

TICK SURVEY VIII.—CHECKLISTS OF TICKS RECORDED FROM THE
BELGIAN CONGO AND RUANDA URUNDI, FROM ANGOLA,
AND FROM NORTHERN RHODESIA.

GERTRUD THEILER and BRITHA N. ROBINSON,
Onderstepoort Laboratory.

CHECKLIST OF TICKS REPORTED FROM BELGIAN CONGO AND RUANDA URUNDI.

This list is based on the records mainly of Schwetz 1927, of Bequaert 1930-31, and on the numerous collections sent for identification to Onderstepoort by Dr. H. R. F. Colback, Le Conseiller Veterinaire, Gouvernement General, Congo Belge, and his staff and by Prof. Dr. M. Wanson. To complete the historical picture older records, though of not much practical value, in so far as localities are not mentioned, have been included. The records of Fiasson 1943, and of Rousselot 1951, from the neighbouring French territories as also those of Sousa Dias 1950, for Angola, and the Tick Survey for Northern Rhodesia have also been listed, to assist in gauging the factors influencing the distribution of the various species of tick.

The results of collections made in Nigeria, by Dr. Unsworth, in Northern Rhodesia by the Department of Veterinary Services, in Anglo-Egyptian Sudan by Dr. Hoogstraal, in Kenya by Wilson and Lewis, in Moçambique by Santio Dias etc. when published and correlated with the above and with the published lists for Angola, Portuguese Guinea, Nyasaland, Eritrea and Italian Somaliland, should give an overall picture of the distribution of the various tick species in Central, East and West Africa.

On the information gathered in these preliminary surveys, it will then be possible to plan more detailed inter-regional surveys and thus obtain the factors influencing the activities and limiting the distribution of the various tick species.

Some of the commoner species are plotted on the vegetation map of the Belgian Congo, to try to give some meaning to their distribution. An attempt will be made to analyse the factors limiting a few of the species.

Tick.	Locality.	Authority.
<i>A. nuttalli</i>	Kipumbu Sakania.....	Tick Survey.
	Mahagi.....	Schwetz, 1927.
<i>A. paulopunctatum</i>	Medje, Haut-Lopori, Arebi, Bolobo.....	Bequaert, 1931.
	(Carnot, Mayama).....	Rousselot, 1951.
	Listed as <i>breviscutatum</i> Bolobo.....	Neumann, 1911.
<i>A. pomposum</i>	Elisabethville.....	Tick Survey.
	Kundelungu, Katanga, Elisabethville.....	Schwetz, 1927.
	Katanga.....	Nuttall and Warburton, 1926.
	Ruanda Urundi.....	Schoenaers, 1951.
<i>A. personatum</i>	Might be found in Katanga.....	Bequaert, 1931.
<i>A. rhinoceros</i>	Syn. <i>A. petersi</i> Lulua district.....	Schwetz, 1927.
<i>A. rugosum</i>	A variety of <i>A. marmoreum</i> ? Congo.....	Neumann, 1899.
<i>A. splendidum</i>	West African i.e. Gaboons, Congo and Cameroons	Dönitz, 1907.
	Congo on <i>Bos brachyceros</i>	Neumann, 1899.
	Tshumbiri, Kisantu.....	Nuttall and Warburton, 1926.
	Kindu, Zambie, Mateba, Boma, Lukula, Mayamba	Bequaert, 1930.
	Kisantu, Galiema, Bokala, Tshumbiri, Kwamouth, Kondue, Kumbu, Nouvelle Anvers.	Bequaert, 1931.
	Aru, common in Haut Ituri	
	Haut Congo.....	Schwetz, 1927.
	(Dolisie).....	Fiasson, 1943.
	(Mindouli, Dolisie, Kelle; Yaounde; Bouafle).	Rousselot, 1951.
<i>A. tholloni</i>	Angumu.....	Tick Survey.
	"Central Africa".....	Dönitz, 1907.
	"Region of the Lakes".....	Nuttall and Warburton, 1926.
	Congo.....	Neumann, 1911.
	Irumi, Beni, Ituri, Semliki forest.....	Bequaert, 1930.
	Congo, quite common.....	Schwetz, 1927.
	Ituri, Haut-Mbomu (Ubangui).....	Bequaert, 1931.
	(Dolisie, Sibiti).....	Fiasson, 1943.
	(Bouafle; N'Gabe).....	Rousselot, 1951.
	Faradje, Karibumba (Beni), Ingerosa (Irumu), Mogende (Bolobo), Wombali, Fundi, Libenge, Basongo, Kamaiembe (Tshikapa), Luvua-Moto (Lomani), Lulua, Medje, Lesse, Arebi-Bondo-Mabe	Bequaert, 1931.
	Zambi.....	
<i>A. variegatum</i>	Nyakangunda, Usumbura; Katabo, Kigande, Muyenzi, Kakumbu, Kingogo, Bushiru, Kisenyi; Kibari, Mulera, Aru, Ituri, Rwankeri, Ruhengeri; Matura, Sangugu, Bunkeya, Costermansville, Walungu, Stanleyville, St. Gabriel; Bururi, Kitega, Nyakatale; Coquilhatville, Leopoldville, Ituri; Binza, Kisantu, Uvira, Kansena, Yangambi, Elisabethville	Roubaud, 1916.
	Congo.....	Tick Survey.
	Congo.....	Neumann, 1899.
	Congo.....	Nuttall and Warburton, 1926.
	Ruanda Urundi.....	Schoenaers, 1951.
	Elisabethville, Bamu, Garamba, Zambie.....	Schwetz, 1927.
	Foradje, Irumu, Boma, Mateba, Dungu, Vanckerckhovenville, Nyangwe, Kasongo, Kalembelembe, Baudouinville, Moliro, Mpala, Tembwe, Baraka, Kindu, Kando, Kiabukwa (Kamina). Garamba, Faradje, Zambi, Uvira, Aba, Luvungi, Irumu, Kasai, Galiema, Ile Bamu (Leopoldville), Mandoko, Aru, Ioa, Luiswishi, Elisabethville	Bequaert, 1931.

