NOTES ON THE ECOLOGY OF DERMACENTOR ANDERSONI IN SOUTHERN ALBERTA

by George P. Holland*

During the period April 24 to July 31, 1938, in connection with the Rodent Plague and Rocky Mountain Spotted Fever Survey in Southern Alberta, considerable time was spent in the mass collecting of the tick **Dermacentor andersoni** Stiles. As a number of cases of Spotted Fever have come to the attention of medical men in Alberta during the past few years, the study of **D. andersoni,** which is the vector of this and other diseases, is a problem of no small importance. In the course of the season's work, notes were, therefore, accumulated on the habits and distribution of this important species.

Distribution:

To those who are familiar with ticks in the hilly regions of interior British Columbia, the southern Alberta prairie does not seem the ideal habitat for a tick population. Nevertheless, they were found to be widespread and extremely plentiful in some localities.

At the present time **D. andersoni** is known to occur from the southern border of Alberta, across the breadth of the province, and north at least to Red Deer (about 52° 15′ N. Lat.). The general opinion throughout the tick-infested areas seems to be that they are becoming increasingly abundant, and that they are progressing gradually northward. Ranchers and doctors around Hanna and Stanmore state that they did not know the wood-tick until during the last few years.

During the course of the survey a strip of country from Waterton Lakes in the west to the Cypress Hills in the east, and from Lethbridge and Medicine Hat, southward to the border was checked for the presence of ticks. Waterton Lakes National Park was found to be virtually tick-free (June 20th-29th). However, according to local residents this place is badly infested earlier in the spring, and the ticks at that time are a great nuisance. There is a great variety of natural hosts for young and adult stages,—marmots, rabbits, ground-squirrels (four species), chipmunks, tree squirrels, mice and weasels, as well as larger animals,—deer, bears, mountain-sheep and so on.

Very few ticks were found in the foothill regions, and as far east as Cardston, although there is no lack of hosts. Ranchers in the Cardston area are unfamiliar with the true ticks—knowing only the sheep ticks, or keds (Hippoboscidae). Careful checking of sheep, cattle and horses revealed no **D. andersoni,** and only very few were secured by dragging.

However, the short grass prairie from Milk River to Manyberries was found to be heavily infested, and the bulk of the season's collecting was done in this region—the south-east corner of Alberta.

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Hosts: Ticks here are fairly plentifully provided with quantity if not variety of hosts. Richardson's Ground Squirrel, **Citellus richardsoni** (Sabine), (the so-called Prairie Gopher) and the White-tailed Jack-rabbit, **Lepus townsendi campanius** Hollister, are fairly abundant and are probably the more important hosts for the larval and nymphal stages. The rabbits, in addition, pick up the adult ticks, as also must the native Pronghorn Antelope, **Antilocapra americana americana** (Ord), which is still fairly common in this part of the country. However, domestic sheep, cattle and horses are more important hosts of the adult stage.

Habitat and Ecology Notes:

While ticks were found sometimes in fair numbers on the open rangelands, the greatest quantity was secured in the vicinity of water. The old river-beds or coulees, which traverse the south country were nearly all infested to a greater or lesser degree. Shallow coulees did not yield so many ticks as did those with more steeply sloping sides, and the most ideal localities were not the wide bottomlands of these old river-beds, but the smaller, deeper draws which were tributary to the main coulee. In such places, ticks would generally be numerous, and after a little experience of collecting in this type of country it became readily possible to judge by the general appearance just which localities were best. As it is well known that ticks are sensitive to relative humidity it is not surprising that they favoured such places rather than the more open, dry and wind-swept areas.

The vegetation in the coulees varied with locality, but consisted chiefly of sage—**Artemisia cana**, rabbit-brush—**Chrysothamnus sp.**, Coralberry—**Symphoricarpos occidentalis**, and various grasses, all of which carried ticks. Strangely enough, ticks of one locality seemed to show a decided preference for one of these plants as a roosting place, whereas those in another area, apparently similar, would choose a different perch.. For instance, at Verdigris Coulee (10 miles east of Milk River), the ticks were found right on the short grass itself, and a tick drag (a piece of white flannelette, one yard square) placed flat on the ground would generally pick up two or three with each sweep. Only a few were taken from the sage or rabbit-brush.. At Manyberries Coulee the reverse was the case, and the grass yielded only a few ticks, most of them being collected from the low-lying bushes, especially those growing over gopher burrows.

While no apparatus was available for taking temperature or humidity readings, it was noted that best collecting occurred on dull, warm, humid days, especially just prior to rain. The ticks at this time were extremely active and readily brushed onto the drags. Collecting was poor on cold and windy days, or when it was particularly hot and dry. During extremes of heat and cold the ticks were generally too lethargic to gain a hold on the flannel drag, and if they did get on the cloth, would frequently let go and fall off before they could be secured and transferred to vials.

