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CASE STUDY

Trichophyton verrucosum INFECTION IN A SAANEN GOAT (*Capra aegagrus hircus*)

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المستخلص

أنثي ماعز من سلالة السعانين تبلغ من العمر عاما واحدا أحضرت الي المستشفي البيطري بجامعة الخرطوم ممثلة عينة لقطيع صغير لأحد صغار المربين من منطقة أمدرمان بولاية الخرطوم. الظواهر الجلدية الرئيسة كانت عبارة عن آفات مرتفعة, متكتلة وذات قشور في أعلاها كما تظهر علي الحيوان أعراض الألم عند لمس هذه الآفات.

الآفات كانت منتشرة علي جميع انحاء الجسم لكنها تنزع للتمركز خاصة على الأذنين, الأجفان العلوية وتحت قاعدة الذيل. تم تشخيصالحالة مبدئياً بالإصابة بالفطار الجلدي. جمعت كشطات من الآفات لإجراء الدراسات الفطرية عليها. تم عمل مسحات مباشرة من الكشط. تم عمل مزارع فطرية علي أجار برين هارت انفيوشن ومن ثم مزارع ثانوية علي أجار سابورود دكستروز. تم عمل مسحات تأكيدية من المستعمرات.تم عزل الشعروية الثؤلولية.

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Abstract

A one year old female Saanen goat(*Capra aegagrus hircus*) was admitted to the Veterinary Teaching Hospital of The University of Khartoum representing a sample of a small herd that was housed by a smallholder in Omdurman Locality in Khartoum State. The main clinical manifestations were different sizes of rounded raised scaling skin lesions with scabs on their tops and painul on palpation. Lesions were spread all over the body, especially on the ears, eyelids and under the base of the tail. The case was tentatively diagnosed as dermatophytosis. Skin scrapings were collected for mycological studies. Direct mounts of the scrapings were performed in 20% KOH. Cultures onto brain heart infusion agar and sub-cultures onto Sabouraud Dextrose Agar were performed . Confirmation mounts from colonies have been done. In lactophenol cotton blue *Trichophyton verrucosum* has been isolated.

Key words: dermatophytosis, goat, *Trichophyton verrucosum*

Introduction

Dermatophytosis is a superficial mycoses caused by dermatophytes and it is commonly referred to as ringworm or tinea and considered to be one of the most important diseases that affect the skin of domestic animals (Cabañes, 2000). Dermatophytes are basically classified into three genera, *Epidermophyton*, *Microsporum* and *Trichophyton*, which include about 40

species. They are usually divided into three ecological groups according to their main natural host or habitat: the anthropophilic (humans), the zoophilic (animals) and the geophilic (soil).

These pathogenic fungi are found worldwide and all domestic animals can be infected (Aiello *et al*, 1998). However, the most frequently isolated species from goats dermatophytosis is *T. verrucosum*. Other species that are possible to affect goats skin include: *Microsporum canis*, *M. gypseum*, *T. mentagrophytes* and *T. equinum* (Cabañes, 2000). Dermatophytes in goats do not invade subcutaneous or other deep tissues.

Animals serve as reservoirs for the zoophilic dermatophytes, and their infections have a considerable zoonotic importance. Zoophilic dermatophytes such as *T. verrucosum* are significant causal agents of human ringworm in many areas of the world. The incidence of dermatophytosis varies in each community, production system and value chain according to climate and natural reservoirs. However, the pattern of the species of dermatophytes involved in dermatophytosis may be different in similar geographical conditions, both in humans and animals. It has been related, among other factors, to the decline in the incidence of animal ringworm in these areas or the degree and closeness of animal to human contact (Pier *et al.*, 1994).

T. verrucosum has been cited as the major agent encountered in cases of bovine, ovine and caprine ringworm. Other species such as *M. canis*, *M. gypseum*, *T. mentagrophytes* and *T. equinum* have been isolated from some of these ruminants (Pier et al. 1994, Pepin et al. 1968, Stenwig 1985). In the

Sudan research concerns in the field of superficial mycoses, seem to be very weak or even non-significant. Such cases my leave veterinary clinics without recognizing their causes and are usually treated based only on the so called tentative diagnosis depending solely on the clinical picture of lesions. In this paper the disease is thoroughly investigated and the causative organism is isolated and identified.

