

Host associations between laelapine mites (Mesostigmata: Laelapidae) and palustrine rodents in Paraguay: a study of host specificity and cryptic species

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Abstract

Host specialization has contributed to the high diversity of laelapine mites associated with Neotropical rodents, but the lack of taxonomic development at the species-level has confounded study of the coevolutionary history of both host and ectoparasite groups. Morphometric comparisons of presumptive polyxenous laelapine species infesting a diverse assemblage of palustrine rodents in Paraguay clearly reveal that each host species is infested by a morphologically distinct mite population. The nominal taxa *Laelaps manguinhosi*, *Gigantolaelaps goyanensis*, and *G. mattogrossensis* may be composites of morphologically distinct but similar species with narrower host preferences. These results suggest that laelapine mites are primarily monoxenous, and that numerous currently unrecognized species may be discerned by standard morphometric techniques.

Key words: Acari, Ectoparasites, Host specificity, Laelapidae, Neotropics, Rodents

Introduction

Laelapine mites (Mesostigmata: Laelapidae) are common associates of Neotropical rodents and marsupials (Tipton *et al.* 1966; Furman, 1972). When parasitic arthropods are sampled from the host skin and pelage, these mites are often abundant, rich in species, and diverse in assemblage (Dowling, 2006). The factors structuring host associations of laelapine mites and Neotropical rodents are still poorly understood, but in some genera host specificity is known to be remarkably high (Gettinger 1987, 1992, Gettinger & Ernest 1995, Gettinger & Owen 2000). In survey and inventory research, host distributions of laelapine mites clearly reflect specificity at higher taxonomic levels (e.g., *Gigantolaelaps* Fonseca only infests sigmodontine rodents of the Tribe Oryzomyini), suggesting that these mites may be distributed in parallel with the phylogenetic relationships of their hosts (Tipton *et al.* 1966, Furman 1972, Gettinger 1987, 1992, Gettinger & Owen 2000). But the host records of some laelapine mite species imply that associations may be polyxenous, with mites actively infesting a wide taxonomic range of rodents that share ecological time and space. It is important to evaluate these associations carefully and determine whether they represent active transfer of polyxenous mites or if these nominal laelapine species are composed of groups of morphologically similar laelapine species with narrower host preferences (“monoxeny”).

In Paraguay, five species of Neotropical rodents and their associated mites were collected from palustrine habitats. These included four oryzomyine species—*Holochilus chacarius* Thomas, 1906, *Pseudoryzomys simplex* (Winge, 1887), *Nectomys squamipes* (Brants, 1827), *Sooretamys angouya* (Fischer, 1814)—and one akodontine species, *Scapteromys aquaticus* Thomas, 1920. *Nectomys*