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OCCURRENCE OF THE CATTLE EAR MITE *(RAILLIETIA AURIS)* IN SOUTHEASTERN KANSAS

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ABSTRACT Forty-seven cattle from 8 separate herds in southeastern Kansas were examined for ear mites *(Raillietia auris)*. Ear mites were directly observed in 12 of the animals while 19 others showed signs of infestation consisting of ulceration and blockage of the auditory canal by a thick plug of pus. The observed occurrence of infestation in 66 percent of the animals examined is higher than expected based on previous reports.

KEY WORDS: CATTLE, EAR MITE, OTITIS EXTERNA, HEARING LOSS

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INTRODUCTION

OVER the past thirty years there have appeared sporadic reports concerning the occurrence of the cattle ear mite, *Raillietia auris*. Though sometimes considered to be rare, this mite has been reported in Europe (3), Asia (1), Africa (2), Australia (9), and South America (12), as well as in North America (10,11,13,14). In most cases, these reports have noted the occurrence of *R. auris* in only a few animals with rarely more than four or five infested animals being noted at any one time. Thus, though geographically widespread, the prevalence of *R. auris* has usually been considered to be low (2,4).

Recently, we have been involved in testing the hearing of cattle (7). During these tests it became apparent that one of our animals suffered a hearing loss. Upon otoscopic examination, it was found that both auditory canals of the affected animal were ulcerated, filled with pus, and infested with mites. Several mites were collected from this animal and were identified as the cattle ear mite, *R. auris*.

Because of the severity of the infestation and its effect on hearing (6), we examined the ears of other cattle in our area of southeastern Kansas. We found that *R. auris* infestation and the associated signs of ulceration and pus, were relatively common in spite of the fact that none of the animals showed clinical signs of discomfort (such as head shaking, rubbing, or anorexia). Not only were mites found in a number of different herds, where present, they appeared to infest nearly all the members of a herd. Thus, far from being rare, infestations of *R. auris* appeared to be the rule rather than the exception.

MATERIALS AND METHODS

A total of 47 cattle representing 8 separate herds in southeastern Kansas were examined (see Table 1). Though attempts were made to examine as many

Table 1. Occurrence of *Raillietia auris* in Southeast Kansas

Location of herd	Animals: Breed	Appearence of Ear Canal: Clean	Signs of mites*	Mites observed	Proportion infested
Mound Valley	Hereford steers	0	14	3	17/17
Buffalo	Simmental X Hereford	14	0	1	1/15
Mound Valley	Hereford heifers	1	3	3	6/7
Girard	Angus	0	2	2	4/4
Mound Valley	Simmental	0	0	1	1/1
Neodesha	Hereford	0	0	1	1/1
Parsons	Hereford	1	0	0	0/1
Parsons	Hereford	0	0	1	1/1
	Totals:	16	19	12	31/47

*Pus and ulceration.

animals as possible, it was not possible to examine every member of a herd. Forty-four of the animals were examined while they were alive while three were post-mortem examinations of heads from local slaughterhouses.

The live animals were examined at the Kansas State University Agriculture Experiment Station in Mound Valley. The animals were drawn from two separate herds of Hereford cattle maintained by the Station, and three additional herds from Buffalo, Girard, and Mound Valley, Kansas were examined within one week of purchase by the Station. Post mortem examinations were made on two animals from separate herds in the Parsons, Kansas, area and a third from the Neodesha, Kansas, area.

Examination of the live animals was carried out by restraining an animal in a squeeze chute and holding its head with a nose lead. An otoscope (5X) with a 7 mm speculum was used to examine each auditory canal. The canal was examined for the presence of mites as well as for the signs of mite infestation which consist of 1) redness, ulceration, and bleeding of the tissue lining the auditory canal (8,9,12), and 2) blockage of the auditory canal by a thick plug of pus (2,3,9,13).

Post mortem material was examined by dissecting the auditory canal to expose the entire canal, eardrum, and middle ear cavity.