TICK SURVEY VIII.

Tick.	Locality.	Authority.
<i>A. variegatum</i> —(ccntd.)	(Brazzaville, Dolisie)..... (Brazzaville, Mindouli, Bangui, Carnot, Bilolo, Bouar; Yaoundé, N'Gaoundere, Ambam, Moroua; Bamaka, Segou, Libreville, Mitzik Oyem). Gahinke, Costermansville, Coquilhatville, Walungu, Kigali, Mayaga, N'Gozi, Kibungu, Katitimba, Nyakatale	Fiasson, 1943. Rousselot, 1951.
<i>Aponomma exornatum</i> ..	The Whole of Africa..... Congo..... Lukolela, Oshwe, Mandoko, Doruma, Mateba Congo..... Leopoldville..... Aba, Riviere Aka near Dungu, Lokolenge, Kole Doruma, Haut-Ituri, Bukama	Dönitz, 1907. Neumann, 1911. Schwetz, 1927. Nuttall, 1916. Tick Survey. Bequaert, 1931.
<i>Aponomma latum</i>	(Segou, Bamako)..... Banana (listed as <i>A. laeve</i>)..... Mai Ivwi (Ruchuru), Boma..... Mayumbe, Bafwasende, Ganda Sundi..... (Brazzaville).....	Rousselot, 1951. Neumann, 1899. Bequaert, 1931. Schwetz, 1927. Fiasson, 1943.
<i>Dermacentor circumgutatus</i>	Congo..... Congo et Haut-Oubangui..... Faradje, Haute-Tshuapa, Mondimbi (Lulonga) Arebi-Bondo-Mabe, Aru, Lulua, Lesse, Ituri forest Katanga, Fundi, Basongo, Mongende, Lesse, Ipa, Region des Grands Lacs. Medje Ingeroso (Irumu) Old Beni, Semliki plains, Karibumba Ruanda Urundi..... (Bouafle; N'Gabe), Congo.....	Neumann, 1911. Neumann, 1897. Bequaert, 1931. Schwetz, 1927. Bequaert, 1930.
<i>Dermacentor rhinoceros</i>	Afrique méridionale et Orientale..... North-eastern Uélé, Faradje, Aba.....	Schoenaers, 1951. Rousselot, 1951. Neumann, 1911. Bequaert, 1931.
<i>Boophilus decoloratus</i> ...	Elisabethville, Djelongo Yubu., Faradje, Banana, Gwane Koponoma, Kania-tandu, Kamatanda, Mura, Buluwe, Kapalowe, Jadotville, Kapemba, Uvira, Dili, Katabo, Usumbura, Hindiro Shangugu, Kingogo, Bushiru, Kisenyi, Mulera, Ruhengeri, Bukamba, Aru, Kitega, Coquilhatville, Costermansville, Walungu, Stanleyville, Bafwasende, St. Gabriel, Ituri, Bururi, Binza, Rutana, Leopoldville, Katentania, Kakumbu, Matamba, Nyanza, Yangangu, Mulungu ex Nioka, A.E.F. Sakania, Koponoma, Mulunguwishi, Djilongo-Yubu Elisabethville, Vankerckhovenville, Kitobola, Irumu, Galiema, Kasai, Uele, Bokalo, Kisan-tu, Boma, Kando, Kamina, Kasenia, Katentania, Tembwe, Mpala, Baudouinville, Luiswishi, Zambi, Mateba, Eala, Kasongo; Kalembelembe, Dungu, Nyangwe, Lewungi, Nian-gara, Yakoma, Hoima Katanga..... Irumu, Lewungi..... Ruanda-Urundi..... Zambi, Faradje, Niapu..... Gakenke, Costermansville, 'N'Gozi, Coquilhatville, Walungu, Kibungi, Kisenyi. (Brazzaville, Mindouli, Dolisie; Bangui, Bilolo; Libreville; Ambam, Yaounde, Bamako, Segou) (Brazzaville, Dolisie; Libreville)..... Listed as <i>Margaropus annulatus</i> var. <i>calcaratus</i> at Coquilhatville	Tick Survey. Schwetz, 1927. Massey, 1908. Bequaert, 1930. Schoenaers, 1951. Bequaert, 1931. Rousselot, 1951. Fiasson, 1943. Newstead, 1907.

