

NOTES ON AFRICAN HAEMAPHYSALIS TICKS: XI. *H. (RHIPISTOMA) PARALEACHI* (IXODOIDEA: IXODIDAE) DISTRIBUTION AND HOSTS OF ADULTS

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ABSTRACT - Host and distribution data are described for 1,573 male and 439 female *Haemaphysalis* (*Rhipistoma*) *paraleachi* collected from 158 hosts representing at least 23 vertebrate species. These specimens were collected over a wide ecological range in Africa from sea level to ca. 2,640 m altitude, ca. 15°W to 45°E, and ca. 20°N to 20°S. Hosts were primarily carnivores (*Canis*, *Lycaon*, *Vulpes*, *Civettictis*, *Genetta*, *Felis Panthera*, *Herpestes*, *Ichneumia*), although specimens were also taken from primates (*Colobus*, *Homo*), rodents (*Tatera*), and ungulates (*Bos*, *Bubalus*, *Syncerus*, *Tragelaphus*). Adults were collected throughout the year with the greatest numbers taken in March, April, May, and September.

INTRODUCTION

Haemaphysalis (*Rhipistoma*) *paraleachi* Camicas, Hoogstraal, and El Kammah was the sixth member of the *Haemaphysalis leachi* group described from Africa (Camicas et al., 1983). Other species in the group include *H. leachi* (Audouin), *Haemaphysalis spinulosa* Neumann, *Haemaphysalis moreli* Camicas, Hoogstraal, and El Kammah, *Haemaphysalis zumpti* Hoogstraal and El Kammah. The purpose of this report is to present new information on the hosts and geographical distribution of *H. paraleachi* in Africa.

MATERIALS AND METHODS

The information presented in this study was derived from specimens collected over seven decades (1913-1989) by many individuals and in various parts of Africa. The methods of collecting were not described by the collectors. Most of the ticks are deposited in the Hoogstraal Tick Collection, Institute of Arthropodology and Parasitology, Georgia Southern University, Statesboro, Georgia, USA; the Camicas Collection, Dakar, Senegal; the P.C. Morell Collection and were previously recorded as "leachi group" until *H. paraleachi* was described (Camicas et al., 1983). The present report is a compilation of the hosts and distribution data on these specimens.

RESULTS AND DISCUSSION

A total of 1,573 adult males and 439 adult females was identified as *H. paraleachi* (Tables 1, 2). Specimens were recorded from a wide range of ecological zones (Fig. 1) including localities from sea level to as high as 2,640 m in Africa. Habitats included tropical rain forests and light tropical forests on the west coast, moist savannahs and rain forests in central Africa, and savannah forests on the east coast.

Adult *H. paraleachi* were collected from hosts during every month of the year. However, the dynamics of seasonal abundance depend upon rainfall patterns at various altitudes. Peak collections were recorded in March, April, May, and September.

Adult *H. paraleachi* primarily infested carnivores, although specimens were also taken from primates, rodent nests, and ungulates (Table 1).

The *H. leachi*-group is the most polymorphic of any group in this genus. At least 6 species or species complexes have been studied: *H. leachi*, *H. spinulosa*, *H. moreli*, *H. punctaleachi*, *H. zumpti* and *H. paraleachi* (Hoogstraal, 1958, 1964; Hoogstraal and El Kammah, 1974; Camicas et al., 1972, 1973, 1983). *Haemaphysalis paraleachi* is one of the most widely distributed species of the group in Africa.

