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IDENTIFICATION TICK SPECIES DETERMINATION OF THEIR SEASONAL RATE IN THE REPUBLIC OF GUINEA

[1*]Aly K., [2]Alpha Oumar Sily D., [2]Mohamed K., [2]Youssouf S., [3]Mamadou Yero B., [3]Ansoumane S.

[1]Higher Institute of Agronomy and Veterinary Valery Giscard d'Estaing, Faranah (Guinea).
[2]Higher Institute of Science and Veterinary Medicine, Dalaba (Guinea).
[2]Research Institute of Applied Biology Guinea Kindia, (Guinea).
[3]Energy Department, Higher Institute of Technology of Mamou (Guinea).

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***Corresponding author: Aly K.**

Higher Institute of Agronomy and Veterinary Valery Giscard d'Estaing, Faranah (Guinea).

ABSTRACT

Ticks are hematophagous arthropods that parasitize almost all vertebrates and can bite humans occasionally. They transmit many germs which are at the origin of zoonoses. This study concerns the identification of tick species involved in the publication of rickettsioses in the Republic of Guinea. The objective of this study was to collect and identify tick species in order to determine their frequency according to the seasons in two prefectures of the Republic of Guinea. Conventional methods used for catching ticks have been used. Samples were taken in the prefectures of Mamou and Kindia. A total of 200 tick samples were taken from the body of N'dama cattle, one hundred (100) in the Kindia administrative area and one hundred (100) in Mamou. The harvested ticks were packaged in the sterile cotton-clogged sterile tubes, labeled and whose information is given on the specimen card: name of animal, tattoo, dress, locality, owner. The cooler was used to send the samples to the Kindia Research Institute for Applied Biology laboratory. In the laboratory, the dichotomous tick identification key was used to identify all the species contained in a pled sample. It focused on the presence and absence of porous area, chitinized scutum, the number of pair of legs, absence of gonopore, surface of the non-rough scutum, stigma with tail, lateral groove. Eight species were identified, including five at Mamou: *Amblyomma variegatum* (63.09%); *Ripicephalus decoloratus* (14.29%); *Ripicephalusannulatus* (15.43%); *Hyalomma tuncatum* (5.95%) and *Haemaphysalis leachi* (1.19%). In Kindia they are *Amblyomma variegatum* (96.92%); *Hyalomma truncatun* (2.05%) and *Ripicephalus geigyi* (1.03%) that have been identified. Ticks were much more abundant in the rainy season. As the localities visited are transit and livestock marketing areas, epidemiological surveillance of tick-borne diseases should be carried out with the ultimate aim of preventing the spread of tick-borne zoonoses in the study areas. In Guinea, ticks are present from May to September however, it is in August that the greatest outbreak is observed. These months are in the rainy season in the regions visited. It should be noted that most known species are sensitive to climate change.This entirely exclusive research is devoted to the identification of ticks in the regions of Mamou and Kindia, because these localities are breeding areas par excellence. They are also placing of transit and marketing, which are factors favoring the transmission of ticks and collaterally rickettsioses. It shows the disparity of tick species according to the area of investigation. Tick-borne disease surveillance programs must be implemented in order to maintain the health of populations.

KEYWORDS: Identification, Cash, Ticks, prefectures, Guinea.

INTRODUCTION

In the Republic of Guinea, a large herd of cattle principal hosts of ticks is high. Ticks are blood-sucking arthropods parasitizing almost all vertebrates and may occasionally bite humans. They transmit many germs that areof zoonoses.[1]

Two main types of ticks are distinguished: The ixodidae or hard ticks so named because of the presence of a hard plate on the dorsal surface of their bodies; The Argasidae or soft ticks which have a soft integument devoid of dorsal shield.[2]

Ticks have three stages of active development: larva, nymph and adult males and females.[3] The ixodidae,

family isthe largest in human and veterinary medicine (80% of species in the world) have a three-phase cycle and each stage research different vertebrate host, or it takes a single blood meal that goes unnoticed. Mating ixodidae occurs most often on the host. After finishing his meal, the fertilized female comes off, falls to the ground and lay eggs.[4]