Tick.	Locality.	Authority.
<i>Boophilus congolensis</i> ...	Coquilhatville ex A.E.F.....	Tick Survey.
<i>Haemaphysalis aciculifer</i>	Aru-Ituri.....	Tick Survey.
	(Carnot).....	Rousselot, 1951.
	Haut-Uéle.....	Bequaert, 1931.
<i>H. calcarata</i>	(Dakar).....	Rousselot, 1951.
<i>Haemaphysalis leachi</i> ...	Elisabethville, Stanleyville, Kapalowe, Gwane, Leopoldville, Kerekere, Rutshuru, Nyakatale, Coquilhatville, Kasai, Bushiru, Kisenyi, Kipumbu, Sakania, Kisiba, Malim Kisabi, Makamba, Nyakatale: Irumu, Djugu Lualaba, Nouvelle-Anvers, Kole, Pweto, Luozi, Dungu, Kiambi, Kwamouth, Kilo, Kiabukwa, Katanga, Tshisika Congo.....	Tick Survey.
	Katanga, Bogandangu, Upper Congo; Kutu, Tshumburi (Lake Leopold), Kimaka; (Kibon- do)	Schwetz, 1927.
	Upoto, Kisenyi, Ruchuru, Lulenga, Niaku Faradjé, Nyangwe, Congo-da-Lemba, Mun- djungani	Neumann, 1911. Nuttall and Warbur- ton, 1915.
	Ruanda-Urundi.....	Bequaert, 1931.
	Kisantu, Kasongo, Nord-Sankuru, Medje, Boma, Banana, Lecozi	Schoenaers, 1951.
	Gakenke, N'Gozi (Brazzaville, Bangui; Maroua; Bamako, Segou)	Rousselot, 1951.
<i>H. parmata</i>	(Nola-Carnot).....	Rousselot, 1951.
<i>Ixodes cavipalpus</i>	Kapiri, Elisabethville, Kisiba, Sakania, Lubile, Kipumbu, Ferme Rosse Congo.....	Tick Survey.
	Kapiri.....	Bequaert, 1930. Schwetz, 1927.
<i>I. daveyi</i>	Congo.....	Bequaert, 1930.
<i>I. rarus</i>	Congo.....	Neumann, 1899.
	Komono.....	Fiasson, 1943.
	Congo.....	Dönitz, 1907.
	Kisenyi, Kivu, Ituri, Gwane, Burunga, Koteli (Itimbiri), Panga, Arebi, Congo-da-Lemba Burunga, Simba, Lokolenge, Bubashero.....	Schwetz, 1927.
	Ruanda-Urundi.....	Bequaert, 1931.
	Costermansville (Nola, Kelle).....	Schoenaers, 1951.
<i>I. rubicundus</i> ?.....	Kiabukwa, Elisabethville, Lubumbashi River, Luiswishi River, Katanga, Lubile, Kapiri, Buli, (Kansanshi Mine, Northern Rhodesia)	Rousselot, 1951. Bequaert, 1931.
<i>I. rubicundus limbatus</i> ...	Lubile, Katanga.....	Neumann, 1911.
<i>I. ugandanus</i>	Kibombo.....	Bequaert, 1931.
	(Komono).....	Fiasson, 1943.
	(Nola).....	Rousselot, 1951.
<i>I. simplex</i>	Aba.....	Bequaert, 1931.
<i>Ixodes</i> sp. <i>rarus</i> group..	Mulera-Ruhengeri; Bushiru, Kisenyi, Yan- gambi	Tick Survey.
<i>Ixodes</i> sp.....	Sur Musaraignes at Bumba, [Possibly <i>I. alluaudi</i>]	Bequaert, 1931.
<i>Ixodes</i> sp.....	Sur Potamogale velox, at Inkongo Kasai.....	Bequaert, 1931.
<i>Ixodes</i> sp.....	Sur Ourebia hastata-Mahagi.....	Bequaert, 1931.
<i>Hyalomma rufipes</i>	Aru.....	Tick Survey.
	(Bamako, Ségou: Bangui).....	Rousselot, 1951.
<i>H. transiens</i>	Usumbura.....	Tick Survey.
	(Bamako Ségou: Bangui; N'Gaoundere).....	Rousselot, 1951.
<i>H. transiens</i> listed as <i>albiparmatum</i>	Ruanda.....	Chodziesner, 1924.
Listed as <i>aegyptium</i>	Kasongo, Mandoko, Kiabukwa, (Kamima), Lo- mami, Elisabethville. Bas Congo probably present, for it is present in the adjoining Cabinda	Bequaert, 1930.

TICK SURVEY VIII.

Tick.	Locality.	Authority.
<i>H. brumpti</i>	(Bamako, Ségou, Tombouctou, Sudan).....	Rousselot, 1951.
<i>H. impressum</i>	(Bangui; Bamako, Ségou).....	Rousselot, 1951.
<i>Rhipicentor bicornis</i>	Elisabethville, Malye, Kisiba, Kipumbu, Yamba, Sakania, Kisiba, Lukangaba	Tick Survey.
	Listed as <i>R. gladiger</i> . Pweto (also Kansanshi Northern Rhodesia)	Neumann, 1908.
	Ruanda-Urundi.....	Schoenaers, 1951.
<i>Rhipicephalus appendiculatus</i>	Mucucca, Murombi, Matura, Hindiro, Shangu-gu, Kisenge, Nyakagunda, Mulera Ruhengeri, Usumbura, Kitega, Nyanza, Aru, Ituri, Bururi, Mission St. Gabriel; Bukamba, Katabo, Bushiru; Costermansville, Walungu; Mulungu ex Nioka A.E.F. Elisabethville, Sakania, Kipumbu, Kapemba, Sake, Uélé; Gwane; Kwa; Katanga, Kingogo, Kisenyi, Yangambi Stanleyville, Goma, Boma	Tick Survey.
	Uvira, Kamaniola, Kisenyi, Ruanda, Plaine de Kawa (Lake Albert)	Bequaert, 1931.
	Boma, Zambi, Kisantu, Kunungu, Bolobo, Ekundja, Mauda, Mandoko, Toa, Kindu, Kasongo, Luiswishi River	Newstead et al 1907.
	Ruanda-Urundi.....	Schoenaers, 1951.
	Elisabethville, Katanga, Boma.....	Schwetz, 1927.
	(Brazzaville).....	Fiasson, 1925.
	Kibungi, Gakenke, Costermansville, Coquilhatville, N'Gozi, Wabungu, Kigali, Mayaga, Kibungu, Kabaya, Kisenyi (Bangui)	Rousselot, 1951.
<i>R. aurantiacus</i> (= <i>R. ziemanni</i>)	Medje.....	Bequaert, 1930.
	Belgian Congo.....	Zumpt, 1943.
	(Dolisie Moyen Congo).....	Fiasson, 1943.
	Kondue, Haut Lopori.....	Bequaert, 1931.
<i>R. ayrei</i>	Usumbura, Coquilhatville, Bunkeya, Aru-Dema; Mulungu ex Nioka A.E.F. Katabo, Kingogo Kisenyi, Bushiru, Costermansville, Bururi	Tick Survey.
<i>R. bequaerti</i>	Ijenda, Mwikosa (Ruanda-Urundi).....	Rousselot, 1951.
<i>R. bursa</i>	See under <i>R. pravus</i>	Tick Survey.
<i>R. capensis</i>	Kai M' Baku, Nyangwe, Rutshiru, Katanda, Kisenyi, Coquilhatville, Gwane, Mayumbe, Nyangwe, Luiswishi, Lubumbashi, Mulera, Ruhengeri, Matura, Walungu, Costermansville, Elisabethville, Sakania, Usumbura, Aru, Ituri, Kiganda, Nyakatale, Bururi; Coquilhatville ex A.E.F.	Schwetz, 1927.
	Seke Banza, Pweto, Katanga, Mateba, Kivu, Baraka, Kasongo	Schwetz, 1927.
	Ruanda-Urundi.....	Schoemaers, 1951.
	Listed as <i>capensis compositus</i> Ruchuru plains, Pweto	Bequaert, 1931.
	Nya-Lukemba.....	Newstead, 1907.
	Kai M' Baku, Mayumbe, Nyangwe, Pweto, Luiswishi, Lubumbashi	Bequaert, 1931.
	Zambi.....	Roubaud, 1916.
	Costermansville, Coquilhatville, Walungu, Kisenyi. (Brazzaville, Bangui, N'Dende, Combat, Dolisie)	Rousselot, 1951.
<i>R. complanatus</i>	Congo.....	Neumann, 1911.
	Kunungu (Bolobo), Haut-Lopori, Kondue.....	Bequaert, 1931.
	Congo.....	Zumpt, 1943.
	Komono Moyen Congo.....	Fiasson, 1943.
	Listed as <i>R. planus</i> Kunungu, Kotelim Ipamu.....	Schwetz, 1927.
	Komona.....	Fiasson, 1943.
	(Kellé).....	Rousselot, 1951.

