

# Communication

## Preliminary observations on ticks and tick-borne diseases in the North West Province of Cameroon. I. Babesiosis and anaplasmosis

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Une enquête sur les tiques et les maladies transmises par les tiques dans la province du Nord-Ouest du Cameroun, au marché au bétail de Bamenda a été effectuée. Les tiques identifiées ont été *Boophilus annulatus* (20 p. 100) et *B. decoloratus* (80 p. 100). Plus de 50 p. 100 de ces tiques ont été collectées au cours de la saison sèche. Sur 524 étalements de sang, 47,3 p. 100 ont été positifs pour *Babesia bovis*, 31,1 p. 100 pour *B. bigemina* et 2,2 p. 100 pour *Anaplasma marginale* ; le reste a été négatif, soit 19,4 p. 100. *Mots clés* : Tique - Babésiose - Anaplasmosis - Bétail - Cameroun.

### Introduction

Ticks and the disease they transmit are of great importance to both developed and developing nations (9), especially those whose economies are based largely upon cattle. Bovine anaplasmosis and babesiosis are supposed to be enzootic in Cameroonian indigeneous cattle (8, 10) even though outbreaks of cattle disease are rare. The status of these diseases in both the highly susceptible exotic and the relatively resistant indigenous breeds in Cameroon is unknown.

Ticks and tick-borne diseases have long been incriminated as major obstacles to efficient livestock production, and production losses may be due to tick irritation ; "worry" compounded by irritation and allergic responses ; blood losses from feeding and physical damage to hide ; paralysis or toxicosis ; deaths or debilitating effects ; predisposition of animals to infections such as dermatophilosis and transmission of pathogenic organisms (1, 3, 4, 6, 7, 12, 13, 16, 17). Even though the existence of ticks in the North West Province of Cameroon has been well established (10, 11) no effort has been made to correlate this existence with the diseases they transmit in this region. In a recent epidemiological survey of cattle in the

North West Province, particular attention was paid to the localisation of *Boophilus* spp. in cattle, their seasonal variation and the occurrence of the diseases they transmit here, mainly anaplasmosis and babesiosis.

### Materials and Methods

#### Tick collection

Ticks were handpicked from cattle assembled at the Bamenda cattle market and from the sedentary cattle at the Animal Research Centre, Bambui (CRZ). The above-mentioned market serves as a collection market for local grazers and as a consumption - distribution market for butchers and cattle traders from all over the North West Province of Cameroon (5). Tick collection was carried out at the market once per fortnight, from October 1987 to September 1988, in cattle which after purchase were usually intended for slaughter at the Bamenda municipal abattoir (5). Tick collection was carried out directly into 8 screw-cap bottles containing 70 % alcohol, the bottles being labelled according to the parts of the animal's body from which the ticks were being picked, namely head, neck, ears, legs, genitalia, anus, tail, and rest-of-body. Identification of the ticks was carried out in the Veterinary Laboratory of the Centre de Recherches Zootechniques (CRZ). Blood smears were made from these cattle simultaneously with tick collection.

### Clinical symptoms

Most of the clinical observations were made on cattle at the CRZ. These animals being sedentary, their health status can readily be monitored and every year they are vaccinated against rinderpest, pasteurellosis, blackquarter and anthrax. However tick infestations remain a real problem at the centre because acaricide spraying (instead of dipping) has been less effective and too expensive.

Bovine babesiosis and anaplasmosis are characterized by a high body temperature (40 - 42 °C), anorexia, haemoglobinuria, anaemia, jaundice, general weakness, reluctance to move, and death sometimes occurs with very little warning. Affected animals may exhibit irritability and aggression. There may be also signs of cerebral derangement such as circling, head pressing, mania and convulsions.

### Diagnosis

Anaplasma and babesia were readily detected in blood smears from areas such as the tail tip or ear in live animals and from organs such as the brain, kidney, heart, liver, spleen and lung in dead animals. Anaplasmosis and babesiosis were diagnosed by thin to thick blood films fixed in methanol, stained with Giemsa and examined microscopically for the intraerythrocytic forms. Thick blood films for the detection of parasitaemia were of considerable value as they allowed the detection of much lower numbers of parasites than with thin blood films.

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## Necropsy findings

Haemorrhage of the endocardium, congestion of the brain and visceral organs, marked swelling of the spleen, jaundice, anaemia, excess quantities of thick granular bile and haemoglobinuria were common observations in animals which died from anaplasmosis and babesiosis.

## Results

Two species of ticks were identified : *Boophilus annulatus* and *Boophilus decoloratus* (Tables I and II). It was observed that the head, ears and tail were the least infested.

Of the 524 blood smears prepared from animals infested by these ticks, 248 (47,3 %) were positive for *Babesia bovis*, 163 (31,1 %) for *Babesia bigemina*, 12 (2,2 %) for *Anaplasma marginale* and 203 smears were negative.

## Discussion and Conclusion

Even though transmission experiments were not carried out it is almost certain that in the North West Province of Cameroon, babesiosis and anaplasmosis are transmitted by ticks of the genus *Boophilus* (*Boophilus annulatus* and *Boophilus decoloratus*). *Babesia bovis* infection is by far

much greater than that by *Babesia bigemina*. The incidence of anaplasmosis is almost insignificant (2,2 %). MERLIN *et al.* (10) suspected the presence of babesiosis here due to the abundance of *Boophilus* spp. Even though the incidence of *Babesia* is apparently high it would have been much higher, if blood from *Babesia* animals was not always infective, which was not the case (14). The seasonal variation of ticks in the North West Province of Cameroon does not seem to correspond with any variation of *Babesia* in cattle. This may be in keeping with the fact that there is no exact correlation between the percentage of erythrocytes which contain *Babesia* and the severity of the clinical symptoms, and that a positive smear in all cases confirms the diagnosis, but a negative smear does not eliminate it (2).

