

## SHORT COMMUNICATION

### **A *Trichophyton mentagrophytes* DERMATOMYCOSIS IN TWO DONKEYS IN TANZANIA: CLINICAL, PATHOLOGICAL AND CHEMOTHERAPEUTIC FINDINGS.**

**J. A. Matovelo<sup>1</sup>, J. E. Cooper<sup>2</sup>, L. S. B. Mellau<sup>3</sup> and M. M. A. Mtambo<sup>3</sup>.**<sup>1</sup>Department of Pathology, <sup>3</sup>Department of Medicine and Public Health, Faculty of Veterinary Medicine, Sokoine University of Agriculture, P.O. Box 3018 Morogoro, Tanzania. <sup>2</sup>Jersey Wildlife Preservation Trust, Les Augres Manor, Trinity, Jersey, JE3 5BP, Channel Islands, U. K.

#### **SUMMARY**

Two sick donkeys (*Equus asinus*) bearing wide spread skin lesions characterized by extensive patches of alopecia exhibiting asbestos-like flakes of scales and multiple pruritic scabs were presented for investigation and management. Dermatophytosis (ringworm) was diagnosed in both donkeys. One animal showed a rapid and dramatic response to treatment with oral griseofulvin. The other donkey responded poorly to treatment probably due to complicating secondary bacterial infections and was therefore euthanised. Following the euthanasia, tissue samples from affected sites on the skin were collected for histopathological and microbiological investigation. The diagnosis of ringworm was based on the clinical signs, post-mortem findings, the demonstration of fungal hyphae in histological sections and the cultural isolation of *Trichophyton mentagrophytes* from skin scrapings.

#### **INTRODUCTION**

Dermatophytosis (ringworm) refers to the superficial fungal infection of the epidermis and hair follicles of both man and animals (Jubb et al., 1985; Rashid et al., 1996). The agents that cause the disease belong to a group of mycelial fungi referred to by common name dermatophytes.

Most infections of ringworm in domestic animals belong to the

genera *Microsporum* and *Trichophyton*. Ringworm is a widely reported disease in the various species of domestic animals (Al-Ani et al., 1995; Harvey, 1990; Jubb et al., 1985). A number of dermatophyte species have been incriminated in the cause of ringworm in the equidae including donkeys (Zukerman et al., 1992). These have included *Trichophyton equinum*, *Trichophyton mentagrophytes*, *Microsporum equinum* and *Microsporum gypseum* (Zukerman et al., 1992). Several

species of dermatophytes including *Trichophyton* spp. and *Microsporum* spp., have been isolated from cases of ringworm in Europe (Harvey, 1990). We have been unable to trace any published reports of the disease in donkeys in Tanzania. In this paper we document the cases of ringworm in domestic donkeys (*Equus asinus*) at the Sokoine University of Agriculture in Morogoro, Tanzania.

## **MATERIALS AND METHODS**

The two affected animals, case 1 an adult female and case 2 a young male, were amongst a group of donkeys kept for study at the Faculty of Agriculture, Sokoine University of Agriculture. They had been purchased from Dodoma a semi arid region located in the central part of the country.

Clinical examination was carried out following visual observation. Diagnostic samples were taken using standard procedures. These included skin scrapings and blood samples from the jugular vein.

Laboratory investigations consisted of examination of the skin scrapings, blood, as well as skin biopsy and post-mortem samples. Skin scrapings from case 1 (adult female) were plated on to Sabouraud's agar. Skin scrapings from case 2 (young male) were treated with 20% potassium hydroxide solution into a wet mount for direct microscopic examination. Fixed tissues were trimmed, dehydrated and embedded in paraffin wax prior to sectioning,

staining and mounting. The paraffin sections were stained by both haematoxylin and eosin (H&E) and periodic acid schiff (PAS) stains. Haematological examination included enumeration of the leucocytes and erythrocytes by using the hemocytometer method. Further, the haematocrit method and the cyanmethaemoglobin method were used for determination of haemoglobin concentration and packed cell volume (PCV) respectively.

Treatment of case 2 (young male) involved regular grooming of the coat and oral griseofulvin supplied under a trade name of Lamoryi (Løvens Kemiske Fabrik, Ballerup, Denmark) for three weeks at a dose rate of 10 mg Griseofulvin per Kg body weight. The Griseofulvin tablets were ground up in an envelope and then mixed with the animal's food.

Case 1 (adult female) that appeared to show a grave prognosis was recommended for euthanasia on humane grounds. The animal was euthanised by intravenous injection of 200mg/ml pentobarbitone Sodium (Euthatal) then taken for *post mortem* examination.

At *post mortem* examination, more tissues including skin were taken and fixed in 10 % neutral buffered formalin (NBF) for histopathological studies.

## **RESULTS**

Clinical examination of the two animals showed characteristic areas

where the lesions typically consisted of an area of alopecia and a prominent whitish asbestos-like accumulation of scales, raised crusts and thickened, apparently inflamed, skin. There was some evidence of pruritus. The skin scraping from case 1 (adult female) yielded a heavy growth of *Trichophyton mentagrophytes*. Whereas, those from case 2 (young male), showed many characteristic fungal hyphae, arthrospores and damaged hair shafts, following treatment with a 20% potassium hydroxide solution.