ERRATA.

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The last three lines to read:—

R. pravus listed as *R.*
bursa

Bukama, Kibombo.....
Nya Lukemba, Costermansville, Kasongo.....
Haut Uélé.....

Swetz, 1927.
Newstead *et al.* 1907.
Bequaert, 1931.

Tick.	Locality.	Authority.
<i>R. cuspidatus</i>	(Ségou Sudan).....	Rousselot, 1951.
<i>R. deltoideus</i> ?.....	Haut Congo, Rutshuru, [This may be <i>R. sulcatus</i>] Ishasa River (Wild hare) <i>sulcatus</i>	Bequaert, 1930. Bequaert, 1930.
<i>R. duttoni</i>	Banana, Zambie, Moanda.....	Schwetz, 1927. Neumann, 1907.
<i>R. dux</i>	Angumu..... Kotele (Itimbiri), Mboga.....	Tick Survey. Larrousse, 1927.
	Ituri, Katanda, Medje, Avakubi, Haut Congo.. Upper Congo.....	Bequaert, 1931. Dönitz, 1901.
<i>R. evertsi</i>	Ruanda-Urundi..... Nyakagunda, Katabo, Bushiru, Usumbura, Aru, Leopoldville, Kitega, Nyanza, Hindiro, Kisenyi, Katentania, Costermansville, Koponoma River, Tembwe, Bianco, Bururi, Nyakatale, Mulunguwishi, Elizabethville Elisabethville, Tembwe, Kando, Katanga, Boma, Dolo, Galiema, Mateba, Zimbi, Dungu, Faradje, Kitobola, Banana, Kiabukwa Katanga, Kiabukwa (Kamina), Tembwe, Kando (Biano) Ruanda-Urundi.....	Schwetz, 1927. Bequaert, 1931. Schoenaers, 1951. Rousselot, 1951.
	Kibungi, Costermansville, Kigali, Mayaga, N'Gozi (Bamako; Bangui Ségou) (Dolisie), listed as var. <i>albigeniculatus</i>	Rousselot, 1951.
<i>R. evertsi mimetica</i>	Kitobola..... Kitobola, Boma, Mateba, Banana, Zambie, Dolo Galiema, Bokala, Dungu, Faradje, Irumu	Bequaert, 1931. Schwetz, 1927.
<i>R. falcatus (R. longus?)</i>	Galiema, Dungu, Mpa, Nyangwe..... Coquilhatville, Aru-Dema, Coquilhatville ex A.E.F. Hoima	Bequaert, 1931. Tick Survey.
<i>R. kochi</i>	Kingogo, Bushiru, Kisenyi, Busago, Rwankeri, Ruhengeri, Mulera, Mucucca, Mutura, Kakumbu, Costermansville, Katentania, Kasa- na, Mwenda, Shyra, Byahi, Kingi, Rega, Ruanda-Urundi.....	Tick Survey. Schoenaers, 1951.
<i>R. longus</i>	Kasongo..... West and Central Africa..... Bungulu Ituri forest, Medje, Garamba..... Galiema, Dungu, Mpa, Nyangwe, Kiabukwa, Kundelungu	Neumann, 1911. Zumpt, 1942. Bequaert, 1931. Schwetz, 1927.
<i>R. lunulatus</i>	Congo..... Kapiri, Kabwe, Katanda..... Ruanda-Urundi..... Lualaba River..... Katanga.....	Rousselot, 1951. Schwetz. Schoenaers, 1951. Neumann, 1907. Massey, 1908.
<i>R. tricuspis</i>	(Ségou Sudan)..... Kingogo, Bushiru, Kisenyi, Katanga, Bukamba, Ruhengeri, Mucucca, Kisantu, Lualaba Congo.....	Rousselot, 1951. Tick Survey. Bequaert, 1930.
	Kapiri.....	Nuttall.
	Kisantu.....	Schwetz, 1927.
<i>R. masseyi</i>	Listed as <i>R. attenuatus</i> . Congo Independant (Kansanshi)	Neumann, 1911.
<i>R. mühlensi</i>	Katanga..... Bukamba, Ruhengeri, Matura, Busogo, Kingo- go, Kisenyi Bukama, Kibombo..... Nya Lukemba, Costermansville, Kasongo..... Haut Uélé.....	Massey, 1908. Tick Survey. Schwetz, 1927. Newstead <i>et al.</i> 1907. Bequaert, 1931.

TICK SURVEY VIII.