As with most recognized members of the group, carnivores were the chief host with 92% of *H. paraleachi*

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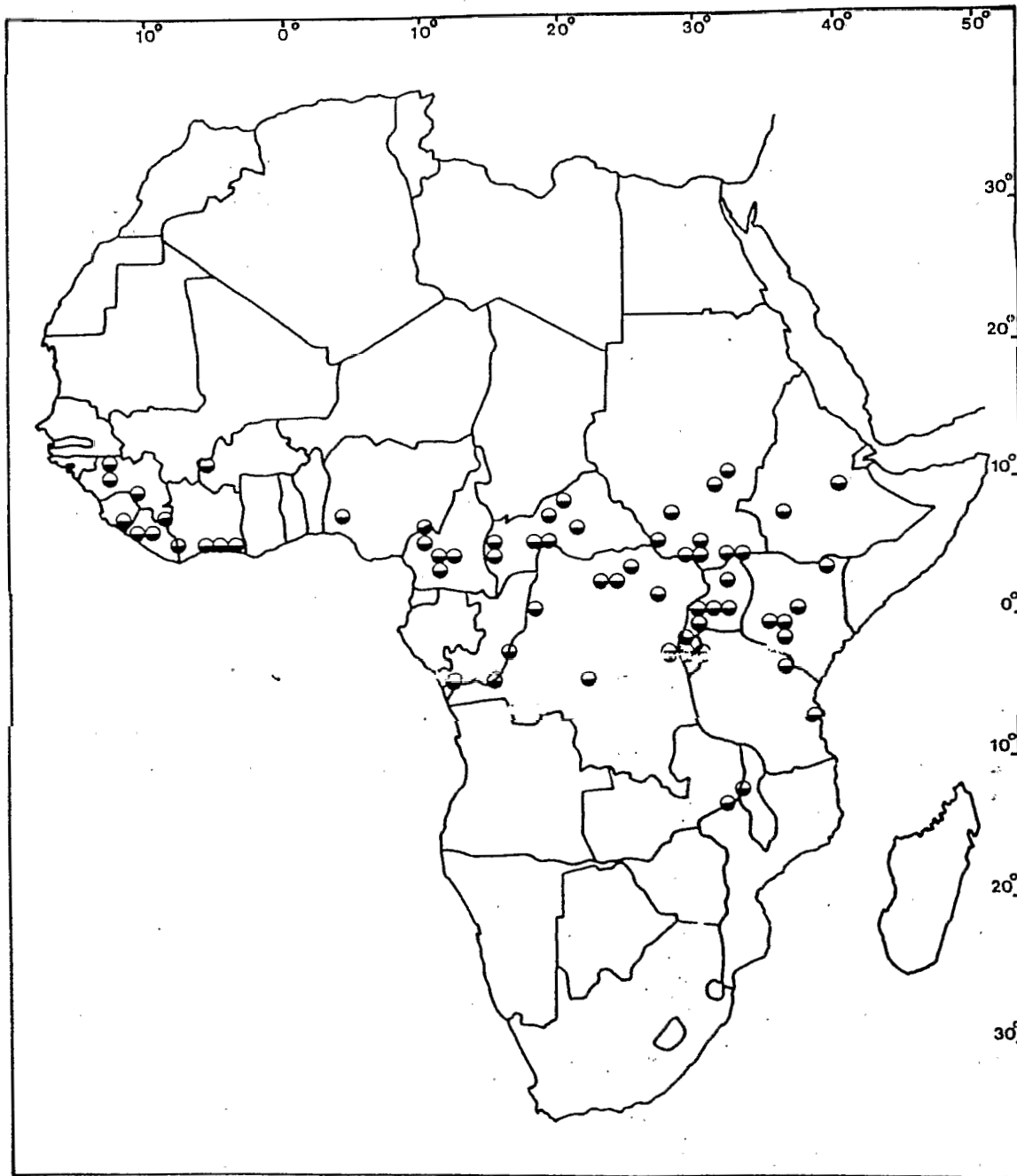


Fig. 1. The distribution of collections of *H. paraleachi* in Africa.

recorded from 142 carnivores representing at least 16 species. Leopards (*Panthera pardus*) accounted for the largest number of specimens (629) and had the greatest mean infestations (89.9), although as many as 574 *H. paraleachi* were collected from a single animal. African civets (*Civettictis civetta*) accounted for a 26% of the specimens with an mean intensity of 22.9. Domestic

dogs were also important hosts although collections were biased towards domestic animals.

