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Ectoparasites of the Blackbuck Antelope (*Antilope cervicapra*)

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ABSTRACT: Fifty-two free-ranging blackbuck antelope (*Antilope cervicapra*) from Texas were examined for ectoparasites. Two species of sucking lice (Anoplura), one species of chewing louse (Mallophaga), one species of louse fly (Diptera), and three species of ticks (Acari) were found. This is the first report of the anoplurans *Linognathus cervicaprae* and *L. pithodes* from the Western Hemisphere. The southern deer ked (*Lipoptena mazamae*), the winter tick (*Dermacentor albipictus*), and the rabbit tick (*Haemaphysalis leporispalustris*) are reported from blackbuck for the first time. The lone star tick (*Amblyomma americanum*) and the mallophagan (*Damalinia cornuta cornuta*) were reported previously from blackbuck in Texas, the latter species under the name *Tricholipeurus balanicus balanicus*.

Key words: Blackbuck antelope, *Antilope cervicapra*, ectoparasites, lice, ticks, deer keds, survey, prevalence.

Many exotic ungulate species have been established on private ranches in Texas since introductions began in 1930. A statewide survey by the Texas Parks and Wildlife Department (Austin, Texas 78744, USA) in 1988 found 67 species of exotic ungulates distributed on 486 ranches in 137 counties. The population of all species consisted of 164,257 individuals. Blackbuck antelope (*Antilope cervicapra*) were the third most numerous species (ca. 21,230 individuals) and were present on 326 ranches in 86 counties. The majority (76%) occurred on the Edwards Plateau of west-central Texas (Traweek, 1989).

The present study was part of a continuing cooperative effort by the United States Department of Agriculture, Animal and Plant Health Inspection Service (APHIS) (Washington, D.C. 20090, USA) and the Southeastern Cooperative Wildlife Disease Study (SCWDS) (The University of Georgia, Athens, Georgia 30602, USA) to monitor the health status of exotic ruminants in Texas. The ancestors of this present-day exotic fauna were imported at a time when health monitoring was far less strict. Furthermore, the diseases and parasites of exotic ungulates in the United States (except in zoos) have been little studied.

The few species of ectoparasites reported from blackbuck in Texas include the rabbit ear mite (*Psoroptes cuniculi*), the lone star tick (*Amblyomma americanum*), and two species of chewing lice, *Damalinia* (*Tricholipeurus*) *parallela* and *D.* (*T.*) *cornuta cornuta* (Thornton et al., 1973; Wright, 1985; Wright and Glaze, 1988). The objective of this study was to assess the present ectoparasite fauna on blackbuck from Texas.

Ectoparasites were collected from animals harvested by a private company (Texas Wild Game Cooperative, Ingram, Texas 78025, USA) that specializes in marketing exotic game meat. All host animals were from game ranches in the Edwards Plateau region of Texas (29°30′ to 30°30′N by 99°00′ to 101°30′W, Bandera, Edwards, Kerr, Sutton, and Val Verde Counties). Those included in the survey were taken 4 to 5 November 1987; 6 to 18 January and 25 July to 5 August 1988; and 23 January to 2 February 1989. Fifty-two blackbuck antelope were examined, representing free-ranging populations on five ranches in five counties (Table 1).

Animals were harvested by shooting. Examinations for ectoparasites involved thorough visual inspections of the entire body of the freshly dead animal or of the hide after skinning. Representative specimens were placed in 70% ethanol by personnel of the SCWDS and submitted to the

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TABLE 1. Prevalence[a] of ectoparasites on blackbuck (*Antilope cervicapra*) in Texas.

Ectoparasite collected	County, collection dates and (number of animals examined)[b]					
	Bandera Nov 1987 (4)	Edwards Jul–Aug 1988 (16)	Kerr Jan 1988 (3)	Kerr Jan–Feb 1989 (6)	Val Verde Jan 1988 (8)	Val Verde Jan–Feb 1989 (14)
Linognathus cervicaprae					13	21
Linognathus pithodes	50		33	67	50	50
Damalinia cornuta cornuta				50	63	7
Lipoptena mazamae		13				
Amblyomma americanum		81	33	100		
Dermacentor albipictus			67	50	13	
Haemaphysalis leporispalustris					13	100

[a] Number of animals infested/number examined expressed as a percentage.
[b] No parasites were found on one animal examined in Sutton County in November 1987.

National Veterinary Services Laboratories (NVSL, Ames, Iowa 50010, USA) for identification. Voucher specimens are in the parasite reference collection at NVSL (Accession numbers 88-14804 through 88-14815, 88-42692 through 88-42703, 89-24234 through 89-24246, 89-24257 through 89-24261, 89-22993, and 89-22996).

We collected 334 ectoparasites on 45 of 52 (86%) blackbuck examined (Table 1). The single animal examined from Sutton County was uninfested as were two of four from Bandera County, three of 16 from Edwards County, and one of 22 from Val Verde County. Two species of sucking lice (Anoplura), one species of chewing louse (Mallophaga), one species of deer ked (Diptera), and three species of ixodid ticks (Acari) were identified (Table 1).

There was considerable variation in the prevalence of the parasites. *Lipoptena mazamae* was the least prevalent parasite, with two Edwards County blackbuck infested with one specimen each. *Linognathus cervicaprae* also was uncommon, with five female individuals found on four hosts. The most abundant and prevalent parasite was *Amblyomma americanum* with 120 specimens (males, females, and nymphs) collected from 20 hosts. *Linognathus pithodes* also was abundant and prevalent, with 93 specimens collected from 18 hosts. Furthermore, it occurred on hosts in three of the five counties sampled. By contrast, *L. cervicaprae*, *L. mazamae*, and *Haemaphysalis leporispalustris* were found in only one county each.

