

MESOSTIGMATID MITES ASSOCIATED WITH THE HOUSE SHREW, *SUNCUS MURINUS*, IN RANGOON, BURMA

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INTRODUCTION

The house shrew, *Suncus murinus*, is a common component of the small commensal mammal fauna throughout most of its range from Pakistan to Japan, and on many Pacific Islands where it has been introduced. Although its importance to the epidemiology of zoonotic disease is not fully understood, it has been implicated as a possible reservoir for plague (Marshall *et al.*, 1967; Brooks *et al.*, 1977), murine typhus (RCDU unpublished data) and leptospirosis (Kundin *et al.*, 1970).

The Rodent Control Demonstration Unit found *S. murinus* to comprise approximately 20% of the sample of 12,350 small mammals collected in Rangoon and vicinity since 1975, second in relative abundance to *Bandicota bengalensis*, the dominant commensal species. Routine ectoparasite collections from the small mammal sample have been studied, and results presented in a series of papers intended to clarify host-parasite relationships of possible importance both to transmission of rodent-borne disease to man, and its maintenance among the reservoir species themselves.

The mesostigmatid mites obtained from *Rattus* species and from *B. bengalensis* were

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reported earlier (Telford *et al.*, 1980 a,b). This study compares the mesostigmatid fauna associated with *S. murinus* in urban and rural localities of the Rangoon area, and with murine rodent mesostigmatids recovered from murine rodents in Rangoon.

MATERIALS AND METHODS

Procedures followed in obtaining samples, processing mites and identification sources were presented earlier (Telford *et al.*, 1980 a). The term urban as used below refers to 134 samples collected within the city of Rangoon, representing 258 mites. Rural samples, all taken within Rangoon Division, were obtained primarily from the contiguous villages of Sabudaung and Ingyingwin in Hlegu Township about 50 Km northwest of Rangoon, represented by 54 samples containing 149 mites. Another 12 samples and 18 mites were available from the town of Hlegu itself, and from four other small villages or towns within 50-80 Km north-northwest of Rangoon.

RESULTS AND DISCUSSION

Identifications of mesostigmatids from urban and rural localities are presented in Table 1.

With the possible exception of *Laelaps* sp. B of Allred, which may be aberrant *L. myonyssognathus* (Telford *et al.*, 1980 a) none of the mites identified to species in this study represent new host records for *Suncus murinus*. *Laelaps myonyssognathus*

Table 1

Distribution of mesostigmatid species from *Suncus murinus* collected in urban and rural localities.

Mite spp.	Urban Rangoon No. (%)	Rural		Total No. (%)
		Sabu-daung/ Ingyingwin No. (%)	Other localities No. (%)	
Parasitic				
<i>Laelaps echidnina</i>	12 (4.6)	1 (0.7)		13 (3.1)
<i>L. nuttalli</i>	14 (5.4)			14 (3.3)
<i>L. myonyssognathus</i>	188 (72.9)	79 (53.0)	13 (72.2)	280 (65.9)
<i>L. sp. B. of Allred</i>	3 (1.2)			3 (0.7)
<i>Hirstionyssus sp.</i>		1 (0.7)		1 (0.2)
<i>Dermanyssus sp.</i>	1 (0.4)	1 (0.7)		2 (0.5)
Fam., Gen. sp. indet	1 (0.4)			1 (0.2)
Free-Living or Predatory				
<i>Androlaelaps</i> or <i>Hypoaspis</i> spp.	33 (12.8)	65 (43.6)	4 (22.2)	102 (24.0)
Uropodidae	6 (2.3)	1 (0.7)	1 (5.6)	8 (1.9)
<i>Cheyletus</i> (?)		1 (0.7)		1 (0.2)
No. mites	258	149	18	425
No. samples	134	54	12	200

