ISSN (Print) 0023-4001
ISSN (Online) 1738-0006

Korean J Parasitol Vol. 52, No. 5: 565-568, October 2014
http://dx.doi.org/10.3347/kjp.2014.52.5.565

▣ BRIEF COMMUNICATION

Ixodid Tick Infestation in Cattle and Wild Animals in Maswa and Iringa, Tanzania

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Abstract: Ticks and tick-borne diseases are important in human and livestock health worldwide. In November 2012, ixodid ticks were collected and identified morphologically from cattle and wild animals in the Maswa district and Iringa urban, Tanzania. *Amblyomma gemma*, *A. lepidum*, and *A. variegatum* were identified from Maswa cattle, and *A. variegatum* was the predominant species. *A. marmoreum*, *Hyalomma impeltatum*, and *Rhipicephalus pulchellus* were identified from Iringa cattle in addition to the above 3 *Amblyomma* species, and *A. gemma* was the most abundant species. Total 4 *Amblyomma* and 6 *Rhipicephalus* species were identified from wild animals of the 2 areas. *A. lepidum* was predominant in Maswa buffaloes, whereas *A. gemma* was predominant in Iringa buffaloes. Overall, *A. variegatum* in cattle was predominant in the Maswa district and *A. gemma* was predominant in Iringa, Tanzania.

Key words: Ixodid tick, cattle, wild animal, Maswa, Iringa, Tanzania

Ticks are important ectoparasites of the livestock and wild animals worldwide. Ticks and tick-borne diseases are major problems in livestock health, especially in tropical and subtropical countries [1,2], including Sub-Saharan Africa [3]. Ticks also carry and transfer several zoonotic pathogens (virus, bacteria, and protozoa) to humans. In Africa, Tanzania ranks the third in terms of increasing livestock numbers in recent decades [4]. Cattle are the dominant livestock species, accounting for about 75% of the total livestock in Tanzania. Tick-borne diseases reduce cattle productivity in Tanzania and neighboring countries [5,6]. *Rhipicephalus* and *Amblyomma* ixodid ticks, which are the most important genera in tick-borne disease transmission, are found in most areas in Tanzania where cattle are bred [7,8]. Among ixodid ticks, *R. appendiculatus* and *A. variegatum* are the most widely distributed species in Tanzania. Because the transfer of ticks between domestic and wild animals may influence overall pathogen transmission, there is a need for more intensive studies on ticks and tick infestations of cattle and wild animals in Tanzania.

The study areas were selected from livestock farms and wildlife reserves. The Shinyanga region, located in the west of Serengeti National Park (Fig. 1), has the largest cattle population (> 3,500,000) in Tanzania [4]. The Iringa region is located in south central Tanzania and has a cattle population of less than 500,000. Because both regions contain game reserves and national parks, habitats of wild and domestic animals overlap. This study was conducted in the Maswa district of the Shinyanga region and in the Iringa urban of the Iringa region. The Maswa district, 1 of the 8 districts of the Shinyanga region, is located along the southwestern boundary of the Serengeti National Park. In the dry season, the Maswa district is a refuge for many Serengeti wild animals. Iringa urban, which is located in the eastern part of the Ruaha National Park, is the capital of the Iringa region and a transport hub to Dar es Salaam, Dodoma, and other cities in Tanzania.

Cattle from 8 herds in the villages of Mwasinasi, Nyashimba, and Nyasosi in the Maswa Game Reserve were examined. The frequency of acaricide treatment in these herds was unclear. Individual cattle were restrained to the ground, and ticks were collected from the ears, belly, udder, and perineum. In Iringa urban, ticks were collected from the ears, belly, udder, perineum, and the back of newly slaughtered cattle from

• Received 18 February 2014, revised 17 July 2014, accepted 3 August 2014.
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slaughterhouses. Ticks from wild animals were also collected from the whole body, especially near the horns. The wild animals examined near the Maswa district and Iringa urban included those that were either freshly hunted down or roadkill; buffalos (*Syncerus caffer*), bush buck (*Tragelaphus* sp.), bush pig (*Potamochoerus larvatus*), eland (*Taurotragus oryx*), leopard (*Panthera pardus*), roan antelope (*Hippotragus equines*), topi (*Damaliscus korrigum*), warthog (*Phacochoerus africanus*), and zebra (*Equus quagga*). Generally, not all the ticks from an individual animal were collected. Collected ticks were placed immediately in 70% ethanol. Morphological identification of tick species was performed by stereomicroscopic observations using an identification guideline [9]. Unidentifiable nymphs were excluded from the study.

Fig. 1. Location of the study areas near Maswa and Iringa in Tanzania.

All cattle examined in the study areas were infested with ixodid ticks. The numbers and species of the ticks identified in this study are shown in Table 1. A total of 129 ticks were collected from domestic cattle of farms in the Maswa District. The tick index of Maswa district cattle was 8.1 (16/129) ticks per animal. All ticks collected belonged to the genus *Amblyomma*, and 127 (98.5%) were identified as *A. variegatum*. One each of *A. gemma* and *A. lepidum* were also identified. We collected 74 ixodid ticks from slaughtered cattle in Iringa urban. The tick index was 1.9 (40/74) ticks per animal, which was lower than that of the Maswa district. Urban environment or collecting in slaughtered cattle may influence lowered tick index. Three genera of ixodid ticks, *Amblyomma*, *Hyalomma*, and *Rhipicephalus*, were identified in Iringa cattle. Forty-four (59.5%) ticks were identified as *A. gemma*, and 6 (8.1%), 9 (12.2%), and 8 (10.8%) ticks were identified as *A. lepidum*, *Amblyomma marmoreum*, and *A. variegatum*, respectively. Two (2.7%) *Hyalomma impeltatum* and 5 (6.8%) *Rhipicephalus pulchellus* were also identified. *A. variegatum* was the most commonly identified tick species from domestic cattle in the Maswa district, whereas *A. gemma* was the most commonly identified tick species in Iringa urban.