On an average warm day ticks did not become active until 9:30 or 10 a.m., and then collecting would be fair until noon. From noon

until 2:30 or 3 p.m., few ticks could be expected, but in the late afternoon and early evening, collecting would be at its peak. On occasion we dragged for ticks in the evening, and would be still picking them up when it became too dark to see.

In general it was only rarely that we happened to see a tick on its perch before it was picked up on the drag. One locality was found, however, where they could be seen fairly readily, clinging to the grass stems. This was at a dry creek bed, leading into Chin Coulee, five miles north of Etzikom. Here the grass was very sparse, and the clinging ticks, sometimes in groups of three or four, were silhouetted against the smooth dry mud of the old creek bed, and were seen quite readily. Nearly all were facing head downward, and hanging onto the grass blades with all pairs of legs. When approached closely, they immediately sensed the presence of the potential host and extended the first, second and fourth pairs of legs, hanging on by the third. If the drag cloth or one's hand were brushed by them they readily left their perches and climbed on.

During the earlier part of the season at Manyberries, it was noted that there was a preponderance of females. Sample groups counted showed a ratio of five females to two males. Later in the season this difference was not noted, and the two sexes were represented in fairly even proportions.

The ticks showed considerable variation in size. Some were really large, especially males, but others, of both sexes, were so stunted as to be very little removed in size from flat nymphs. In general, it may be said that they averaged smaller in size than ticks of the same species found in the interior dry belt of British Columbia.

In the course of the season three partly engorged female ticks (one, May 26th, Manyberries Creek; and two, June 2nd at the Dominion Range Station) were picked up on drags. This is a most unusual happening. Whether these ticks had been scratched off by the host or whether they had released of their own accord, finding some physiological condition not suited to their tastes in the blood of the host, leads to interesting conjecture. Perhaps they had been feeding on rabbits which were infected with tularaemia, and which had died before they could complete engorgement.

In south-east Alberta the tick season apparently commences in late March, depending on weather conditions, reaches its peak in May and early June, and comes to an end in July. A very few ticks were found to be still active in the Milk River country on July 8th, and some at Etzikom, July 13th.

Numbers of ticks secured:

Actual abundance of ticks in this country, of course, varied with locality, but in general they were plentiful. In Manyberries Coulee sometimes fifteen would be taken on a single drag over a ground-squirrel burrow. At "Big Coulee," just north of Manyberries, 1500 specimens were secured by two men in five and one-half hours. This was extremely good collecting, as part of this time was lost because of intermittent showers of rain. At Lone Tree and Geddes Coulees

(Dom. Range Exp. Station) two men collected 1750 ticks in a single day (June 2nd). In certain deep draws leading into the south side of Chin Coulee, just west of Foremost it was possible, under ideal conditions, for each man to pick up 150-200 ticks per hour! In one spot at Verdigris Coulee, east of Milk River, a most unusual situation was found where ticks were plentiful on the bare ground of a cattle trail. Here as many as 23 were taken on a single sweep of the drag cloth. Ordinarily it was quite a reliable rule that ticks were more common on the bushes bordering stock trails, but usually not many ticks would be found on the trail itself.

Due to the unusually wet spring of 1938, many days during the tick season were completely lost. However, about thirty-five days of suitable weather were devoted to tick collecting, and during this time nearly 22,000 specimens were obtained.

NEW RECORDS OF SIPHONAPTERA FOR BRITISH COLUMBIA

by George P. Holland*

In the course of checking over part of the collection of fleas at the Kamloops Laboratory, Dominion Department of Agriculture, Division of Entomology, five species have been established as new records for British Columbia. These follow:

Xenopsylla cheopis (Roths). 1903—See details below.

Opisocrostis tuberculatus (Baker) 1904.
Taken from Columbia ground squirrel, **Citellus columbianus columbianus** (Ord.), collected at Kimberley, B. C. (May 5th, 1938, J. B. Poole) and at Waterton Lakes, Alta. (June 27th, 1938, G. P. Holland).

Neopsylla inopina Roths., 1915.
Taken from **Citellus c. columbianus** (Ord.) collected at Kimberley, May 14th, by J. B. Poole.

Rectofrontia fraterna (Baker), 1895.
From **Citellus c. columbianus** (Ord.) at Waterton Lakes National Park, on the boundary of British Columbia and Alberta, June 27th, 1938, by G. P. Holland.

Ctenophyllus terribilis Roths., 1903.
From pika, **Ochotona princeps** ssp. collected at Reno Mountain, Salmo, May 29, 1936 by T. K. Moilliet; at Mt. Dunn, North Thompson Valley, Aug. 11, 1937 by G. P. Holland; and at a rock slide five miles west of Salmon Arm, Aug. 10, 1938, by G. P. Holland.

A series of 36 fleas collected from Norway rats, **Rattus norvegicus** Erxleben, taken September 8th, 1938 at the city dump, Vancouver,

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