Eight specimens were collected from rodent nests, 7 from primates, and 19 from bovids. The single collection from humans indicates the need for further studies to assess the possible vector potential of this species in nature.

Table 1. Host records of *Haemaphysalis paraleachi* in Africa.

Species	No. Specimens		Total	No. Hosts
	NM*	FF*		
Carnivora: Canidae				
<i>Canis familiaris</i> (domestic dog)	115	119	234	60
<i>Canis adustus</i> (side-striped jackal)	56	21	77	10
<i>Canis aureus</i> etc. (golden jackal)	42	4	46	5
<i>Canis mesomelas</i> (black-backed jackal)	12	7	19	2
<i>Canis sp.</i>	23	4	27	1
<i>Lycan pictus</i> (African hunting dog)	1	0	1	1
<i>Vulpes spp.</i> (red foxes)	36	12	48	2
Carnivora: Felidae				
<i>Felis catus</i> (domestic cat)	9	11	20	7
<i>Felis serval</i> (serval)	2	4	6	1
<i>Felis silvestris</i> (African wild cat)	43	25	68	9
<i>Panthera leo</i> (lion)	53	26	79	10
<i>Panthera pardus</i> (leopard)	594	35	629	7
Carnivora: Viveriidae				
<i>Civettictis civetta</i> (African civet)	423	90	513	23
"civet"	55	19	74	1
<i>Genetta nigrina</i> (bush genet)	1	0	1	1
<i>Genetta sp.</i>	1	0	1	1
Carnivora: Herpestidae				
<i>Herpestes ichneumon</i> (grey mongoose)	4	0	1	1
<i>Ichneumia albicauda</i> (white-tailed mongoose)	0	1	1	1
Carnivora: Hyaenidae				
"hyaena"	1	0	1	1
Rodentia: Cricetidae				
<i>Tateris sp.</i> (gerbils)	0	1	1	1
Rodentia: family unknown				
"rodent nest"; "rodent hair"	2	5	7	3
Primate: Cercopithecidae				
<i>Colobus polykomos</i> (black & white colobus)	6	0	6	1
Primate: Hominidae				
<i>Homo sapiens</i> (man)	1	0	1	1
Artiodactyla: Bovidae				
<i>Bos taurus</i> (domestic cattle)	3	2	5	3
<i>Syncerus caffer</i> (African buffalo)	2	0	2	2
<i>Bubalus bubalis</i> (water buffalo)	11	1	12	1
<i>Tragelaphus scriptus</i> (bush buck)	0	1	1	1
Miscellaneous				
"mammal"	8	1	9	1
"house"	0	1	1	1
"herb"	3	8	11	3
unknown	69	41	110	10
TOTALS	1573	439	2011	158

* MM = males; FF = females

Table 2. *Haemaphysalis paraleachi* collected in various parts of Africa.

