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## Siphonaptera from Itasca State Park Region

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etes (in one case triple) on one or both sides of the heterocyst were common; and the granules in mature akinetes were often round and prominent, as is seen in *Aphanizomenon flos aquae* in this area. Very occasionally a trichome contained two sets of heterocysts and akinetes. The jelly around almost all heterocysts seen on May 9 and 17, was unusual.

The Loch Gregor *A. elenkinii* has two forms of mature akinetes, those as in Fig. 1, a, having an inclosing outer wall, and those as in Fig. 1, c, d, e, which do not have this outer wall. Part of the akinetes in the second group have cups into which the adjacent trichome cells fit, Fig. 1, c, and d, and part do not have these cups, Fig. 1, e. Most

of the ripe akinetes seen had the outer wall. Perhaps 10 percent were in the second group.

The thickened hyaline wall of the akinete develops as the akinete ripens. There is no evidence of it at the early stage of Fig. 1, b.

The appearance of this alga in good quantity with no indication at all in the bloom of the type I or type III trichomes, seems to establish the type II *A. elenkinii* as a distinct sub-species.

#### Reference

HILL, H. 1969. *Aphanizomenon elenkinii* Kiesel in Minnesota Lakes. J. Minn. Acad. Sci. V. 36, No. 1, 1969.

## Siphonaptera from Itasca State Park Region

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During the summer of 1968, Van Huizen made a collection of fleas incidental to a larger project on the reproductive biology of chipmunks. These parasites were taken from the vicinity of Lake Plantagenet, Hubbard County, Minnesota, about 15 miles northeast of Itasca State Park. During the same summer, Larson collected fleas in the Park itself. During the summer of 1970, Benton and Larson collected within the Park and in its immediate vicinity to the west, in Hubbard and Clearwater counties. These collections total 302 specimens of 17 species. Examination of specimens in the Entomology Collection at the University of Minnesota revealed one additional species from the Itasca region. This is *Oropsylla arctomys* (Baker), a common parasite of the woodchuck, *Marmota monax*. The single specimen from Itasca State Park was taken from a cabin.

Itasca State Park constitutes a part of the western edge of the mixed coniferous-deciduous forests of north central Minnesota. It includes a variety of habitats in Hubbard and Clearwater counties, and because of the presence there of the University of Minnesota biological station, its biology is well known. This paper, however, represents the first systematic effort to determine the species of Siphonaptera present in the area.

Nomenclature of the fleas follows Hopkins and Rothschild (1953 et seq.), while nomenclature of the mammals follows Hall and Kelson (1959). True hosts (i.e. those which satisfy the biological requirements of the flea species) are marked with an asterisk when known.

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Fox (1940) listed 15 species as occurring in Minnesota. Of these, seven have not been reported previously from the Itasca region. Five of the seven probably occur there, on the basis of the known distribution of the species or the presence there of suitable hosts. These are:

*Ceratophyllus diffinis* Jordan — of transcontinental occurrence on ground-nesting birds.

*Ceratophyllus rossitensis swansoni* (Liu) — the type locality is Fertile, Minnesota, about 75 miles west of Itasca State Park, on short-eared owl.

*Orchopeas howardii* (Baker) — the most common flea on gray squirrels, which occur in the Park region.

*Nearctopsylla genalis* (Baker) — a parasite of moles and less commonly shrews, occurring west to the Rocky Mountains.

*Epitedia wenmanni* (Rothschild) — common on deer mice and other small mammals, but usually taken in the fall, winter and spring months. It would not be expected to appear in our summer collections.

#### Order Siphonaptera

##### Family Hystrichopsyllidae

##### *Hystrichopsylla dippiei* ssp.

Two females from Hubbard county

Hosts: *Tamias striatus*, *Eutamias minimus*

On geographic grounds, we would expect these specimens to belong to the nominate subspecies. Females are not identifiable to subspecies, and no males have as yet been taken from this area.

##### *Catallagia borealis* Ewing

One female from Hubbard county

Host: *Clethrionomys gapperi*\*

While our specimen does not agree well with *C. borealis* from eastern localities, G. P. Holland has referred specimens from nearby Manitoba to this species. Females

are variable, however, and this specimen is probably within the normal range of variation of the species.

*Corrodopsylla curvata curvata* (Rothschild)

One female from Clearwater county

Host: *Sorex cinereus*\*

*Ctenophthalmus pseudagyrtus pseudagyrtus* Baker

Seven males, 12 females, from Hubbard and Clearwater counties

Hosts: *Tamias striatus*, *Eutamias minimus*, *Tamiasciurus hudsonicus*, *Spermophilus tridecimlineatus*, *Condylura cristata*, *Sorex cinereus*

Family Leptopsyllidae

*Peromyscopsylla catatina* (Jordan)

Three males, two females from Hubbard and Clearwater counties

Host: *Clethrionomys gapperi*\*

Family Ceratophyllidae

*Ceratophyllus riparius riparius* (Jordan and Rothschild)

Nine males from Hubbard county

Host: *Riparia riparia*\* (nest)

*Opisocrostitis bruneri* (Baker)

Twenty-one males, 43 females from Hubbard and Clearwater counties

Hosts: *Spermophilus tridecimlineatus*\*, *Spermophilus franklini*\*, *Tamias striatus*, *Eutamias minimus*, *Tamiasciurus hudsonicus*, *Glaucomys sabrinus*, *Peromyscus maniculatus*, *Microtus pennsylvanicus*

*Opisodasys pseudarctomys* (Baker)

Two males, eight females from Clearwater county

Hosts: *Glaucomys sabrinus*\*, *Tamiasciurus hudsonicus*

*Dactylopsylla ignota ignota* (Baker)

One male, one female from Clearwater county

Host: *Geomys bursarius*\*

*Orchopeas caedens durus* (Jordan)

Three males, two females from Clearwater county

Hosts: *Tamiasciurus hudsonicus*\*, *Tamias striatus*

*Orchopeas leucopus* (Baker)

Thirty-nine males, 50 females from Clearwater county

Hosts: *Peromyscus maniculatus*\*, *Clethrionomys gapperi*, *Zapus hudsonius*

*Megabothris acerbus* (Jordan)

Three males, six females from Hubbard and Clearwater counties

Host: *Tamias striatus*\*

*Megabothris asio megacolpus* (Jordan)

Five males, five females from Clearwater county

Hosts: *Microtus pennsylvanicus*\*, *Clethrionomys gapperi*

*Megabothris quirini* (Rothschild)

Five males, 13 females from Hubbard and Clearwater counties

Hosts: *Clethrionomys gapperi*\*, *Zapus hudsonius*, *Napeozapus insignis*, *Microtus pennsylvanicus*, *Peromyscus maniculatus*, *Tamias striatus*

*Monopsyllus eumolpi eumolpi* (Rothschild)

Nineteen males, 19 females from Hubbard and Clearwater counties

Hosts: *Eutamias minimus*\*, *Tamias striatus*, *Spermophilus franklini*

*Monopsyllus vison* (Baker)

Eleven males, eight females from Hubbard and Clearwater counties

Hosts: *Tamiasciurus hudsonicus*\*, *Tamias striatus*\*, *Glaucomys sabrinus*, *Spermophilus franklini*, *Mustela erminea*

Family Ischnopsyllidae

*Myodopsylla insignis* (Rothschild)

One male from Itasca State Park

Hosts: *Myotis lucifugus*\*

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