Anaplasma and *Ehrlichia* infections in wildlife reservoirs and livestock in Shimba Hills National Reserve (SHNR), Kwale County, Kenya

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INTRODUCTION

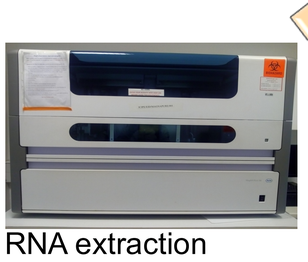
Anthropogenic activities remain key drivers of disease emergence as humans encroach into wildlife habitats that are major reservoirs of zoonotic bacterial pathogens. Little is known about the distribution and genetic characterisation of *Anaplasma* and *Ehrlichia*, the causative agents of human granulocytic anaplasmosis and human monocytic ehrlichiosis, respectively. We investigated these tick-borne zoonotic bacteria in wildlife and livestock in the Shimba Hills National Reserve (SHNR) of Kenya, an area in which wildlife live in close proximity to humans and livestock.

OBJECTIVES

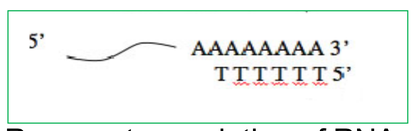
To detect and identify tick-borne bacteria in wildlife and livestock in Shimba Hills National Reserve.

METHODS

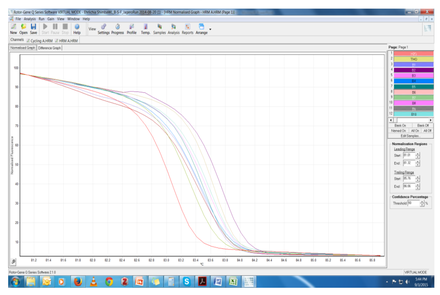
Diverse free-ranging wildlife and livestock species sampled



RNA extraction

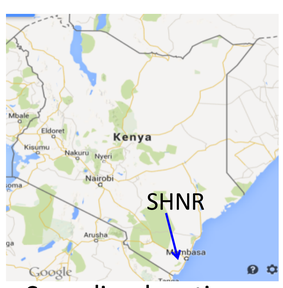


Reverse transcription of RNA to its complementary cDNA.



Assay: HRM analysis of 16S rRNA gene utilising universal primers based on multiple alignments of *Ehrlichia* and *Anaplasma* sequences.

Sequencing confirmation



Sampling location

RESULTS

Table 1. Percent pathogens detected against the specimen storage method.

	Wildlife					Livestock		
Pathogen detected	Buffalo (*n*=18)	Sable antelope (*n*=5)	Warthog *n*=3	Bush-buck *n*=1	Hartebeest *n*=1	Cattle *n*=42	Sheep *n*=2	Goats *n*=17
E. chaffeensis	1 (5.6)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
E. spp	2 (11.1)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
A. marginales	4 (22.2)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (4.8)	0 (0.0)	3 (17.6)
A. phagocytophilum	0 (0.0)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)
Anaplasma spp.	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	0 (0.0)	1 (5.9)
Total	7 (38.9)	1 (20.0)	0 (0.0)	0 (0.0)	0 (0.0)	2 (4.8)	0 (0.0)	4 (23.5)

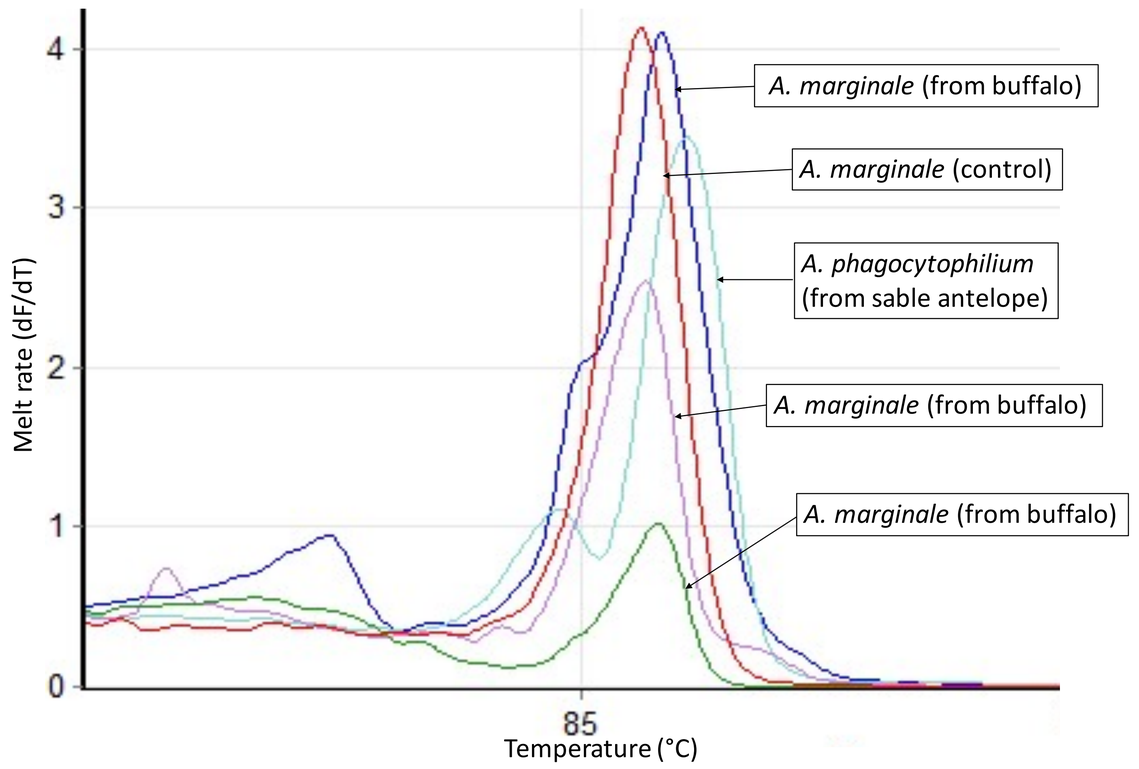


Figure 1: Melt rates (change in fluorescence with change in temperature) of *Anaplasma* spp. 16S PCR products from wildlife blood samples.

CONCLUSION

The SHNR ecosystem provides an interface for wildlife-livestock interactions that may pose a challenge to food security in the region as well as conservation threats to the wildlife.

IMPACT

Diverse tick-borne bacteria pathogens were identified in wildlife and livestock populations, including emerging pathogens, such as *E. chaffeensis*, responsible for life-threatening human monocytic ehrlichiosis, as well as *Anaplasma marginale* and *A. phagocytophilium,* which can cause tick-borne fevers in both livestock and humans.

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