

ZOOLOGICAL SURVEY OF THE UNION OF SOUTH AFRICA.
TICK SURVEY: PART VII.—DISTRIBUTION OF *HAEMAPHYSALIS LEACHI*,
THE YELLOW DOG TICK.

GERTRUD THEILER AND BRITHA N. ROBINSON,
Onderstepoort Laboratory.

General Distribution.

Both adults and immature stages of *Haemaphysalis leachi* feed on dogs.

Haemaphysalis leachi occurs consistently throughout the eastern districts of the Transvaal, through into Portuguese East Africa, from where it extends southwards through Swaziland, Zululand, and down through the Eastern Province, along the coastline as far as the Alexandria district. It is fairly plentiful in the Worcester, Swellendam, Cape Town and Malmesbury areas.

In the Transvaal it may be considered absent from the Rustenburg, Marico and Lichtenburg districts as well as the western districts of the Potchefstroom area and is scarce in the more arid parts of the central and northern Transvaal.

Records of *H. leachi* in the Orange Free State, Basutoland, Karroo and the Cape Plateau are scarce, it is absent from the western and north western Cape Province, as also from South West Africa.

Distribution in the Vegetational Types.

I. Forest.

(a) *H. leachi* is present in the *evergreen deciduous bush* and *sub-tropical forest* fringing the East Coast from the Alexandria district northwards into Portuguese East Africa.

(b) Absent from the *temperate evergreen forest* at the *George-Knysna-Zitzikama* area and from the small isolated areas east of the Escarpment, but is present in the Katberg-Amatola range.

(c) In the *evergreen sclerophyllous bush* of the Cape Peninsula it is fairly plentiful, but it is absent from the areas south of the Langeberg-Outeniqua ranges as well as from the Western Province vegetation of the Groot Zwarte Berg.

II. Parkland.

(a) Scarce in the *sub-tropical evergreen* and *deciduous tree and thorn forest* which is found in the Transvaal north of the Zoutpansberg; the lowveld, Southern Rhodesia, Portuguese East Africa and extends southwards as a narrow strip that terminates in Zululand.

(b) *Sub-tropical evergreen and deciduous tree and thorn forest.* Here *leachi* is fairly plentiful in the wetter areas with a tendency to die out eastwards in the more arid areas.

(c) Conditions in the *thorn country* or "*mak bosveld*" or the portion of the Transvaal west of the *Bankenveld* and Limpopo Highlands, Bechuanaland and the Mafeking and Vryburg areas, are apparently unsuitable for *H. leachi*, as it is consistently absent from these parts.

III. *Grassland.*

(a) *H. leachi* is most prevalent in the *tall grasslands* to the east of the Drakensberg, extending from Barberton in the Eastern Transvaal southwards as far as Port Elizabeth.

(b) In the *short grasslands* or *highveld* extending from the Sabie area of the Transvaal southwards through the Eastern Free State and Basutoland to Wodehouse and Barkly East, *H. leachi* is absent though it crops up on isolated farms in the area. This is also the case in the *mixed grassveld* of the Southern Transvaal and of the Central and Northern Orange Free State.

IV. *Desert Shrub.*

The vegetation map shows *H. leachi* to be mainly absent from all three types of *desert shrub*. The so-called *Karoo veld* may be a pure stand of scrub or it may be an intermingling of *scrub and grass* in some areas; the amount of grass present may be determined by rainfall or grazing practices. There is a tendency for *H. leachi* to maintain itself where grass is present.

Influence of Temperature and Altitude.

The degree to which altitude and temperature influence the distribution of *H. leachi* is difficult to gauge. Records of the presence of *H. leachi* in the low-lying coastal belt as well as in the highveld of the Limpopo Highlands indicate that altitude plays little or no part as a limiting factor. Temperature in conjunction with rainfall on the other hand may play a considerable rôle. Records show that *H. leachi* cannot maintain itself in areas with an annual period of frost exceeding 120 days, and it is scarce in areas with more than 60 days of frost per annum. However, in areas where there are less than 60 days of frost per annum *H. leachi* is plentiful.

Influence of Rainfall.

