SHORT COMMUNICATION

Some Ectoparasites of Commensal Rodents from Huambo, Angola

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ABSTRACT Eight species of ectoparasites were collected from 166 commensal rodents, including *Rattus rattus* (L.), *Rattus norvegicus* (Berkenhout), and *Mus musculus* (L.), from January to December 1986, in Huambo, Angola. The oriental rat flea, *Xenopsylla cheopis* (Rothschild), was the predominant species with respect to mean intensity and prevalence. Other fleas collected were *Ctenophthalmus (Ethioctenophthalmus) machadoi* Ribeiro, *Dinopsyllus (Dinopsyllus) smiti* Ribeiro, and *Echidnophaga gallinacea* (Westwood). The mite *Laelaps (Echinolaelaps) muricola* Trägårdh, the louse *Polyplax spinulosa* (Burmeister), one species of *Ixodes* Latreille, and one species of *Ornithonyssus* Sambon were also recorded. The following represent new host records: *C. machadoi* from *R. rattus* and *R. norvegicus*, *D. smiti* from *M. musculus*, and *L. muricola* from *R. rattus* and *M. musculus*. For the first time, the monthly flea indices throughout the year are presented for Angola.

KEY WORDS Ectoparasites, commensal rodents, flea indices

EXCEPT FOR FLEAS, Angolan rodent ectoparasites are not well known. Early studies on Angolan Siphonaptera were mainly taxonomic, emphasizing descriptions of species. Jordan (1936) listed 17 species, including nine new species. Between 1957 and 1960, another five species were described. Ribeiro (1969) enriched the siphonapteran fauna with the addition of 12 records. The only comprehensive research on Angolan fleas concerning systematics, geographical and ecological distribution, flea–host interrelationships, and data related to epidemiology of plague was presented by Ribeiro (1974). Some records of mammal lice, including Anoplura and Mallophaga, were reported by Werneck (1959).

Here we report the fleas and other large ectoparasites of commensal rodents and the monthly examination records for Angola.

Materials and Methods

Commensal rodents were trapped in urban and suburban sites in the municipality of Huambo, People's Republic of Angola, between January and December 1986. Huambo is located in the mountain forest biome, at an altitude of 1,700 m.

After killing with sulphuric ether, each rodent was immersed in a jar containing water and then shaken vigorously for some time. After washing, each supernatant was filtered and the ectoparasites picked off the filter paper. Ectoparasites recovered from each rodent were stored individually in vials of 70% ethanol, labeled by host number and date, and submitted for identification to the Department of Parasitology, Federal University of Minas Gerais, Brazil.

Rodents were identified in the Institute of Veterinary Investigation, Huambo, Angola. Voucher specimens of ectoparasites mounted on permanent slides (fleas and ticks in Canada balsam, lice and mites in Hoyer's solution) are deposited at the Federal University of Minas Gerais, Brazil.

Results and Discussion

In total, 314 ectoparasite specimens representing eight species were taken from 166 commensal rodents, including 119 *Rattus rattus* (L.), 18 *Rattus norvegicus* (Berkenhout), and 29 *Mus musculus* (L.). Species of ectoparasites and their respective hosts are shown in Table 1. Because the method of processing ectoparasites we used misses smaller mites, only large specimens of ectoparasites were found.

The total prevalence of ectoparasites on each rodent species was similar. However, mites were more predominant on *R. norvegicus*, whereas

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Table 1. Ectoparasites encountered on 166 commensal rodents from Huambo, Angola

Ectoparasites	*R. rattus* (n = 119)[a]			*R. norvegicus* (n = 18)[a]			*M. musculus* (n = 29)[a]			Total (n = 166)[a]		
	Infested		n^b	Infested		n^b	Infested		n^b	Infested		n^b
	No.	%		No.	%		No.	%		No.	%	
Acari	7	(5.9)	16	7	(38.9)	16	5	(17.2)	9	19	(11.4)	41
Ixodes sp.	1	(0.8)	1	—	—	—	—	—	—	1	(0.6)	1
L. muricola	4	(3.4)	8	6	(33.3)	15	4	(13.8)	8	14	(8.4)	31
Ornithonyssus sp.	3	(2.5)	7	1	(5.6)	1	1	(3.4)	1	5	(3.0)	9
Anoplura: *P. spinulosa*	2	(1.7)	2	—	—	—	—	—	—	2	(1.2)	2
Siphonaptera	53	(44.5)	250	4	(22.2)	7	9	(31.0)	14	66	(39.8)	271
C. (E.) machadoi	1	(0.8)	1	1	(5.6)	4	—	—	—	2	(1.2)	5
D. (D.) smiti	—	—	—	—	—	—	2	(6.9)	2	2	(1.2)	2
E. gallinacea	1	(0.8)	6	—	—	—	—	—	—	1	(0.6)	6
X. cheopis	53	(44.5)	243	3	(16.7)	3	7	(24.1)	12	63	(38.0)	258
Total	54	(45.4)	268	9	(50.0)	23	12	(41.4)	23	75	(45.2)	314

[a] Number of hosts examined.
[b] Number of ectoparasites collected.

greater numbers of fleas were found on *R. rattus* and *M. musculus* (Table 1). The relative intensity of ectoparasites (mean of 1.3 = 23:18 [Table 1]) found on *R. norvegicus* was the same as that reported from Brazil by Linardi et al. (1984).