Male	No. ticks		Host (no. examined)	Country (Province) Collection*		Date	Number
		Female		Locality			
GUINEA (Labe)							
23	4		<i>Canis</i> sp.	Pita		Oct 63	HH41,924
2	7		herb	Koba (Kindia)		May 88	JLC-GK3
5	0		<i>Canis adustus</i>	Seindaru (Kindia)		May 88	JLC-GK1
SIERRA LEONE							
2	1		<i>Civettictis civetta</i>	Njala		-	HH5873
0	2		Domestic dog	Karafaia		14	HH5871
0	1		Domestic dog	Dunkiawallia		Jun 13	HH5872
LIBERIA (Montserbrado)							
0	1		<i>Civettictis civetta</i>	Kakata		Nov 69	HH43,217
LIBERIA							
19	2		<i>Civettictis civetta</i>	Totota		Nov 60	HH5863
0	1		<i>Civettictis civetta</i>	Harbel		Dec 60	HH5864
2	3		Domestic cat	Harbel		-	HH40,643
1	2		Domestic dog	Balahim		30	HH41,925
IVORY COAST (Abidjan)							
17	3		<i>Civettictis civetta</i>	Adiopodoume		May 53	HH40,928;
5	0		<i>Civettictis civetta</i>	Adiopodoume		May 53	HH42,288
14	3		<i>Civettictis civetta</i>	Adiopodoume		May 53	HH43,127
0	1		<i>Tragelaphus scriptus</i>	Adiopodoume		Jul 59	HH43,128
1	0		Domestic cat	Adiopodoume		May 60	HH43,129
3	0		Domestic cat	Adiopodoume		Jul 61	PCM
9	11		Domestic dog	Adiopodoume		Jun 52	HH43,123
3	1		Domestic dog	Adiopodoume (Ndiende)		Apr 61	HH43,133
17	3		Domestic dog	Yapo		May 59	HH42,290
1	2		Domestic dog	Adiopodoume (Gomon)		May 60	HH43,132
0	1		Domestic dog	Adiopodoume (Banolilie)		Apr 61	HH43,131
1	0		Domestic dog	Adiopodoume (Banolilie)		Mar 61	HH43,130
IVORY COAST (Man)							
7	0		<i>Panthera pardus</i>	Tai		Jan 56	HH42,270
9	2		<i>Civettictis civetta</i> (2)	Yanle		Jun 48	HH42,271;289
MALI (Sikasso)							
1	0		<i>Panthera Pardus</i>	Sikasso		Jul 56	HH40,653
BENIN							
1	1		Domestic dog	Tohone		May 55	HH6208
NIGERIA (Western)							
0	1		Domestic dog	Ibadan		Jan 56	HH6683
CAMEROON (Oriental)							
4	0		<i>Civettictis civetta</i>	Foumban		50	HH41,926
3	0		<i>Civettictis civetta</i>	Obala		Sep 64	HH42,294
21	5		<i>Civettictis civetta</i>	Nanga-Eboko		56	HH42,293
5	1		<i>Civettictis civetta</i>	Evodoula		Oct 52	HH42,291
1	0		<i>Genetta</i> sp.	-		-	IPP
4	3		<i>Panthera leo</i>	Ntui		Dec 52	HH43,121
1	0		Domestic dog	M'Balmayo		Dec 49	HH5767
2	0		Domestic dog	M'Balmayo		Dec 49	IPP

CENTRAL AFRICAN REPUBLIC (Bamingui-Bangoran)					
14	3	<i>Panthera leo</i>	Bamingui	-	HH41,742
CENTRAL AFRICAN REPUBLIC (Haute Sangha)					
1	0	Herb	Bilolo (Berberati)	Jan 48	IPP
CENTRAL AFRICAN REPUBLIC (Kemo-Gribingui)					
1	0	Domestic dog	Sibut	-	IPP
CENTRAL AFRICAN REPUBLIC (Nana Mambere)					
3	1	Domestic dogs (2)	Bouar	Aug 69	HH41,740;743
CENTRAL AFRICAN REPUBLIC (Ombella Mpoko)					
9	1	<i>Civettictis civetta</i>	Bozo	Mar 75	JLC-RCA73
CENTRAL AFRICAN REPUBLIC (Ouaka)					
0	1	Herb	Bambari	-	HH43,148
4	3	<i>Panthera leo</i>	Bambari	Jul 58	PCM
0	1	Domestic dog	Bambari	Apr 62	PCM
CENTRAL AFRICAN REPUBLIC					
6	0	<i>Panthera leo</i>	-	Feb 71	HH42,699
ZAIRE (Oriental)					
0	2 molted	Rodent hair	Garamba Nat. Park	-	HH6437
2	3 molted	Rodent nest	Garamba Nat. Park	Nov-Dec 50	HH42-000;001
3	1 molted	-	Garamba Nat. Park	Sep 51	HH42,004
39	11	<i>Civettictis civetta</i>	Buta, Uele	-	HH42,202
49	3	-	Avakubi	50	HH42,197
12	5	<i>Civettictis civetta</i>	Ibembo	Mar 50	HH42,210
2	2	Domestic dog	Api	-	HH5755
ZAIRE (Occidental)					
2	1	<i>Panthera pardus</i>	Luluabourg (=Kananga)	25	HH42,006
ZAIRE (Equateur)					
4	12	Domestic dog (2)	Mbandaka	Oct-Nov 45	HH42,322;324
ZAIRE (Central)					
0	1	-	Banana, Weka	-	HH42,195
4	0	<i>Panthera leo</i>	Bodjo	Dec 70	HH 5,754
ZAIRE (Kivu)					
0	2	Domestic dog	Bukavu	Jan 48	HH42,206
ZAIRE					
8	1	Mammal	-	Sep 52	HH42,002
1	0	Hyena	-	Apr 51	HH42,003
0	2	-	-	Oct 49	HH42,005
ANGOLA (Cabinda)					
2	4	Domestic dog	Cabinda	Jul 23	HH43,120
SUDAN (Equatoria)					
5	2	<i>Civettictis civetta Schwarzii</i> (2)	Torit	Apr-Jun 50	HH5889; HH40,656
5	19	Domestic dogs (14)	Katire	Oct 51- Dec 52	HH5911;5933 5942;5945; 40,658;668; 675;686
0	3	Domestic dog	Maridi	Oct 76	JLC-Su3bis
0	1	Domestic dog	Moru	Dec 60	HH5937