It would seem that rainfall and ground-humidity are the chief factors limiting the distribution of *H. leachi*. Areas with a high rainfall, i.e. 25 inches and over, are apparently favourable and show a dense tick population. In areas with an annual rainfall from 20 inches to 25 inches *H. leachi* occurs in fewer numbers; but in areas such as the Western and North-Western Cape Province, the Karroo, Central and North-Western Orange Free State, Western Transvaal and South West Africa, where the rainfall is less than 20 inches it is entirely absent.

The absence of *H. leachi* from George-Knysna-Zitzikama, where climatic conditions appear to be favourable to its maintenance, is difficult to explain. It may, however, be attributed to inadequate collections sent in from this area.

The general distribution picture of *H. leachi* is confused as there are numerous records of the tick from areas where its presence is not expected and in areas

where *H. leachi* is plentiful there are many blanks. These blanks may, however, be explained by the fact that on these farms the dogs are kept clean of ticks.

The presence of *H. leachi* in otherwise tick-free areas may be due to suitable climatic conditions on the specific farms, so that ticks introduced to the farms on animals have managed to maintain themselves. Careful checking over of Government Veterinary Officer reports indicates that this may be so, as many of these farms are reported to be "river farms", where the increased ground humidity may create favourable conditions for *H. leachi*.

Influence of Wild Life.

The zoological survey records go to show that *H. leachi sensu strictu* is confined to dogs, and but occasionally on domestic cats. The small wild carnivores are infested by a smaller, plumper variety, which has provisionally been identified as *H. leachi var. indica*. As yet the immature forms of the variety have not been bred under laboratory conditions, so that we are not in a position to state categorically that the immature stages of *H. leachi* do not feed on wild carnivores. The main evidence is against them doing so, for the wild carnivores and their tick variety, are present throughout South Africa extending even into the more arid areas, whereas the distribution of *H. leachi* does not follow that of the ubiquitous dog.

Area 1, G.V.O. Johannesburg.

Present in *middleveld grasslands* of Krugersdorp, Vereeniging and Heidelberg; absent from the *highveld* and *middleveld* of the rest of the district.

Area 2, G.V.O. Potchefstroom.

Present in *middleveld* of Klerksdorp, Potchefstroom, Ventersdorp and two *middleveld farms* in Wolmaransstad district. Absent from *middleveld* and *thornveld* of the rest of the area.

Area 3, G.V.O. Mafeking.

No records of *H. leachi* received from area 3.

Area 4, G.V.O. Potgietersrust.

Present in "*makbosveld*" of Potgietersrust and Waterberg districts, absent from *Bankenveld* of the rest of the district.

Area 5, G.V.O. Pietersburg.

Present in *bankenveld*, "*makbosveld*", *sub-tropical evergreen and deciduous tree and thorn forest* of Pietersburg and Letaba districts. Absent from *thorn country* of North-Western Pietersburg district.

Area 6, G.V.O. Zoutpansberg.

Solidly present in *evergreen deciduous tree and bush* of central and eastern portions of the district. Absent from western *sub-tropical evergreen and deciduous tree and thorn forest* portion.

DISTRIBUTION OF HAEMAPHYSALIS LEACHI.

Area 7, G.V.O. Barberton.

Consistently present throughout the district.

Area 8, G.V.O. Piet Retief.

Present on *grassveld* of Wakkerstroom and Piet Retief, scarce on western *highveld* of Wakkerstroom.

Area 9, G.V.O. Lydenburg.

Present on *lowveld of Pilgrims Rest*, Lydenburg and *highveld* of Belfast. Absent from the rest of the area and consistently absent from the Middelburg district.

Area 10, G.V.O. Ermelo.

Present in the *short grassland* of Carolina and Ermelo and *tall grassland* bordering on Swaziland. Absent from the *mixed grasslands* of the western portions of Bethal and Standerton.

Area 11, G.V.O. Pretoria.

Present in *middleveld* of Pretoria and Witbank districts, south of the Magaliesberg; the northern portions are *evergreen* and *deciduous tree and bush* of the *Bankenveld* and appear to be free of *leachi*.

Area 12, G.V.O. Rustenburg.

Present in mixed grassland of the southern borders of the district; also in southern band of *evergreen and deciduous tree and bush*. The central and northern parts of the area consist almost entirely of "*dry bushveld*" from which *leachi* appears to be consistently absent.