Ninety-seven ticks were collected from wild animals, including 4 *Amblyomma* species and 6 *Rhipicephalus* species (Table 2). *A. lepidum* (36.1%) was predominant in buffaloes of the Maswa district, whereas *A. gemma* (26.8%) was predominant in buffaloes of Iringa urban. Unlike in other wild animals, *Rhipicephalus* ticks were rare in buffaloes.

This study shows that various species of ticks infest the cattle and wild animals of 2 areas in Tanzania. *Amblyomma* ticks, which are well-known vectors for *Ehrlichia* and *Rickettsia* species that cause heartwater, spotted fever, and African tick-bite fever in animals and humans [10], were the most predominant tick species in cattle (Table 1). In the present study, 4 *Amblyomma* species were isolated in cattle. *A. variegatum* and *A.*

Table 1. Identification of ticks from cattle in Maswa and Iringa

Tick species	No. Ticks from cattle						
	Maswa (n=16)			Iringa (n=40)			Total (%)
	Male	Female	Subtotal (%)	Male	Female	Subtotal (%)	
Amblyomma gemma	-	1	1 (0.8)	37	7	44 (59.5)	45 (22.2)
A. lepidum	-	1	1 (0.8)	6	-	6 (8.1)	7 (3.5)
A. marmoreum	-	-	-	9	-	9 (12.2)	9 (4.4)
A. variegatum	96	31	127 (98.5)	7	1	8 (10.8)	135 (66.5)
Hyalomma impeltatum	-	-	-	1	1	2 (2.7)	2 (1.0)
Rhipicephalus pulchellus	-	-	-	4	1	5 (6.8)	5 (2.5)
Total	96	33	129	64	10	74	203

Table 2. Identification of ticks collected from wild animals

Tick species	Maswa							Iringa	Total (%)
	Buffalo (n=2)	Bush buck (n=1)	Bush pig (n=1)	Eland (n=1)	Leopard (n=1)	Warthog (n=1)	Zebra (n=1)	Buffalo (n=2)	
A. gemma	2	-	-	-	-	-	-	24	26 (26.8)
A. lepidum	26	-	-	9	-	-	-	-	35 (36.1)
A. marmoreum	1	-	-	-	-	-	-	1	2 (2.1)
A. variegatum	2	-	-	-	-	2	-	-	4 (4.1)
R. appendiculatus	-	-	5	-	-	-	-	-	5 (5.2)
R. e. evertsi	-	-	-	-	-	-	1	-	1 (1.0)
R. muhsamae	-	-	4	-	-	-	-	-	4 (4.1)
R. pravus	-	-	-	-	4	1	-	-	5 (5.2)
R. pulchellus	2	-	-	-	-	-	8	1	11 (11.3)
R. simus	-	-	4	-	-	-	-	-	4 (4.1)
Total	33	0	13	9	4	3	9	26	97

gemma were the predominant tick species in cattle of the Maswa district and Iringa urban, respectively. Of the *Amblyomma* species, *A. variegatum* is the most common and widely distributed tick species in Tanzania, covering sub-humid and low-to-high altitudes of the country [7]. However, *A. gemma* was common in the arid and semi-arid bushland and wooded grassland areas. In general, *A. variegatum* is robust, whereas *A. gemma* and *A. lepidum* need more specialized environmental conditions. Compared to a previous report [7], no appreciable changes in the distribution of *Ambyomma* ticks were found in the Maswa and Iringa areas.

Rhipicephalus ticks, which transmit the pathogens causing East Coast fever, Boutonneuse fever, Lyme disease, and Q fever [11], were rare in cattle but common in wild animals in the study areas. The most common ixodid tick species in Tanzania are *R. appendiculatus*, which comprised 49% of ticks collected in an extensive survey [7]. *R. appendiculatus* shares most of its range with *A. variegatum*. It was also reported that *R. appendiculatus* was the most common tick found on smallholder dairy cattle in Iringa [12]. In this respect, the absence of *R. appendiculatus* in the cattle in this study was unexpected. The numbers of cattle and wild animals examined in this study were small. Therefore, survey on the ticks from cattle, wild animals, and vegetation of Tanzania are required.

The present study identified ticks infesting cattle and wild animals in 2 regions of Tanzania. Maswa and Iringa are shelters of wild animals in the dry season. Ticks may migrate between cattle and wild animals in these areas. Therefore, more extensive studies are required to control tick infestation and tick-borne diseases in these areas.

ACKNOWLEDGMENTS

This study was supported by the Project of Cooperation on Bioresources with Tanzania Wildlife Research Institute (TAWIRI) through the National Research Foundation of Korea (NRF) (2012K1A3A9A01027507).

CONFLICT OF INTEREST

We have no conflict of interest related to this work.

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