

# Ectoparasitic mites (Acarina) from small mammals in southern Sweden

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## 1. Introduction

In 1963—1969 small mammals were collected at five places in Scania, the southernmost province of Sweden (Fig. 1). Two localities are situated on the coast, the others inland. The aim was to study seasonal fluctuations in numbers of rodents and their ectoparasites. This paper lists the mites collected.

## 2. Material and methods

A total of 2,507 small mammals, representing ten species (Tab. 1), was collected at all seasons. 1,206 specimens, representing seven species, had 8,582 mites, an infestation frequency of 48.1 %.

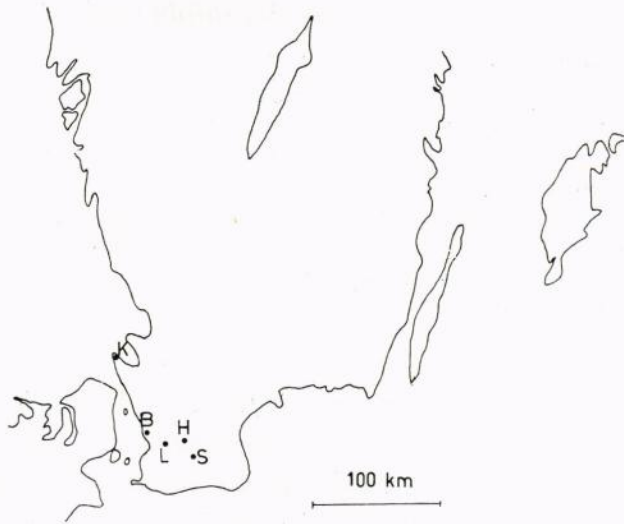
The mammals were collected in live net cage traps (Edler 1971). The ectoparasites were removed by tweezers and preserved in 80 % ethanol until mounting on slides.

## 3. The ectoparasitic mites

The mite species are listed below, arranged according to Bregetova et al. (1955) and Bregetova (1956), but in a few cases the names suggested by Evans and Till (1966) are used.

8,582 mites were recorded. 7,334 of them belong to the superfamily Gamasoidea Reuter (order Parasitiformes). The others (*Myobia*, *Pygmephorus*

Fig. 1. Southern Sweden with the collecting localities. B=Barsebäck, H=Hällestad, K=Kullaberg, L=Lund and S=Stampen.



and *Neotrombicula*), all of them suborder Trombidiformes Reuter, are Acari-formes.

29 species were represented, 5 of them new to Sweden. There were 1,249 larvae, 100 protonymphs, 336 deutonymphs, 607 males and 6,290 females. 99.7 % of the 1,248 specimens of Acariformes were larvae (Tab. 2 and 3).

**Order Acariformes Reuter**  
**Suborder Trombidiformes Reuter, 1909**  
**Family Pyemotidae Oudemans, 1937**

*Pygmephorus* sp.

Three specimens found on *S. araneus*.

It has been recorded by several authors from *Talpa europaea* L. and *Apodemus* spp. in Europe, but these are probably temporary hosts (Zumpt 1961).

**Family Trombiculidae Ewing, 1929**

*Neotrombicula zachvatkini* Schluger, 1948 (= *Trombicula zachvatkini* Schluger 1948).

1,244 larvae found on *S. araneus*, *C. glareolus*, *M. agrestis* and *A. sylvaticus*.

The larvae of this mite are parasites both on mammals and man. They are known from many species of small mammals in Europe (Kepka 1964).

### Family *Myobiidae* Mégnin, 1877

#### *Myobia musculi* Schrank 1781

One specimen from *A. sylvaticus*.

The Myobiidae parasitize small mammals throughout the world and are strongly host specific (Hughes 1959 and Baker and Wharton 1952). *M. musculi* is mostly found on *M. musculus* and sometimes on *A. sylvaticus* (Bregetova et al. 1955 and Evans et al. 1961). Wharton (1960) showed that interstitial fluid and not blood is the food source. It is often responsible for dermatitis in laboratory rats and mice.