Tick.	Locality.	Authority.
<i>R. neavei</i>	Bukama..... Kisenyi-Kibene, Ijenda, Rwankuri (Ruanda-Urundi)	Bequaert, 1931. Rousselot, 1951.
<i>R. pravus</i>	Kingogo, Kisenyi, Bukamba, Mura River, Murombi, Costermansville, Nyakatale, Mucucca, Elizabethville. (Also listed by some as <i>R. neavei punctatus</i>)	Tick Survey.
<i>R. pravus</i>	Listed as <i>bursa</i> , Congo.....	Neumann, 1897.
<i>R. sanguineus</i>	Kipumbu Leopoldville, Sakania, Mondowa, Kisiba, Mali. Makamba, Kingogo Kisenyi, Mission S. Gabriel, Stanleyville, Elizabethville, Yamba, Apoyo Landana, Loango, Congo..... Elizabethville, Katanga, Boma, Banana, Mayumbe, Pweto, Galiema, Kiabukwa Stanleyville, Leopoldville, Sakania, Luishwishi, Uélé, Goma, Faradje, Makamba Stanleyville, Koteli, Itimbiri, Nyangwe, Haut-Uélé, Faradje, Ekundja, Koteli, Kasongo, Elizabethville Ruanda-Urundi..... (Bangui)..... (Bamako, Ségou; Abecher, Dakar, Nola, Carnot, Bilolo, Brazzaville, Maroua)	Tick Survey. Neumann, 1911. Schwetz, 1927. Newstead <i>et al.</i> , 1907. Bequaert, 1931. Schoenaers, 1951. Fiasson, 1943. Rousselot, 1951.
<i>R. simpsoni</i>	Congo-da-Lemba.....	Bequaert, 1931.
<i>R. simus</i>	Yanangu, Coquilhatville, Elizabethville, Leopoldville, Nyakatale, Bukavu, Gwane, Medje, Banana, Kasongo, Bunkeya, Aru, Ruchuru, Lukangaba, Mulungu ex Nioka, Kipumbu-Sakania Sakania, Bukama, Kibombo, Lubile, Moliro, Bolobo, Kunungu Zambi..... Ruchuru plains, Medje, Banana, Kasongo, Aba, North Lake Edward Ruanda-Urundi..... (Bangui)..... Listed as var. <i>shipleyi</i> Garamba, Buli..... Aba.....	Tick Survey. Schwetz, 1927. Roubaud, 1916. Bequaert, 1931. Schoenaers, 1951. Rousselot, 1951. Bequaert, 1931. Zumpt, 1943.
<i>R. sulcatus</i>	Kindu, Semliki plains, Kasongo..... Tshisika (Females only)..... (Ségou).....	Bequaert, 1931. Schwetz, 1927. Rousselot, 1951.
<i>R. supertritus</i>	Banks Lualaba River..... Garamba.....	Neumann, 1907. Bequaert, 1931.
<i>R. senegalensis</i>	(Bamako Ségou; Bangui, Dolisie, Brazzaville) Coquilhatville, Bosobola (atypical).....	Rousselot, 1931. Tick Survey.
<i>R. ziemanni</i>	(Carnot, Kelle), Sibiti..... Angumu.....	Rousselot, 1951. Tick Survey.

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CHECK LIST OF TICKS REPORTED FROM ANGOLA.

	Locality.	Authority.
<i>Ornithodoros moubata</i> ...	Ambaca, Malanje, Bihe, Bailundo, Andulo, Caconda, Chiyaka, Benguela, Lovaleland, Moxico, Landana (Cabinda). <i>Livingstone says it is common in Angola</i>	Nuttall and Warburton, 1908.
<i>Argas persicus</i>	Cassinga, Nova Lisboa. Known from most areas (No fowl ticks found in San Salvador)..... Quilengues, probably widely distributed.....	Sousa Dias, 1948. Gamble, 1914. Sousa Dias, 1948.
<i>Ornithodoros savignyi</i> ...	Landana (Cabinda). [Not listed for Angola, though very prevalent in the drier adjoining South West Africa]	Santos Dias, 1950.
<i>Amblyomma astrion</i>	Luanda..... Luanda and neighbouring regions; Quifangonda Angola.....	Dönitz, 1909. Sousa Dias, 1948. Inglez, 1942.
<i>A. pomposum</i>	Cubal do Hanho, and Alta Catumbela, fairly common Benguela.....	Leitão, 1942.
	Cubal do Hanho, Alto Catumbela..... <i>Present throughout Angola, more especially on the plateaux rather than along the coast</i>	Nuttall and Warburton, 1926. Leitão, 1942. Sousa Dias, 1948.
<i>A. splendidum</i>	San Salvador, Fukian.....	Gamble, 1914.
<i>A. tholloni</i>	San Salvador.....	Gamble, 1914.
<i>A. variegatum</i>	(? Cubal do Hanho, Alto Catumbela ?). [The specimen identified at Onderstepoort was a nymph]	Leitao, 1942.
<i>Aponomma exornatum</i> ..	Absent in Angola..... San Salvador.....	Sousa Dias, 1948. Gamble, 1914.
<i>Boophilus decoloratus</i> ...	Chinchoxo..... District of Benguela and Huila..... <i>The most common parasite of domestic stock met with from North to South and from the high wet plateaux to the coast. [Present in desert of Mossamedes?]</i>	Neumann, 1899. Ruela, 1915. Sousa Dias, 1949.

TICK SURVEY VIII.

