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PSOROPTES CUNICULI IN CAPTIVE WHITE-TAILED DEER IN MICHIGAN

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Psoroptes cuniculi has been identified as an ear mite of domestic rabbits, goats, sheep, horses, donkeys, mules, white-tailed deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), and possibly animals of the genus *Gazella* (Anonymous, 1979, *Psoroptic Cattle Scabies Research: An Evaluation*. National Research Council, Nat. Acad. Sci., Washington, D.C. 167 pp.). *Psoroptes* sp. (probably *P. cuniculi*) has been reported in free-ranging white-tailed deer from Alabama, Georgia, Florida, and South Carolina (Roller et al., 1978, *J. Am. Vet. Med. Assoc.* 173: 1242-1243; Strickland et al., 1970, *J. Parasitol.* 56: 1038) and in captive mule deer in Colorado (Roberts et al., 1970, *J. Parasitol.* 56: 1039-1040).

This is the first report of *P. cuniculi* in white-tailed deer in the Great Lakes states. It occurred in a captive herd at the Houghton Lake Wildlife Research Area (HLWRA) which is located in northern lower Michigan. A herd of approximately 100 deer has been maintained on the 18.8 ha area since its establishment in 1959. The deer are observed daily, handled bimonthly, and examined for abnormalities. Ear lesions have never been observed. In 1977, 26 captive female deer from the facility were examined at necropsy, and found to be negative by ear swab examination for ear mites (Williams, pers. comm.).

In October 1979, nine adult male white-tailed deer were penned in a 1.2 ha enclosure at the HLWRA for use as breeding stock. During the annual antler removal procedure, two animals were observed to have yellow crusty serous

exudate in the external ear. On closer examination, a heavy infestation of mites was observed within the ear canals and pinnae. The epidermis within the ear was inflamed and hairless. Samples of the mites were preserved in 70% ethyl alcohol for later examination.

In November, 1979, three of seven additional bucks from the same enclosure were observed to have crusty, yellow-brown material in their ears. Alopecia was present around the base of the antlers, the lacrimal gland opening, face and brisket (Fig. 1). Skin scrapings and ear swabs revealed what appeared to be the same mite found in the ears of bucks examined in October. The remaining four bucks did not show gross lesions and were negative for mites.

In October, 1980, 21 captive male white-tailed deer of various ages were penned in the 1.2 ha enclosure at the HLWRA. During antler removal a small amount of crusty exudate was observed in the ears of three bucks. Ear swabs were taken from all 21 deer and six were positive for ear mites.

Following the discovery of mites in 1979 and 1980, all deer in the 1.2 ha enclosure were treated each year with a solution containing a mixture of one part Gammex (Pitman-Moore, Washington Crossing, New Jersey 08560, USA.) and eight parts of Canex (Jensen-Salsbery Laboratories, Kansas City, Missouri 64141, USA.). The deer were transferred to a chute and were then treated with the solution via a spray bottle. The ears and all areas of alopecia were thoroughly saturated. Treatment was administered



FIGURE 1. Alopecia around the antler pedicle of white-tailed deer due to psoroptic mites.

at weekly intervals for one month. All the deer responded well to the medication and were negative for mites following the last treatment.

In the fall of 1980, a 1.5 year-old captive male white-tailed deer from Fenner Arboretum, a nature park in Lansing, Michigan died of trauma and the head was brought to the Rose Lake Wildlife Pathology and Physiology Laboratory (RLWPPL) for examination. This deer had a brownish, dried, crusty, exudate inside the pinna of the ear. Microscopic examination of the material revealed mites identical to those found on the captive deer at the HLWRA.

In June, 1981, five one-year-old female white-tailed deer were euthanized at the HLWRA. The pinnae and ear canals of these does appeared normal. During routine necropsy, a crusty exudate was observed deep in the auditory canal of each animal. Mites were seen in the ear

canal exudate of all five deer. Samples of mites from all animals were preserved in 70% ethyl alcohol.

After finding the mites in the captive deer held at the HLWRA, a statewide survey of wild white-tailed deer was initiated during the 1980 firearm deer hunting season. At roadside deer check stations located along the major north-south thoroughfares in the Lower Peninsula of Michigan, swabs of both auditory canals were taken from deer and each swab was placed in a capped tube and refrigerated for future examination. The samples were examined under a dissecting microscope within 4 wk of collection. A total of 2,262 deer was checked but none was found to be positive for ear mites.

The mites from the captive deer were identified as *Psoroptes cuniculi*. Representative specimens have been deposited in the National Parasite

Collection at Beltsville, Maryland (Accession #76958). The length of the outer opisthosomal setae (OOS) of the mites found on white-tailed deer in Michigan (mean of 88 μm or 90 μm , range of 70-102 μm) are within the OOS measurements for *P. cuniculi* [mean 89 μm , range 64-164 μm (Sweatman, 1958, Can. J. Zool. 36: 905-929)]. There is an overlap with *P. ovis* (72-268 μm) in the lower range, but the mean for *P. ovis* is much greater (122 μm) (Sweatman, op. cit.). *Psoroptes cervinus*, reported from the body of wapiti (*Cervus elaphus nelsoni*) and from the ears of bighorn sheep (*Ovis canadensis*), have a much longer OOS (range 145-354 μm) than *P. cuniculi* (Sweatman, op. cit.).

The source of the outbreaks at the HLWRA is unknown. The animals were in a deer-proof pen; however, rodents and other small animals were not excluded. Holz (1955, Tierärztl. Umsch. 10: 248-249) experimentally transmitted *P. cuniculi* by using the housefly (*Musca domestica*). Possibly other flies such as blackflies, stable flies, houseflies, and deerflies may transmit the mite mechanically. Regardless of the source, once the infestation becomes established in one deer, infestation of other deer would readily occur during physical contact.

Mite infestation in the five does examined in 1981 was detected only after removal of the ear. Such infestations likely are overlooked because the mites are deep in the ear canal (Kellogg et al., 1971, J. Med. Entomol. 8: 495-498). Also, it is possible that low-level infestations in free-ranging deer may be responsible for the absence of mites during this survey. The results of the statewide survey suggest that *P. cuniculi* is more common in confined animals than in free-ranging animals in Michigan. However, there is potential for free-ranging white-tailed deer to become infested with *Psoroptes cuniculi*. The infestation is probably of limited clinical importance although it may cause some irritation and alopecia. In addition, the dermatological changes may reduce the aesthetic appeal of the deer to the hunter.

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