It seems to be new to Sweden.

### Order *Parasitiformes* (Reuter) Zachvatkin Suborder *Mesostigmata* G. Canestrini, 1819 Superfamily *Gamasoidea* Reuter Family *Parasitidae* Oudemans, 1902

#### *Pergamasus crassipes* L., 1758

One female on *A. flavicollis*.

Sometimes this free-living mite is found in nests of birds and small mammals (Nordberg 1936 and Mrciak et al. 1966). A few records from the fur of small mammals are also known (Mrciak and Brander 1965 and Edler 1969). According to Micherdziński (1969) it is common throughout Europe.

#### *Eugamasus kraepelini* Berlese, 1904

Four deutonymphs, one from *S. araneus* and three from *A. flavicollis*.

Normally it is free-living, but in some cases it has been found on small mammals (Mrciak and Rosický 1956 and Edler 1969). It is found in most parts of Europe (Micherdziński 1969).

#### *Eugamasus remberti* Oudemans, 1912

Eight deutonymphs, five from *S. araneus* and three from *M. agrestis*.

The deutonymph is found both in the nests and on the fur of small mammals in many parts of Europe. The adult is free-living (Mrciak and Tovornik 1966, Edler 1968 and 1969 and Micherdziński 1969).

#### *Eugamasus* sp.

Deutonymphs from *S. araneus*, *N. fodiens* and *C. glareolus*.

#### *Ologamasus* sp.

One deutonymph on *S. araneus*.

According to Micherdziński (1969) the name of this genus should be *Holoparasitus* Oudemans, 1936.

#### *Parasitidae* sp.

Five deutonymphs from *C. glareolus*.

**Family Ascaidae Oudemans, 1905**

*Euryparasitus emarginatus* C. L. Koch, 1839

23 deutonymphs and one male on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

It is a free-living predator, common in nests of small mammals in Europe and Asia (Bregetova 1956 and Pirjanik 1962) but sometimes the nymphs are found on the fur of small mammals (Edler 1969).

According to Micherdziński (1969) the name should be *Parasitus oudemansi* Berlese, 1903.

*Cyrtolaelaps mucronatus* G. & R. Canestrini, 1881

35 deutonymphs were found on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis*, *A. sylvaticus* and *M. erminea*.

It is known from the nests of small mammals and, as deutonymphs, from their fur (Willmann 1952 and Edler 1968 and 1969).

*Cyrtolaelaps minor* Willmann, 1952

32 deutonymphs found on *S. araneus*, *S. glareolus* and *A. sylvaticus*.

This species is rare on the fur of small mammals and this is only the second record from Sweden (Mrčiak 1959 and Edler 1968).

**Family Laelaptidae Berlese, 1892**

*Hypoaspis sardoa* Berlese, 1911 (= *Androlaelaps sardous* Berlese, 1911 used by Bregetova 1956).

Three females on *S. araneus*, *C. glareolus* and *A. sylvaticus*.

This mite is mostly found in nests and litter, but sometimes on small mammals. It is known from Europe (Evans and Till 1966), but new to Sweden.

*Hypoaspis hyatti* Evans & Till, 1966

One female on *S. araneus*.

Evans and Till (1966) found it on *Bombus muscorum* L. in Great Britain. It is new to Sweden.

*Androlaelaps fahrenheitzi* Berlese, 1911 (= *Haemolaelaps glasgowi* Ewing, 1925 in Bregetova 1956).

Three deutonymphs and nine females on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

It is found in most parts of the world on a variety of small mammals and in their nests (Evans and Till 1966, Solomon 1968 and Edler 1969). It is important as a reservoir for some diseases (Mrčiak and Tovornik 1966).

*Haemolaelaps casalis* Berlese, 1887

Two females on *A. sylvaticus*.

It is cosmopolitan, usually found in birds' nests, where reproduction takes place, and rarely on small mammals (Mrčiak 1959 and Evans and Till 1966).

Edler (1969) stated that it was new to Sweden. However, Sellnick (1956)



recorded *H. molestus* Oudemans, 1929 from various localities in central Sweden. This is synonymous with *H. casalis* (Evans and Till 1966).