Tick.	Locality.	Authority.
<i>Haemaphysalis leachi</i> . . .	San Salvador, Kibokolo do Zombo Mulondo; Landana (Cabinda) Chiumbo, Luimbale, Mungo in Bailundo; Nova-Lisboa; [Probably more widespread than the present collection would indicate]	Gamble, 1914. Dias, 1950. Sousa Dias, 1948.
<i>Hyalomma transiens</i>	Mulondo, Sendi, Quipungo Luanda; Luatira in Bié; Vila Nova, Cuito, Quipeio, Huambo; Lepi in Caála, Mungo, Luhanda, Lumbale, Lunge in Bailundo; Ganda, Bocoio in Lobito; Bimbas in Benguela; Anja, Chingoroi, Impulo in Quilengues; Lubango, Onquenha, Mulondo in Quipungu; Galangue in Ganguelas; Cafu in Gambos	Dias, 1950. Sousa Dias, 1948.
<i>Ixodes cavipalpus</i>	Benguela	Nuttall and Warburton, 1926. Sousa Dias, 1948.
<i>Rhipicephalus appendiculatus</i>	Chiumbo, Mungo in Bailundo; Nova Lisboa, Sá da Bandeira Benguela and Huila; Catumbela	Ruella, 1915.
<i>R. capensis</i>	Cubal do Hanho, Alto Catumbela Bocoio in Lobito; Sá da Bandeira San Salvador	Leitão, 1942. Sousa Dias, 1948. Gamble, 1914.
<i>R. duttoni</i>	Malange; Lunjata in Saurimo; Cossa in the area of the Companhiados Diamantes <i>Very common on the plateaux of Benguela and Huila, to the South and on the Coastal regions, as also in the drier regions of Mocamedes.</i> Cacuaco in Luanda; in Bailundo; Covaco in Benguela; Sá da Bandeira; in Karakul zone of Moçamedes; Humbe in Gambos; Otchinjau in Curoca; Naulila in Cuamato	Sousa Dias, 1948.
<i>R. evertsi</i>	(Benguela, Lobito, Catumbela) [?]	Ruella, 1915.
<i>R. evertsi</i> , var. <i>mimeticus</i>	<i>One of the most widely dispersed species met with on the high-rainy plateaux and on the dry coastal plains from North to South.</i> [Replaces <i>R. evertsi</i> in the adjoining South West Africa.] Caconda, Serra in Comp. Diamantes; Mucques in Luanda; Bailundo; Vila Nova, Quipeio, Nova Lisboa in Huambo; Lepi, Chenga in Caála; Carto and Bimbas in Benguela; Sá da Bandeira, Humpata; Onquenho (Mulondo) in Gambos, Perreira d'Eca, Nualilo in Cuamato	Sousa Dias, 1948.
<i>R. falcatus</i> (= <i>longus</i>) . . .	San Salvador Angola	Gamble, 1914. Tick Survey.
<i>R. longus</i>	Portuguese West Africa	Zumpt, 1942.
<i>R. lunulatus</i>	San Salvador	Gamble, 1914.
<i>R. oculatus</i>	Bocoio in Lobito. [Common in the adjoining drier South West Africa]	Sousa Dias, 1948.
<i>R. pravus</i>	(Listed as <i>R. neaveipunctatus</i>) Chiumbo, Lunge, Luimbale, Mungo in Bailundo, Cassengue, Cuito in Quipeio, Cussavo, Huambo; Lepi in Caála; Vila da Ponte in Ganguelas; Humpato, Lubango	Sousa Dias, 1948.
<i>R. sanguineus</i>	San Salvador Quipungo, Malange; Landana (Cabinda) Chiumbo, Lunge, Mungo in Bailundo; Quipeio, Nova Lisboa; Cubal in Benguela; Malange	Gamble, 1914. Dias, 1950. Sousa Dias, 1948.
<i>R. simus</i>	Mungo in Bailundo; Bocoio in Lobito, Cacondo; Humpata in Lubango	Sousa Dias, 1948.
<i>R. tricuspis</i>	Chiumbo, Lungo in Bailundo; Cuito, Quipeio	Sousa Dias, 1948.

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CHECK LIST OF TICKS REPORTED FROM NORTHERN RHODESIA.

Tick.	Locality.	Authority.
<i>Amblyomma hebraeum</i> .	Ndola (introduced), Mazabuka (introduced)	Tick Survey.
<i>A. marmoreum</i>	Nawalía N.E. Rhodesia (Kinghorn)	Nuttall and Warburton.
<i>A. pomposum</i>	Nteka, Namwala	Tick Survey.
	Msofa R., Ulala Plateau; Mwingwa in Namwala distr.-Kafui	Nuttall and Warburton.
<i>A. variegatum</i>	Machili Barotseland, Mongu, Barotseland, Mazabuka, Ndola, Isoka, Mulekatembo, Abercorn, Chingala, E. Luangwa, Chinsali, Isoka, Tanganyika border, Nteka Isoka, E. of Fort Hill, Namushekende, Lubwa Mission Chinsali, Mwene Hufungwe, Wayetwekas Village 15 m. S. of Fort Hill, Nteka, Fort Jameson, Mankoya, Choma, Lusaka, Namwala, Lochinvar, Chiwala	Tick Survey.
<i>Aponomma exornatum</i>	Northern Rhodesia	Nuttall and Warburton.
<i>B. decoloratus</i>	Gwembe Zambesi Valley; Monze	Tick Survey.
	Mongu, Abercorn-Kalambo Falls Road; Isoka Mwene Hufungwe, Mulekatemrwe, Allanson, Wayetwekas Village 15 m. S. Fort Hill, Nteka, Abercorn, Mankoya, Ndola, Mazabuka, Choma, Namwala, Chingala, Machili, Chimala, Namushekende. Lusaka, Kasempa	Tick Survey.
<i>B. fallax</i>	Nteka, Lubwa Mission Chinsali, Mulekatemrwe, Wayetwekas Village, Abercorn-Kalambo Falls Road, Isoka; Abercorn, E. Luangwa, Musagamas; Chinsali, Tanganyika border; E. of Fort Hill	Tick Survey.
<i>Haemaphysalis leachi</i>	(<i>humerosoides</i>) Lhunga on Kalunga Road, Namwala, Isoka, Mazabuka Chinsali, Lusaka, Ndola	Tick Survey.
	Brokenhill, Serenje, Msofu River on Ulala Plateau, Fort Jameson, Upper Luangwa Valley, Mpamadzi River	Nuttall and Warburton.
<i>Hyalomma rufipes rufipes</i>	Mongu, Musagamas E. Luangwa Valley; Mazabuka, Senanga, Namwala, Namushekende, Mankoya, Barotseland	Tick Survey.
<i>H. transiens</i>	Machili Barotseland, Mongu, Isoka, Chinsali Mazabuka, Allanson, Ndola, Namwala, Choma, Mankoya, Fort Jameson-Ngoni reserve, Namushekende, Abercorn, Lusaka, Chiwala	Tick Survey.
<i>Ixodes cavipalpus</i>	E. of Fort Hill; 15 m. S. of Fort Hill; Nteka, Ndola, Lusaka, Mankoya, Abercorn	Tick Survey.

