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New Records of Ectoparasites and Other Epifauna from *Scalopus aquaticus* and *Blarina carolinensis* in Arkansas

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Running Title: Ectoparasites of Soricomorpha in Arkansas

Compared to its surrounding states, little is known about the ectoparasites infesting the wild mammals of Arkansas (Schiefer and Lancaster 1970, Whitaker and Wilson 1974, Whitaker et al. 2007, McAllister et al. 2013). Recently, McAllister et al. (2013) suggested that additional ectoparasite surveys on mammals should be undertaken, particularly on insectivores. Here, we report information on some ectoparasites and other epifaunistic arthropods collected from the eastern mole, *Scalopus aquaticus*, and southern short-tailed shrew, *Blarina carolinensis*, from Arkansas. Ectoparasites have previously been reported from eastern moles by Whitaker and Schmelz (1974), Whitaker and Wilson (1974), Whitaker et al. (2007) and others and from southern short-tailed shrews by Whitaker et al. (1994), Nims et al. (2004, 2008), Whitaker et al. (2007) and Sylvester et al. (2012).

Twenty-four southern short-tailed shrews were collected using live traps between August 2012 and April 2013 from Union Co. and 3 eastern moles were collected using kill traps between May 2013 and June 2014 from Union ($n=2$) and Benton ($n=1$) cos. After being euthanized following American Society of Mammalogists guidelines (Sikes et al. 2011), individuals were examined for ectoparasites following standard methods (Gardner 1996). Ectoparasites and other arthropods were processed and identified using appropriate guides (Peck 1982, Whitaker 1982, Benton 1983, Lukoschus et al. 1988). Voucher specimens of hosts are deposited in the mammal collection at Henderson State University (HSU) in Arkadelphia, Arkansas. Representative ectoparasites are deposited in the General Ectoparasite Collection in the Department of Biology at Georgia Southern University, Statesboro (accession nos. L3564; L3569; L3584; L3587-L3589; L3680). We provide a taxonomic summary of the ectoparasites and other epifauna collected below.

Coleoptera: Leptinidae

Leptinus spp. beetles are epifaunistic arthropods of small mammals in the Holarctic region (Peck 1982). They are not true ectoparasites because they feed on dead host skin, sebaceous secretions and material in host mammal nests. In North America, *L. americanus* occurs west of the Mississippi River and east of the Rocky Mountains, whereas *L. orientamericanus* Peck occurs east of the Mississippi River and *L. occidentamericanus* Peck is found west of the Rocky Mountains (Peck 1982). *Leptinus americanus* has been reported previously from Washington County, Arkansas, from a tree stump ($n=2$) and from a mammal nest ($n=28$) (Peck 1982). We collected *L. americanus* from one of 24 southern short-tailed shrews and 2 of 3 eastern moles. This species has previously been reported from *Scalopus aquaticus* (Whitaker and Schmelz 1974), but *B. carolinensis* represents a newly reported host record. Whitaker et al. (1994) reported *L. americanus* from *B. carolinensis* from South Carolina; however, since 1982, beetles east of the Mississippi River have been treated as *L. orientamericanus* as detailed by Peck (1982).

Siphonaptera: Ctenophthalmidae

Ctenophthalmus pseudagyrtes is a common flea on shrews, moles, and other small mammals throughout much of North America although most records are from eastern States and Provinces (Hopkins and Rothschild 1956, Durden et al. 2012). We collected *C. pseudagyrtes* from both individuals of *S. aquaticus* (one male, one female flea) from Union Co. and from one of 24 individuals of *B. carolinensis* (one male flea) from Union Co. This species has been previously collected from *S. aquaticus* from Arkansas (Schiefer and Lancaster 1970); *B. carolinensis* is a new host record. It has also been recorded previously from

nearby Missouri and Texas (Kollars et al. 2007, McAllister and Wilson 2012).

One of 24 southern short-tailed shrews was infested with two *Doratomyia blarinae* (one male, one female). Whitaker et al. (1994) reported this species from *B. carolinensis* in South Carolina but this collection represents a new state record for Arkansas. This flea appears to be widely distributed as an ectoparasite of *Blarina* spp., mostly in eastern North America (Hopkins and Rothschild 1956, Whitaker et al. 1994, Ritzi et al. 2005, Durden et al. 2012).

Acari: Laelapidae

Echinonyssus blarinae was collected from one of 24 southern short-tailed shrews. This mite has previously been reported from seven species of insectivores (including both *B. carolinensis* and *S. aquaticus*) and from at least 16 States and Provinces combined (Whitaker and Wilson 1974, Ritzi et al. 2005, Whitaker et al. 1994, 2007, Nims et al. 2008, Sylvester et al. 2012). However, this is the first record from Arkansas.

Haemogamasus harperi is a relatively large mite that is ectoparasitic mainly on shrews and moles (Whitaker and Wilson 1974, Whitaker et al. 2007). It has previously been reported from both *S. aquaticus* and *B. carolinensis* (Whitaker and Schmelz 1974, McAllister and Wilson 2012, Sylvester et al. 2012). One of two moles was infested with two *H. harperi* (both females) in this survey. This collection represents a new state record for this mite from Arkansas.

Acari: Listrophoridae

Olistrophorus blarina was collected from one of 24 southern short-tailed shrews. This tiny fur mite has previously been collected from *B. brevicauda*, *B. carolinensis* and *B. hylophaga* and has been reported from eight U.S. States (Whitaker and Wilson 1974, Whitaker et al. 1994, 2007, Ritzi et al. 2005, Nims et al. 2008). However, this represents the first record of this mite from Arkansas.

Acari: Glycyphagidae

One hypopial deutonymph of *Glycyphagus hypudaei* was collected from one of 24 *B. carolinensis*. This tiny fur mite has been collected from more than

70 species of mammals (including *B. carolinensis*), mainly rodents and insectivores, in North America with previous records from more than 25 States and Provinces combined (Whitaker and Wilson 1974, Whitaker et al. 1994, 2007, Nims et al. 2004, Ritzi et al. 2005). Nevertheless, this represents the first record of *G. hypudaei* from Arkansas.

Acari: Myobiidae

One of 24 southern short-tailed shrews was infested with 2 fur mites, *Protomyobia blarinae*. This small mite has previously been recorded from *B. brevicauda*, *B. carolinensis* and *B. hylophaga* from the States/Provinces of Georgia, Indiana, Kansas, Manitoba, New Brunswick, New York, Ontario and South Carolina (Whitaker et al. 1994, 2007, Ritzi et al. 2005, Nims et al. 2008). However, this is the first record of *P. americana* from Arkansas.

In conclusion, we record 2 species of fleas and 5 species of mites from 2 species of soricomorphs in Arkansas with all 7 of these arthropod species representing new state records. Whitaker and Wilson (1974) summarized 8 species of ectoparasitic/epifaunistic mites from mammals in Arkansas and Whitaker et al. (2007) added a ninth species to the state list. Based on the examination of just 26 soricomorph specimens, we have increased the Arkansas list by 56%. Clearly, the ectoparasite fauna, particularly the mite fauna, of Arkansas mammals is inadequately documented. Therefore, we recommend additional ectoparasite surveys of Arkansas mammals.

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Ectoparasites of Soricomorpha in Arkansas

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