

Zoological Survey of the Union of South Africa. Tick Survey.—Part V. Distribution of *Rhipicephalus evertsi*, the Red Tick.

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General Distribution.

Rhipicephalus evertsi is present throughout the Transvaal, Swaziland, Natal, the Native Territories, the eastern portion of the Eastern Province, the northern Orange Free State, along the southern coastal strips of the south west Cape, and the Western Province stretching up to Van Rhyns dorp.

It is absent, except for odd records, from the Karrooveld of the Central Cape, from Bushmanland, Namaqualand and South-West Africa.

It is present in the southern areas of Portuguese East Africa, Southern Rhodesia, and in Eastern Bechuanaland bordering on the Transvaal but dies out westwards in the Kalahari desert. It seems to be but insecurely established in the mixed grass and Karrooveld of the Eastern Province and of the southern Orange Free State. In South West Africa and in the more arid parts of Bechuanaland its place is taken by the drought-resistant *R. evertsi* var *mimetica*.

Distribution in the Vegetational Types.

The Vegetation map shews *R. evertsi* to be present:—

- (1) In all three types of *forest*.
- (2) In all three types of *Parklands*, dying out, however, in the dry Bushveld of Bechuanaland.
- (3) In all three types of *grass lands*, though apparently maintaining itself with difficulty in the short grass of the Barkly East Area.

The vegetation map shews *R. evertsi* to be absent:—

- (1) From all three types of *Desert shrub*.

It seems, however, to be able to maintain itself in the *thorn country and desert shrub* in the Kuruman district, as well as on certain farms in the Karrooveld having karroo scrub mixed with grass, stretching from Steytlerville, Graaff Reinet, Middelburg, Phillipolis to Jacobsdal, with a few outliers in the Herbert and in the Hay districts. The stock inspector for Namaqualand reports that *R. evertsi* has only recently become established in the Coastal Sandveld in the Wallekraal and Kamaggas area.

The Influence of Dipping.

Dipping in no way disturbs the distribution picture. According to the records, dipping in itself, no matter how conscientiously carried out, does not eradicate this species. The immature stages live well down inside the ear, and the adults most frequently under the tail above the anus—both regions are liable to escape wetting during dipping operations, both regions need to be hand-dressed. It is interesting to note that its numbers have been considerably reduced on the farm 4.A.3—a farm in the Potgietersrust area on which both *R. appendiculatus* and *B. decoloratus* have been completely eradicated by conscientious dipping.

The Influence of Temperature and of Altitude.

Altitude and low temperature in themselves are not limiting factors to the distribution of *R. evertsi*, it is as prevalent in the Highveld of Belfast (though but precariously established in Barkly East) as it is in Natal.

The influence of Rainfall.—The influence of Seasonal Variations in Relative Humidity and/or Aridity.

Increasing aridity—expressed as rainfall—seems to be the factor limiting the distribution of *R. evertsi*; the critical rainfall lying between 10"-15" per year.

In how far the type of vegetative coverage exerts any influence is difficult to establish; in the dry grass land areas along the Limpopo the tick tolerates a 10" rainfall per year, whereas in other regions e.g., Aberdeen, Hofmeyer, Colesberg it is absent at a 12" rainfall i.e., areas having a mixed grass and Karroo scrub cover. The explanation in these Karroo areas may not be so much the difference in the plant growth, but may be the prolonged drought which prevailed the year before the majority of the collections were made.

R. evertsi appears to shew no seasonal variations in its activities. It is a two host tick and hence is exposed to climatic hazards only at two periods of its life history, namely, at the egg-young larva stage and at the nymph-adult ecdysis; the assumption hence is that the unfed larva is as tolerant of climatic changes as is the unfed adult.

Disease.

R. evertsi is capable of transmitting East Coast Fever, caused by *Theileria parva*; Pseudo East Coast Fever caused by *T. mutans*; Redwater caused by *Piroplasma bigeminum* in cattle; Biliary Fever in horses caused by *Nuttallia equi*; Spirochaetosis in various domestic stock caused by *Treponema theileri*.

Remarks on the separate Government Veterinary Officer Control Areas.

These remarks must be read in conjunction with maps 1 and 2 of Part I, and with Map I of this article.

Since *R. evertsi* is so consistently either present or absent it is not worth while discussing each G.V.O. area separately, but only to analyse in detail those areas in which it appears to be precariously established.

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

R. evertsi is absent from most farms labelled as *Karooveld* or *Karoo mixed with grass*. In the *Highveld short grass* areas, it was collected on most farms. Its absence from two farms in the Wodehouse and two in the Barkly East district may be more apparent than real in that only one collection was sent in from each of these areas. The officer in charge of the collecting, states for Barkly East that ticks are more plentiful on stock in the winter time.