Area 14, G.V.O. Vryheid.

Mainly *tall grasslands*; rising in Paulpietersburg to true *highveld*, *H. leachi* is recorded to be consistently present throughout the entire area.

Area 15, G.V.O. Dundee.

The area is situated in the *tall grasslands* of the "*middleveld*" rising to true *highveld* in Utrecht and north and east Newcastle. *H. leachi* is present throughout the area

Area 16, G.V.O. Ladysmith.

The area is mainly *tall grassland* where *H. leachi* is consistently present. *H. leachi* is apparently absent from the "*mixed grassveld*" of the north eastern part of the Bergville district.

Area 17, G.V.O. Estcourt.

Is situated mainly in *tall grass*, with *H. leachi* present throughout.

Area 18, G.V.O. Pietermaritzburg.

This area ranges from the *tall grasslands* of the "middleveld" to the "highveld" in Impendhle. Presence of *H. leachi* is recorded from selected farms in Maritzburg, Camperdown and Richmond districts; no reports were received from Impendhle district.

Area 19, G.V.O. Greytown.

H. leachi is prevalent in *thornveld and grassland* of New Hanover and Southern portion of Umvoti district, absent from Msinga, Kranskop and northern Umvoti districts. This apparent absence of *H. leachi* from Msinga, Kranskop and Umvoti may be due to the inadequate collection sent in.

Area 20, G.V.O. Ixopo.

Vegetation ranges from *tall grassland* of the Ixopo "middleveld" to higher "middleveld" of Polela and true *highveld* of Himeville. *H. leachi's* presence recorded throughout the area, though it is less prevalent on higher levels of Underberg and Polela districts.

Area 21, G.V.O. Port Shepstone.

H. leachi is present in the coastal and in the sugar-cane belts as well as in the open *tall grasslands* of the "middleveld".

Area 22, G.V.O. Eshowe.

H. leachi is present throughout the area, the vegetation of which ranges from *coastal evergreen and deciduous bush and sub-tropical forest* to true *lowveld*.

Area 23, G.V.O. Nongoma.

The area lies mainly in *sub-tropical evergreen and deciduous tree and thorn forest* from which *H. leachi* appears to be entirely absent. *H. leachi* is again present in the *tall grasslands* of the western part of the area as well as in the narrow strip of *sub-tropical forest* along the coast.

Area 24, G.V.O. Durban.

Present in narrow coastal strip of *sub-tropical forest* as well as in *tall grasslands* to the west of the area. No records of *H. leachi* sent in for Inanda district; its apparent absence may be due to unsatisfactory collections.

Areas 26, 27 and 28, G.V.O. Umtata.

H. leachi present throughout the area, the vegetation of which consists of *coastal belt of sub-tropical forest, grassy plains of "low and middleveld" tall grassland*, as well as *tall grasslands* of Butterworth area, where tick life is abundant.

Area 29, G.V.O. Flagstaff.

H. leachi recorded from most farms in the area. Vegetation ranges from *tall open grasslands and grasslands with scrub and thornbush* to *sub-tropical forest* in the coastal strip.

DISTRIBUTION OF HAEMAPHYSALIS LEACHI.

Area 30, G.V.O. Kokstad.

Present on most farms in the area, which lies above 3,500 ft. with open *tall grassveld* of the "middleveld" rising to "highveld".

Area 31, G.V.O. Aliwal North.

Vegetation mainly *Highveld* with *Karoo-veld* in Venterstad; in the western portions of Albert and Molteno *H. leachi* is recorded from only one farm in the area i.e. a farm in Aliwal North district bounded on the North by the Orange River.

Area 32, G.V.O. Queenstown.

Area lies mostly above 3,500 ft., the vegetation varying from *tall grassveld* of Cathcart to *Highveld* of the Stormberg and *Karoo* areas of the Tarkastad district. *H. leachi* absent from the area, except for one farm in the Queenstown district, and also three farms in Elliot district. (No explanation for their presence.)

Area 33, G.V.O. East London.

Vegetation is a narrow coastal band of *evergreen and deciduous bush, subtropical forest* and also *tall grassland*. *H. leachi* is absent from the district except on one farm in the East London district, which has a high rainfall, and one farm in the Kingwilliamstown district, which is a river farm with grass and thorn veld. Possibly dipped out in this area.