TICK SURVEY VIII.

Tick.	Locality.	Authority.
<i>Rhipicephalus appendiculatus</i>	Abercorn-Kalambo Falls Road., Isoka, E. Luangwa Valley, Chinsali, Nteka, Mazabuka, Ndola, Nomwala, Lusaka, Choma, Mulobezi, Monze, Mankoya, Chiwala	Tick Survey.
<i>R. ayrei</i>	Abercorn-Kalambo Falls Road; Isoka, Chinsali, Nteka, Mankoya, Ndola, E. of Fort Hill, Wayetwekas Village 15 m. S. of Fort Hill, Abercorn, Lusaka-Nkomeshya, Fort Jameson	Tick Survey.
<i>R. evertsi</i>	Machili Barotseland, Mongu, Mazabuka, Allanson, Ndola, Chingala, Namwala, Choma, Mankoya, Namushekende, Monze, Lusaka, Chiwala, Kasempa	Tick Survey.
<i>R. maculatus</i>	Namwala.....	Tick Survey.
<i>R. masseyi</i>	Kansanshi.....	Nuttall and Warburton, 1907.
<i>R. neavei</i>	Isoka, Chinga.....	Tick Survey.
<i>R. pravus</i>	Machili Barotseland, Mongu, Isoka, Nteka, Wayetwekas Village 15 m. S. of Fort Hill, Ndola, Musagamas, Chinsali, Namwala, Choma-Macha	Tick Survey.
<i>R. sanguineus</i>	Chinsali, Mazabuka, Ndola, Mankoya, Lochinvar	Tick Survey.
<i>R. simus</i>	Nteka-Isoka, Chinsali, Machili, Mazabuka, Chisamba, Choma-Macha, Mulobezi, Namwala, Fort Jameson, Chingola	Tick Survey.
<i>R. sulcatus</i>	Mazabuka, Namwala.....	Tick Survey.
<i>R. supertritus</i>	Northern Rhodesia, Lusaka.....	Tick Survey.
<i>R. tricuspis</i>	Mongu, Machili, Mazabuka, Mankoya, Namwala, Fort Jameson, Lusaka	Tick Survey.
<i>Rhipicentor bicornis</i>	Tunduma-Mwenzu.....	Tick Survey.

DISCUSSION.

In so far as the records do not represent a collection systematically planned so as to have specimens from all representative types of vegetation, at all times of year, it is impossible to give definite views on the true distribution of any one species. All that is possible is to indicate what the probable distribution will be.

R. appendiculatus (Map II) known to prefer Savannah country in South Africa where moisture conditions are adequate, seems to shew the same preferences in the Congo. It is most consistently present in the East African Highland districts of Ruanda Urundi, from whence we also have the most complete records; it is probably more prevalent in the Southern Congo Savannah of the Bas Congo, Kasai and Bas Katanga, as also in the Rhodesian Highlands of Northern Angola, where the conditions are not too dry, Northern Rhodesia and the Haut Katanga, than is indicated by the present records; to the North the records are even more scanty, but in all probability it will be found prevalent in the Ubangi Savannah in those areas where the humidity conditions are still favourable, and will be absent from the more arid Sudanese districts.

The general conditions in the Lower Guinea forest would appear to be unfavourable, except in those areas where the forest has been cleared to allow for more open grazing for cattle. *Appendiculatus* is not a forest tick.

Boophilus decoloratus (Map II) in South Africa is not confined to Savannah but occurs also in open grass lands. Humidity, as represented by 15" annual rainfall is the limiting factor, provided the drought periods between the uneven

rainy seasons are not too great. On a rainfall-humidity basis one could expect it to occur throughout the areas under consideration, except in the more arid areas of Angola and the Northern Sudanese arid districts of French Equatorial Africa. It has been recorded more frequently than has *R. appendiculatus*; this may be due to the fact that it is a one-host tick which is active during most of the year with no marked seasonal preferences, so that it will be more likely to occur in most collections. Its occurrence in the tropical rain belt, as is the case for *R. appendiculatus*, is possibly confined to the open cleared areas.

R. sanguineus and *H. leachi* (Map II) do not feature in the collection as often as one could expect. Humidity and temperature conditions throughout are favourable. (*R. sanguineus* is essentially a warm weather tick and cannot stand the low temperature which *H. leachi* can). The gaps in the collection are probably due to the fact that fewer collections have been made off dogs than off cattle, though occasionally *R. sanguineus* also occurs on bovines and buck. Throughout the areas under consideration *sanguineus* shews a remarkable range of morphological variations, specimens, more especially from the drier areas, being most atypical in their punctuation pattern and their chitinization.

R. ayrei (Map II) seems to be an East African tick. It has been recorded from the North Eastern corner of Northern Rhodesia and the adjoining Haut Katanga, otherwise it is also found in Northern Moçambique, Nyasaland, Tanganyika, Uganda and Kenya. The record from Coquilhatville seems to be very isolated, but the few records from the Ruanda-Urundi will in all probability fit into the general East African distribution picture, when more detailed collections have been made.

Uroboophilus fallax (Map III). The East African *U. fallax*, introduced into South Africa and Southern Rhodesia, after the 1896 rinderpest outbreak, has not been found in the Congo thus far. It is present in the North Eastern corner of Northern Rhodesia, in Nyasaland and Tanganyika. *B. congolensis* described from Brazzaville and parts of Afrique Equatoriale Française has been found at Coquilhatville in cattle ex A.E.F.

