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## DERMATOMYCOSIS IN A MULE DEER IN ALBERTA

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**Abstract:** Severe dermatomycosis (ringworm) caused by an unidentified dermatophyte occurred in a mature, debilitated, female mule deer (*Odocoileus hemionus*) from southwestern Alberta. Lesions involved much of the body surface and were characterized by severe alopecia of the face, lower thoracic wall and abdomen, perineum and limbs. The skin was markedly encrusted and scaly in all areas. The histologic lesions included marked hyperkeratosis and a chronic dermatitis with the presence of numerous spherical ecto- and endothrix arthrospores and segmented mycelial elements. The causative organism could not be grown on artificial media, but the distribution and morphology of arthrospores, the presence of segmented mycelia and the nature of the inflammatory reaction, suggested infection by a *Trichophyton* species. This is the first report of dermatomycosis in a free-ranging big game animal in North America.

### INTRODUCTION

Although dermatomycotic infections are well known in domestic species<sup>2,3,4</sup> their occurrence in wild ungulates of North America has not been documented to date. The following report describes such an infection.

The subject, a 4 to 5 year old, female mule deer (*Odocoileus hemionus*) was observed in sternal recumbency for several days near a haystack in southwestern Alberta in mid-March, 1973. The animal would allow human approach to within approximately 3 m before attempting to move off and was obviously terminally ill. The deer was shot and transported to the laboratory for necropsy.

### NECROPSY FINDINGS

External examination of the carcass revealed severe alopecia of the face and ears (Fig. 1), lower thoracic wall, lateral and ventral abdominal wall, lumbar area, perineum and limbs. The skin had a gray, dusted appearance and was

markedly encrusted with dried serous exudate and flakes of keratin in all areas, including those on which patches of hair remained. There was an accumulation of scaly debris in the auditory canals. Fewer than ten *Dermacentor* sp. ticks were present on the skin.

Internal examination revealed a thin, emaciated carcass with severe depletion of fat depots and concomitant serous



FIGURE 1. Severe alopecia of the muzzle, face, ears and skull areas. Note the keratin flakes in and on the ears.

atrophy of these areas. The animal was not pregnant, a finding which was unusual for an Alberta deer in this age class. An early acute fibrinous pericarditis was evident. Several *Cephenemyia* sp. larvae were observed in the nasopharynx. Several cysticerci of *Taenia hydatigena* were found attached to the pericardial sac and to the omentum; four adult *Thysanosoma actinioides* were present in the small intestine.

Tissues for histopathologic examination were fixed in 10% neutral buffered formalin, processed routinely, embedded in paraffin, cut at 6  $\mu$ , and stained with hematoxylin and eosin (H&E). Selected hairs and skin scrapings were pressed into the surface of pour plates of Mycosel\* medium which were partially sealed with masking tape to prevent dehydration and incubated at 37 and 20 C respectively, for up to 4 months. Despite repeated attempts to culture the causative dermatophyte, the organism failed to grow.

Histopathologic examinations of the skin revealed marked hyperkeratosis and acanthosis accompanied by a chronic inflammatory reaction. The latter was characterized by edema, increased connective tissue and numerous mononuclear cells, chiefly plasmacytes, as well as

a light, diffuse infiltration of neutrophils. Microabscesses were seen frequently in the epidermis. Almost all hair follicles examined revealed many spherical ecto- and endothrix arthrospores (Fig. 2) measuring 4-6 $\mu$ , the latter often in chains, with extensive invasion of the surrounding keratin layer by segmented mycelia.

#### DISCUSSION

The dearth of published information on dermatomycotic disease in North American big game animals is somewhat surprising in view of the extent to which common ranges are shared by domestic and wildlife species. All the recoveries of *Trichophyton mentagrophytes* by McKee et al.<sup>5</sup> for example, occurred in opossums collected from areas frequented by domestic livestock. No gross or microscopic lesions were observed despite the isolation of ringworm fungi from the hair of wild animals examined.<sup>5,6</sup> findings which suggested that these organisms rarely cause disease in free-ranging wildlife.

The severity and duration of ringworm infections often depend upon the nutritional status of the host.<sup>7</sup> In this case, the animal was not pregnant, only 4 to 5 years old and had experienced an unusually mild, relatively snow-free winter. Furthermore the subject was the only individual in a group of several deer which appeared in any way to be abnormal. These factors suggested that the infection was the cause of the debilitated condition of the animal.

Despite the failure of this dermatophyte to develop on artificial media, it has been identified tentatively as a *Trichophyton* sp. based on the following observations: 1) its ability to penetrate hair shafts; 2) the linear arrangement of spherical ecto- and endothrix arthrospores; 3) the segmented mycelia in the keratin layer of the skin; and 4) the marked hyperkeratosis and inflammatory response in the skin.<sup>1,2,3,4,7</sup>



FIGURE 2. Cross section of hair revealing ecto- and endothrix arthrospores. Note the linear arrangement of endothrix arthrospores. H. & E. X 500.

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