

## AN OUTBREAK OF DERMATOPHYTOSIS IN FREE RANGING WILDLIFE IN TSAVO EAST NATIONAL PARK, KENYA.

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*Une épizootie de dermatophytose s'est déclarée sur des gazelles de Grant (Gazella granti) à Tsavo-Est, en août 1996. La maladie s'est ensuite étendue à d'autres régions et à d'autres espèces dans les deux mois qui ont suivi, à l'intérieur du Parc national. Ces espèces étaient l'impala (Aepyceros melampus) et la girafe (Giraffa camelopardalis). Toutes les classes d'âge et les deux sexes ont été touchés. A l'examen microscopique, 100 % (20) des grattages de peau avaient des spores ectothriques et 90 % (18) ont donné des cultures positives de Microsporum gypseum. Trichophyton schonleinii a aussi été isolé de gazelles de Grant près d'un camp. La source de l'infection était le sol et la présence de dromadaires dans le parc. La transmission s'est faite par contact. Une sécheresse prolongée a été un facteur de prédisposition en affaiblissant les animaux par manque de nourriture.*

### INTRODUCTION

Dermatophytes are one of most common fungi found parasitizing man, various mammals and birds. These fungi only invade the superficial layers of the skin (Jacob, 1988 ; Muller et al., 1989). Dermatophytic infections are well documented in domestic animals all over the World (Jubb and Kennedy, 1970 ; Jungerman and Schwartzman, 1972). In Kenya a review of fungal infections affecting domestic animals has been done over a ten year period (Macharia et al., 1993). Despite the well documentation of mycotic diseases in domestic animals no information is available on the situation in wildlife in Kenya. The significance to conservation on different species of wildlife is also unclear. This paper describes findings following observations of cases of alopecia in grant's gazelles (*Gazella granti*) in satao and Aruba areas of Tsavo East National Park in August 1996. Investigations were carried out over a four month period to determine the nature, extent, cause and possible means of management.

### MATERIALS AND METHODS

The study was carried out in Tsavo East National Park in Kenya. A total of over 1,000 animals of different species were observed over the four month study period. These included Buffaloes (*Syncerus caffer*), Grant's gazelle (*Gazella granti*), Impala (*Aepyceros melampus*), Fringed eared Oryx (*Oryx gazella callotis*), Kongoni (*Alcelaphus buselaphus cokei*), Wildebeest (*Connochaetes taurinus*), Eland (*Taurotragus Oryx*), Defassa Waterbuck (*Kobus ellipsiprymus defassa*), Gerenuk (*Litocranius walleri*), Dik dik (*Madogua kirkii*) Warthogs (*Phacochoerus aethiopicus*) Lesser kudu (*Tragelaphus imberbis*), Zebra (*Equus burchelli*), Hunter's hartebeest (*Damaliscus hunteri*), Giraffe (*Giraffa camelopardalis*).

A total of 20 adult impalas (5 males and 15 females) from three different herds of 25, 42 and 57 individuals respectively were captured by chemical immobilization. Sampling was biased to animals showing lesions characteristic of dermatophytosis. 40 adult (30 females and 10 males) grants gazelles of herd sizes 30, 54, and 35 individuals were also chemically immobilized and sampled. Animals were located by searching the study area with a Landrover 110, by driving along the park roads and when necessary driving as close as the animals could allow, for closer observation. Information received from tour drivers was also used to locate the animals. Searches were conducted throughout the day from 6.00 a.m to 5.00 p.m. Animals were darted from the vehicle using a rifle (Palmer Cap-Chur, Palmer chemical and Equipment Co., Inc P.O. Box 867 Palmer Village Douglasville, Georgia, 30133 U.S.A). Cap - chur darts (3 ml), one and half inch needles were used with the rifle. Etorphine (C-Vet, Minister House, Bury St. Edmunds, Suffolk, UK) mixed with Xylazine (Crystalline Rompun, Bayer U.K. Ltd., Agrochem Division, Eastern Way, Bury st Edmunds, suffolk IP32 7A11 U.K.) was used. The Drug cocktail was placed in the dart and the projectile fired at the animals shoulder or rump from distances ranging from 10 to 40 metres. Average total doses for adult Grants gazelles and Impala used ; were Etorphine 1 mg and Xylazine 3 mg.

