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CONTROL PROGRAM

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The gray fox, *Urocyon cinereoargenteus*, has been the object of considerable attention in Texas in recent years due to the large number that have been found to be rabid by the State Department of Health. Negri bodies have been demonstrated in stained brain sections of 131 of the 152 fox heads examined in 1947 and 1948. Table 1 gives the monthly total of fox heads examined from November 1947 through April 1949.

In 1947 the rabid fox situation was believed by the Texas Legislature to be of sufficient importance to warrant the passage of a bill authorizing the payment of a \$2.00 bounty for each fox killed in counties designated by Dr. George W. Cox, State Health Officer. This certification of eligibility has been based on the demonstration by a county that rabies in fox within its borders constitutes a public health problem. Before payment is made, as proof of the kill, the bounty bill requires that the tail of each fox be sent to the State Department of Health. Many of the tails are detached while the animals are still warm and before a mass exodus of ectoparasites has begun. The tails mailed in tight cardboard containers or papers sacks still retain many of their ectoparasites.

This unusual collecting method has been surprisingly successful. Either living or dead ectoparasites have been found on approximately ten per cent of the fox tails examined. Twelve species have been taken: five ticks—*Amblyomma americanum*, *Ixodes texanus*, *I. scapularis*, *I. cookei*, *I. sp.* (probably *kingi*); two fleas—*Pulex irritans* and *Hoplopsyllus affinis*; one louse—*Trichodectes quad-*

raticeps; and four mites—*Atricholaelaps glasgowi*, *Atricholaelaps megaventralis* *Liponyssus bacoti*, and *Eulaelaps stabularis* (Table 2).

The most abundant ectoparasite taken has been the flea, *Pulex irritans*. One fox tail was found to be harboring 185 of these fleas and another 150. A

TABLE 1.—Monthly totals of foxes examined for rabies from November 1947 through April 1949

MONTH	NUMBER EXAMINED	NUMBER POSITIVE	MONTH	NUMBER EXAMINED	NUMBER POSITIVE
November 1947	2	0	August	1	1
December	6	5	September	11	10
January 1948	7	7	October	9	9
February	7	4	November	16	15
March	3	1	December	24	23
April	3	1	January 1949	14	12
May	3	0	February	12	10
June	1	0	March	21	18
July	5	5	April	12	11

TABLE 2.—Ectoparasites taken from Texas fox tails in February, March, and April, 1949

ECTOPARASITES	NUMBER OF FOX TAILS WITH ECTOPARASITES	NUMBER OF ECTOPARASITES	COUNTIES
<i>Pulex irritans</i>	89	884	Falls, Freestone, Limestone, Robertson, San Augustine, Wood
<i>Hoplopsyllus affinis</i>	1	1	Falls
<i>Amblyomma americanum</i>	48	314	Falls, Franklin, Freestone, Leon, Limestone, Jasper, Robertson, San Augustine
<i>Ixodes texanus</i>	5	6	Freestone, Limestone
<i>Ixodes scapularis</i>	1	1	Robertson
<i>Ixodes cookei</i>	2	2	Freestone, Robertson
<i>Ixodes sp.</i> (probably <i>kingi</i>)	2	5	Limestone, Robertson
<i>Ixodes sp.</i> (larvae)	2	4	Robertson
<i>Atricholaelaps glasgowi</i>	6	45	Falls, Freestone, Limestone, Robertson
<i>Atricholaelaps megaventralis</i>	1	2	Falls
<i>Eulaelaps stabularis</i>	1	1	Freestone
<i>Liponyssus bacoti</i>	1	1	Limestone
<i>Trichodectes quadraticeps</i>	1	2	Freestone

total of 884 *Pulex irritans* was taken from 89 infested fox tails. This is by far the most common flea on wild carnivorous animals in the southwest. Eads (Jour. Mamm., 29: 268-271, 1948) found 90 Texas coyotes to be infested with an average of 22.5 *P. irritans* per animal and no effort was made to recover every flea from the animals. In Lavaca County, Texas, Randolph and Eads

(Ann. Ent. Soc. Amer., 39: 597-601, 1946) found this species abundant on the gray fox, red wolf, domestic dog, opossum, raccoon, and striped skunk.

Other Texas State Department of Health host records for *Pulex irritans* are: ringtailed cat, bobcat, badger, spotted ground squirrel (*Citellus spilosoma*), prairie dog (*Cynomys ludovicianus*), kangaroo rat (*Dipodomys ordii*), wood rat (*Neotoma micropus*), grasshopper mouse (*Onychomys leucogaster*), domestic rats (*Rattus norvegicus* and *R. rattus*), cottontail (*Sylvilagus audubonii*), domestic cow, horse, human, and young poultry.

A single specimen of *Hoplopsyllus affinis* (rabbit flea) was the only other species of flea taken. Since this flea readily leaves a dead host, it is not surprising that it has not been encountered in larger numbers.

The most important arthropods taken of concern in the transmission of human diseases are undoubtedly the ticks. The lone star tick, *Amblyomma americanum*, has been the most frequently recovered. A total of 314 was taken from 48 infested fox tails. Fifty-nine live *A. americanum* were removed from one tail and 40 from another. In Texas this tick is believed to be the chief vector of spotted fever, "Bullis fever," and tularemia, and has been found naturally infected with the Q fever organism.

Ticks of the genus *Ixodes* have been rather commonly seen, but usually only one or two are found on an infested fox tail. Six *Ixodes texanus* have been taken from five tails, one *I. scapularis* and two *I. cookei* from two tails, and five *I. sp.* (probably *kingi* as determined by Kohls) from two tails.

Two specimens of the fox louse, *Trichodectes quadraticeps*, were taken from a single fox tail. Four species of parasitic mites have been taken. Forty-two specimens of *Atricholaelaps glasgowi* have been removed from four infested fox tails. This common mite parasitizes a wide variety of hosts. Texas State Department of Health host records are: pocket gopher, tree squirrel, ground squirrel, prairie dog, pocket mouse, cotton rat, wood rat, domestic rat, grasshopper mouse, kangaroo rat, and cottontail. Single specimens of the rodent mites *Liponyssus bacoti* and *Eulaelaps stabularis* have been taken. Two *Atricholaelaps megaventralis*, also a rodent parasite, were removed from a single fox tail.

It is interesting to compare the species of ectoparasites obtained from examining only the fox tails with those taken from sixteen whole foxes by Randolph and Eads (*loc. cit.*) in Lavaca County, Texas. These investigators took the following species: fleas—*Pulex irritans*, *Rhopalopsyllus coxi*, *Hoplopsyllus affinis*, *Orchopeas howardii* (squirrel flea), *Cediopsylla simplex* (rabbit flea), *Echidnophaga gallinacea* (chicken flea); ticks—*Amblyomma americanum*, *Dermacentor variabilis* and *Ixodes scapularis*.

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