

THE GENUS *ORNITHONYSSUS* SAMBON 1928  
IN THE ETHIOPIAN REGION : DESCRIPTION OF A NEW SPECIES  
AND A REDESCRIPTION OF *O. ROSEINNESI* (ZUMPT & TILL, 1953)  
(ACARINA, MESOSTIGMATA)

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HABITAT  
IN ETHIOPIAN  
REGION  
ACARI  
OF MEDICAL  
AND VETERINARY  
IMPORTANCE

ABSTRACT : A new macronyssid mite is described based on material collected by the authors in July 1981 from an elephant shrew (*Elephantulus myurus* Thomas and Schwann, 1906) at Kimberley, South Africa. The female of *Ornithonyssus roseinnesi* (Zumpt and Till, 1953) is redescribed and a key given to females of the Ethiopian species of *Ornithonyssus*. New host records for the genus in the Ethiopian region are presented.

WIRTE  
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KRANKENMILBEN

ZUSAMMENFASSUNG : Auf der Grundlage von Material welches die Autoren im Juli 1981 von der Elefantenschrew (*Elephantulus myurus* Thomas und Schwann, 1906) in Kimberley, Südafrika, gesammelt haben, wird hier ein neue Milbe der Familie *Macronyssidae* beschrieben. Ausserdem wird das Weibchen der Art *Ornithonyssus roseinnesi* (Zumpt and Till, 1953), neu beschrieben und ein Schlüssel zur Identifizierung der äthiopischen Ornithonyssinen gegeben. Neue Wirte für diese Gattung im äthiopische Raum werden aufgeführt.

#### INTRODUCTION

Recently the genus *Ornithonyssus* has been reviewed on a worldwide basis by MICHARDZINSKI (1980) but apart from the description of a new species, all his information on African species is based on the work of ZUMPT (1961). Since the publication of ZUMPT's book new records of *Ornithonyssus* mites have come to light from African mammals and birds, including the discovery of a new species.

In July 1976 a single female mite was taken from a Namaqua rock mouse *Aethomys namaquensis* (A. Smith, 1834) captured at Onseepkans, Kenhardt district, Cape Province. This mite resembled *Ornithonyssus roseinnesi* (Zumpt and Till, 1953) in general appearance but had setae present on the opisthonotal region of the dorsal shield (behind seta *J4*) — a feature absent in the figures of ZUMPT and TILL (1953) and MICHARDZINSKI (1980). On examination of the type series at the South African Institute for Medical

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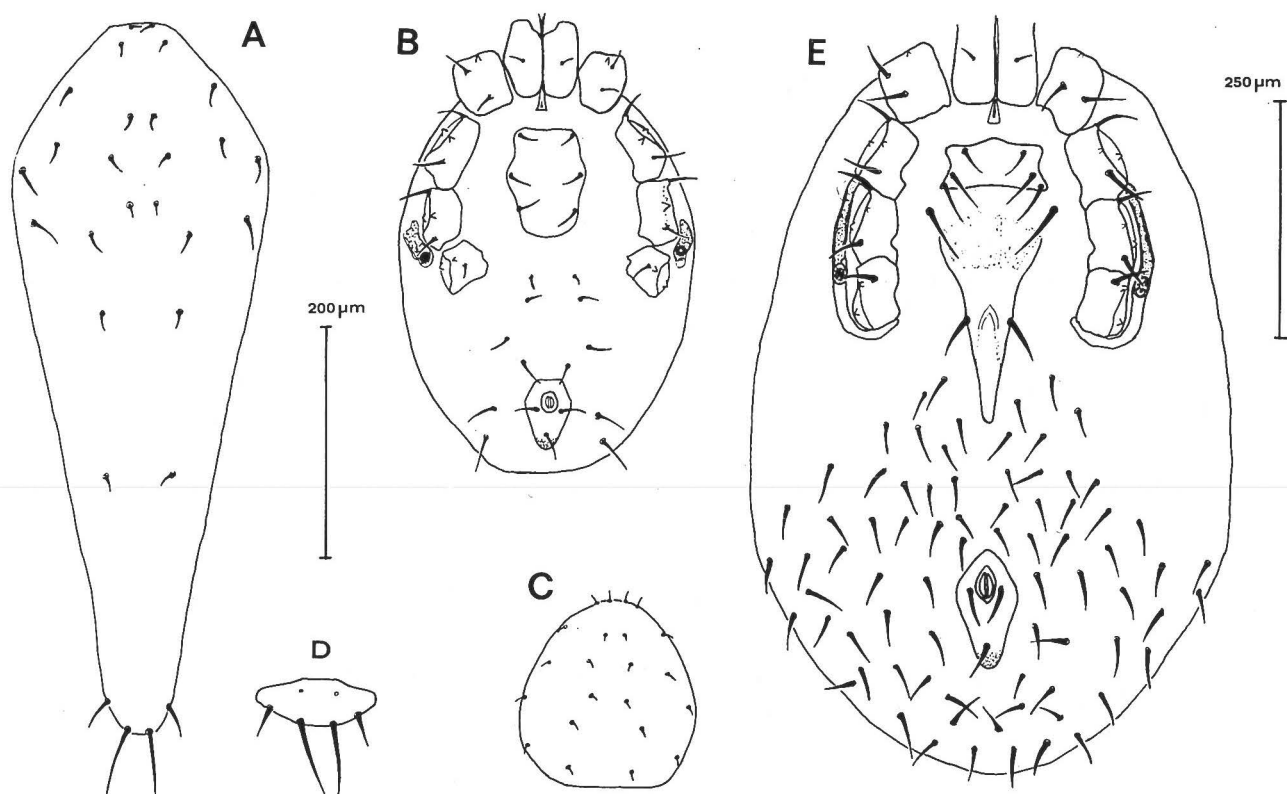


