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THE PREVALENCE OF ANTIBODY TO CONTAGIOUS CAPRINE PLEUROPNEUMONIA (*Mycoplasma* strain F38) IN SOME WILD HERBIVORES AND CAMELS IN KENYA [□]

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Abstract: Sera of 11 species of wild herbivores were tested for antibody to *Mycoplasma* strain F38 which causes contagious caprine pleuropneumonia (CCPP) in Kenya. Antibodies were found in buffalo (*Syncerus caffer*) (32%), impala (*Aepyceros melampus*) (10%) and camels (*Camelus dromedarius*) (49%) but not in bushbuck (*Tragelaphus scriptus*), eland (*Taurotragus oryx*), Grant's gazelle (*Gazella granti*), kongoni (*Alcelaphus buselaphus cokei*), oryx (*Oryx beisa*), Thomson's gazelle (*Gazella thomsonii*), waterbuck (*Kobus defassa*) and wildebeest (*Connochaetus taurinus*).

The infection of a single Thomson's gazelle resulted in the development of antibody but no clinical disease. A goat kept in contact did not become infected.

INTRODUCTION

Contagious caprine pleuropneumonia (CCPP) has been recognized in Kenya for several decades but only recently has the causal agent been isolated.^{4,5} Three strains of *Mycoplasma* were isolated, F38 and G69 causing acute contagious pleuropneumonia⁵ and F30 causing a non-contagious pleuropneumonia.⁴ Infection experiments were conducted with the three strains F38, G69 and F30 and the other known CCPP-associated *Mycoplasma* strains PG3 (National Type Culture Collection 10137), the Nigerian reference strains N 108¹ and Vom and *M. mycoides* subspecies *mycoides* (Gladysdale). F38 and G69 caused acute fatal fibrinous pleuropneumonia by intratracheal-endobronchial inoculation and by contact with experimentally infected animals.^{3,5,6} F30 and Vom were highly pathogenic by inoculation^{3,4} and strains PG3, IV108 and *M. mycoides* subspecies *mycoides* (Gladysdale) did not cause pleuropneumonia in goats.³

Serological tests were developed and the findings of the complement fixation and agar gel diffusion tests indicated that F38 is related to *M. mycoides*. In addition, the growth inhibition test indicated that F38 and G69, differed from PG3, N108, Smith,² F30, Vom and *M. mycoides* subspecies *mycoides* (Gladysdale).

Mycoplasma of the F38 strain were isolated from 21 acute cases from 14 outbreaks.⁵ Sera from 10 species of mainly free-ranging wild herbivores and from camels (*Camelus dromedarius*) were screened by the complement fixation test (CFT) for antibody to *Mycoplasma* strain F38. This strain F38 which proved to be highly infectious for goats^{3,5} was used to inoculate one Thomson's gazelle (*Gazella thomsonii*).

MATERIALS AND METHODS

Blood was collected and sera were obtained from nine species of free-ranging

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wild herbivores from five districts, two species of wild herbivores in captivity (Kabete) and three species of domesticated wild herbivores and camels (Kilifi District) (Table 1). The animals were either shot, manually restrained or immobilized by the injection of a mixture of xylazine, [Ⓜ] etorphine HCl [Ⓜ] and acepromazine maleate [Ⓜ] by projectile syringe. [Ⓜ] The presence of antibody to *Mycoplasma* strain F38 was determined by CFT.^{4,6} CFT titres of 1:32 and over were regarded as evidence of exposure (positive).

EXPERIMENT

An adult male Thomson's gazelle captured several months earlier and found free of antibody to CCPP, was inoculated by the intratracheal-endobronchial route with 20 ml of a culture of *Mycoplasma* (F38) containing over 10⁹ colony forming units. For collection of serum and recording of body temperatures the gazelle was immobilized weekly, for 4 months, by the injection of 10 mg xylazine delivered by projectile syringe.

RESULTS

Six of 19 (32%) buffalo (*Syncerus caffer*) from three areas, one of 10 (10%) impala (*Aepyceros melampus*) and 66 of 134 (49%) camels from two areas were positive (Table 1). The experimentally inoculated Thomson's gazelle did not develop clinical disease but serum antibody was present from day 14 to day 54 postexposure, with a peak titre of 1:128 between days 35 and 42. The goat kept in contact with the gazelle did not become infected.

DISCUSSION

To date attempts to isolate *Mycoplasma* causing CCPP from wild herbivores and camels have been unsuccessful.⁸ This is the first report of antibody to this organism in wild herbivores and camels. Shifrine *et al.*¹⁰ attempted to isolate *M. mycoides* from lymph nodes from 36 buffalo in East Africa, but failed. Significant CF antibody to *M. mycoides* subspecies *mycoides* were found in wildebeest (*Connochaetes taurinus*) and hippopotamus (*Hippopotamus amphibius*) but not in impala, eland, waterbuck, buffalo and zebra.^{9,10} The CFT enabled *M. mycoides* subspecies *mycoides* to be distinguished from the caprine strains.⁵

The prevalence of antibody to *Mycoplasma* strain F38 was low (4.9%) in 10 species of free-ranging herbivores from 6 districts of Kenya. Although the disease was readily transmitted by contact among goats,^{5,6} wild animals except buffalo in infected areas did not have complement fixing antibodies to the causative organism and may not have a role in the epidemiology of CCPP. Following acute caprine pleuropneumonia, CF antibodies persisted in goats for at least 4 months.⁷ The possible involvement of the buffalo requires further study. The experimental infection of the Thomson's gazelle indicated that this species was susceptible to infection although clinical disease did not develop. For this reason Thomson's gazelle probably would not be an important source of infection for goats. The significance of antibody in camels is not clear, as the causal agent has not been identified.⁸ Goats on the same farms as the camels had no history of CCPP, but it is possible that a *Mycoplasma* identical to or closely related to strain F38 may have been present.

[Ⓜ] Rompun 2%. Bayer, Leverkusen, Germany.

[Ⓜ] Large Animal Immobilon. Reckitt and Colman Ltd., Hull, England.

[Ⓜ] Palmer Chemical and Equipment Company. Douglasville, Georgia, USA.

TABLE 1. Serologic survey for antibody to CCPP (*Mycoplasma F38*) in Kenya (1974-1977).

SPECIES	AREA	Kabete							total	positive
		Captivity	Kajiado	Kilifi	Laikipia	Machakos	Nakuru	Narok		
Buffalo	<i>Syncerus caffer</i>			4/4*	1/6	1/7		0/2	6/19	32%
Bushbuck	<i>Tragelaphus scriptus</i>	0/1			0/3		0/6		0/10	0%
Camel	<i>Camelus dromedarius</i>			64/102	2/32				66/134	49%
Eland	<i>Taurotragus oryx</i>	0/5	0/11	0/12					0/28	0%
Grant's Gazelle	<i>Gazella granti</i>		0/10				0/6		0/16	0%
Impala	<i>Aepyceros melampus</i>		1/9				0/1		1/10	10%
Kongoni	<i>Alcelaphus buselaphus cokei</i>					0/4	0/6		0/10	0%
Oryx	<i>Oryx beisa</i>			0/20					0/20	0%
Thomson's Gazelle	<i>Gazella thomsonii</i>				0/9		0/1		0/10	0%
Waterbuck	<i>Kobus defassa</i>				0/1	0/2	0/7		0/10	0%
Wildebeest	<i>Connochaetes taurinus</i>		0/10						0/10	0%

*The number of sera recorded "positive" in the complement fixation test (titres of 1/32 or higher) are given, as the numerator, over the total tested, as denominator.

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