Materials and Methods

Clinical observations:

A one year old female Saanen goat(*Capra aegagrus hircus*) (weighing > 35 kg), housed in Omdurman Locality in Khartoum State was admitted to the teaching hospital of the Faculty of Veterinary Medicine, University of Khartoum with a one month history of skin lesions of scaling and abrasions(fig. 1-A). This patient was brought resembling a sample of a small herd that was housed by the owner. The disease infected the whole herd within a short period of time. The lesions spreaded all over the body especially on the ears, eyelids and under the base of the tail. Fresh lesions were rounded in shape, about 1-5 cm in diameter, covered with scabs. The scabs could easily be removed leaving a reddish area devoid of hair underneath. (fig1-B) or they could soon be detached by themselves (fig.1-C). In some lesions the scabs shedded by themselves.

General clinical examinations were carried out and all vital physiological parameters were within the normal ranges. Deep skin scrapings

has been taken from the periphery of the lesions for further mycological investigations.

Fig. 1: Different size rounded , raised scaling and crusting skin lesions (A) lesions on the right thoracic wall with scabs on their tops - to expose the lesions, the hair around them was clipped out, (B) same lesions in-A showing scabs detachment after sampling, (C) Auto detachment of the scabs on the left scapular region.

Laboratory examinations

Crusts and deep skin scrapings from the lesions were examined by direct microscopy in 20% Potassium Hydroxide solution (fig 2.).

Small amounts of skin scrapings were cultured onto duplicate slopes of brain heart infusion agar (fig. 3-A) containing chloramphenicol (0.05mg/ml), actidione (0.5mg/ml) and 0.5% yeast extract. The cultures were incubated for 5 days at 30°C. Colonies were then sub-cultured onto Sabouraud Dextrose Agar (fig. 3-B)

Mounts after culturing

Mounts from colonies were examined in lactophenol cotton blue for identification of the isolates.

Results

Direct potassium hydroxide mounts of the skin scraping have shown large numbers of endothrix spores and hyaline hyphae inside the hair (fig. 2 - A & B).

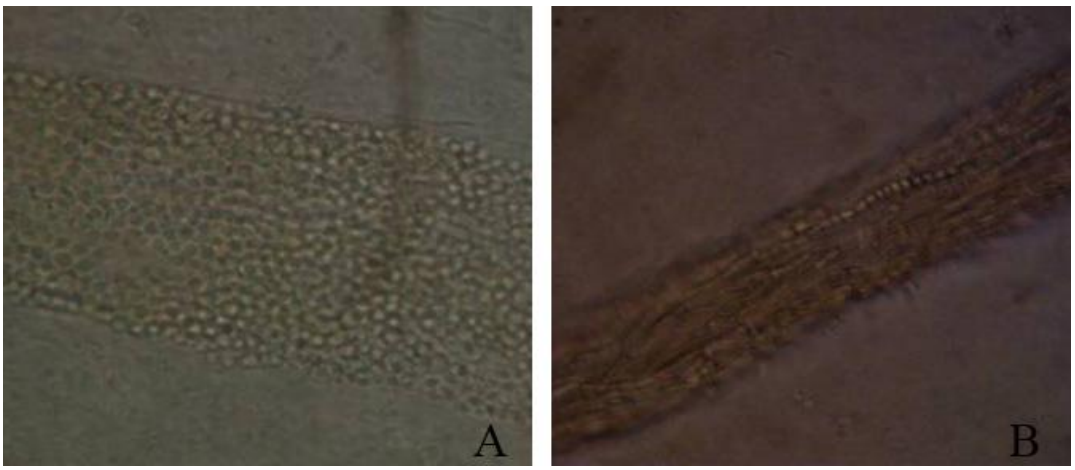

Fig. 2: Direct examination of skin scrapings in 20% KOH (400x) (A) showing large numbers of endothrix spores (B) showing a hyaline hyphae inside the hair.