Ticks have preferential binding sites on vertebrate animals varies by species and sometimes between stages within the same species. They can bite humans all over the body, often found on the head, neck or groin. The main ixodidae are of the genus Ixodes, *Ripicephalus*, *Dermacentor*, Amblyomma and Hyalomma, which are the vectors for rickettsial agents ticks, lyme disease and Ehrlichiosis.[5] Ticks spread via saliva about 38 species of bacteria, parasites and viruses when it bites his victims to drink. They are suitable for only composed of blood supply. They are ectoparasites of vertebrates (including cold-blooded vertebrates such as lizards, snakes and turtles). Man can develop allergies to their saliva with renal impairment.[6] *Amblyomma R africa* isolated in 1992 in Zimbabwe is the main rickettsial disease in Africa and one of the most common in the world, it affects all age ranges. Events such as hepatosplenomegaly in children, neurological damage, meningitis, cardiovascular reached 60%oftenrecorded in Guadeloupe (West Indies), Island of the meeting, South Africa, Ethiopia, Brazil and Uganda.[7] Seven (7) diseases are tick-borne Lyme borreliosis, tick-borne encephalitis, granulocytic anaplasmosis, Tibola, LAR, tularemia and Q fever The number of cases of borreliosis was estimated at 85 cases per 100 000 population.[7] In China, 14 cases were confirmed by PCR, 15 to 30% in Pakistan, Japan and Australia. In Thailand, 80 people confirmed by PCR including 34 children and 46 adults with mortality 2 to 5%.[8] The *Ripicephalus sanguineus* is a brown dog tick responsible for Mediterranean spotted fever is a zoonosis. It has an estimated frequency of 40 per 100,000 inhabitants in France.[9]

Recent studies have shown that the disease almost always overlooked, is currently in phase of geographic expansion and constitutes a major cause ofconsultation in several febrile syndromes in prefectures of Africa.[10,11,12,13]

The objective of this study was to collect and identify the tick species in order to determine their frequency depending on the season in two prefectures Administration of the Republic of Guinea.

MATERIAL AND METHODS

Material

Study zone

The Mamou Prefecture occupies a pivotal position between the two natural prefectures Upper Guinea, Middle Guinea and Lower Guinea. It is between 9:45 and 11°36 north latitude and 11°20 and 12°20 west longitude.

The prefecture of Kindia is 458.13 m in the transition region between the Maritime Guinea and Average Guinea. It is located in south-western Guinea between 9°30 'and 10°40' north latitude and 12°50' and 13°20' west longitude.

These two Prefectures belong to the Sub-Guinean climate; whose main feature is the alternation of two (2) seasons. A dry season of 6 months (December to May), characterized by the harmattan (hot dry wind) usually blowing from the continent towards the ocean. A rainy season from 6 months (June to November), characterized by the monsoon (hot and humid wind) partly causing plenty of rain, blowing from the ocean to the continent throughout the season.

At all these prefectures, there is a vegetation of bush and tree savannah, interspersed with islets de and plantation forests; there are also classified forests.

Livestock is a very important activity in these prefectures, we it raises cattle, sheep, goats and poultry.

The fauna species encountered are apes (chimpanzees, baboons, red and gray monkeys), the Calobe-magistrates, warthogs, bush pigs, porcupine's pigs, gibes, deer. The species of the most common birdsare the herons, partridges, vultures, pigeons, parrots and guinea fowl. Among the reptiles are: snakes, pythons, vipers, dwarf crocodiles, pangolins and mouth-typed.[14]

Animal material

A total of 100 ticks' samples were collected at N'Dama in each administrative area.