Area 32, G.V.O., Queenstown.

Present throughout, but shews a tendency to be absent at certain times, being most consistently present during the April-June collecting period. Whether this winter activity is more apparent than real needs to be investigated.

Area 37, G.V.O., Oudtshoorn.

In these areas the records tend to shew a period of inactivity during the July-September interval; but as in 32 this statement needs to be controlled.

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

Absent throughout the Karroo scrub farms, but tends to crop up in the Phillipstown area, where apparently grass is becoming re-established. Here it is, however, not consistently present; thus the 1938 collections shewed no *R. evertsi* at all, collections sent in subsequently shewed the tick to be present at odd months in different years. This unquestionably shews the tick to be but precariously established.

Area 41, G.V.O., Middelburg.

The distribution picture for this area is somewhat confused. The confusion can in all probability be ascribed to the rather poor collection sent in, only once from most farms, and possibly also to the fact that during the preceding year there had been a severe drought. Many of the farms are described as mixed vegetation, *Karoo scrub and grass*, and all have an average rainfall of 12" or over. In normal years, in all probability, *R. evertsi* could be recovered from most farms in the eastern parts of the collecting area, but in all probability it will be found to be absent from the pure *Karoo* veld of Hanover, Middelburg, Richmond and Colesberg.

Area 42, G.V.O., Calvinia.

R. evertsi is absent throughout the *Karooveld*, most areas having a rainfall well below 10" per annum. It is present in the western areas with a *Western Province flora* and a rainfall above 15". The record at D.3. Elandsvlei, undoubtedly, represents a recent introduction by trekking sheep, for it occurs in but one collection. The three collecting areas B.1, 2 and 3 are given on the Map as *Karooveld*, whereas in actuality this Nieuwoudt region is very much a transition from a *Western Province* to a *Karoo flora*. Whether the tick is established or not is difficult to say, it occurs in all three collections made, but these farms lie in regions where trekking is almost continuous, the rainfall is given as 4"-8". In no other regions of S. Africa is *R. evertsi* able to maintain itself at so low a rainfall, so that one can but conclude that the records represent introductions and repeated replacements from the adjoining *Western Province Areas*.

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

The tick is absent throughout these *Karoo regions*, registering but 3"-15" of rain per year. It is recorded once on two farms situated on the Beaufort West flats and once from Die Vlakte in Carnarvon. These records can be looked upon as recent introductions and in all probability the tick will not be able to maintain itself.

Area 51, G.V.O., Kimberley.

As in 41 the distribution picture is somewhat disturbed partly due to the fact that the collections were not always adequate, but, in this instance, also partly due to the fact that many farms lie in areas approaching the critical 10"-12" per year e.g., Hay and Herbert districts. In the Orange Free State districts of Phillipolis, Fauresmith and Jacobsdal it is established but apparently somewhat insecurely. One must, however, remember that, though there is an average annual rainfall of well over 10" in these areas, they are subject to periodic droughts of long duration.

Area 52, G.V.O., Bloemfontein.

Present throughout the *grassveld* with a rainfall of 15"-22", absent from the *Karooveld* of Bethulie and Trompsburg with an average rainfall of 15".

Area 55, G.V.O., Namaqualand.

Absent throughout, with a rainfall 3-7". On the two farms B.3 and B.4 in the Sandveld of Wallekraal and Kamaggas the tick has unexpectedly become established and is maintaining itself, having been sent in in three successive collections. According to the official collector it is of quite recent introduction, being otherwise quite unknown in Namaqualand.

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

Absent in the *Karooveld* of Aberdeen and of Willowmore, present in the *mixed grass and Karoo scrub* of Graaff Reinet.

Area 58, Van Rhyns Dorp.

Absent in the northern *Karoo Areas* with a rainfall of 4-5", present in the *Western Province flora*, mostly with a rainfall above 10".

SUMMARY.

1. The distribution of *R. evertsi* is given in terms of political Divisions, as well as in terms of Vegetational coverage.
2. *R. evertsi* is seen to be present in all *forest, parkland and grass land* areas with a rainfall above 10". It is absent from all *Karoo* areas below 10"; it appears to maintain a precarious footing in *mixed Karoo scrub and grass* areas with a rainfall between 10-15".
3. It shews no essential periodicity in its activities.
4. It is not controlled by dipping alone; handdressing with dipping is essential for its suppression.

UNION OF SOUTH AFRICA

Provincial Boundaries
District Veterinary Officers' Boundaries

RAINFALL



- Under 3 inches
- 3 inches to 10 inches
- 10 inches to 15 inches
- 15 inches to 20 inches
- 20 inches to 25 inches
- 25 inches to 30 inches
- 30 inches and over

R. rivers:
Present
Absent

