive of *D. congolensis* in all samples (Figure 5). This distinctive morphology of the organism was demonstrated by most of the workers as the most practical diagnostic method for dermatophilosis (Abu-Samra, 1978; Quinn *et al.,* 1994). The organisms were observed in different forms depending on the stage of development varying from long branching filaments, filaments packed with zoospores and mature free zoospores released from the filaments. Kaminski and Suter (1976) and Hyslop (1980) described pleomorphic

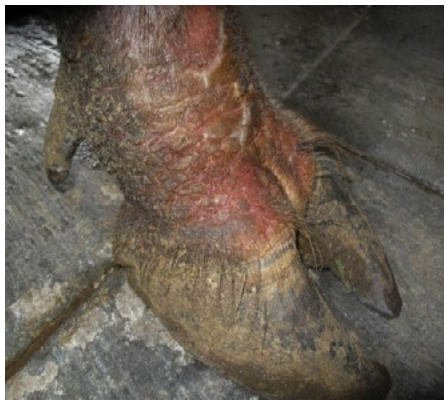

Figure 1. Lesions with thick scabs and fissures on limb.

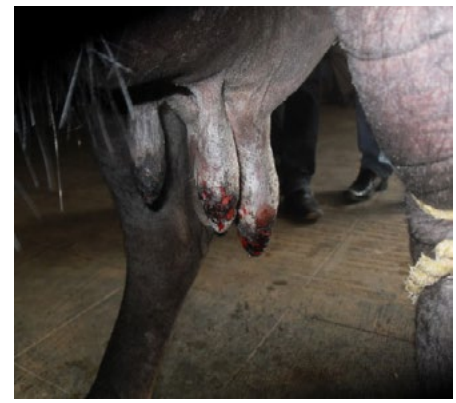

Figure 2. Lesions on the udder.

Figure 3. Lesions on the tail.

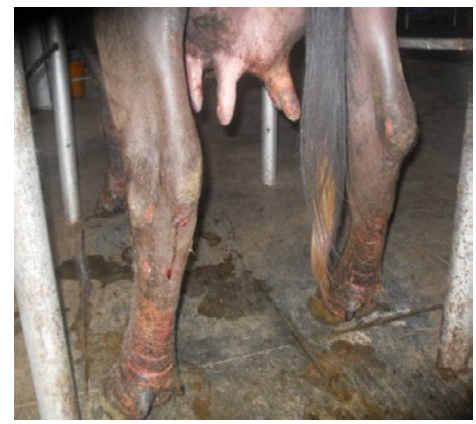

Figure 4. Severe generalised dermatophilus dermatitis.

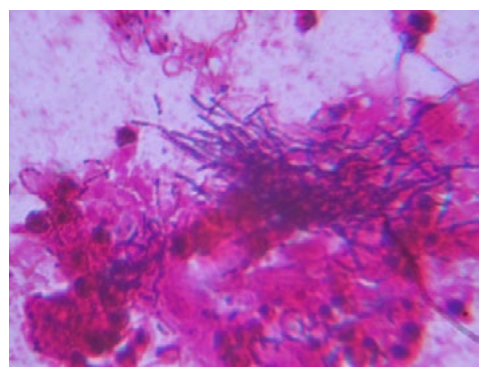

Figure 5. Branching filaments of *D. congolensis* in scabs(Gram's stainx1000).

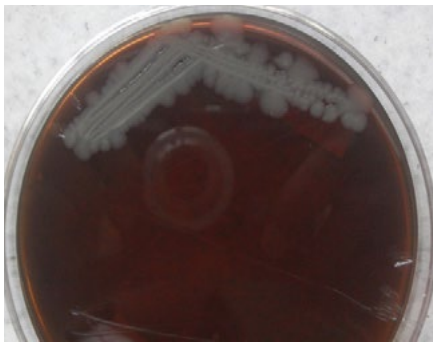

Figure 6. Greyish white haemolytic colonies of *D. congolensis* in sheep blood agar.

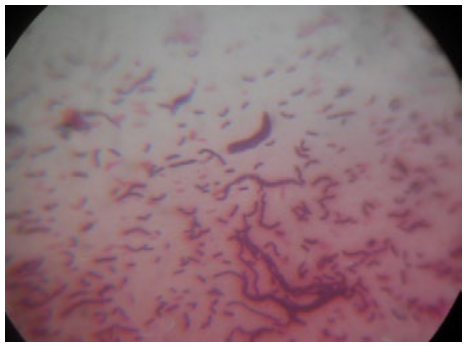

Figure 7. Filaments and zoospores of *D. congolensis* from culture (Gram's stainx1000).

nature of *D. congolensis* in stained smears of scabs and stated that the organism might be seen in any form of the various stages of its lifecycle.

Culture of the scab materials from all five animals yielded typical beta haemolytic colonies of *D. congolensis* in sheep blood agar in presence of 10 percent carbon dioxide (Figure 6). There were variations in the shape, colour and texture of the colonies. Similar observations were also made by Gordon (1964) and EL-Nageh (1971).

Microscopical appearance of organisms in Gram stained smears from colonies were also highly variable with Gram positive branching filaments in different stages of segmentation, packets of coccoid forms, germinating spores or combinations of the above forms depending on the age of the culture and strain of the isolate (Figure 7). The wet mount preparation of all the isolates revealed motile zoospores. All the isolates were haemolytic producing clear zones of haemolysis in seven percent sheep blood agar within a period of 24 to 72 h of incubation. The isolates were positive for catalase, oxidase and urease tests and were able to digest gelatin and Loefflers coagulated serum, indicating proteolytic activity. The isolates showed hydrolysis of starch and casein. All the isolates showed negative results with nitrate test and indole test. Similar biochemical characteristics were also reported for *D. congolensis* by several workers (Pal, 1995; Mannan *et al*., 2009).

All the five isolates produced acid from glucose, fructose and sucrose within 24 h of incubation. But variable results were obtained with maltose, mannitol and lactose. The isolates were unable to produce acid from sorbitol and xylose. This is in agreement with previous findings (Mannan *et al*., 2009; Shaibu *et al.,* 2011). None of the isolates produced gas from the sugars. No fungal elements or mites could be detected on microscopical examination of skin scrapings using 10 percent potassium hydroxide.

The results of the present study confirmed occurrence of Dermatophilosis among buffaloes in Kerala. The presence of predisposing factors such as prolonged wetting, high humidity, high temperature and various ectoparasites might have predisposed to the occurrence of the condition. An early and prompt diagnosis and treatment of the condition has to be undertaken to reduce the economic loss to farmers.

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