FIG. 1 : *Ornithonyssus capensis* n. sp.

A. — Female, dorsal shield ; B, C, D. — Protonymph, venter (B), podonotum (C), pygidium (D) ; E. — Female holotype, venter.

Research, Johannesburg, the original descriptions were found to be inadequate. In common with our specimen the type material was seen to have setae present posterior to seta *J4*. It was decided that they were the same species and that a redescription of *O. roseinnesi* should be made.

The redescription of *O. roseinnesi* together with a description of the new species and a key to the females of the Ethiopian species of *Ornithonyssus* are presented in this paper. The system of setal nomenclature proposed by MICHERDZINSKI (1980) is used for the terminology of the setae of the opisthonotum, with the exception of the I series which is replaced by the capital *J*. New host records for the genus in Africa are also given.

#### *Ornithonyssus capensis* n. sp. (Fig. 1, A-E)

##### ■ *Diagnosis.*

The female of this species is easily recognised by having only two pairs of relatively long setae of the dorsal shield posterior to seta *J4*, by an extremely short and well defined peritreme, and by the chaetotaxy of genu IV,  $2\frac{2}{1}\frac{3}{1}2$  (11). The protonymph has a podonotum with 11 pairs of very short setae, a pygidium with two pairs of setae and genu IV with chaetotactic formula  $1\frac{2}{0}\frac{2}{0}1$  (6).

■ *Female*

Idiosoma (holotype) with a greatest width of 560  $\mu\text{m}$ , length 770  $\mu\text{m}$ . Dorsal shield reticulate, long and tapering (605  $\mu\text{m}$  long, 234  $\mu\text{m}$  wide), bearing 14 pairs of setae, all short except Z5 and J6 (30  $\mu\text{m}$  and 55  $\mu\text{m}$  long respectively), seta *i.3* absent. Sternal shield 125  $\mu\text{m}$  wide, 50  $\mu\text{m}$  long posterior margin invaginated almost to the level of seta *st 2*, *st 3* situated on margin of most posterior extension of the plate. Genitoventral shield 72  $\mu\text{m}$  wide at level of genitoventral setae, reticulate, short, tapering sharply to a blunt point posteriorly. Anal shield 140  $\mu\text{m}$  long, 55  $\mu\text{m}$  wide, elongate, broadly rounded anteriorly and tapering to a blunt point posteriorly. Anal setae 30  $\mu\text{m}$  long; adanal setae subequal. Endopodal plates absent. Peritreme well defined, thick and strikingly short barely reaching to posterior margin of coxa II.

Gnathosoma with four pairs of short, simple, slender setae; hypostomal seta III 20  $\mu\text{m}$  long.

TABLE 1. Segmental chaetotaxy of female and protonymph *Ornithonyssus capensis* n. sp.