42	4	<i>Canis aureus sudanicus</i> (5)	Torit	Nov 49- Apr 50	HH40,659;661; 671;684;694
10	7	<i>Canis mesomelas elgonae</i>	Yubo	May 48	HH40,688
0	1	House (floor)	Moru	59	HH5951
0	1	<i>Ichneumia albicauda albicauda</i>	Yei	Apr 49	HH5936
SUDAN (Upper Nile)					
0	1 molted	<i>Tatera</i> sp.	Paloich	Feb 62	HH6558
11	8	<i>Felis silvestris ugandae</i> (4)	Paloich	Feb 61	HH7064; 40,670;677;693
6	0	<i>Felis silvestris ugandae</i>	Paloich	Feb 62	HH42,733
16	6	<i>Felis silvestris ugandae</i>	Malakal	Mar 62	HH42,725
2	4	<i>Felis serval phillipsi</i>	Paloich	Feb 61	HH40,673
4	3	<i>Felis silvestris ugandae</i>	Paloich	Oct 60	HH40,696
5	8	<i>Felis silvestris ugandae</i>	Paloich	Sep 63	HH40,698
1	0	<i>Felis silvestris ugandae</i>	Malakal (nr)	Mar 61	HH7081
23	13	<i>Canis adustus namrui</i> (6)	Paloich	Feb-Mar 61	HH7074; 7075;7079; 40,666;681;692
13	5	<i>Canis adustus</i>	Paloich	Mar 61	HH42,402
11	1	<i>Canis adustus</i>	Malakal	Feb 62	HH42,735
1	0	<i>Herpestes i. ichneumon</i>	Paloich	Mar 61	HH40,678
1	0	Domestic dog	Paloich	Aug 62	HH9910
0	1	Domestic dog	Sobat	Jul 13	HH5896
SUDAN (Bahr El Ghazal)					
0	1	Domestic cat	Wau	Oct 53	HH40,655
ETHIOPIA (Kafa)					
2	0	<i>Civettictis civetta</i>	Jimma	-	HH9289
1	3	Domestic dog	Jimma	-	HH40,715
18	9	<i>Vulpes</i> sp.	Bulbal	Apr 79	HH45,844
18	3	<i>Vulpes</i> sp.	Sokoru/Deke	Aug 79	HH45,847
186	47	<i>Civettictis civetta</i>	Mezan Tefari	Mar 80	HH45,853
ETHIOPIA (Harrar)					
6	0	<i>Colobus polykomos</i>	Hirna Valley	Sep 62	HH40,711
ETHIOPIA (Wollo)					
10	4	Domestic dogs	Kutaber	Aug 71	HH43,065
0	1	-	-	63	HH6371
31	6	<i>Panthera pardus</i>	Manera Field Station	Mar-Apr 63	HH40,713
11	1	Domestic buffalo	Manera Field Station	Mar-Apr 63	HH40,716
547	27	<i>Panthera pardus</i>	-	-	HH40,709
UGANDA (West Mengo)					
0	1	Domestic cattle	Entebbe	Oct 68	HH9114
13	4	Domestic dog	Entebbe	Jan 66	HH41,983
7	13	Domestic dogs (5)	Kampala dog pound	May 71	HH42,711;715
0	1	Domestic cat	Kampala	Nov 40	HH42,343
3	2	Domestic cat	Entebbe	Feb 45	HH42,383
UGANDA (Ntotoro)					
55	19	Civet	Bwamba	Sep	HH43,768
UGANDA (Western)					
1	0	Human	-	-	HH5868
UGANDA (Ankole)					
1	1	<i>Panthera leo</i>	Nyabushozi	Oct 65	HH40,700
UGANDA (Acholi)					
1	3	Domestic dog	Aswa	Jun 66	HH40,282