*Ololaelaps* sp.

One male on *S. araneus*.

Species of this genus prefer damp localities.

*Eulaelaps stabularis* C. L. Koch, 1836

421 specimens, most of them females, found on *S. araneus*, *N. fodiens*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

Known from Europe, Asia and North America on various host animals and in their nests (Bregetova 1956 and Mrciak 1959). Nordberg (1936) found it in Finland in nests of *Riparia riparia* L. Edler (1968 and 1969) recorded the species in north and central Sweden especially from *C. glareolus*. In this collection, the highest infestation was found on *A. sylvaticus*, 13.6 % (Tab. 4), compared with about 8 % on *A. flavicollis* and *M. agrestis*. Only 5.3 % of the *C. glareolus* collected had this mite.

*Laelaps hilaris* C. L. Koch, 1836

926 specimens found on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

This species is common throughout Europe. The main hosts are species of *Microtus* and *Pitymys*, the latter not occurring in northern Europe (Mrciak 1959). The infestation frequency of *M. agrestis* was 63.6 %. On the other host animals it was always less than 2 %.

*Laelaps agilis* C. L. Koch, 1836

4,284 specimens found on *S. araneus*, *N. fodiens*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

This was the most frequent species forming 49.9 % of the collected mites. It is known from most parts of Europe. The main hosts are *A. flavicollis* and *A. sylvaticus* (Solomon 1968). In the present investigation 69.7 % of all collected *A. flavicollis* and 47.8 % of *A. sylvaticus* were infested with *L. agilis*. The other host animals had an infestation frequency below 3 %. Edler (1971) found that significantly more *A. flavicollis*, ca. 75 %, than *A. sylvaticus*, ca. 50 %, were infested by *L. agilis* in southern Sweden. In central Sweden the infestation was about the same, 25 %, on both the species. The number of mites per infested host was, however, higher on *A. flavicollis* than on *A. sylvaticus* both in southern and central Sweden. Similar observations have been made by several authors, e.g. Pirjanik (1962) found the infestation frequency on *A. flavicollis* to be 55.6 % and on *A. sylvaticus* 38.1 %. The mean values of mites per infested host were 8.8 and 7.6 respectively.

*Hyperlaelaps arvalis* Zachvatkin, 1948 (= *Hyperlaelaps microti* Ewing, 1933 in Evans and Till 1966)

496 specimens found on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

55 % of the *M. agrestis* collected were infested by this mite. Other host animals had an infestation frequency below 1 %. According to some authors *M. arvalis* Pallas is the main host, though species of *Pitymys* also are heavily infested at many places (Mrciak 1959). *H. arvalis* has a wide ecological

amplitude and is found in most parts of Europe. In most parts of Scandinavia and Finland, where *M. arvalis* is not found, *M. agrestis* is the main host. *M. oeconomus* Pallas may also be infested by this mite (Edler 1969).

*Myonyssus rossicus* Bregetova, 1956

111 specimens on *C. glareolus*, *A. flavicollis* and *A. sylvaticus*.

8.7 % of the *A. flavicollis* collected, 1.7 % of *A. sylvaticus* and 0.7 % of *C. glareolus* had this mite. It is found in some other European countries, viz. USSR, Czechoslovakia, Bulgaria, Albania and Roumania on species of *Apodemus* (Bregetova 1956, Mrciak 1958, 1959 and 1960 and Solomon 1968). It lives in nests of small mammals, where the development takes place. All stages may parasitize small mammals (Mrciak 1959). This species is new to Sweden.

### Family *Haemogamasidae* Oudemans, 1926

*Haemogamasus horridus* Michael, 1892

25 specimens on *S. araneus*, *N. fodiens*, *C. glareolus*, *A. flavicollis* and *A. sylvaticus*.

This mite is known from many small mammals in Europe, though it is more common in their nests (Mrciak and Brander 1965). The specimens found on the mammals are mostly deutonymphs, 52 % of all specimens in this collection. This confirms the observations of Mrciak (1958), Mrciak and Brander (1965) and Edler (1969).