Skin scrapings were collected with a sterile scalpels (No.22) from the border of normal skin and the lesion of the clinically infected animals after cleaning the infected areas with 70% alcohol. Blood samples were taken from the jugular vein and placed in plain tubes or tubes with anticoagulant (serum in plain glass tubes (10 ml) ; heparinised tubes (5 ml); and ethylene diaminetetra acetic acid (EDTA) tubes (5 ml) were used, for routine serology biochemistry and hematology. Smears were made to check for hemoparasites. Biopsy tissue samples measuring approximately 5 mm by 2 mm were taken from skin lesions and fixed in 10% phosphate buffered formal saline.

Each skin scraping sample taken was divided in two parts. One part was placed in a few drops of 10% potassium hydroxide solution on a slide and then covered with a cover slip. This was left for 40 minutes and then examined microscopically for characteristic fungal elements. The other part of the sample was inoculated on the surface of Sabourand's dextrose agar. The inoculated plates were incubated at 30°C for up to four weeks.

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Cultures yielding colonies suggestive of dermatophytes were identified by the morphology of thallus and direct microscopic examination of hyphae microconidia and macroconidia (Rebell and Taplin, 1970). Retrospective studies of medical records for treatment of camels in the park was undertaken to investigate any previous outbreaks of skin problems and fungal infections were confirmed in July 1996.

## RESULTS

100% (20) of the skin scrapings collected from impalas had ectothrix spores on microscopic examination, while 90% (18) were positive for *Microsporum gypseum* on culture. In Grants gazelle 100% (40) of the samples had ectothrix fungal spores and 85% (34) were positive on culture for *Microsporum gypseum*.

Two Grant's gazelles in the Vicinity of a wildlife camp had a concurrent infection with *Trichophyton schoenleinii*. All age groups and sexes of animals were affected. The disease spread to involve giraffes with *Trichophyton schoenleinii* being isolated on culture. *Trichophyton schoenleinii* was isolated in 69.2% (9/13) of the camels in the park.

Blood haematology and biochemical values were within the range of those previously reported elsewhere for Impala and grant's gazelles (Frank, 1986 and Drevemo et al., 1974). No hemoparasites were seen on the slide smears. Histopathology revealed acanthosis, hyperkeratosis and infiltration with inflammatory cells. In Keratinized layers of the epidermis and hair follicles fungal spores and mycelia were present.

## DISCUSSION

Dermatophytes are the most frequently encountered among fungi parasitizing man, various mammals and birds. These fungi represent the group of pathogenic fungi which invade the superficial layers of skin only (Jacob, 1988 and Muller et al., 1989). Dermatomycosis is well documented in domestic animals in Kenya (Macharia et al., 1993). But despite the interaction between wildlife and domestic animals there is no published information on the situations in wildlife. This study describes the first recorded outbreak of dermatophytosis in free ranging wildlife in Kenya.

The source of the infection were presumed to be two fold. *Microsporum gypseum* is geophilic and grants gazelles had congregated around a water source in Aruba dam which had dried up leaving lots of decaying vegetation in the soil. The animals most likely got infected when feeding on lush vegetation left by the receding water. Spread from animal to animal was by contact.

*Trichophyton schoenleinii* from retrospective studies most likely originated from camels in the park kept for camel safaris and always have continuous contact with tourist and handlers thus increasing their chances of picking infection from man and eventually passing it over to wildlife when browsing and dusting on the ground in the Park. Prolonged drought was thought to be a predisposing factor as to why the outbreak was wide spread because of the poor nutritional status of the and this will reduce the spread of the disease by contact. The disease eventually spread to involve the rest of Park West of river Galana which acted as barrier preventing further spread Eastwards.

Possibility of immunosuppression in the animals was ruled out because haematology and biochemical values were within the normal range previously reported for impala and Grant's gazelles. (Frank, 1986 and Drevemo et al., 1997). Following a rinderpest outbreak which swept through the area in 1994-1995 serum collected was tested using enzyme linked immunosorbent assay (ELISA) for antibodies against rinderpest virus and these was negative. This study shows the dangers of having domesticated animals with continuous contact with man in parks because it increases risks of disease transmission to wildlife.

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