The diversity of parasite species collected on individual hosts ranged from one to four species. The number of hosts infested with one, two, three, and four parasite species were 27, 11, four, and three, respectively.

The collections of *L. cervicaprae* and *L. pithodes* are the first records of these sucking lice in the Western Hemisphere. Evidently host-specific to blackbuck, *L. cervicaprae* was reported previously in 1847 at a menagerie in Paris (France) and in 1938 at the Zoological Garden of London (England) (Ferris, 1951). There are no published records from other host species or from free-ranging blackbuck in their native India and Nepal. *Linognathus pithodes* is reported previously only on a blackbuck in the Zoological Garden of London, in 1916 (Ferris, 1951). We found no other published records of this louse in the Western Hemisphere or in India and Nepal. This louse now seems to be widespread on blackbuck in Texas. A recent monograph on the sucking lice of North America (Kim et al., 1986) lists neither *L. pithodes* nor *L. cervicaprae*.

The first New World specimens of the antelope-specific chewing louse *D. cornuta cornuta* were collected in 1982 from a blackbuck in Texas (Wright, 1985). This report referred to the parasite as *Tricholipeurus balanicus balanicus*, but Wer-

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neck (1957) earlier had designated *D. cornuta cornuta* as a senior synonym for this louse. We have compared specimens taken by Wright (1985) with our own specimens, and we confirm the identity of the two. This louse previously was taken from blackbuck in the London Zoo in 1938. However, most extant specimens came from dorcas gazelles (*Gazella dorcas*) as early as the 1840's, and Werneck (1957) suggests that this louse is properly a gazelle parasite. Nevertheless, it now seems well established on blackbuck in Texas, and therefore, we feel that the reported occurrence (Thornton et al., 1973) of *Damalinia parallela* on three blackbuck from central Texas merits re-examination. This seems to be the only published record of a host for *D. parallela* other than a deer (primarily *Odocoileus* spp.). Thus far, extensive efforts to locate voucher specimens from the collections of Thornton et al. (1973) for comparison have been unsuccessful.

We found one other insect ectoparasite not previously reported from blackbuck; single male deer keds (*L. mazamae*) were collected from each of two antelope. Hippoboscids, especially those from mammals, are fairly specific in their host preferences (Bequaert, 1942). All three species of *Lipoptena* in North America normally occur on deer or wapiti (Bequaert, 1954–57). There are occasional records of accidental occurrences of *L. mazamae* on domestic cattle (Drummond, 1966) and stray occurrences on the grison (*Tayra barbara*) and the collared peccary (*Tayassu tajacu*) in tropical America. The specimens of *L. mazamae* from blackbuck probably represent a similar straying; both were small, unfed, and slightly sclerotized individuals.

Ticks collected from blackbuck included three species that are common or occasional parasites of domestic, wild, and exotic animals in the Edwards Plateau region of Texas. However, one group of 14 blackbuck taken on a single ranch in January 1989 was 100% infested with larvae and nymphs of *H. leporispalustris*. This is the first record of this tick from blackbuck. Because of their host-finding behavior, adults of this tick species are highly host-specific (Camin and Drenner, 1978), primarily attacking lagomorphs; the immature ticks attack rabbits and also ground-feeding birds (Bishopp and Trembley, 1945). Larger hosts, including various ruminants, are occasionally infested, but a prevalence exceeding 10% is unusual. Thus, the sudden appearance of this 100%-infested sample of 14 animals is anomalous and provocative. This tick is known to occur in discrete, geographically isolated populations, discernible on the basis of statistically measurable morphological characteristics (Thomas, 1968). Possibly intraspecific variation also exists among such local populations, based upon host selection behavior and leading to this unusually high tick prevalence on blackbuck. All the known infestations of blackbuck by *H. leporispalustris* are from one ranch in Val Verde County, Texas, and perhaps the local tick population there has adapted to readily infest the local antelope population. Goddard (1989) recently found that a localized population of the host-restricted brown dog tick (*Rhipicephalus sanguineus*) seemingly was able to adapt toward attacking humans. Four species of *Haemaphysalis* from Asia are reported previously from indigenous blackbuck. These are *H. birmaniae* in Nepal (Hoogstraal, 1970), *H. bispinosa* and *H. himalaya* in Nepal (Mitchell, 1979), and *H. intermedia* in India (Miranpuri et al., 1978). None of these species is particularly host specific.

There are other exotic arthropod ectoparasites that eventually might be found on blackbuck from Texas. Mitchell (1979) found two species of fleas (*Anicistropsylla nepalensis* and *Ctenocephalides felis*) and three ticks (*Haemaphysalis* sp., *Dermacentor auratus*, and *Rhipicephalus haemaphysaloides*) on blackbuck in Nepal. Previously, Clifford et al. (1975) found a single female *Ixodes ovatus* on a blackbuck in Nepal. Also, a louse fly (*Lipoptena*

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iniqua) is known only from blackbuck in northern India (Maa, 1969).

Finally, we have in our reference collection another case of *Psoroptes cuniculi* from blackbuck that corroborates and antedates the record of Wright and Glaze (1988). Our specimens (NVSL Accession Number 85-20205) were collected in February 1985 from a captive blackbuck in a wild animal park in Warren County, Ohio (USA).

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