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Records of Bat Ectoparasites from the Luquillo Experimental Forest of Puerto Rico

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During the course of ecological research in the Luquillo Experimental Forest (LEF) of Puerto Rico, we collected ectoparasites from seven species of bats: *Artibeus jamaicensis jamaicensis*, *Brachyphylla cavernarum intermedia*, *Eptesicus fuscus wetmorei*, *Erophylla sezekorni sezekorni*, *Monophyllus redmani portoricensis*, *Pteronotus parnellii portoricensis*, and *Stenoderma rufum darioi*. Herein, we report ectoparasites infesting these bats and provide comments on host-parasite associations.

Bats were captured in mist nets from various locations within the LEF during the dry (March) and rainy (June–August) seasons of 1988 and 1989. Within 20 minutes of capture, wing and tail membranes, pelage, ears, and face were examined for the presence of arthropods. Ectoparasites were removed and placed in vials containing 70% ethyl alcohol; a separate vial stored all ectoparasites from each bat. Hosts were then banded and subsequently released.

TABLE 1. Ectoparasites of bats from Puerto Rico.

Host	Ectoparasite	Family
<i>Artibeus jamaicensis</i>	<i>Megistopoda aranea</i> ^{1,3,7,c}	Streblidae
	<i>Paralabidocarpus foxi</i> ¹	Labidocarpidae
	<i>Paralabidocarpus artibeii</i> ^{4,c}	Labidocarpidae
	<i>Periglischrus iheringi</i> ^{1,2,3,5,7,c}	Spinturnicidae
	<i>Periglischrus vargasi</i> ^{1,2,c}	Spinturnicidae
	<i>Spelaeorhynchus praecursor</i> ^{1,3,6,7,c}	Spelaeorhynchidae
	<i>Aspidoptera phyllostomatus</i> ^{7,a,c}	Streblidae
	<i>Trichobius intermedius</i> ^{1,7,c}	Streblidae
<i>Brachyphylla cavernarum</i>	<i>Trichobius robynae</i> ¹	Streblidae
	<i>Lawrenceocarpus micropilus</i> ^{1,4}	Labidocarpidae
	<i>Lawrenceocarpus puertoricensis</i> ¹	Labidocarpidae
	<i>Radfordiella oudemansi</i> ^{1,3}	Macronyssidae
	<i>Trichobius truncatus</i> ^{1,3,7,c}	Streblidae
<i>Eptesicus fuscus</i>	<i>Periglischrus cubanus</i> ^{7,a,b,c}	Spinturnicidae
	<i>Spinturnix bakeri</i> ^{7,c}	Spinturnicidae
<i>Erophylla sezekorni</i>	<i>Trichobius robynae</i> ¹	Streblidae
	<i>Trichobius truncatus</i> ³	Streblidae
	<i>Ornithodoros viquezasi</i> ³	Argasidae
	<i>Ornithodoros sp.</i> ^{7,c}	Argasidae
	<i>Periglischrus cubanus</i> ^{7,a,c}	Spinturnicidae
<i>Monophyllus redmani</i>	<i>Spelaeorhynchus monophylli</i> ^{1,2,3,6,7,c}	Spelaeorhynchidae
	<i>Trichobius cernyi</i> ^{7,c}	Streblidae
	<i>Trichobius robynae</i> ^{1,7,c}	Streblidae
	<i>Trichobius truncatus</i> ^{1,3}	Streblidae
	<i>Trichobius sp.</i> (near <i>sparsus</i> Kessel) ^{2,c}	Streblidae
	<i>Nycterophilia parnellii</i> ^{7,a,c}	Streblidae
	<i>Periglischrus vargasi</i> ^{7,a,c}	Spinturnicidae
<i>Stenoderma rufum</i>	<i>Paralabidocarpus artibeii</i> ^{1,4,c}	Labidocarpidae
	<i>Paralabidocarpus foxi</i> ^{1,c}	Labidocarpidae
	<i>Paralabidocarpus stenodermi</i> ^{1,c}	Labidocarpidae
	<i>Periglischrus iheringi</i> ^{1,2,3,7,c}	Spinturnicidae
<i>Pteronotus parnellii</i>	<i>Cameronieta thomasi</i> ^{7,a,c}	Spinturnicidae

1 = Webb and Loomis, 1977; 2 = Tamsitt and Valdivieso, 1970; 3 = Tamsitt and Fox, 1970a; 4 = Tamsitt and Fox, 1970b; 5 = Rudnick, 1960; 6 = Fain et al., 1967; 7 = this study; a = new record for Puerto Rico; b = new host record; c = known from the Luquillo Experimental Forest.

The primary arthropod groups sampled in this study, spinturnicid wing-mites, spelaeorhynchid ear-mites, argasid ticks, and streblid bat-flies, can be easily seen and collected while examining the bat host. Other ectoparasites may occur on these bats, but were undetected by our sampling protocol.

We collected spinturnicid wing-mites from all the bat species (Table 1). *Periglischrus cubanus* is reported in Puerto Rico for the first time, infesting *Brachyphylla cavernarum* and *Erophylla sezekorni*. This mite was originally described from several species of bats (including *B. nana*) in Cuba (Dusbabek, 1968). *Periglischrus vargasi* infests several species of glossophagine bats, and has been reported from *Monophyllus cubanus* (= *redmani*) in Cuba (Dusbabek, 1968). This is the first report of an association between *P. vargasi* and *M. redmani* in Puerto Rico. *Cameronieta thomasi*, also a

spinturnicid wing-mite, was collected from *Pteronotus parnellii*. *Cameronieta* was first established as a morphologically distinct group from *Periglischrus* by Machado-Allison (1965). This genus appears to be host specific on *Pteronotus* and *Mormoops*, and the association was used to support separation of mormoopid bats from phyllostomids (Smith, 1972). This is the first record of an association between *C. thomasi* and *P. parnellii* in Puerto Rico.

Mites of the family Spelaeorhynchidae were taken from the ears of *Artibeus jamaicensis* ($n = 28$) and *M. redmani* ($n = 9$). Unfortunately, all these mites were damaged during removal. The mouthparts of spelaeorhynchids are embedded deeply in the skin, and it is necessary to cut part of the ear to remove them intact. Two species were observed in this study—*Spelaeorhynchus praecursor* on *A. jamaicensis*, and *S. mon-*

ophylli on *M. redmani*. These two mites are described and illustrated by Fain et al. (1967).

Argasid ticks (*Ornithodoros* sp.) were collected from *E. sezekorni*. These specimens may be *O. vignerasi*, a taxon first reported on Puerto Rico from *E. bombifrons* (= *sezekorni*) by Tamsitt and Fox (1970a).

Streblid batflies were collected from *A. jamaicensis*, *M. redmani*, and *B. cavernarum*. Of those infesting *A. jamaicensis*, both *Megistopoda aranea* and *Aspidoptera phyllostomatis* are well-known ectoparasites of this host throughout its range. In contrast, associations between *Trichobius intermedius* and *A. jamaicensis* are known only from the Caribbean and Central America (Peterson and Hurka, 1974), including Puerto Rico (Webb and Loomis, 1977). *Trichobius truncatus* was found infesting *B. cavernarum*. This association has also been reported by Tamsitt and Fox (1970a). *Trichobius cernyi* was known previously only from Cuba, and is reported for the first time associated with *M. redmani*. The primary host of *Nycterophilina parnelli* is *Pteronotus parnelli*. Although this mormoopid bat is present in Puerto Rico, it was seldom captured during our study. The association of *N. parnelli* on *M. redmani* is a new record for Puerto Rico and may, in this instance, indicate roost sharing between two bat species.

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