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Cattle ticks in Cameroon: Is *Rhipicephalus* (*Boophilus*) *microplus* absent in Cameroon and the Central African region?

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ABSTRACT

In most parts of the world, ticks are rapidly developing resistance to commonly used acaricides thus rendering control difficult. This constraint is further compounded by the introduction of new species in areas where they did not exist before. Such is the case with the introduction into and rapid spread of *Rhipicephalus* (*Boophilus*) *microplus* in some countries of West Africa. With the looming threat of its further spread in the region, the objective of the present study was to update knowledge on cattle ticks in Cameroon. Among 19,189 ticks collected monthly from 60 animals in 5 herds from March 2012 to February 2013, *Rh.* (*B.*) *decoloratus* was the most abundant species with a relative prevalence of 62.2%, followed by *Amblyomma variegatum* (28.4%), *Rh.* (*B.*) *annulatus* (0.2%), *Rh.* (*B.*) *geigyi* (0.03%), other *Rhipicephalus* spp. (8.4%) and *Hyalomma* spp. (0.3%). *Rh.* (*B.*) *decoloratus* and *A. variegatum* were also the most widely distributed in space. Infestation rate was generally high, with average tick count/animal of about 80 during peak periods. Tick distribution and abundance in the different sites was as varied as the underlying factors, among which the most important were management systems and climatic factors. The effects of rainfall and temperature were confounded by other factors and difficult to evaluate. However, it appears tick development depends among other factors, on a humidity threshold, above which there is not much more effect. *Rh. microplus* was not found during this study, but more extensive tick collections have to be done to confirm this. In conclusion, cattle tick infestation in Cameroon remains an important cause for concern. Farmers need assistance in the use and management of acaricides in order to increase their efficiency and reduce the development of resistance. Although *Rh. microplus* was not found, its introduction from other West African countries is imminent if adequate measures, especially in the control and limitation of animal movements, are not taken.

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Introduction

In most parts of the world, cattle ticks are rapidly developing resistance to commonly used acaricides, thus rendering control difficult. This constraint is further compounded by the introduction of new tick species in areas where they did not exist before. Such is the case with the introduction into and rapid spread of *Rhipicephalus* (*Boophilus*) *microplus* in some countries of West Africa; notably Côte d'Ivoire, Benin, Togo, Burkina Faso and Mali (Madder et al., 2007, 2012; Adakal et al., 2013). The threat of the spread of this tick in the entire West and Central African region is real and requires appropriate measures to keep the situation under control. A necessary first step will be for each country in the region to establish a baseline situation of ticks in association with factors influencing their distribution and prevalence. In the present study, a survey was carried out in the main livestock producing areas of Cameroon to determine the presence or absence of *Rh.* (*B.*) *microplus* and to establish baseline data on existing tick species prior to any potential invasion.

Materials and methods

Study sites and experimental herds

The study was carried out at selected sites in the main cattle-producing regions of Cameroon, consisting of Wakwa in the Adamawa Region, Bambui, Jakiri (Vekovi and Tan) and Weh in the North West Region (Fig. 1). These sites were targeted because they host substantial numbers of imported cattle or are noted for transborder animal movements that could likely be associated with new tick species introductions. Geographical characteristics of the