Area 35, G.V.O. Worcester.

Mainly "*Western Province vegetation*" in Caledon, Worcester, Robertson and Montagu districts, Laingsburg and West Montagu *Karoo* proper, as well as inclusion of *Karoo* into Worcester and Robertson. The distribution of *H. leachi* is confused due to variability of rainfall and vegetation types. Many of the farms with *Karoo type vegetation* are river farms under irrigation; this may explain the presence of *H. leachi* in areas where it would normally be expected to be absent.

Area 36, G.V.O. Swellendam.

"*Western Province vegetation*" with open "*sourveld*" and bush covered hills, one or two incursions of *Karoo*. Winter rainfall. *H. leachi* is present along the coastal region and is evenly distributed throughout the area, though absent from farms with *Karoo* and *semi-Karoo* vegetation.

Area 37, G.V.O. Oudtshoorn.

Vegetation varies. Coastal strip of *temperate evergreen forest* followed by a band of "*Western Province vegetation*" and beyond the Langeberg and Outeniqua range a strip of *Karoo veld*, bordered on the north by "*Western Province vegetation*" of Swartberg range. *H. leachi* is present on all farms in the coastal strip and "*Western Province vegetation*" but is generally absent from *Karoo* farms except, as in Oudtshoorn district, where extensive irrigation takes place.

Area 38, G.V.O. De Aar.

Vegetation *Karoo veld*. *H. leachi* is very scarce because of dry arid *Karoo* conditions, but is recorded from three farms with river veld or vleis, in the Philipstown district.

Area 39, G.V.O. Port Elizabeth.

In this area there is a general meeting and intermingling of *tall grassveld*, *Karoo veld* and "*Western Province vegetation*". *H. leachi* is present in the evergreen *sclerophyllous bush* of the Humansdorp district as well as the *tall grassveld* of the eastern part of Uitenhage district, but is absent from the *Karoo veld* of Jansenville, Steytlerville and Uitenhage.

Area 40, G.V.O. Grahamstown.

Mainly *tall grassland* with a narrow coastal strip of *sub-tropical forest*. Numerous rivers break up the area and reach far back into the surrounding mountainous regions. *H. leachi* is present in the coastal belt as well as inland, where the *tall grassland* is well watered by the numerous rivers.

Area 41, G.V.O. Middelburg.

Entire district is *Karoo veld* from which *H. leachi* could be expected to be absent. However, this is not the case and *H. leachi* is found in various parts. This may be due to introduction and *H. leachi* maintains itself in favourable conditions e.g. irrigation, etc.

Area 42, G.V.O. Calvinia.

Vegetation consists mainly of *Karoo veld* with *evergreen sclerophyllous bush* in western half of Ceres district and *desert succulents* and *desert grass* in the north western corner of Calvinia. *H. leachi* is reported from four farms in various parts of the area, all with *Karoo* type vegetation and with a low rainfall. A certain amount of annual trekking has taken place in these areas until recently.

Area 43, G.V.O. Beaufort West.

Karoo veld. *H. leachi* recorded from two farms in the Carnarvon district and is present on all farms in Murraysburg district as well as Eastern Beaufort West district; absent from the rest of the area.

Area 44, Gordonia-Kenhardt.

Entire area *Karoo veld* and *desert scrub*. *H. leachi* absent except for one specimen on a farm on the South West Africa border, possibly introduced from another area, and has managed to maintain itself.

Area 45, G.V.O. Cape Town.

"*Western Province vegetation*". *H. leachi* was sent in from some areas with 14-17 inches rainfall. Conditions appear to be fairly favourable in areas with vleis and rivers.

DISTRIBUTION OF HAEMAPHYSALIS LEACHI.

Area 46, G.V.O. Malmesbury.

Low rainfall, "scrub vegetation". *H. leachi* absent from the area. This absence may be explained by the rather poor conditions and by the intensive farming carried out in the district.

Area 47, G.V.O. Bedford.

The area lies partly in the *tall grass* area, rising to the highlands of the Winterberg to the north and merging into *Karoo veld* to the west. *H. leachi* is absent from *Karoo veld* of Pearston (except for one *grassveld* farm in the district) and *tall grassveld* of Bedford, Somerset East, Adelaide and Fort Beaufort, but is present on all farms in the *Karoo veld* of Cradock.

