

of any new forms which may be described during the course of this work will be deposited in the Canadian National Collection at Ottawa.

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ECTOPARASITES OF BIRDS AND MAMMALS IN BRITISH COLUMBIA

VI. A Preliminary List of Parasitic Mites

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The study of mites has been neglected by zoologists for many years for the good reason that they form one of the smallest and most difficult of animal groups. The final item of identification with many species is the length and contour, from the lateral aspect, of the stylets of the mouth. When the whole mite is one millimetre or less in length, its stylets are infinitely smaller. Moreover, the animals generally die in a retracted condition with the suctorial apparatus concealed in the cephalothorax, and it requires fine technique to get them extruded. Therefore until quite recently, there have been very few names in acarology in North America and it is difficult to obtain identifications. For many years Dr. Nathan Banks was practically the only authority and he is now succeeded by Dr. H. Ewing of the United States National Museum. Moreover, the literature on mites is very scattered and difficult to acquire. Consequently the following list contains only a few names, some of them being only of family and genus; it has not been possible to arrive at specific identifications.

I am deeply indebted to Dr. H. Ewing for his kindness in checking the few determinations I was able to make and for examining the bulk of my material.

Mites are both terrestrial and aquatic; remarkably little is known about the latter. They breathe both with and without trachea. The land mites may be plant feeders or parasitic upon mammals, birds and reptiles or predaceous upon other mites or any small arthropods. Like spiders, they have eight legs

although most of them are born with only six.

My collections contain twenty records from the following fourteen bird hosts:—eared grebe, bald-headed eagle, fish-hawk, night-hawk, domestic pigeons and poultry, cave, barn and tree swallows, Japanese starling, tame canary, towhee, Brewer's blackbird, mountain bluebird; also thirty-seven records from the following eighteen mammal hosts:—coast deer, spotted skunk, domestic cats, weasel, packrat, Norway and black rat, muskrat, pocket gopher, coast and Streater's squirrels, coast vole, red-backed mouse, coast shrew, masked shrew, species of *Peromyscus*, species of *Microtus*, and many records from coast moles often with two species of mites on each. The genus *Peromyscus* includes several species, here taken as one host.

Superfamily PARASITOIDEA

Family PARASITIDAE

Subfam. *Spinturnicinae*

Genus *Spinturnix*, on bats, has been considered in my report on the parasites on bats (1940:16).

Subfam. *Parasitinae*

Euhaemogamasus liponyssoides (Ewing), is a large mite common on moles in Vancouver at all times of the year. I have a large number of records taken from Scheffer's mole during the last four years. The mites are true blood suckers and are generally found distended with blood. They are fast-moving, running rapidly in and out of the fur of the moles, and remain alive for over twenty-four hours after the death of their hosts.

Nymphs of one of the *Parasitinae*, species undetermined, occurred in a recently-vacated nest of a mountain bluebird at Lac du Bois, Kamloops, 3100 ft. elevation, 20.VI.1937.

Laelaps, sp. indet. Enormous numbers of this mite in all stages of growth including eggs, occurred on a muskrat at Kamloops, 9.VI.1935 and on another at Vancouver, 14.VI.1935. Normally the mites do not show on the rats at all, but as soon as the fur is parted they may be seen running in all directions. The muskrat from Kamloops was the most heavily mite-infested animal I have seen to date.

Atricholaelaps, sp. indet. Specimens were obtained from the recently-vacated nests of both tree swallow, Kamloops, 5.VIII.1936, and Brewer's blackbird, Kamloops, 27.VI.1937. The blackbird's nest also contained specimens of *Analgesidae* (bird mites), sp. indet.

Family DERMANYSSIDAE

All the members of this family are true parasites; they are found on mammals, birds and reptiles.

Liponyssus sylviarum Canestrini and Fonzago, the northern fowl mite, was recovered in some numbers in 1927 from a poultry farm on the Fraser Delta, apparently from recently-imported birds. I have encountered it in Vancouver once since then, in a minor infestation.

Liponyssus bacoti (Hirst), the tropical rat mite, appeared in outbreak

form in a large store in Vancouver some years ago, when I reported it to this Society. I have taken it since in small numbers on Norway and on black rats.

Liponyssus, sp. indet., was taken on Streater's red squirrel at Riske Creek, Chilcotin, 29.VI.1930.

Dermanyssus gallinae (Degeer), the common poultry mite, is universal. My records are from: a poultry house at Lytton, 23.VIII.1931; an outbreak in a business block in Vancouver in October 1935, when the mites spread from pigeons' nests in window awnings and plagued the workers all over the building; barn swallows' nests, Kamloops, 16.VII.1935, 1.VIII.1937, and 8.VIII.1937 and the nest of eave swallows, Nicola Dry Farm, 29.VII.1938. Now the Kamloops swallows' nests were at least seven miles, and the Nicola nest at least ten miles in a bee-line, from the nearest farm, so the swallows got their infestations of these mites either by carrying infested hen feathers from many miles away, or by bringing mites with them upon returning from the South in spring. If the latter is the case, it is probable that infestations of this mite in hen houses arise from swallows more frequently than from hens themselves.