*Haemogamasus nidi* Michael, 1892

818 specimens on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

A mean of 4.0 *H. nidi* were found on infested *C. glareolus*, but only 2.1, 2.0 and 2.3 on *M. agrestis*, *A. flavicollis* and *A. sylvaticus*. The infestation frequency on *C. glareolus*, 15.8 %, was a little less than on *M. agrestis* and *A. flavicollis*, about 18 %. Edler (1971) showed that even if it prefers species of *Microtus* in many countries, e.g. Czechoslovakia, Yugoslavia and Roumania, the main host in Sweden is *C. glareolus*. Microtidae are more common than Muridae as hosts.

This mite is very common not only in the fur but also in the nests of small mammals. In southern Sweden I have found that about 60 % of the mites from some rodent nests were *H. nidi*. Furman (1968) recorded the same frequency of this species<sup>1</sup> in rodents' nests in the USA.

*H. nidi* is known from Europe, Greenland, the USA and Japan. It is a vector of certain diseases, e.g. tick encephalitis (Mrciak 1960).

*Haemogamasus hirsutus* Berlese, 1889

40 specimens found on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis* and *A. sylvaticus*.

This mite is found in the nests as well as on the fur of small mammals.

<sup>1</sup> Furman used the name *H. ambulans* Thorell, giving as a synonym *H. nidi* Michael. European authors use the name *H. ambulans* Thorell for another species (cf. Bregetova 1956 and Evans and Till 1966).



The nymphs prefer the fur and the adults the nests (see Mrciak and Tovor-nik 1966 and Edler 1969). In the present study 21 of the 40 specimens were deutonymphs. It has a wide ecological amplitude and is found on a variety of small mammals in all parts of Europe. It is a vector of tick-borne encephalitis (Mrciak 1960).

*Haemogamasus hirsutosimilis* Willmann, 1952

21 females on *A. flavicollis* and *A. sylvaticus*.

This species is known from many countries in Europe. It is recorded from various mammals and especially from their nests (Mrciak 1959, Mrciak et al. 1966 and Evans and Till 1966). This species is new to Sweden.

### Family *Liponyssidae* Ewing, 1923

*Hirstionyssus isabellinus* Oudemans, 1913

34 specimens found on *S. araneus*, *C. glareolus*, *M. agrestis*, *A. flavicollis*, *A. sylvaticus* and *M. erminea*.

Although this collection is small, it is evident that species of Microtidae are the main hosts (cf. Mrciak and Brander 1965 and Edler 1969). 30 of 34 specimens were found on *C. glareolus* and *M. agrestis*. It is, however, found in less numbers on a variety of host animals and also in nests (Mrciak 1959). It is known from many parts of Europe, Asia and North America. It is important as vector of tularemia (Mrciak 1960).

*Hirstionyssus soricis* Turk, 1945 (= *Hirstionyssus eusoricis* Bregetova 1956).

Twelve females on *S. araneus*.

It is restricted to the Soricidae (Bregetova 1956). According to literature it is very rare. It is known from USSR (Bregetova 1956), Czechoslovakia (Mrciak 1958), Roumania (Feider et al. 1965), Great Britain (Evans and Till 1966) and Sweden (Edler 1969).

*Hirstionyssus musculi* Johnston, 1894 (= *Hirstionyssus latiscutatus* de Meillon & Lavoipierre, 1944 in Evans and Till 1966).

Ten specimens found on *S. araneus*, *A. flavicollis* and *A. sylvaticus*.

Species of Muridae are the main hosts of this mite, which only rarely parasitizes Microtidae (Mrciak and Brander 1965). Nine of the ten mites were found on species of *Apodemus*. It is known from Europe and South Africa (Evans and Till 1966). It is a vector of tularemia (Mrciak 1960).

## 4. Frequency of various mite species on host animals

The frequency of the common gamasid mites on common host animals is found in Tab. 5. *Neotrombicula zachvatkini* is not included, because of 1,244 specimens 1,186 were found on 130 specimens of *C. glareolus*.