Leg	Coxa	Trochanter	Femur	Genu	Tibia	Tarso
Female						
I	$\frac{00}{11}0(2)$	$\frac{01}{21}1(6)$	$\frac{32}{13}2(13)$	$\frac{33}{21}2(13)$	$\frac{33}{21}2(13)$	—
II	$\frac{00}{11}0(2)$	$\frac{00}{21}1(5)$	$\frac{32}{12}1(11)$	$\frac{32}{11}2(11)$	$\frac{22}{11}2(10)$	$\frac{313}{212}3(18)$
III	$\frac{00}{11}0(2)$	$\frac{10}{21}0(5)$	$\frac{21}{10}1(6)$	$\frac{22}{11}2(10)$	$\frac{12}{11}2(9)$	as II
IV	$\frac{00}{10}0(1)$	$\frac{10}{21}0(5)$	$\frac{21}{20}1(6)$	$\frac{23}{11}2(11)$	$\frac{13}{11}2(10)$	as II
Protonymph						
I	$\frac{00}{11}0(2)$	$\frac{00}{20}1(4)$	$\frac{22}{11}2(10)$	$\frac{22}{11}1(8)$	$\frac{22}{11}1(8)$	—
II	$\frac{00}{11}0(2)$	$\frac{00}{02}1(4)$	$\frac{22}{11}1(8)$	$\frac{22}{00}1(6)$	$\frac{12}{11}1(7)$	$\frac{313}{202}3(17)$
III	$\frac{00}{11}0(2)$	$\frac{10}{11}0(4)$	$\frac{21}{10}1(5)$	$\frac{22}{00}1(6)$	$\frac{12}{11}1(7)$	as II
IV	$\frac{00}{10}0(1)$	$\frac{10}{20}0(4)$	$\frac{21}{10}0(4)$	$\frac{22}{00}1(6)$	$\frac{12}{11}1(7)$	as II

Leg measurements : I = 621  $\mu\text{m}$ , II = 525  $\mu\text{m}$ , III = 520  $\mu\text{m}$ , IV = 680  $\mu\text{m}$  long. Segmental chaetotaxy (Table 1) as for the genus *Ornithonyssus*

(Micherdzinski, 1980) except genu IV with formula  $2\frac{2}{1}\frac{2}{1}3(11)$ .

■ *Protonymph*

Idiosoma (average of paratypes) with greatest width 254  $\mu\text{m}$ , length 345  $\mu\text{m}$ . Podonotum 159  $\mu\text{m}$  wide, 152  $\mu\text{m}$  long, with 11 pairs of short setae 13  $\mu\text{m}$  long. Pygidium 89  $\mu\text{m}$  wide, 27  $\mu\text{m}$  long with two pairs of setae, setae Z5 and J6 27.5  $\mu\text{m}$  and 41  $\mu\text{m}$  long respectively. Sternal shield 110  $\mu\text{m}$  wide, 75  $\mu\text{m}$  long with three pairs of short sternal setae. Anal shield 35  $\mu\text{m}$  wide, 55  $\mu\text{m}$  long. Anal and adanal setae short and subequal. Peritreme short. Gnathosomal setae short, slender.

Leg measurements : I = 322  $\mu\text{m}$ , II = 269  $\mu\text{m}$ , III = 267  $\mu\text{m}$ , IV = 332  $\mu\text{m}$  long. Segmental chaetotaxy (Table 1) as for genus *Ornithonyssus* except genu IV with formula  $1\frac{2}{0}\frac{2}{0}1(6)$ .

■ *Male* — unknown.

*Type material*

Female holotype, three paratypes and eight protonymphs (coll. A. J. Shepherd, PL 81 : 125) Benfontein, Kimberley, Cape Province, South Africa on *Elephantulus myurus* Thomas and Schwann 1906, collected July 1981.

Specimens are in the collection of the South African Institute for Medical Research, Johannesburg.

*Ornithonyssus roseinnesi* (Zumpt & Till, 1953)

*Liponyssus roseinnesi* : ZUMPT & TILL, 1953 ; *Ornithonyssus roseinnesi* : STRANDTMANN & WHARTON, 1958 ; *Macronyssus roseinnesi* : ZUMPT, 1961 ; *Ornithonyssus roseinnesi* : MICHERDZINSKI, 1980.