Rhipicephalus kochi (Map III) (syn. *jeannelli*) seems to be restricted to the East African Highlands of Ruanda-Urundi and the adjoining Kenya and possibly Uganda. When present it often appears in great numbers.

E. evertsi and *R. evertsi mimetica* (Map III). In South Africa the subspecies *mimetica* has been found only in the very dry regions of South West Africa, and *R. evertsi* is found in all areas, except the drier regions, dying out at 10—15" annual rainfall. In the regions under consideration *R. evertsi* is not as abundant as could be expected, although it appears to be able to maintain itself in all the main types of vegetation, except possibly the uncleared tropical rain forests. *R. evertsi mimetica* whose distribution in South Africa does not overlap that of the *R. evertsi evertsi*, here occurs together with it in the Southern Congo Savannah vegetation of Northern Angola and the Western Bas Congo as also in parts of the Ubangu Savannah adjoining the Anglo-Egyptian Sudan, areas of lesser rainfall though not nearly as arid as South West Africa.

R. simus (Map III) whose immature stages feed on field mice and rats and whose adults feed on larger mammals, is never found in large numbers on domestic stock. It is apparently universally distributed over the continent. It occurs in hot moist regions as well as in dry and in cold areas.

The Amblyommas.

A. variegatum (Map I) would appear to be most prevalent in the Eastern Congo; it appears throughout the Rhodesian Highlands of North Eastern Northern Rhodesia and of the Haut Katanga, as also throughout the Southern Congo Savannah, the East African Highlands, with an apparent absence in the Rutshuru plains, it is present in the Sudanese-Ubangi Savannah.

In the west it is replaced by *A. pomposum* (Map I) in the Rhodesian Highlands of Angola. *A. pomposum* also occurs associated with *variegatum* in North Eastern N. Rhodesia and the adjoining Haut Katanga. In the Bas Congo and adjoining French Equatorial Africa it may be associated with or replaced by *A. splendidum*, *A. splendidum* reaching into the Lower Guinea forest in the Congo-Ubangi. There are also a few further odd records for *A. splendidum* in the Kasai, Bas Katanga and Haut Ituri, all areas with a rainfall above 30" per annum.

Amblyomma astrion and *A. cohaerens* (Map I). A certain amount of confusion exists as to the identification of these two species. We are inclined to think that further work on larger collections will show the two to be synonymous. It would seem that *A. astrion* is confined to the drier regions of the West (except the Coquilhatville Record) and *A. cohaerens* to the Eastern Highland areas.

Amblyomma hebraeum has been incorrectly recorded from the Congo. It does not occur in more recent collections, older records may represent the occurrence of *A. cohaerens* which can easily be mistaken for *A. hebraeum*.

The Hyalommas.

Most areas of the Belgian Congo are much too humid for the xerophylic Hyalommas. *H. transiens* (Map I) is abundant in the Rhodesian Highland vegetation of Angola, and Northern Rhodesia, and begins to die out in the Haut Katanga. Except for a few odd records it is absent from the Southern Congo Savannah, it is entirely absent from the Eastern Highlands and Eastern Ubangi Savannah. Both *H. transiens* and *H. rufipes* occur again in the Ubangi-Shari of the French Congo where they are associated with *H. impressum*, the West African form. [*H. transiens* includes the form *albiparmatum*].

The Argassids.

O. moubata. The distribution of this tampan has been plotted, from past literature, by Leeson. The few records in the tick survey fall within Leeson's distribution. The newer records from Angola shew it as reaching slightly further south than indicated by Leeson.

O. savignyi. As this tick is a rapid feeder and as it does not infest cattle corrals or native huts, it does not often feature in collections, also since it has been frequently identified as *O. moubata*, it will probably be some time before we have sufficient locality data to enable us to give its distribution. It is prevalent in parts of South West Africa and Bechuanaland, and one might expect it to follow the dry coastal strip into Angola; however, as yet it has not been recorded from Angola at all; it crops up, however, in the rather wetter Cabinda, at Landana. Its Congo records are vague. Hoogstraal records it from the Anglo-Egyptian Sudan, so that it could also be expected in the more arid regions of French Equatorial Africa. The older records i.e. Jack 1931, for Rhodesia, Lounsbury 1899, for Moçambique, appear to be inaccurate, for the

tick has not been found again by more recent collectors. The vague Congo references may be for the Bas Congo or possibly for some of the drier eastern areas adjoining Tanganyika or the northern areas next to the Anglo-Egyptian Sudan, although the rainfall in the two latter areas would appear to be too high for *O. savignyi*. Further collections need to be made and collated to give the humidity-aridity preferences of this tampan. It is a dry area tick, but how dry we do not yet know.

Host-specific ticks: *A. vesperilionis* off bats, *Amblyomma cuneatum* off pangolins, *A. rhinocerotis* off Rhinoceros, *A. tholloni* off elephants, *Aponomma exornatum* off Varanids, *A. latum* off snakes, *Dermacentor circumguttatus* off elephant, *D. rhinocerotis* off Rhinoceros, *Rhipicephalus simpsoni* off *Thryonomys swinderianus* would appear to be able to maintain themselves in all areas in which their hosts occur.

Of the lesser known ticks it is at present not yet possible even to indicate their preferences.

SUMMARY.

I. The ticks from the Belgian Congo have been listed, and the commoner species plotted on a vegetation map.

II. An attempt has been made to analyse the distribution of the commoner species which play an economic rôle in the Belgian Congo.

ILLUSTRATIONS.

MAP I.

Distribution of *Amblyomma variegatum*, *A. splendidum*, *A. pomposum*, *A. cohaerens*, *A. astrion* and *Hyalomma transiens*.

MAP II.

Distribution of *Rhipicephalus appendiculatus*, *R. ayrei*, *R. sanguineus*, *R. capensis*, *Haemaphysalis leachi* and *Boophilus decoloratus*.

MAP III.

Distribution of *Boophilus congolensis*, *B. fallax*, *Rhipicephalus pravus*, *R. kochi*, *R. evertsi*, *R. evertsi mimeticus* and *R. simus*.