RESULTS

The presence of *R. auris* (Fig. 1) can be determined by direct otoscopic examination by the following two criteria. First, examination may reveal the presence of the mites near the external opening of the auditory canal. If so, the mites appear as 1 mm white spheres with legs and can often be seen moving about. However, in the majority of cases, infestation by *R. auris* is accompanied by a plug of pus in the auditory canal with the mites located deep within the canal between the plug and the tympanic membrane (9). As a result the mites are often hidden from view. Therefore, the second criterion of mite infestation is the observation of pus accompanied by redness or ulceration of the auditory canal.

The following observations, then, are divided into three categories: 1) clean—ears with no signs of mites, pus, or ulceration, 2) signs of mites—pus and ulceration present, but mites not directly observed, and 3) mites directly observed. It should be noted that in the following observations pus and ulceration were *always* present when mites were observed.

Survey of Area Cattle. The results of the survey of 47 animals from 8 separate herds in southeastern Kansas are shown in Table 1. Of these animals, 19 showed signs of *R. auris* while mites were directly observed in 12 other animals. Thus, 66% of the animals examined here had either mites or signs of mite infestation.

In four instances several members of a single herd were examined. The proportion of infested animals is these samples provides some insight into the nature of the infestation. In three of these herds, all or nearly all of the animals

examined had ear mites while in the fourth herd only one animal from a sample of 15 was infested. In other words, the prevalence of infestation within a herd was either very high or very low. This finding suggests that once *R. auris* becomes established within a herd they infest nearly all of its members and are not necessarily confined to a few, perhaps weaker, individuals.

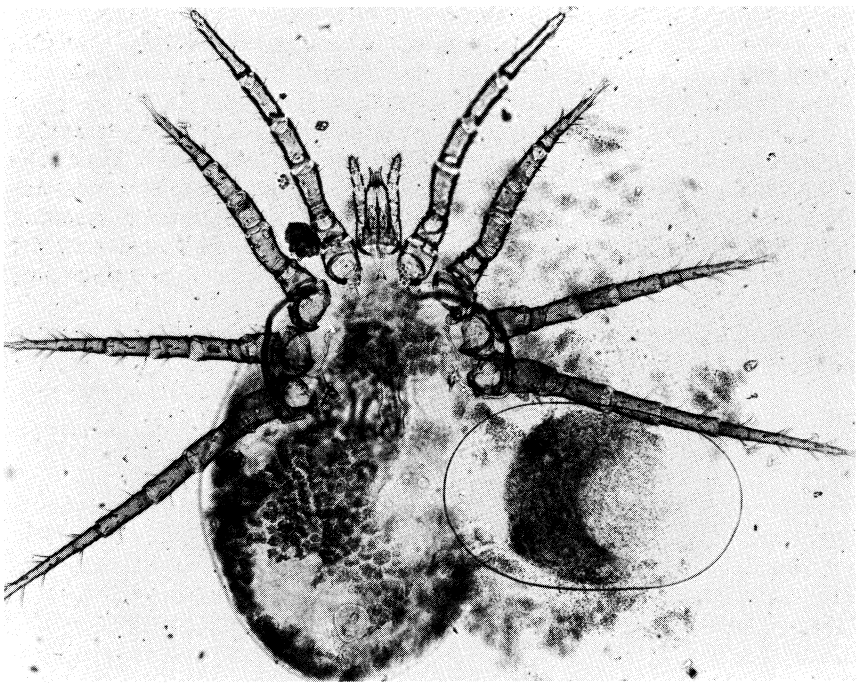

Fig. 1. Raillietia auris female, with egg released from ruptured opisthosoma X34. (Photography by Dr. J. R. Georgi.)