■ *Diagnosis*

This species is easily recognised by the extremely short setae over the entire surface of the dorsal shield, by the characteristic shape of the

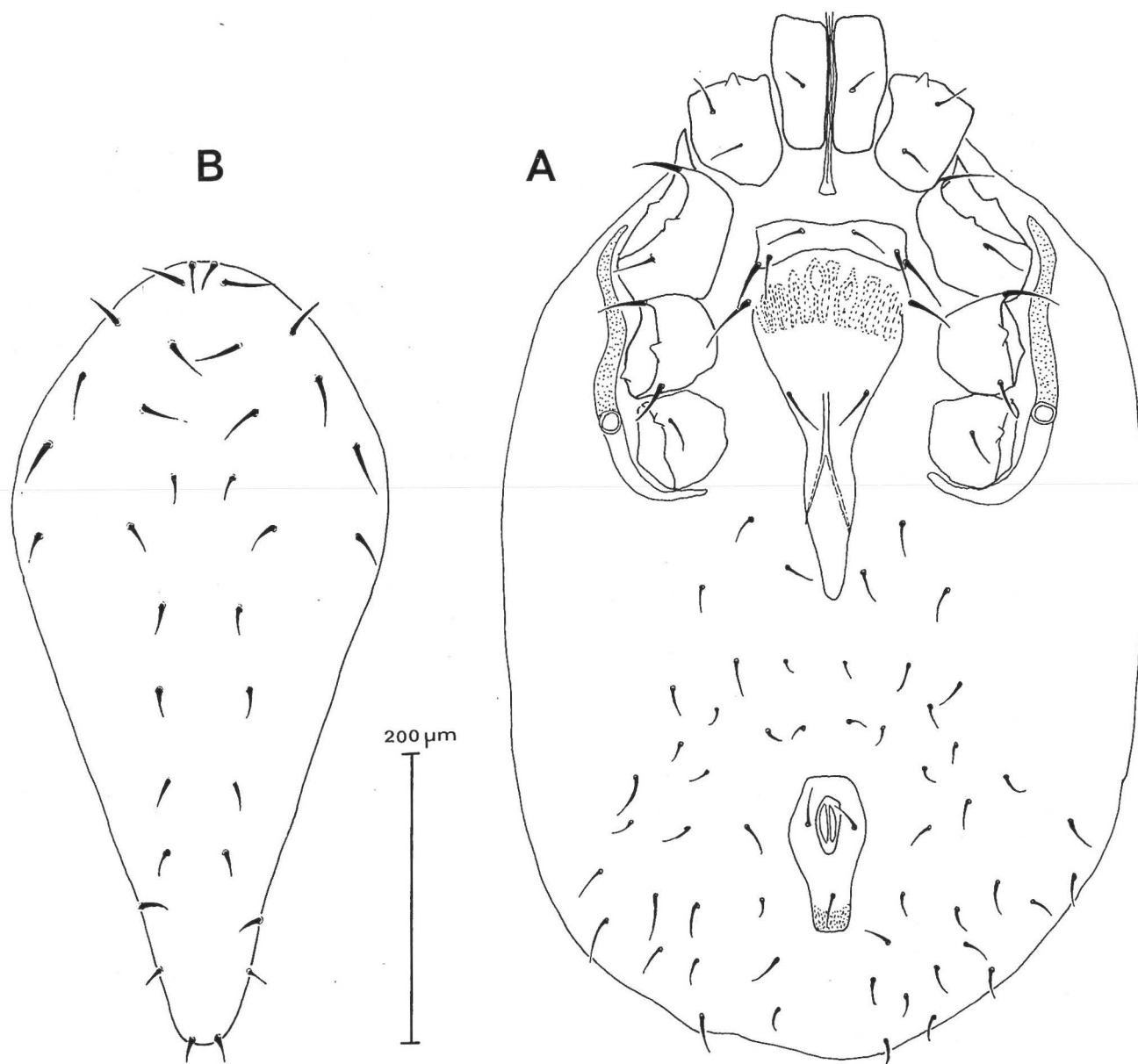


FIG. 2 : *Ornithonyssus roseinnesi* (Zumpt & Till, 1953).

A, B. — Female, venter (A), dorsal shield (B).

sternal shield (length/width = 1/5) by the antero-dorsal spine present on coxa II.

■ *Female* (Holotype no. 1327)

Idiosoma with greatest width 440 μm, 662 μm long. Dorsal shield 262 μm wide, 535 μm long,

elongate pear-shape, tapering posteriorly, slightly reticulate with 17 pairs of short setae (longer anteriorly). Seta *I3* absent *I6* 10 μm long. Venter of idiosoma with approximately 25 pairs of short (on average 25 μm long) slender setae. Sternal shield 117 μm wide, 22.5 μm long, extremely narrow and much wider than long. Genitoventral

shield tapering to a blunt point posteriorly. Genitoventral setae 60  $\mu$ m apart. Anal shield pear-shaped, 60  $\mu$ m, wide, 102  $\mu$ m long. Anal and adanal setae short, subequal.