Area 49, G.V.O. Bethlehem.

Area lies entirely in *short grassland*. Presence of *H. leachi* is recorded from most farms in the area, appears to be entirely absent from the Ladybrand district.

Area 50, G.V.O. Kroonstad.

Vegetation mainly *mixed grasslands* of *Middleveld* with a strip of *short highveld grassland* to the east and a narrow strip of "*Bushveld*" along the western boundary of Bothaville. *H. leachi* appears to be absent from the whole of the area except on two farms near the northern borders of Winburg and Ventersburg districts.

Area 51, G.V.O. Kimberley.

Mainly *Karoo veld* in the districts of Phillipolis, Fauresmith, Jakobsdal, Hay and Herbert. Barkly West and Kimberley fall mainly into "*Bushveld*". *H. leachi* absent from the area except for one farm in the *Bushveld* area of Barkly West with a rainfall of 17 inches and one farm in the "*Brokenveld*" Fauresmith district with a rainfall of 15 inches.

Area 52, G.V.O. Bloemfontein.

Mainly *short grassveld* in the districts Wepener, Zastron, Rouxville, Smithfield and Thabanchu. Northern half of Bloemfontein district is *mixed grassveld* and southern Bloemfontein district and districts Edenburg, Reddersburg and Trompsburg and Bethulie are mainly *semi Karoo*. *H. leachi* is present in all parts of Bloemfontein district as well as *short grassveld* of Edenburg and Bethulie, but is absent from the rest of the area.

Area 53, G.V.O. Hoopstad.

Area for the most part *mixed grassveld* of the *middleveld* with a small corner of Brandfort in the *highveld* and a strip on the western side of Boshof in "*bushveld*". *H. leachi* is absent from the entire area, except for one farm in the Brandfort district with a rainfall of 20 inches p.a.

Area 54, G.V.O. Vryburg.

Area is entirely *thorn country* and *thorn country and desert scrub*; low rainfall. *H. leachi* is recorded from one farm in the Kuruman district; it is absent from the rest of the area.

Area 55, G.V.O. Namaqualand.

Very low rainfall area 3-5 inches p.a. Vegetation *desert succulents*, scrub and grass. *H. leachi* absent from the area.

Area 57, G.V.O. Graaff-Reinet.

Rainfall under 12 inches p.a. Vegetation mainly *Karoo veld*. *H. leachi* recorded from one farm in the Aberdeen district but is absent from the rest of the area.

Area 58, G.V.O. van Rhynsdorp.

Area mainly in *desert scrub* with south eastern corner in the *short grasslands*. Rainfall 5-6 inches p.a. *H. leachi* absent.

Area 59, G.V.O. Clanwilliam.

Area mainly *short grassveld*, rainfall 5-6 inches p.a. *H. leachi* present on all farms in the area.

Portuguese East Africa.

Vegetation consists of a coastal strip of *evergreen and deciduous bush* and *sub-tropical forest*, followed by *sub-tropical evergreen* and *deciduous tree* and *thorn forest* to the interior. *H. leachi* is abundant in the southern portion of the area but is absent from the rest of the area, except in the north western corner.

Swaziland.

Vegetation ranges from dry "lowveld" (rainfall 15-20 inches) in the west to *tall grasslands* of the mountainous eastern portion (rainfall up to 55 inches). *H. leachi* is present throughout the area.

Summary.

1. The distribution of *Haemaphysalis leachi* is given in terms of political divisions as well as in terms of vegetational coverage.

2. The factor playing the most important rôle in limiting the spread of *H. leachi* appears to be increasing aridity; the critical level appears to be at 20 inches rainfall, irrespective of the type of vegetation.

3. The annual duration of frost apparently also plays a rôle, it does not occur in areas with over 60 days of heavy frost per annum.

4. It is generally absent from *Karoo veld* but appears to be able to maintain itself precariously where the *Karoo veld* also contains *grasses*.

5. Careful handdressing of dogs appears to control the tick.

6. Small carnivores appear to play no rôle in the distribution of *H. leachi sensu strictu*, in that they are parasitized by a variety of *H. leachi* and not by *H. leachi sensu strictu*.

