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Ectoparasites of the Evening Bat (*Nycticeius humeralis*) from Michigan

Christopher M. Ritzi¹ and Olivia M. Munzer^{2,3}

Previous records for bat ectoparasites in Michigan were reported in Dood and Kurta (1982, 1988), and included most of the bat species known to occur in Michigan. This supplement adds the ectoparasites of the evening bat, *Nycticeius humeralis* (Rafinesque) (Chiroptera: Vespertilionidae), which was not known to occur as a resident in Michigan at that time. The first records of ectoparasites for the evening bat in Michigan are reported herein. Throughout the range of the evening bat, several species of ectoparasites have been reported previously. The most ectoparasites collected from *N. humeralis* from across their range have included the macronyssid mite, *Steatonyssus ceratognathus* (Ewing) (Acarina: Macronyssidae) (Whitaker, Jr. 1973), a species of bat bug, *Cimex adjunctus* (Barber) (Heteroptera: Cimicidae) (Watkins 1972), the fur mite, *Acanthophthirus nycticeius* (Fain and Whitaker, Jr. 1987) (Acari: Myobiidae), and the follicle mite, *Demodex nycticeii* (Desch, Jr. 1996) (Acari: Demodecidae). Other parasites that have been associated with evening bats have included *Macronyssus crosbyi* (Ewing and Stover) (Acari: Macronyssidae), *Androlaelaps fahrenheitsi* (Berlese) (Acarina: Laelapidae), *Ripiaspichia Americana* (Ewing) (Acari: Trombiculidae), and *Myiatriombicula esoensis* Sasa and Ogata (Acari: Trombiculidae) (Ritzi 2004).

During June to August in 2006 and 2007, ectoparasites were recovered from a colony of evening bats, *N. humeralis*. This colony remains the only known colony of evening bats within the state of Michigan. Prior to the 21st century, only 3 records of evening bats existed in the state. However, as part of a survey to locate Indiana bats, *Myotis sodalis* (Miller and Allen) (Chiroptera: Vespertilionidae), a colony of *N. humeralis* was discovered in August 2004 near Palmyra in Lenawee County, Michigan (Kurta et al., 2005).

All bats that were examined for ectoparasites were captured by mist-netting as part of a larger study of the ecology and natural history of bats in this colony (Munzer, 2008). As such, ectoparasitic collection was conducted when time allowed. Twenty four bats were sampled and visually examined for parasites in the fur and on the wing and tail membranes. Parasites were counted and collected using fine forceps. This technique loosely followed that outlined in Ritzi et al. (2001). All parasites recovered were placed in vials of ethanol, and stored until they could be processed in the lab. Parasites were slide mounted in PVA medium, and identified using Radovsky and Furman (1963) and Usinger (1966). Identifications were verified by the senior author against reference specimens maintained in the Jim V. Richerson Invertebrate Collection (JVRIC). All ectoparasites recovered constitute new county records, while *Steatonyssus ceratognathus* (Ewing) (Acari: Macronyssidae) is a new state record for Michigan (Table 1). Ectoparasite vouchers are maintained in the JVRIC at Sul Ross State University.

Of the 24 bats examined, 12 were adult females, 5 were juvenile females, and 5 were juvenile males. Due to low sample size, we did not compare hosts by sex or reproductive condition for variations in parasite abundance or intensity. However, it should be noted that both species of ectoparasites have been taken from *N. humeralis* in other portions of their range (Ubelaker and Kunz, 1971; Whitaker, Jr. and Wilson, 1974). Out of the 24 hosts visually sampled for ectoparasites, only four hosts were clean of any ectoparasitic infestation.

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Table 1. Ectoparasites recovered from *Nycticeius humeralis* (n = 24) from Lenawee County, Michigan. Prevalence reports the average percent of those hosts infested in the sample, while mean intensity is the average number of parasites per infested host.

Ectoparasites	Number Recovered	Prevalence	Mean Intensity
<i>Cimex adjunctus</i> Barber	2 (2F) ¹	3%	1
<i>Steatonyssus ceratognathus</i> (Ewing)*	162 (107F, 21M, 34P) ¹	80%	8.1

¹F are adult female ectoparasites, M are adult male ectoparasites, and P are protonymphs
*new state record

Cimex adjunctus is a common hemipteran on several species of bats in North America. It has been collected from the vespertilionid bats *Eptesicus fuscus* (Beauvois), *Myotis lucifugus* (LeConte) and *M. sodalis* in Michigan (Dood and Kurta 1982), as well as other vespertilionid bats in the eastern United States (Usinger 1966).

The macronyssid mite, *S. ceratognathus*, by contrast is a rather host specific mite, typically only found on *N. humeralis*. It has been collected primarily on evening bats in the following states: Alabama, Georgia, Florida, Indiana, Iowa, North Carolina, Ohio, Oklahoma, South Carolina, and Texas, with accidental records on *E. fuscus*, *Lasiurus borealis* (Muller) (Chiroptera: Vespertilionidae), *M. lucifugus*, *M. sodalis*, and *Tadarida brasiliensis* (Geoffroy-Saint-Hilaire) (Chiroptera: Molossidae) (Whitaker, Jr. and Wilson 1974, Whitaker, Jr. et al. 2007). It's presence on *N. humeralis* is not surprising in Michigan, as it tends to be the most prevalent parasite associated with evening bats throughout their range (Ritzi 2004).

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