Gnathosomal setae simple, slender, of average-length; hypostomal seta III = 32.5  $\mu$ m long. Endopodal plate small, triangular, present opposite coxa II. Peritreme reaches to coxa II.

Leg measurements: I = 462  $\mu$ m, II = 370  $\mu$ m, III = 335  $\mu$ m, IV 425  $\mu$ m long. Segmental chaetotaxy as for the genus *Ornithonyssus* (MICHERDZINSKI, 1980). Anterodorsal spine present on coxa II.

■ *Protonymph* — Unknown.

■ *Male* — Unknown.

#### *Hosts and localities*

The original description was based on 49 females collected from the nest of a rodent, *Rhabdomys pumilio* (Sparman, 1784), at Goshen, Cape Province. Since then only a single female has been found, taken from *Aethomys namaquensis* (A. Smith, 1834) at Onseepkans, Cape Province in 1976. The great distance between the two collecting sites suggests a wide distribution for this species.

#### KEY TO THE FEMALES OF THE ETHIOPIAN SPECIES OF *Ornithonyssus sambon*, 1928

1. Palpal trochanter with ventral spine..... 3
- Palpal trochanter without ventral spine..... 2

2. Anterodorsal spur on coxae II present, genus IV with 10 setae, Z5 and J6 small.....  
*roseinnesi* (Zumpt & Till, 1953)
- Anterodorsal spur on coxa II absent, genu IV with 11 setae, Z5 and J6 long..... *capensis* n. sp.
3. Anterodorsal spur present on coxa II..... 5
- Anterodorsal spur absent on coxa II..... 4
4. Three pairs of lateral seta posterior to J4 on the dorsal shield, Z4 and J6 subequal.....  
*sylviarum* (Canestrini & Fanzago, 1877)
- Four pairs of lateral setae posterior to J4 on the dorsal shield, Z5 and J6 subequal, Z4 shorter.....  
*bursa* (Berlese, 1888)
5. Dorsal shield narrow, tapering posteriorly..... 6
- Dorsal shield otherwise..... 7
6. Anal shield greatly extended posteriorly to form long lobe, large species (idiosoma greater than 1.5 mm), sternal shield with round, pore-like structures..... *africanus* (Zumpt & Till, 1958)
- Anal shield without lobe, smaller species (idiosoma less than 1 mm), sternal shield without pore-like structures. Cosmopolitan species.....  
*bacoti* (Hirst, 1913)
7. Posteroventral spur on coxa III present.....  
*lukoschosi* Micherdzinski, 1980
- Posteroventral spur on coxa III absent..... 8
8. Dorsal shield broad and rounded, peritreme reaching to coxa II, anal shield large and distinctly broad....  
*galagus* (Zumpt & Till, 1953)
- Dorsal shield tapering, peritreme extending to coxa I, anal shield smaller and more narrow.....  
*nyctinomi* (Zumpt & Patterson, 1951)

#### NEW COLLECTION RECORDS

*Ornithonyssus bacoti* (Hirst, 1913) :

<i>Arvicanthus niloticus</i>	Parakou, Dahomey	1 female
<i>Crocidura</i> sp.	Parakou, Dahomey	8 females, 1 PN *
<i>Crocidura</i> sp.	Borgou region, Dahomey	3 males, 12 females
<i>Crocidura flavescens</i>	Grahamstown, Cape Province	2 females, 2 PN
<i>Crocidura mariquensis</i>	Okavango, Botswana	1 male, 3 females
<i>Crocidura occidentalis</i>	Okavango, Botswana	7 females
<i>Dendromus</i> sp.	Roodepoort, Transvaal	7 females
<i>Herpestes pulverulentis</i>	Cape Peninsula, Cape Province	5 females
<i>Lemniscomys striatus</i>	Segbaria, Dahomey	2 females

\* PN = protonymph.