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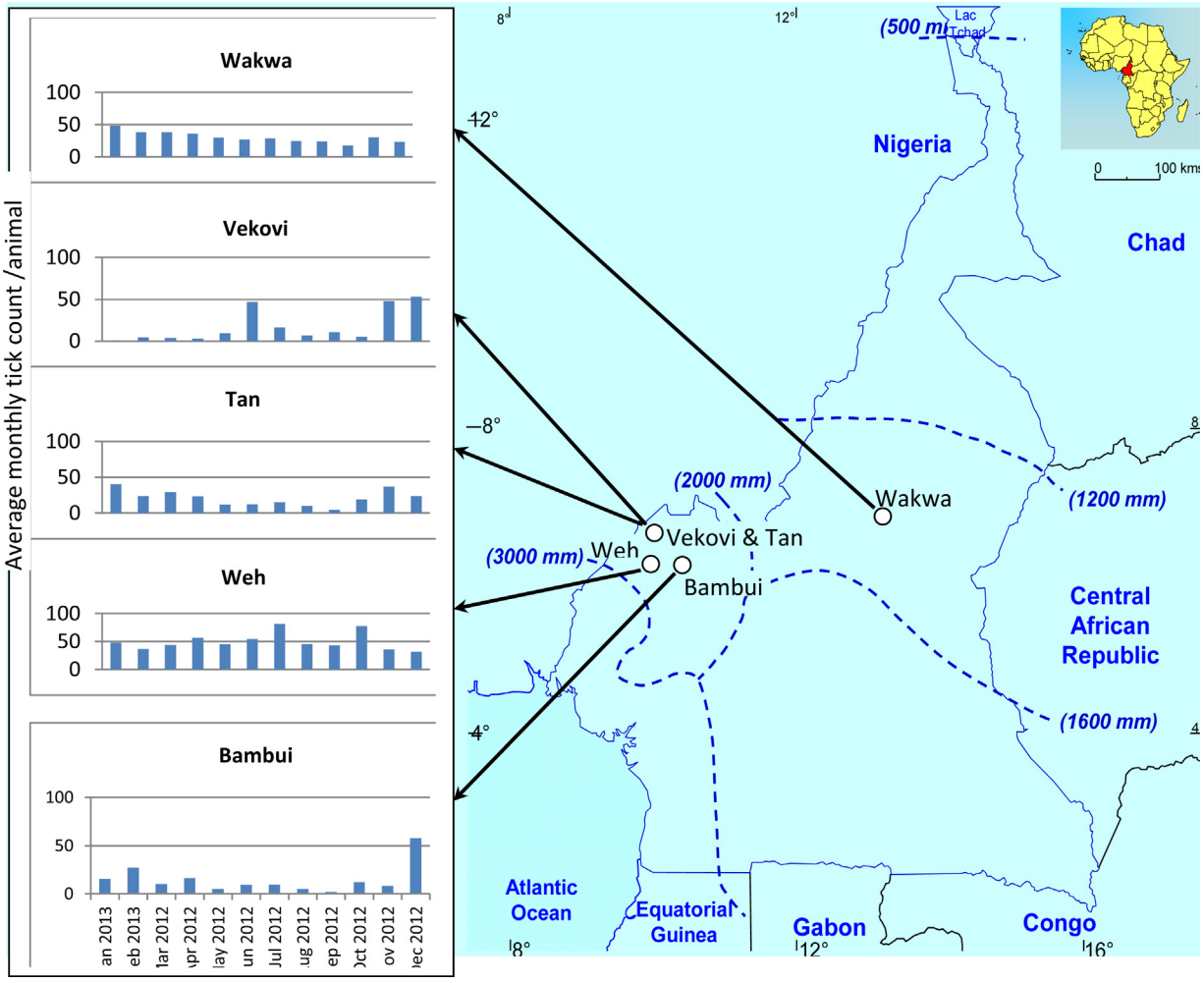

Fig. 1. Monthly point prevalence of cattle ticks (all species) in different sites in Cameroon.

Table 1
Geographical location of tick collection sites.

Site	Longitude	Latitude	Altitude (m)
Bambui	010°16′ E	006°07′ N	1500
Tan/Vekovi	010°16′ E	006°01′ N	1680
Wakwa	013°32′ E	007°15′ N	1200
Weh	010°16′ E	006°00′ N	1030

sites are presented in Table 1. At each site, herds for sampling were randomly selected from a group of farmers who indicated their willingness to collaborate. Herd management systems varied from one site to another. The Vekovi herd consists of pure Holstein cattle imported mainly from Kenya, belonging to members of a dairy co-operative. The 12 animals retained for the study at this site were found in 8 households. Herd size per household ranged from 1 to 5 animals. They all practiced the semi intensive system with restricted grazing in individual paddocks. The bulk of the forage provided to the animals was from cut-and-carry. The Tan and Weh herds belong to traditional pastoralist in extensive systems, grazing on communal pastures and practicing transhumance. The Bambui and Wakwa herds belong to IRAD (Institute of Agricultural Research for Development) and are kept semi intensively. However, they frequent communal pastures. Within each herd, 12 animals were randomly selected among those less than 2 years old and ear-tagged for monthly tick sampling.

Tick collection and identification

Tick collection was done around the same period of each month (20–24) and lasted from March 2012 to February 2013. Ticks were collected from the entire body of the animal using a pointed forceps in a manner as to preserve the mouth parts that are useful for identification, and kept in vials containing 70% ethanol till identification. Tick identification was based on stereoscopic and low-power microscopic morphology with the aid of identification guides (Walker et al., 2003; Tick Application, 2012). Focus was on the search of *Rhipicephalus* (*Boophilus*) *microplus*, therefore only members of this genus and *Amblyomma variegatum* were identified to species level.

Data analysis

To compare infestation rates for the 12 months of tick collection, analyses of variance with repeated measures (Crowder and Hand, 1990) were performed, in a fixed model with two factors, using SAS Inc. (2003). The first analysis took into account tick species and their development stage and the second considered the sites and body parts. Tick count data were log-transformed ($\ln(x+1)$) to achieve normality and stabilize the variances before applying ANOVA. Least square means of the number of ticks were estimated from the analysis and used to establish figures describing the changing trends of tick population according to the factors considered. Tick species distribution by site and on the different body parts of the host were

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