Methods

TheTicks are samples were taken from the body of N'Dama cattle in livestock in prefectures administrative Mamou and Kindia, packaged in sterile tubes. All tubes were identified and were marked corresponded to an animal in which information is given on the sampling sheet (pet name, tattoo, dress, resort owner). The cooler was used to transport the samples to the laboratory of the Research Institute of Applied Biology of Guinea (IRBAG) in Kindia.

The biological identification method: The dichotomous key was used to identify all tick species contained in the sample. She focused on the presence and absence of Scutum chitinase, the even number of legs, presence of porous areas, etc.

Statistical analysis

Level 2prefecturesinvestigation, the number of ticks collected were recorded by species and by month, for each locality. The abundance of each species of ticks were calculated relative to the total number of ticks collected during the study period. The data obtained were subjected to descriptive statistics with R 2. 13.0 software.

The differences between the dependent variables were considered significant for a p-value <0.05.

RESULTATS

A total of 200 cattle was examined and 279 ticks were collected with an average of 23 ticks per animal for periods of one to two months. Six (6) tick species were identified: *Amblyomma variegatum* (86.74%); *Ripicephalus annulatus* (4.66%); *Ripicephalus decoloratus* (4.30%); *Hyalomma truncatum* (3.22%); *Ripicephalus geigyi* (0.72%) and *Haemaphysalis leachi* (0.36%).

Table 1: Frequency of identified species of ticks in the region of Mamou.

Prefecture	Animal species	Identified tick species	Number of species	Total cash Identified	Percentage by species	p-value
Mamou	Cattle	*Amblyomma Variegatum*	53	5	63.09	< 2.2* 10 -16
		Ripicephalus decoloratus	12		14.29	
		Ripicephalus annulatus	13		15.48	
		Hyalomma truncatum	5		5.95	
		Haemaphysalis leachi	1		1.19	
Total			**84**		**100**	

In Mamou, a greater number of species of ticks five (5) was identified. Tropical Bont Tick was the most widespread (63.09%) followed by *Ripicephalus annulatus* (15.48%) and (1.19%) *Haemaphysalus leachi*.

Table 2: Identified tick species in the region of Kindia.

Prefecture	Animal species	Identified tick species	Number of species	Total cash Identified	Percentage of species	p-value
Kindia	Cattle	*Amblyomma Variegatum*	189	3	96.92	< 2.2 *10-16
		Hyalomma truncatum	4		2.05	
		Ripicephalus geigyi	2		1.03	
Total			**195**		**100**	

In Kindia, three (3) tick species were identified and *Amblyomma variegatum* was the species most widespread (96.92%) while *Ripicephalus geigyi* was the least widespread (1.03).

Table 3: Summary of identified ticks of crops during this study.

Prefecture	Identified species	Number identified by species	Total identified species	Percentage of species
Mamou	*Amblyomma Variegatum*	242	6	86.74
	Haemaphysalis leachi	1		0.36
	Hyalomma truncatum	9		3.22
	Rhipicephalus annulatus	13		4.66
Kindia	*Rhipicephalus decoloratus*	12		4.3
	Ripicephalus geigyi	2		0.72
Total		**279**		**100**

Through this figure, between those six-spec identified, the Amblyomma variegatum with (86.74%) is the one who is more frequented in Republic of Guinea, followed by Rhipicephalus annulatus with a percentage of (4.66%) and the Haemaphysalis leachiis considered to be the one which is less from the face of the country.

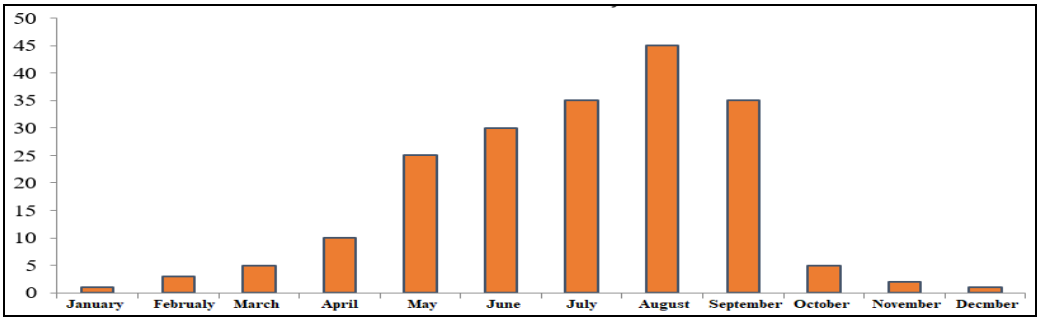

Figure 1: Frequency of ticks according to the months and seasons.