was reported for this host in Pakistan (Allred, 1975), India (Mitchell, 1968), Thailand (Allred, 1970) Nepal (Mitchell, 1979) and Vietnam (Wang, 1963). *Laelaps echidnina* is known from *S. murinus* on Okinawa and Taiwan and *L. nuttalli* on Okinawa (Reisen *et al.*, 1975). Allred (1970) listed *L. nuttalli* from *S. murinus* in Thailand, and Mitchell (1979) recorded it in Nepal from *S. murinus*. *Hirstionyssus sunci* and *H. indosinensis* are known from *S. murinus* in China (Teng and Pan, 1963), and *Hirstionyssus sp.* in Nepal (Mitchell, 1979). *Dermanyssus gallinae* was reported from *S. murinus* in Okinawa (Reisen *et al.*, 1975), and *Liponyssoides sanguineus* from Nepal (Mitchell, 1979). Two other species recorded from *S. murinus* in Thailand

(*Laelaps turkestanicus* and *L. algericus* Allred, 1970), Pakistan (*L. algericus* Allred, 1975) and Nepal (*L. algericus*, Mitchell, 1979) were not found. In view of the abundance of *Androlaelaps/Hypoaspis* species on Burmese *S. murinus*, the records of *Androlaelaps suncus* on *S. varius* of Basutoland (Till, 1963), and *A. triangularis* on *S. murinus* in Nepal (Mitchell, 1979) are of interest.

The most striking finding seen is the very high proportion (24%) of the total sample comprised by the presumably free-living mesostigmatids belonging to *Androlaelaps* or *Hypoaspis* species (Tables 1, 4). Their prevalence in rural localities was 2-4 times that in the urban area, and strongly contrasts

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Table 2

Relative abundance of parasitic mesostigmatid mite species obtained from *Suncus murinus* and murine rodents in the vicinity of Rangoon.

Mite spp.	<i>Suncus murinus</i>		Murine rodents	
	Urban No. (%)	Rural No. (%)	Total No. (%)	Urban No. (%)
<i>Laelaps echidnina</i>	12 (5.5)	1 (1.0)	13 (4.1)	428 (29.8)
<i>L. nuttalli</i>	14 (6.4)	0	14 (4.5)	804 (56.0)
<i>L. myonyssognathus</i>	188 (85.9)	92 (96.8)	280 (89.2)	94 (6.5)
<i>L. sp. A of Allred</i>	0	0	0	60 (4.2)
<i>L. sp. B of Allred</i>	3 (1.4)	0	3 (1.0)	4 (0.3)
<i>L. wittei</i> (?)	0	0	0	1 (0.1)
<i>Liponyssoides muris</i>	0	0	0	43 (3.0)
<i>Ornithonyssus bacoti</i>	0	0	0	2 (0.1)
<i>Dermanyssus</i> sp.	1 (0.4)	1 (1.0)	2 (0.6)	0
<i>Hirstionyssus</i> sp.	0	1 (1.0)	1 (0.3)	0
Fam., Gen sp. Indet	1 (0.4)	0	1 (0.3)	0
Total mites	219	95	314	1436

Table 3

Relative abundance of the three most common mesostigmatid mites among murine rodent species and shrews.

Host species in order of relative abundance	%total mammals	<i>Laelaps nuttalli</i> No.(%)	<i>Laelaps echidnina</i> No.(%)	<i>Laelaps myonyssognathus</i> No.(%)	Total No.(%)
<i>Bandicota bengalensis</i>	52.6	342 (70.4)	68 (14.0)	76 (15.6)	486 (29.7)
<i>Suncus murinus</i>	19.9	14 (4.6)	13 (4.2)	280 (91.2)	307 (18.8)
<i>Rattus exulans</i>	18.8	26 (12.7)	165 (80.9)	13 (6.4)	204 (12.5)
<i>R. rattus</i>	5.6	30 (17.1)	141 (80.1)	5 (2.8)	176 (10.8)
<i>R. norvegicus</i>	3.1	406 (88.1)	54 (11.7)	1 (0.2)	461 (28.2)
Total		818	441	375	1634

Table 4

Relative distribution of the most common mesostigmatid species among rodents and shrews in Rangoon and vicinity.