Contrary to the results of Ribeiro (1974), the infestation by the oriental rat flea, *Xenopsylla cheopis* (Rothschild) on *R. rattus* was almost 3-fold greater than that observed on *R. norvegicus*. Seven of 271 flea specimens collected (2.6% [Table 1]) indicated an interchange between commensal and wild rodents, although *Ctenophthalmus (Ethioctenopthalmus) machadoi* Ribeiro and *Dinopsyllus (Dinopsyllus) smiti* (Ribeiro) have been reported previously only from wild rodents (Ribeiro 1974).

Rodents, essentially commensal rodents worldwide, have been reported to be unusual hosts for ixodid ticks. Therefore, the occasional infestation of *R. rattus* by *Ixodes* sp. (Table 1) may reveal ecological affinities between rodents and other mammals. However, *R. rattus* parasitized by *Polyplax spinulosa* (Burmeister) has been noted in many parts of the world (Ferris 1951).

Currently, the Angolan flea fauna includes 48 species and subspecies. In this report, although all the species of fleas have been recorded previously from Huambo (Ribeiro 1974), the following represent new host records: *R. rattus* and *R. norvegicus* for *C. machadoi* and *M. musculus* for *D. smiti*. In addition, *X. cheopis* is reported for the first time in Angola on *M. musculus*, although this record is common in several parts of the world. Before this study, *Echidnophaga gallinacea* (Westwood) had not been found infesting *R. rattus* in Angola.

According to Coffee & Retief (1972) and Okereke (1973), *Laelaps (Echinolaelaps) muricola* Trägärdh is one of the most frequently collected mites in the Ethiopian Region. Nevertheless, those authors did not report *R. norvegicus* and *M. musculus* as hosts.

The monthly prevalence of ectoparasites and flea indices are shown in Table 2. Except for September, ectoparasites were found throughout

Table 2. Monthly prevalences of ectoparasites and flea indices on 166 commensal rodents in the municipality of Huambo, Angola, from January to December 1986

Months	Commensal rodents					Flea indices	
	No. collected	Infected by ectoparasites		Infested by *X. cheopis*		Total	Specific *X. cheopis*
		No.	%	No.	%		
Jan.	18	17	94.4	13	72.2	5.2	4.8
Feb.	14	10	71.4	6	42.9	2.4	2.4
Mar.	10	6	60.0	5	50.0	1.4	1.0
Apr.	16	8	50.0	8	50.0	3.6	3.6
May	18	8	44.4	8	44.4	1.8	1.8
June	24	12	50.0	10	41.7	0.8	0.7
July	13	4	30.8	4	30.8	0.7	0.7
Aug.	13	3	23.1	3	23.1	0.3	0.3
Sept.	12	—	—	—	—	—	—
Oct.	8	1	12.5	1	12.5	0.1	0.1
Nov.	8	2	25.0	1	12.5	0.1	0.1
Dec.	12	4	33.3	4	33.3	0.5	0.5
Total	166	75	45.2	63	38.0	1.6	1.6

the year. Also, infestation by *X. cheopis* was observed for 11 mo. It was exclusive in May, July, October, and December. Both prevalences (overall and *X. cheopis*) and flea indices decreased from February to September (Table 2).

The annual flea index ranged from 0.1 to 5.2, with a mean of 1.6, with the highest indices coinciding with the late dry season (January and February) and extending to the short rainy season (March to May [Table 2]). The flea index is used most often to determine the potential risk of transmission of plague and murine typhus from rats to humans (Pollitzer 1954, Bahmanyar & Cavanaugh 1976, Traub et al. 1978, Gratz & Brown 1983), to assess the potential for plague transmission within rodent populations, and to examine aspects of flea–host relationships (Schwan 1984).

A specific *X. cheopis* index of >1.0 was noted from January to May (Table 2). Because such a value indicates a dangerous situation for plague (Pollitzer 1954, Bahmanyar & Cavanaugh 1976), flea and rodent control measures should be concentrated during that period. Although this study provided data from a single year, it is clear that flea indices and infestations on rodents were influenced by climatic conditions. Therefore, flea population peaks will occur cyclicly. The recent civil war and social disturbances in Angola notwithstanding, this situation should not be underestimated.

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