

Notes on the Parasitic Beaver Beetle, *Platypsyllus castoris* Ritsema, 1869
and Mouse Nest Beetle, *Leptinus orientamericanus* Peck, 1982
(Coleoptera: Leiodidae: Platypsyllinae) in Virginia

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ABSTRACT

The parasitic Beaver Beetle (*Platypsyllus castoris* Ritsema, 1869) is documented from Virginia for the first time from specimens collected on American Beaver (*Castor canadensis* Kuhl, 1820) in Charles City, Fairfax, and Rappahannock counties. Another leiodid previously recorded from the Commonwealth, the Mouse Nest Beetle (*Leptinus orientamericanus* Peck, 1982), is reported from the Southern Red-backed Vole. *Myodes gapperi* (Vigors, 1830), a new Virginia host record.

Keywords: *Myodes gapperi*, new host record, Southern Red-backed Vole.

INTRODUCTION

Leiodid beetles in the subfamily Platypsyllinae are dorsoventrally flattened and wingless mammalian ectoparasites that lack or have reduced eyes and are associated with rodents, shrews, and moles. The Beaver Beetle, *Platypsyllus castoris* Ritsema, 1869 (Fig. 1), is an ectoparasite of the American Beaver, *Castor canadensis* Kuhl, 1820, in North America and the Eurasian Beaver, *Castor fiber* Linnaeus, 1758, in Eurasia. Originally described as a flea, this species was later recognized as a beetle by LeConte (1872), who placed it in its own family Platypsyllidae, a taxon that was later considered a subfamily of the Leiodidae (Lawrence & Newton, 1982). These eyeless beetles have numerous rows of spines that permit their passage through beaver fur, but help to prevent the host from easily grooming them out.

The American Beaver has a geographic range that extends from Alaska and Canada south of the Arctic Circle to Florida and northern Mexico (Helgen, 2005) and it is likely that the Beaver Beetle has a distribution similar to that of its host (Peck, 2006). The beaver ectoparasite was previously known in North America from seven provinces in Canada (AB, BC, NF, NS, ON, QC, SK) and 26 states in the United States (AK, AL, CA, FL, IA, ID, IL, LA, ME, MI, MN, MO, MS, MT, NC, ND, NE, NJ, NY, OK, OR, PA, SD, TX, WA, WY), the District of Columbia, as well as in Europe (Peck, & Newton, 2017). The specimens noted in this work are the first records of the species' occurrence in Virginia.

MATERIALS AND METHODS

Three beavers killed by vehicles were examined for ectoparasites and their beetles given to Eckerlin who



Fig. 1. *Platypsyllus castoris* Ritsema from Charles City County, Virginia. (credit A.V. Evans)

preserved them in 70% ethanol. Later, they were processed by overnight clearing in 10% potassium hydroxide solution, dehydrated in an ethanol series, cleared in xylene, and mounted to slides in Canada balsam. *Leptinus* beetles were similarly processed and mounted. Vouchers of both species have been deposited in the collections of the National Museum of Natural History (NMNH) and the Virginia Museum of Natural History (VMNH). Specimens collected on the George Washington Memorial Parkway (GWMP) have been deposited in the collections maintained at the GWNP, Turkey Run Park Headquarters, in McLean, Virginia. Three additional Virginia specimens of *Platypsyllus castoris* were collected and identified by Evans and retained in his collection (AVEC) in Richmond, Virginia, which is affiliated with the NMNH in Washington, D.C. All of these beetles were combed out of the fur just behind the shoulders of two beavers. One specimen was point-mounted, while the other two were preserved in 70% ethanol.

RESULTS

The five records of Beaver Beetles collected in Virginia bear the following locality data: Two females ex *Castor canadensis*, 19 January 1986, K.A. Strohmayer, 0.5km south of Belle Haven Marina, GWMP, Fairfax County, Virginia. Five males, two females ex *C. canadensis*, 19 February 1986, J. McBreen, Rt. 123, Lorton, Fairfax County, Virginia. Eight males, three females ex *C. canadensis* March 1986, S.W. Gotte, Lake Royal, Burke, Fairfax County, Virginia. One male ex *C. canadensis*, 4 May 2019, A.V. Evans and M.C. Odom, Harrison Lake National Fish Hatchery, 37.336728° N, 77.187224° W, Charles City County, Virginia. One male and one female ex *C. canadensis*, same collection data as previous record, except 29 August 2019, 37.342805° N, 77.188125° W.

A search for additional Virginia records at the NMNH and VMNH yielded no additional specimens. However, holdings in the Virginia Tech Entomology Collection (VTEC) in Blacksburg, Virginia produced an additional record that included six Beaver Beetles collected in January 1992 by Tom Blount from a beaver in Shenandoah National Park, Rappahannock County, Virginia. These specimens are preserved in ethanol and were identified by Eric Day.

Another ectoparasitic platypsylline, *Leptinus orientamericanus* Peck, 1982, (Fig. 2) occurs in numerous localities in the United States east of the Mississippi River (AL, DC, DE, FL, GA, IL, IN, KY, MD, NC, NJ, NY, OH, PA, SC, TN, VA, WV) and has been recorded in association with seven species of small mammals in the orders Eulipotyphla (formerly Insectivora) and Rodentia (Peck & Newton, 2017). Hosts in Virginia are the Northern Short-tailed Shrew, *Blarina brevicauda* (Say, 1823), Star-nosed Mole, *Condylura cristata* (Linnaeus, 1758), and Eastern Mole, *Scalopus aquaticus* (Linnaeus, 1758) from the counties of Culpeper, Fairfax, Highland, King George, Montgomery, and Tazewell (Peck, 1982; Eckerlin & Painter, 1993).

Eckerlin examined 113 Southern Red-backed Voles, *Myodes gapperi* (Vigors, 1830) in Virginia and found a single female *L. orientamericanus* on a Southern Red-backed Vole collected 2 April 1993, Flattop Mountain, Giles County, Virginia. This specimen, now deposited in the NMNH represents a new Virginia host and county record. Its association with this species is likely accidental simply because of the rarity of its occurrence. Additional specimens of *L. orientamericanus* housed in the VTEC were collected from the Virginia counties of Cumberland, Henry, and Patrick, all of which are new county distribution records.



Fig. 2. *Leptinus orientamericanus* Peck (sex undetermined) from Montgomery County, Indiana. (credit K. Schnepf)

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