Although 325 *S. araneus* were collected, only 67 were infested, with a total of 137 mites. This is partly due to the rapid death of these hosts in the traps causing the parasites to leave the host. In her investigation of fleas Brinck (1966) found that the infestation frequency of *S. araneus* fell from 61 % to

6 %, some time after death. It is well known that fleas leave a host rather quickly after its death. However, mites are not so mobile as fleas and represent different ecological groups of ectoparasites (Sosnina 1967 and Edler 1971). In this collection the infestation frequency by mites was 28.2 % on live specimens of *S. araneus* and 18.5 % on dead ones (Tab. 1). The difference is not significant,  $0.05 < P < 0.1$ . Since the traps were placed in the late afternoon and examined next morning, the dead specimens may have been dead only a few hours.

Two parasites, not mentioned in Tab. 5, *Hirstionyssus soricis*, specific to Soricidae, and *Cyrtolaelaps mucronatus* made up 8.8 % and 14.6 % respectively of the Gamasoidea on *S. araneus*. *H. soricis* was found only on this host. Less than 1 % of the mites on the other hosts consisted of *C. mucronatus*. Feider et al. (1965) found *C. mucronatus* to be the predominant mite, 28.57 %, on *S. araneus* in Roumania.

*C. glareolus* had 666 gamasid mites, 69.7 % of which were *Haemogamasus nidi*. This confirms the results of Edler (1971), who showed that *C. glareolus* is the main host of this mite in Sweden. In Roumania Feider et al. (op cit.) also found *H. nidi* predominant, 51.07 %, among the gamasid mites of this host, followed by *Laelaps clethrionomydis*, 27.66 %, which was not represented in the material from southern Sweden. It is found in forest and mountain zones, but so far not in the coastal land (Mrciak and Tovornik 1959 and Edler 1968 and 1969). 32.6 % live and 26.1 % dead *C. glareolus* were infested.

Of 1,447 mites found on *M. agrestis*, 60.5 % were *Laelaps hilaris*, and 31.9 % *Hyperlaelaps arvalis*. In Sweden *M. agrestis* is the main host of these mite species (see sect. 3). 81.3 % of the live specimens and 81.8 % of the dead ones were infested.

1,966 gamasid mites were found on *A. flavicollis*. 85.4 % were *Laelaps agilis*. As mentioned (see sect. 3) it is restricted to species of *Apodemus*. 79.6 % of the live specimens were infested, and three of the six dead.

The greatest number of gamasid mites, 3,109, was found on *A. sylvaticus*. 82.1 % were *L. agilis*. 57.8 % of the live specimens and 33.3 % of the dead were infested.

Feider et al. (op cit.) found the same high frequency of *L. agilis*, 86.15 %, on *A. flavicollis* in Roumania, followed by *H. nidi*, 4.58 %. In this Swedish collection 5.8 % were *H. nidi*. The predominant species on *A. sylvaticus* in Roumania were *Haemolaelaps glasgowi* (= *Androlaelaps fahrenheitzi*), 46.94 %, and *L. agilis*, 30.16 %, followed by *H. nidi*, 8.39 %, and *E. stabularis*, 7.94 %. In this collection from Sweden 9.6 % were *E. stabularis* and 5.5 % *H. nidi*. Only on *A. sylvaticus* was there a significant difference between the infestation frequencies of live and dead hosts. Similar calculations for *A. flavicollis* were impossible because only six dead animals were collected.

The frequency of total infestation differed significantly between the five host species, except *M. agrestis* and *A. flavicollis*. The difference between them was only 2.5 % ( $0.5 < P < 0.6$ ). This makes it possible to rank the host species as regards frequency of infestation. About one fifth of the *S. araneus* were infested, one third of the *C. glareolus*, one half of the *A. sylvaticus* and four fifths of the *A. flavicollis* and *M. agrestis* (Tab. 1).