Culture onto duplicate slopes of brain heart infusion agar have shown heaped, waxy, button like colonies (fig. 3 - A).

Fig 3: cultures of *T. verrucosum* (A) Brain Heart infusion Agar culture: showing Orange, heaped, and waxy button like colony, (B) Sabouraud Dextrose Agar culture: showing a white flat powdery colony.

Lactophenol Cotton Blue (LPCP) mounts revealed chains of chlamydoconidia (fig. 4 - A). The colonies changed to white flat powdery after sub-culturing onto Sabouraud Dextrose Agar (fig. 3 - B) and revealed thin septate hyphae in LPCB mounts (fig. 4- B).

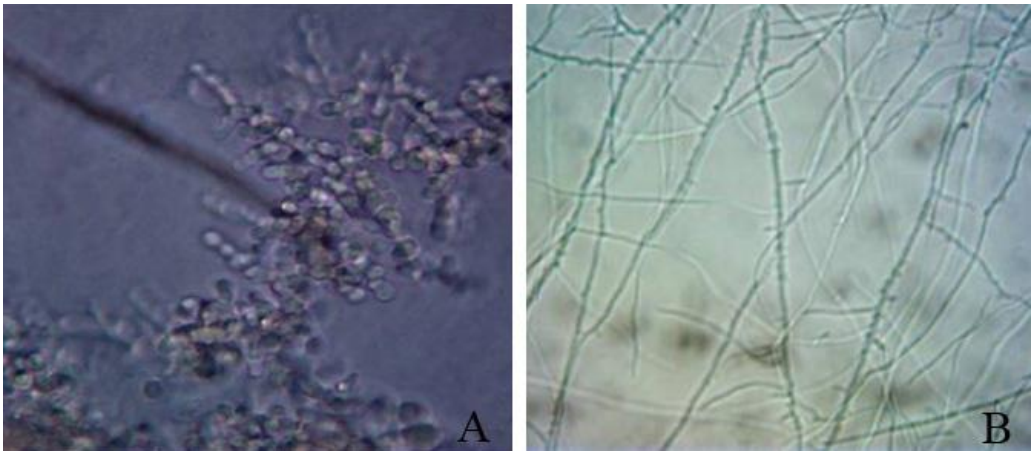

Fig. 4: Lactophenol cotton blue (LPCB) (400x): (A) showing chains of chlamydoconidia, (B) showing thin septate hyphae.

Based on the macroscopic and microscopic structure, the isolate was identified as *T. verrucosum*.

Discussion

It is known that the importance of the fungi that cause dermatophytosis emanates from their epidemic nature. *T. verrucosum* causes dermatophytosis among human and many species of animals in different areas in the world (Romano *et al.*, 2008). In addition to this it can cause significant economic losses due to severe skin damage. In the present study the organism causing dermatophytosis in the Saanen goats was isolated and identified as was found to be caused by *T. verrucosum*.

T. verrucosum have been isolated from goats worldwide. In Jordan by Ali-Shtayeh *et al.,* (1988): in Bangladesh by Richard *et al.* (1994); in India by Thakur *et al.* (2009); in Spain by Gancedo *et al.* (1981). In the Sudan *T. verrucosum* was isolated from goats by Karim and Abdalla (1988); from cattle by Abdel-karim *et al.* (1988); from camels by Fadl-Elmula *et al.* (1994) and Wisal, (2009); from donkeys by Wisal *et al.* (2005).

In the Sudan, good laboratories affiliate to the veterinary clinics are scarce or even do not exist, except in Central Research Laboratories and some institutes and universities. However in the current investigation we followed authentic methods and techniques which made possible the isolation of *Trichphyton verrcosum* from Saanen goats. The results recorded in the current study are of Veterinary significance recording the disease in an exotic breed of goats (Saanen) for the first time and supported the work of pervious workers (Karim and Abdalla 1988) who also recorded the disease in goats. Moreover, the results obtained in the investigation is of public health significance as it recorded *T. verrucosum* infection in a group of Saanen goats housed by small holder in Omdurman Locality, Khartoum state.

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