This figure show that August is the best period of pullulating of Tick followed immediately by the month of Jullal and September. Then, January and December are considered as the rare period for the tick.

DISCUSSION

In Guinea, ticks are present from May to September, however, is that in August the largest outbreak is detected. These months are the rainy season in prefectures visited. Note that most of the known species are sensitive to climate change and this fact is the basis of changes in their distribution in West Africa.[15,16]

In the Guinean zone of Senegal, averages lowest were found 3.34 in sheep.[17] These data are different averages found in our study. This difference could be explained by the varying ecological and climatic conditions from one country to another and may be favorable or unfavorable to the development of ticks. Similarly, within a country, climate changes observed during successive years will promote or oppose changes in tick population.[15,18]

Worldwide, many studies have been reported on ticks. The presence of theborreliosis tick in Borr*ennglia crocidurae* was already known in southern Mauritania from Morel's work in 1965,[19] who was notably found the vector Rosso Aleg, Kaedi Mbout Kiffa, Aioun El Atrous and Nema. *Amblyommasonrai* was also found to Tiouilit on the Atlantic coast north of Nouakchott and another batch of ticks from this locality was infected with *Borrelia crocidurae*.[20] In the same period of disease cases in humans have been reported to Bogue (16°35' N, 14°16' W) in Senegal.[21]

As shown in our study, the study of ticks should in principle cover a wide area. In Quebec, for example, a major study on tick I. scapularis vector of Lyme disease was conducted in 2007 and 2008. In fact, 40.2% of 3,198 I. scapularis ticks were collected from animals or in the environment.

These ticks were either larvae (837) or nymphs (261) and is adults (189). The majority of I. scapularis were found in three geographic areas of the Montérégie region, around the Richelieu River, near the US border on the south shore of Montreal, along the St. Lawrence River between Châteauguay and Longueuil around the Yamaska and Noire rivers.[22] Albipictus D. and I. angustus are species that are not found in the 2007 arm of the study, but have nevertheless been identified in Quebec. At all study sites, some I. scapularis and rodents were positive for B. burgdorferi, the causative agent of Lyme disease.[23] This fact was found in our study where it was found a disparity in the distribution of ticks according to prefectures and according the places visited. Tropical Bont Tick (86.74%) were the species most encountered because it was present in all sampling sites.

Regarding the role played by ticks in the transmission of zoonoses, hard ticks, the most documented in France were*Rhipicephalus sanguineus*Ixodes ricinus and *Dermacentor reticulatus*, play a key role in the transmission ofrickettsial. The germs are parasites of blood cells and / or endothelial cells, and are the source of a few specific clinical picture dominated by a febrile syndrome accompanied by pains originally sometimes locomotive disorders and hematological signs including thrombocytopenia.[24,25]

In terms of acarology, usually, the research conducted on ticks generally interested one or a few species. It is also not at all addressed the complex epidemiological cycles are carried out in these vectors, host wild vertebrates (small mammals, reptiles and/or wild birds), the hosts 'anthropogenic' vertebrates (humans, equines, domestic carnivores, ruminants and domestic birds) and their associated pathogens.

CONCLUSION

This fully proprietary research is devoted to tick identification in prefectures Mamou and Kindia by what these areas are a breeding area par excellence. They are also placing of transit and marketing, which are factors favoring transmission of ticks and collaterally rickettsial. It shows the disparity of tick species according to the investigation zone. tick disease surveillance programs must be achievements in order to preserve the health of populations.

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