From the ticks collected, *Boophilus decoloratus* was the dominating species (tables I, II). These ticks represented more than 80 % of the *Boophilus* ticks collected. More than 50 % of the *Boophilus* spp. were collected during the dry season (fig. 1). However, cattle were infested by the three stage (larva, nymph, adult) of *Boophilus* throughout the year and the number of *Boophilus* ticks in each animal varied greatly in the course of the year.

TABLE I Localisation of *Boophilus* spp. on cattle.

	Part of animal									%
	Head	Ears	Neck	Legs	Genitalia	Anus	Tail	Rest-of body	Total by	
Larva	0	8	31	67	48	60	0	9	223	1.4
Nymph	2	27	388	309	254	153	0	98	1 231	7.8
<i>B. annulatus</i> ♂	0	0	20	215	147	13	0	30	425	2.7
♀	0	3	26	537	300	4	0	80	950	6.0
<i>B. decoloratus</i> ♂	18	13	429	554	568	367	1	650	2 600	16.5
♀	97	53	1 567	2 492	2 599	1 056	4	2 469	10 337	65.63
Total	117	104	2 461	4 174	3 916	1 653	5	3 396	15 760	100
%	0.74	0.66	15.61	26.48	24.84	10.48	0.03	21.16	100	

TABLE II Seasonal variation (dynamics) of *Boophilus* spp.

	Month											
	0	N	D	J	F	M	A	M	J	J	A	S
Larva	1	18	36	16	14	58	13	7	3	0	20	44
Nymph	51	113	167	142	136	162	12	39	69	24	121	218
<i>B. annulatus</i> ♂	22	54	121	39	73	17	9	14	2	9	22	29
♀	34	141	249	91	69	119	48	60	17	17	48	73
<i>E. decoloratus</i> ♂	99	191	282	735	417	298	58	52	77	65	135	182
♀	507	904	1 294	1 876	1 267	1 029	554	291	512	363	656	954
Rainfall	216	66	0	27.7	15	90.2	338.8	219.4	228.5	261.6	327.4	459
T. max. (°C)	29	25.2	25.8	26.2	27.4	26.2	—	24.7	23.5	21.5	21.6	22
T. min. (°C)	15.9	15.4	14.4	14.9	16.9	17.3	—	16.6	15.5	15.5	15.3	15.4

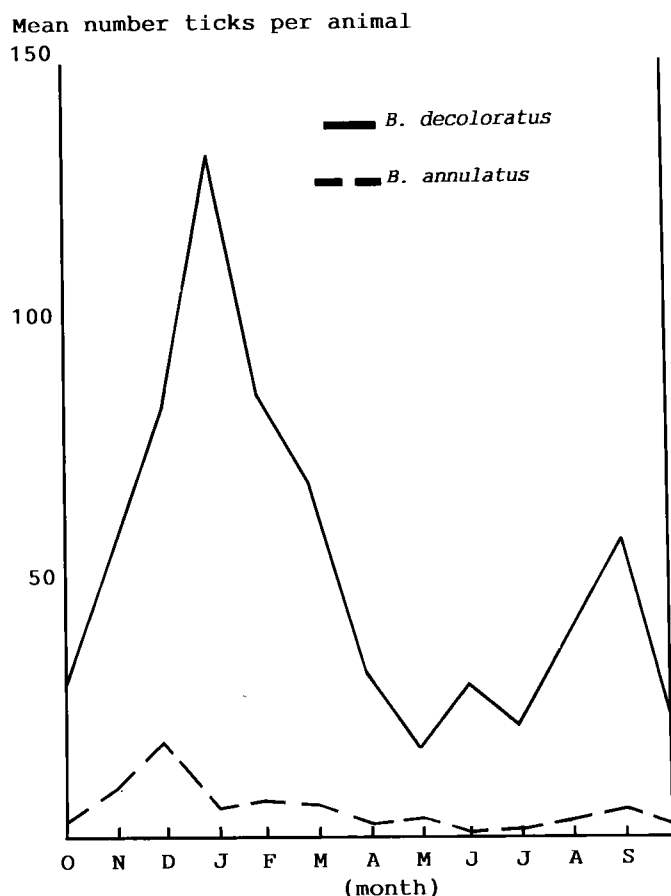


Fig. 1 : Dynamics of Boophilus.

During the dry season, most cattle go on transhumance where there is neither access to acaricide spraying nor dipping. The Fulani herdsmen also maintain a meticulous hand deticking policy, but this hardly reduces the effect on immediate disease transmission as only engorged ticks are seen and picked.

The prospects for the eradication of ticks in Africa are dim (15). When tick control is the only measure taken against tick-borne disease, it should be as intensive as possible especially where susceptible breeds are concerned, with the disadvantage that a precious endemic stability as regards babesiosis and anaplasmosis may be lost for local breeds. In order to maintain this stability, an integrated tick control programme including acaricides, pasture spelling, resistant cattle and genetic manipulations might lead to a great success.

This practice contributes to numerically reducing subsequent tick populations, and its effect is thus not negligible as far as the epidemiology is concerned.

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During a survey on ticks and tick-borne diseases in the North-Western Cameroon at the Bamenda cattle market, the ticks identified were *Boophilus annulatus* (20 %) and *B. decoloratus* (80 %). More than 50 % of the ticks were collected during the dry season. Of 524 blood smears 47.3 % were positive for *Babesia bovis*, 31.1 % for *B. bigemina* and 2.2 % for *Anaplasma marginale*. 19.4 % were negative. **Key words** : Tick - Babesiosis - Anaplasmosis - Cattle - Cameroon.

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