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ADDITIONAL SIPHONAPTERA RECORDS FROM SMALL MAMMALS  
IN THE CENTRAL UPPER PENINSULA OF MICHIGANWilliam C. Scharf<sup>1</sup> and Patrick E. Lederle<sup>2</sup>

## ABSTRACT

Fleas were collected from mammals during the period 1990–1992 in two upper peninsula counties. Identified specimens were compared to existing distribution records for both parasite and host. Only those records which are newly documented for county, upper peninsula or Michigan are listed. We report one previously unknown flea species and five new host records for Michigan. One host record is new for the upper peninsula. In addition, seven new host/parasite combinations are recorded for two central upper peninsula counties.

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Six previous studies document flea and host species distributions in the upper peninsula of Michigan and islands of the Great Lakes near the upper peninsula shoreline (Lawrence et al. 1965, Wilson and Johnson 1971, Scharf and Stewart 1980, Scharf et al. 1990, Scharf 1991, and Scharf in press). Additional comparisons of distributions were made with Timm (1975) for northern Minnesota and Benton (1980) for the northeastern United States. Despite the semblance of thorough coverage by previous studies, much of the large geographic area of the upper peninsula of Michigan, and a variety of flea hosts remain unexamined. The goal of this paper is to further the knowledge of flea and host species distributions with new records from the region.

## MATERIALS AND METHODS

We collected 143 fleas of 12 species from 9 mammal host species in Dickinson and Iron Counties between 1990 and 1992. Some flea species were not new records, and are not listed here. The majority of the specimens were collected by systematic trapping using Leathers live traps by PEL. He and assistants collected regularly as part of long term small mammal studies in Dickinson and Iron Counties conducted by the Michigan State University Terrestrial Vertebrates Group (1986–1992).

The live trapping was performed at two sites. The Pirlot Road site (T43N R29W, Sections 14, 23, and 26) was located in Dickinson County, approxi-

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mately 13 km east of Sagola, MI. The Michigamme site (T44N R31W, Sections 24 and 25) was located in Iron County, approximately 6 km northwest of Channing, MI. Previous collections of fleas from these sites in prior years are reported in Scharf et al. (1990).

Small mammals were brushed and examined, and fleas were picked up with forceps or an alcohol wetted finger. All fleas were stored in 70% ethyl alcohol, and later cleared and mounted in Canada Balsam on glass slides for microscopic identification by WCS. Most Siphonaptera were identified using Holland (1949), but Benton (1983) was used in some instances. Holland's nomenclature is followed except that *Nearctopsylla genalis genalis* (Baker) follows the accepted nomenclature of Hopkins and Rothschild (1953). The slides are in the personal collection of WCS with voucher specimens of all species deposited in the University of Minnesota Entomology Collection.

Mammal hosts were identified by PEL. Mammal names are according to Hamilton and Whitaker (1979), but also reflect nomenclatural revisions mandated by Jones et al. (1992).

## RESULTS

The following list by parasite family and species consists minimally of new county records for either host or parasite. New records for the mainland of the upper peninsula, and new records for Michigan are noted. Additional specimens that were reported in earlier works are not repeated. Following each county name, is the distribution of the sexes of the flea, the number of hosts from which the flea was collected (if it exceeded one) and collection dates to indicate phenology and temporal abundance.

### CERATOPHYLLIDAE

***Megabothris acerbus* (Jordan)** – Eastern Chipmunk, *Tamias striatus* (L.), Dickinson Co., 5 males, 7 females from 5 hosts 8–29 May 1991; Woodland Deer Mouse, *Peromyscus maniculatus gracilis* LeConte NEW RECORD FOR MICHIGAN, Iron Co., 1 male, 26 May 1991.

***Opisdasys pseudarctomys* (Baker)** – Southern Flying Squirrel, *Glaucomys volans* (L.), Dickinson Co., NEW RECORD FOR MICHIGAN, 5 males, 13 females, 20 February 1992.

***Orchopeas caedens caedens* (Jordan)** – *G. volans*, Dickinson Co. NEW RECORD FOR MICHIGAN, 1 Male, 20 February 1992.

***Orchopeas leucopus* (Baker)** – Pygmy Shrew, *Sorex hoyi* Baird, NEW RECORD FOR MICHIGAN, Dickinson Co., 1 male, 3 March 1992.

### LEPTOPSYLLIDAE

***Peromyscopsylla h. hesperomys* (Baker)** – *Peromyscus maniculatus gracilis*, Dickinson Co., NEW RECORD FOR UPPER PENINSULA, 1 female, 17 June 1991.

## HISTRICHOPSYLLIDAE

***Ctenophthalmus pseudagyrtis* Baker** – Masked Shrew, *Sorex cinereus* Kerr, Dickinson Co., 1 male, 18 February 1992; *Tamias striatus*, Dickinson Co. 1 male, 28 May 1991; Red Squirrel, *Tamiasciurus hudsonicus* (Erxleben), Iron Co., 1 male, 21 February 1990.

***Epitedia wenmanni* (Rothschild)** – *Peromyscus maniculatus gracilis*, Dickinson Co., 1 male, 6 February 1990; *Tamiasciurus hudsonicus*, Dickinson Co., 3 males, 18 February 1990, 1 male, 21 February 1990.

***Nearctopsylla genalis genalis* (Baker)** – *Sorex hoyi*, Dickinson Co., NEW RECORD FOR MICHIGAN, 1 female, 3 March 1992.

***Tamiophila grandis* (Rothschild)** – *Tamias striatus*, Dickinson Co., 2 females, 1 from one host 29 May 1992, and 1 from another host 20 July 1992.

## DISCUSSION

Both species of flying squirrels, *Glaucomys*, are considered to be true hosts of *Opisdasys pseudarctomys* (Holland 1949) and it is remarkable that this flea has not been collected previously from the center of both hosts' distribution in the northern lower peninsula (Baker 1983, Scharf and Stewart 1980, Scharf et al. 1990). *G. volans* has previously been collected only four times in the upper peninsula (Baker 1983), but we have each recorded its presence there independently from several sites prior and subsequent to this study. Evidence supporting a sporadic distribution of the two flying squirrel species in the upper peninsula is demonstrated by our capture of *G. sabrinus* only at the Michigamme site (fleas reported in Scharf et al. 1990) and *G. volans* only at the Pirlot Road site (fleas reported in this paper) during the entire seven years of trapping. The other new flea species from *G. volans*, *Orchopeas caedens caedens*, is common on other species of cavity nesting Sciuridae, especially the red squirrel, in many areas of the state (Lawrence et al. 1965, Wilson and Johnson 1971, Scharf 1980, Scharf et al 1990).

The two new state records from the pygmy shrew, *Sorex hoyi*, include the flea *Nearctopsylla genalis genalis*, which exhibits host specificity for the genus *Sorex* and the more ubiquitous flea *Orchopeas leucopus*, whose true hosts appear to be mice of the genus *Peromyscus* (Holland 1949). In the latter case, it seems that collecting and identifying the host in the central upper peninsula was instrumental to the discovery of its parasites. The new record of *Megabothiris acerbus* from *Peromyscus maniculatus gracilis* is unremarkable because the true host of this flea appears to be *Tamias striatus*, and the two mammal species undoubtedly share the same nesting habitat occasionally.

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