Host species in order of relative abundance	No. samples	<i>L. nuttalli</i> No. (%)	<i>L. echidnina</i> No. (%)	<i>L. myonnsognathus</i> No (%)	<i>Laelaps</i> sp. No. (%)	<i>Liponyssoides muris</i> No. (%)	<i>Androlaelaps</i> or <i>Hypoaspis</i> No. (%)
<i>B. bengalensis</i>	171	74 (43.3)	51 (29.8)	57(33.3)	15 (8.8)	2 (2.2)	4 (2.3)
<i>S. murinus</i>	192	10 (5.2)	12 (6.3)	125 (65.1)	0	0	57 (29.7)
<i>R. exulans</i>	122	18 (14.8)	92 (75.4)	10 (8.2)	0	12 (9.8)	2 (1.6)
<i>R. rattus</i>	72	12 (16.7)	54 (75.0)	3 (4.2)	8 (11.1)	10 (13.9)	1 (1.4)
<i>R. norvegicus</i>	52	38 (73.1)	25 (48.1)	1 (1.9)	0	2 (3.8)	1 (1.9)
Total	609	152 (24.9)	234 (38.4)	196 (32.2)	23 (3.8)	26 (4.3)	65 (10.7)

with the prevalence of this group on *Rattus* species (0.4%, Telford *et al.*, 1980 a) and *Bandicota bengalensis* (0.7%, Telford *et al.*, 1980 b) in Rangoon. A possible explanation may lie in the fact that *S. murinus* constructs nests at ground level but not in deep ground burrows as do *B. bengalensis* and *R. norvegicus* or high within houses/vegetation as do *R. exulans* and *R. rattus*. The infestation level by *Androlaelaps/Hypoaspis* spp., is considerably greater than that by free-living uropodines (1.9%) or predatory species (*Cheyletus* ?, 0.2%) where abundance of the latter groups is comparable (0.9%, Telford *et al.*, 1980b) to that found on murines.

Relative abundance of the parasitic species found is shown in Table 2, in comparison with that reported on murine rodents in Rangoon (Telford *et al.*, 1980b). Clear differences between infestations on murines and shrews exist among species sufficiently common to be of potential importance in intra-murine transmission of certain diseases. As seen in Table 3, the two abundant *Laelaps* species, *L. nuttalli* and *L. echidnina* predominate on the three *Rattus* species, but are somewhat less common on *B. bengalensis* where *L. myonyssognathus* is more often seen. This species is dominant on *S. murinus* where both *L. nuttalli* and *L. echidnina* are uncommon, and could form an epidemiologically important link between the shrew and rodent populations. *Laelaps echidnina* and *L. nuttalli* on the other hand, easily connect the most abundant murine, *B. bengalensis*, with the three *Rattus* species.

Relative distribution of the most common species among samples from the five small mammals (Table 4) confirms the importance as possible vectors of *L. nuttalli*, *L. echidnina* and *L. myonyssognathus* within the rodent-shrew community. It clearly suggests that *L. myonyssognathus*, though less common on *Rattus* species, may be the most significant laelaptid in epidemiological terms because

of its greatest relative abundance on the two most commonly captured species, *B. bengalensis* and *S. murinus*. Much remains to be conclusively demonstrated as to the vector importance of these mites, but their presence is documented herein.

SUMMARY

In Rangoon and vicinity *Suncus murinus* comprises almost 20% of the small mammal population with almost equal load of mesostigmatid mites compared to murine rodents. *Suncus murinus* was infested by four species of laelapids, out of which *L. myonyssognathus* seems to infest more on urban *S. murinus*. The infestation of the free living *Androlaelaps* or *Hypoaspis* species is higher on the rural shrews while the *Cheyletus* species is higher on the urban than the rural *S. murinus*.

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