Macroscopic Examination. The head of one animal infested with ear mites was recovered from a local slaughterhouse for closer examination. The auditory canals were carefully dissected along their entire length and the bullae were opened. A 3-cm long plug of pus was found located in the middle portion of each auditory canal. Numerous mites identified as *R. auris* were observed between the plug of pus and the eardrum with some mites appearing to be imbedded in the pus. The eardrums were found to be intact and no mites were observed in the middle ear cavities. Furthermore, no mites could be found in the portion of the auditory canal between the external opening and the plug of pus. This observation, then, supports the findings of others that the presence of pus and ulceration in the ears of cattle generally indicates the presence of *R. auris* even though none can be directly observed in that part of the canal distal to the pus (9).

Clinical Signs. Extreme cases of *R. auris* infestation have been reported to produce clinical signs in an animal such as holding the head to one side and rubbing an ear on the ground (11,13), facial paralysis (2), or anorexia and emaciation (13). However, none of the animals which we examined showed behavioral signs of infestation and, indeed, their owners were surprised to learn that their cattle had ear mites. Thus, it is usually not possible to determine whether an animal is infested without restraining it and carefully examining its ears.

DISCUSSION

With a few exceptions, previous reports of *R. auris* have been case studies involving small numbers of animals, usually 5 or less (2,9,13,14). As a result, it has been difficult to determine the prevalence of *R. auris* infestation in cattle. Even where large numbers of animals have been examined the prevalence of infestation has often been unclear, usually because the total number of animals examined has not been given (5,11). One exception, however, is the report by Nunes and her colleagues in Brazil (12). In a survey of 60 Zebu cattle obtained from slaughterhouses in 19 different towns in the state of Minas Gerais, Brazil, they found 51 cases of ear mite infestation. Thus, it would appear that the discovery of a high prevalence of *R. auris* is not without precedent.

The results of the present study support the conclusion that there is a high prevalence of *R. auris* infestation in cattle. Furthermore, given the results of the present as well as previous studies, it would appear that a high prevalence of *R. auris* infestation is not limited to the tropics nor is it specific to a single breed or species of cattle. Thus, given the wide distribution of *R. auris,* it might be expected that similar rates of infestation can be found elsewhere throughout the world.

The fact that *R. auris* is so rarely reported is due no doubt to the difficulty in detecting its presence. Cattle generally show no overt signs of infestation and direct examination of the auditory canals of live cattle is not a common practice. Furthermore, if some of the insecticides currently used to control other parasites are effective in controlling the mite, then it is not surprising that some herds should be relatively free of the mite while others are severely infested. These factors then may account for the relative lack of reports of *R. auris.*

Given a high prevalence of *R. auris,* the question arises as to its potential effects on the well-being of an animal and, therefore, its economic significance. Indeed, there are at least three ways in which mite infestations may affect cattle.

First, there is the potential effect of mite infestation on production. In examining mite-infested cattle, one is struck by the condition of the animals' auditory canals. In spite of the lack of signs of distress on the part of the animal, it is difficult to believe that the ulceration and blockage of the canal by

pus do not cause some discomfort to the animal. Furthermore, it would seem reasonable that such discomfort would be exacerbated by chewing and swallowing, just as an earache affects humans. It would stand to reason, then, that chronic infestation of *R. auris* might significantly affect an animal's ability to gain weight or produce milk. Such symptoms were reported in at least one severe infestation (13). Thus, it would be of interest to determine the effect of milder ear mite infestations on production in cattle.

A second potential effect of *R. auris* infestation is that it may lead to secondary infections which result in the debilitation, and even death of an animal. Indeed, such occurrences have also been reported (2,11,12,13). Though it appears relatively rare for *R. auris* infestation to lead to mortality, the possibility should not be neglected.

Finally, the hearing loss produced by mite infestations presents a potential problem for cattle (6). The degree of impairment is sufficiently large that a similar level of impairment in humans would be labeled as a severe hearing loss. Furthermore, the greatest loss occurs at those frequencies to which normal cattle are most sensitive and which may, therefore, be of greatest biological importance to them. This hearing loss may be sufficient to affect an animal's ability to use sound as a means of maintaining the cohesion of the herd or for the detection of predators. While such factors may not be important to confined animals, they may play a role in the survival of free-ranging and wild cattle.

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