UGANDA (Kigezi)						
1	1	-	Nakabande	Oct 40	HH42,338	
UGANDA (Ruwenzori National Park)						
0	2	<i>Panthera leo</i>		Jan 71	HH42,532	
14	0	<i>Panthera leo</i>	Mweya	Jun 74	HH44,616	
UGANDA						
6	16	Domestic Alsatian dog	-	Apr 71	HH42,710	
KENYA (Rift Valley)						
3	1	<i>Panthera pardus</i>	Naivasha	Jul 29	HH5825	
13	0	<i>Civettictis civetta schwarzii</i>	El Burgon	Jun 48	HH40,726	
KENYA (Central)						
1	0	<i>Genetta nigrina erlangeri</i>	Kiambu	Aug 56	HH40,748	
2	0	<i>Canis mesomelas elongae</i>	Kiambu	Apr 55	HH41,979	
1	0	<i>Syncerus caffer</i>	Nyeri	Oct 57	HH42,302	
1	0	<i>Syncerus caffer</i>	Ontulili	Dec 57	HH42,304	
KENYA (Nyanza)						
1	0	Domestic cow	Lumbwa	59	HH42,299	
1	0	Domestic dog	Kericho	Jul 49	HH42,636	
RWANDA						
12	23	-	Gisenyi	Sep 49	HH42,315;317	
2	3	-	Gikongoro	Dec 74	PCM	
BURUNDI (Muringa)						
2	1	-	Kanyinya	48	HH42,204	
0	5	-	Kanyinya	47	HH42,209	
BURUNDI (Ngozi)						
14	1	Domestic dog	Ngozi	Jan 80	HH45,755	
TANZANIA (Arusha)						
6	14	<i>Panthera leo</i> (2)	Ngorongoro	Sep 65	HH43,933; HH44,050	
2	0	Domestic dog (2)	Arusha	Jul-Aug 56	HH5974;41,319	
2	1	Domestic cattle	Arusha	Feb 60	HH42,300	
TANZANIA (DAR Es Salam)						
0	4	Domestic cat	Msasani	May 74	HH44,614	
ZAMBIA (Eastern)						
7	0	<i>Civettictis civetta</i>	Lundazi	Aug 62	HH43,678;679	
51	5	<i>Civettictis civetta</i>	Fort Jameson	Jul 62	HH43,680	
3	0	<i>Panthera pardus</i>	Lundazi	Jul-Aug 62	HH43,690;692	
4	2	<i>Canis adustus</i>	Lundazi	Aug 62	HH43,675	
1	0	<i>Lycaon pictus</i>	Fort Jameson	Jul 62	HH43,693	

*HH = H. Hoogstraal Collection at the Institute of Arthropodology and Parasitology, Georgia, Southern University, Statesboro, GA, USA

JLC = J.L. Camicas Collection at Dakar, Senegal

PCM = P.C. Morel Collection

IPP = Pasteur Institute Collection in Paris, France

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