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## 6. Abstract

8,582 mites of 29 species were collected from small mammals in southern Sweden. Five species were new to Sweden. The distribution and host relationship is discussed. A fifth of the *Sorex araneus*, a third of the *Clethrionomys glareolus*, half the *Apodemus sylvaticus* and four fifths of the *A. flavicollis* and *Microtus agrestis* were infested. There was no difference in the infestation of live and dead specimens except for *A. sylvaticus*.

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Tab. 1. Frequency of infestation of the small mammals collected.

	Specimens		Infestation frequency		
	collected	infested	total	on live animals	on dead animals
<i>Sorex minutus</i> L. ....	26	0	—	—	—
<i>S. araneus</i> L. ....	325	67	20.6	28.2	18.5
<i>Neomys fodiens</i> Penn. ....	5	3	—	—	—
<i>Clethrionomys glareolus</i> Schreb. ....	735	235	32.0	32.6	26.1
<i>Microtus agrestis</i> L. ....	151	123	81.5	81.3	81.8
<i>Apodemus flavicollis</i> Melch. ....	310	245	79.0	79.6	—
<i>A. sylvaticus</i> L. ....	947	532	56.2	57.8	33.3
<i>Mus musculus</i> L. ....	5	0	—	—	—
<i>Rattus norvegicus</i> Berkenhout ....	2	0	—	—	—
<i>Mustela erminea</i> L. ....	1	1	—	—	—
Σ .....	2,507	1,206	48.1	—	—

Tab. 2. Distribution of mite species by locality.

	Stampen, Blentarp	Hällestad	Lund	Barse- bäck	Kullaberg
<i>Pygmephorus</i> sp. ....	3	—	—	—	—
<i>Neotrombicula zachvatkini</i> .....	103	251	—	—	890
<i>Myobia musculi</i> .....	—	—	—	—	1
<i>Pergamasus crassipes</i> .....	1	—	—	—	—
<i>Eugamasus kraepelini</i> .....	3	—	—	—	1
<i>E. remberti</i> .....	—	1	1	5	1
<i>Eugamasus</i> sp. ....	—	—	—	—	7
<i>Ologamasus</i> sp. ....	—	—	—	—	1
Parasitidae sp. ....	—	4	—	—	1
<i>Euryparasitus emarginatus</i> .....	12	1	—	6	5
<i>Cyrtolaelaps mucronatus</i> .....	9	9	1	4	12
<i>C. minor</i> .....	1	27	—	—	4
<i>Hypoaspis sardoa</i> .....	—	—	—	1	2
<i>H. hyatti</i> .....	—	—	—	1	—
<i>Androlaelaps fahrenheiti</i> .....	6	3	—	3	—
<i>Haemolaelaps casalis</i> .....	—	2	—	—	—
<i>Otolaelaps</i> sp. ....	—	—	—	—	1
<i>Eulaelaps stabularis</i> .....	35	15	40	19	312
<i>Laelaps hilaris</i> .....	51	563	29	99	184
<i>L. agilis</i> .....	1,488	949	321	78	1,448
<i>Hyperlaelaps arvalis</i> .....	99	182	23	89	103
<i>Myonyssus rossicus</i> .....	67	8	2	—	34
<i>Haemogamasus horridus</i> .....	11	—	—	—	14
<i>H. nidi</i> .....	243	55	81	39	400
<i>H. hirsutus</i> .....	19	1	1	8	11
<i>H. hirsutosimilis</i> .....	15	6	—	—	—
<i>Hirstionyssus isabellinus</i> .....	1	—	—	11	22
<i>H. soricis</i> .....	—	—	—	12	—
<i>H. musculi</i> .....	1	1	2	—	6
Σ gamasid mites .....	2,062	1,827	501	375	2,569
Σ all mites .....	2,168	2,078	501	375	3,460



Tab. 3. Distribution of mite species between infested host species.