*Post-mortem* examination revealed an emaciated carcass with a deficient hair coat due to multiple foci of alopecia, scaling and exudative dermatitis. There were no significant pathological changes in other organs.

The skin of the donkey had several alopecic patches where the skin appeared thickened and covered with flaky crusts. The lesions had spread over the face, brisket, flanks, and the back and on the limbs. No blood parasites were detected. On haematological investigations, the only noteworthy abnormality was the low erythrocyte count which was as low as  $2.6 \times 10^6/\mu\text{l}$  for the adult female (case 1) as opposed to the normal range of  $6 - 12 \times 10^6/\mu\text{l}$ .

Treatment of case 2 (young male) yielded an apparent clinical cure. Within three weeks of commencing therapy the lesions appeared less marked and the skin less crusty and thickened. After six weeks the skin was almost normal, although there were still patches of alopecia. Three months later the hair coat was normal.

Histopathological examination revealed excessive acanthosis, parakeratotic hyperkeratosis and the hair follicles were heavily packed with fungal hyphae (Figure 1). Fungal hyphae were also present in the thickened keratinized layer of the epidermis (Figure 2).

## DISCUSSION

The two donkeys showed lesions that were characteristic of dermatophytosis. Diagnosis was confirmed by microscopical examination of skin scrapings, cultural isolation of the fungi and histopathological studies. Dermatophytosis is generally reported to be more common in foals than in adult animals. However, reduced host resistance and unusual environmental factors can tip the balance in favour of infection (Jubb *et al.*, 1993) as it appears to have been the case with the adult female donkey in this study which was already in a grave state of health by the time it was presented for attention. This study has demonstrated that uncomplicated ringworm infection can respond well to appropriate chemotherapy a finding which has been demonstrated satisfactorily in a number of studies in a variety of species in different geographic areas (Basudeb-Maiti *et al.*, 1991). In some of the reported studies such chemotherapy has included the use of herbal preparations including onions, garlic and lemon extracts only to mention a few (Sharma and Dwivedi, 1990).

However, it needs to be pointed out here that there are reports indicating that administration of Griseofulvin in pregnant animals has been associated with teratogenic effects on their foetuses (Schutte *et al.*, 1997)

There are relatively few horses in Tanzania but donkeys are an important domestic species. The health of these animals is relevant to their role in transporting food, household effects and cutting down on various forms of human drudgery. Dermatophytosis can be readily diagnosed and, as this study demonstrates, will probably respond to appropriate therapy. Ringworm being a zoonosis and also that donkeys live in close proximity with human beings, it is important that ringworm is diagnosed and dealt with promptly. Although ringworm is frequently encountered in domestic animals, this appears to be the first documentation of ringworm as it affects donkeys in Tanzania

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Figure 1: Fungal hyphae (white arrows) tangled up in a hair follicle in hyperplastic epidermis. Periodic Acid Schiff stain. X 40 objective

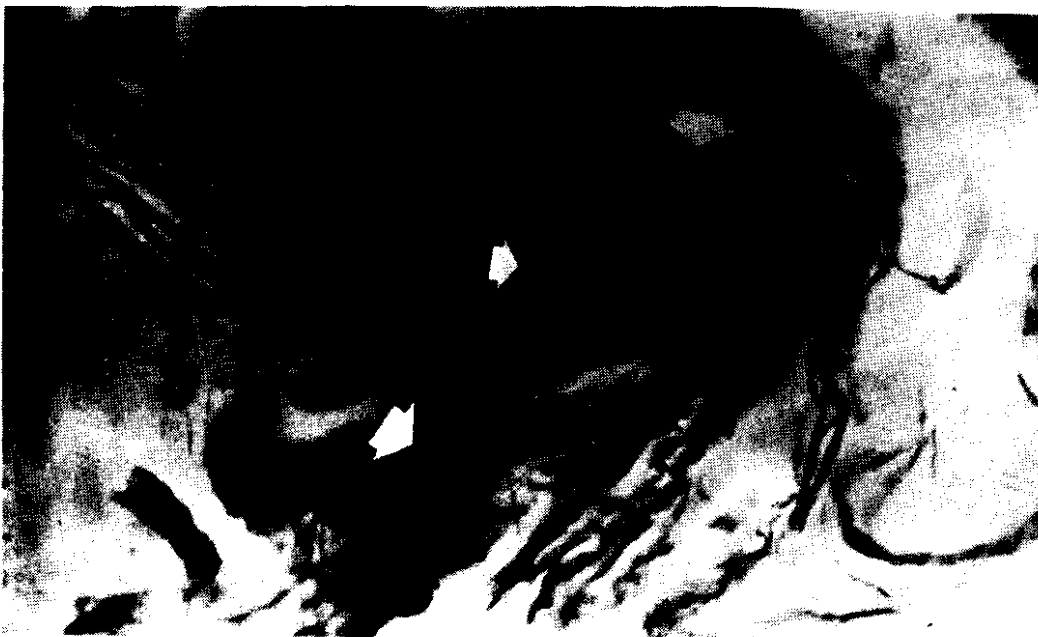


Figure 2: Fungal hyphae (white arrows) tangled up in thickened hyperkeratotic epidermis (black arrows). Periodic Acid Schiff stain. X 40 objective