Superfamily EUPODOIDEA

Family BDELLIDAE

The larvae of a species of family Bdellidae, together with a species of analgesid, occurred on a towhee at the University, 13.VI.1937. Most of the mites of this superfamily are, according to Ewing, "free-living and predaceous. The best-known are the Bdellidae or snouted mites which are rather large and are brightly coloured." The occurrence of these mites on the towhee was probably accidental.

Superfamily TROMBIDOIDEA

Family TROMBIDIIDAE

Subfam. *Trombiculinae*

Mites of this superfamily constitute the Harvest mites and Chiggers.

Trombicula, sp. indet. A species of this mite was taken on the coast white-bellied mouse, *Peromyscus maniculatus austerus* (Baird), Vancouver, 14.I.1937. *Trombicula* mites are often exceedingly troublesome to man and his domestic animals in the eastern States; as far as I know they have never been reported as being a nuisance in Canada. (On this same *Peromyscus* mouse, occurred the mite *Radfordia subuliger* Ewing, apparently a very recently described genus and species, which does not fit into any key available to me so I have included it with *Trombicula* because of the host on which it was found.)

Neoschöngastia blarinae (Ewing), from Streater's red squirrel, Riske Creek, Chilcotin, 29.VI.1930, and from the same host at Lac du Bois, Kamloops, 5.VII.1936. In the specimens examined, a remarkable relationship is apparent between this mite and the skin of its host. The skin forms a hood over the mite, like a cupped hand; the cups all point backward from

the head-end of the host and may be found with the mite almost concealed underneath, or recently vacated, with a puncture mark showing where the mite had been attached. Judging from its name, the species was taken from *Blarina* sp., a shrew; it appears to be widely distributed in the Interior of the Province, since Riske Creek and Kamloops are about 250 miles apart. Ewing says that one species of this genus, *N. americana* (Hirst), occurs on chickens in the southern States and is very injurious.

Family CHEYLETIDAE

Mites of the genus *Myobia* were collected off a *Peromyscus* sp. sent in from the Kootenays, 10.I.1941. These are very small, almost transparent mites in which the front legs are remarkably modified for clasping hairs. They move very slowly and are usually found attached to the base of the host's hairs.

Superfamily SARCOPTOIDEA Family ANALGESIDAE

The superfamily Sarcoptoidea consists of parasitic mites that have no trachea. A species of this family, indeterminate, was taken in some numbers from a bald-headed eagle, 21.III.1937. The same species of mite or a closely allied one occurred in the nest of a Brewer's blackbird at Kamloops, 27.VI.1937.

Bucholzia, sp. indet. A very large number of these mites was taken from between the barbs of the primaries of a fish hawk collected near Vancouver 25.VII.1940.

Family SARCOPTIDAE

This family contains the itch mites. I have already reported *Otodectes cynotus* (Hering) as being a very common parasite in the ears of cats in Vancouver (1940:20).

This summary of parasitic mites is all that can be listed at this time. A number of collections from various hosts are still unnamed. Many more species will come to light with future collecting.

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A FURTHER NOTE ON THE FOOD HABITS OF THE BRINE FLY, *EPHYDRA HIAN* SAY.

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In 1938 a paper was presented to the Entomological Society of British Columbia titled "A Note on Brine Flies in British Columbia" (Proc. Ent. Soc. British Columbia, No. 35, pp. 11-13; February, 1939), in which reference was made to the surprising amount of minute globular bodies that was observed when a sample of the salt, sodium carbonate, was diluted and filtered. It was thought that these globular bodies were algae that constituted the food of the ephydrid larvae.

Prof. G. J. Spencer was kind enough to study larvae that were forwarded to him, and to have a sample of the salt analyzed at the University of British Columbia. Recently he informed me that the numerous globular bodies found in the salt, formerly believed to be algae, were eggs of the brine shrimp (Phyllopoda) and that these constitute the food of the brine fly larvae.

A PRELIMINARY LIST OF THE SPECIES OF *CULICOIDES* IN WESTERN CANADA

(Diptera: Ceratopogonidae)

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During the past season, the writer has been occupied with a study of the species of the genus *Culicoides* in British Columbia. Although "No-see-ums" or "Punkies" are a common pest in many parts of the province, the only previous record in the literature is that of *Culicoides obsoletus* Meigen, (*C. sanguisugus* Coquillet) taken at Kaslo, B.C. by H. G. Dyar in 1903.

Most of the specimens examined were already in the collection of the Dominion Animal Parasite Laboratory at Kamloops, B.C., while others were added by the writer from districts visited during the summer. The list includes records of specimens from Alberta and Saskatchewan, which were found amongst the material at the Kamloops Laboratory, and which are mentioned for the sake of completeness. It is as follows:-

Culicoides biguttatus Coquillet. Cascade, B.C.

Culicoides cockerelli Coquillet. Spuzzum, B.C.