<i>Malacothrix typica</i>	Mafeking, Cape Province	2 males, 12 females
<i>Mastomys natalensis</i>	Soubroukou, Dahomey	1 female
<i>Mastomys natalensis</i>	Panyam Fish Farm, Nigeria	2 females
<i>Mus musculus</i>	Johannesburg, Transvaal	1 female
<i>Myomys daltoni</i>	Karaduwa, Nigeria	2 females
<i>Rattus norvegicus</i>	Durban, Natal	2 females
<i>Rattus rattus</i>	Groot Eiland, Vaaldam, Transvaal	4 males, 4 females, 8 PN
<i>Rhabdomys pumilio</i>	Namib Desert Park, South West Africa/Namibia	8 PN

*Ornithonyssus bursa* (Berlese, 1888) :

<i>Colius colius</i>	Pretoria, Transvaal	1 female
<i>Laniarus atrococcineus</i> nest	Olifantsfontein, Transvaal	20 females
<i>Myrmecocichla formicivora</i>	Venterstad, Orange Free State	1 female
Native huts	Ovamboland, South West Africa/Namibia	10 females
<i>Onychognathus morio</i> nest	Pietermaritzburg, Natal	10 females
<i>Telephorus zeylonus</i> nest	Johannesburg, Transvaal	3 females

*Ornithonyssus roseinnesi* (Zumpt and Till, 1953) :

<i>Aethomys namaquensis</i>	Onseepkans, Cape Province	1 female
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*Ornithonyssus sylviarum* (Canestrini, Fanzago, 1877) :

<i>Myrmecocichla formicivora</i>	East London, Cape Province	1 male, 4 females
<i>Prinia maculosa</i>	Cape Twon, Cape Province	16 females
<i>Pycnonotus barbatus</i>	Pretoria, Transvaal	1 male, 23 females, 3 PN

## DISCUSSION

Host and localities for each of the nine species of *Ornithonyssus* recorded from the Ethiopian region are summarized in Table 2. The majority are endemic to the region, exceptions being *O. bacoti*, *O. bursa* and *O. sylviarum* which are cosmopolitan. These three species are also of medical and veterinary importance. *O. bacoti*, recorded many times from wild and domestic rodents in Africa, is a common source of human dermatitis. It may also be implicated in the epidemiology of several diseases including plague, tularemia, rickettsialpox and murine typhus (ZUMPT, 1961). The tropical fowl mite, *O. bursa*, is widely distributed throughout the Ethiopian region and has been recorded from a number of wild bird species and domestic fowl. Similarly, *O. sylviarum* has been recorded from several wild bird species in the Cape Province and the Transvaal.

TABLE 2. Hosts and localities of *Ornithonyssus* species in the Ethiopian region.

Species	Locality	Host
<i>O. africanus</i> (Zumpt & Till, 1958)	Transvaal	<i>Rhinolophys clivus</i> (Chiroptera)
<i>O. bacoti</i> (Hirst, 1913)	Cosmopolitan	Domestic and wild rodents
<i>O. bursa</i> (Berlese, 1888)	Cosmopolitan	Birds
<i>O. Capensis</i> n. sp.	Cape Province	<i>Elephantulus myurus</i> (Insectivora)
<i>O. galagus</i> (Zumpt & Till, 1953)	Uganda/Transvaal	<i>Galago senegalensis</i> (Primates)
		<i>Graphiurus murinus</i> (Rodentia)
<i>O. lukoschosi</i> Micherdzinski, 1980	Zambia	<i>Graphiurus murinus</i> (Rodentia)
<i>O. nyctinomi</i> (Zumpt & Patterson, 1951)	Cape Province	<i>Tadarida bocagei</i> (Chiroptera)
<i>O. roseinnesi</i> (Zumpt & Till, 1953)	Cape Province	<i>Rhabdomys pumilio</i> (Rodentia)
		<i>Aethomys namaquensis</i> (Rodentia)
<i>O. sylviarum</i> (Canestrini & Fanzago, 1877)	Cosmopolitan	Birds

In general the genus *Ornithonyssus* in the Ethiopian region appears to be adapted to avian

or arboreal hosts, exceptions being *O. roseinnesi* and *O. capensis* which have only been recorded from ground-living small mammals. Two species, *O. africanus* and *O. nyctinomi*, are parasitic on bats and two, *O. bursa* and *O. sylviarum*, exclusively on birds. Both *O. lukoschosi* and *O. galagus* have been found on the woodland dormouse (*Graphiurus murinus*), an arboreal rodent, while *O. galagus* has also been recorded from the night ape (*Galago senegalensis*). The primary host of *O. bacoti* is *Rattus rattus* which originally may have been arboreal (ROSEVEAR, 1969). Commonly known as the roof rat, it is an excellent climber and it seems probable that *O. bacoti* was associated with *R. rattus* prior to its domestication.

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