	<i>S. araneus</i>	<i>N. fodiens</i>	<i>C. glareolus</i>	<i>M. agrestis</i>	<i>A. flavicollis</i>	<i>A. sylvaticus</i>	<i>M. erminea</i>	Larvae	Proto-nymphs	Deuto-nymphs	♂	♀	Σ
<i>Pygmephorus</i> sp. ....	3	—	—	—	—	—	—	—	—	—	—	3	3
<i>Neotrombicula zachvatkini</i> ....	8	—	1,186	41	—	9	—	1,244	—	—	—	—	1,244
<i>Myobia musculi</i> .....	—	—	—	—	—	1	—	—	—	—	—	1	1
<i>Pergamasus crassipes</i> .....	—	—	—	—	1	—	—	—	—	—	—	1	1
<i>Eugamasus kraepelini</i> .....	1	—	—	—	3	—	—	—	—	4	—	—	4
<i>E. remberti</i> .....	5	—	—	3	—	—	—	—	—	8	—	—	8
<i>Eugamasus</i> sp. ....	2	1	4	—	—	—	—	—	—	7	—	—	7
<i>Ologamasus</i> sp. ....	1	—	—	—	—	—	—	—	—	1	—	—	1
Parasitidae sp. ....	—	—	5	—	—	—	—	—	—	5	—	—	5
<i>Euryparasitus emarginatus</i> ....	6	—	3	1	11	3	—	—	—	23	1	—	24
<i>Cyrtolaelaps mucronatus</i> .....	20	—	7	2	1	4	1	—	—	35	—	—	35
<i>C. minor</i> .....	4	—	27	—	—	1	—	—	—	32	—	—	32
<i>Hypoaspis sardoa</i> .....	1	—	1	—	—	1	—	—	—	—	—	3	3
<i>H. hyatti</i> .....	1	—	—	—	—	—	—	—	—	—	—	1	1
<i>Androlaelaps fahrenheitzi</i> .....	1	—	3	3	2	3	—	—	—	3	—	9	12
<i>Haemolaelaps casalis</i> .....	—	—	—	—	—	2	—	—	—	—	—	2	2
<i>Ololaelaps</i> sp. ....	1	—	—	—	—	—	—	—	—	—	1	—	1
<i>Eulaelaps stabularis</i> .....	9	2	58	18	36	298	—	—	—	1	5	415	421
<i>Laelaps hilaris</i> .....	24	—	16	876	3	7	—	—	8	11	38	869	926
<i>L. agilis</i> .....	8	2	38	4	1,678	2,554	—	4	76	102	362	3,740	4,284
<i>Hyperlaelaps arvalis</i> .....	5	—	4	462	22	3	—	1	14	38	111	332	496
<i>Myonyssus rossicus</i> .....	—	—	5	—	65	41	—	—	—	6	17	88	111
<i>Haemogamasus horridus</i> .....	7	2	10	—	4	2	—	—	1	13	5	6	25
<i>H. nidi</i> .....	10	—	464	58	115	171	—	—	1	26	51	740	818
<i>H. hirsutus</i> .....	17	—	8	3	8	4	—	—	—	21	13	6	40
<i>H. hirsutosimilis</i> .....	—	—	—	—	14	7	—	—	—	—	—	21	21
<i>Hirstionyssus isabellinus</i> .....	1	—	13	17	1	1	1	—	—	—	3	31	34
<i>H. soricis</i> .....	12	—	—	—	—	—	—	—	—	—	—	12	12
<i>H. musculi</i> .....	1	—	—	—	2	7	—	—	—	—	—	10	10
Σ gamasid mites .....	137	7	666	1,447	1,966	3,109	2	5	100	336	607	6,286	7,334
Σ all mites .....	148	7	1,852	1,488	1,966	3,119	2	1,249	100	336	607	6,290	8,582

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Tab. 4. Infestation frequency (%) of common host animals by well-represented mites.

	<i>S. araneus</i>	<i>C. glareolus</i>	<i>M. agrestis</i>	<i>A. flavicollis</i>	<i>A. sylvaticus</i>
<i>E. stabularis</i> .....	2.2	5.3	7.9	7.7	13.6
<i>L. hilaris</i> .....	1.8	0.7	63.6	0.6	0.6
<i>L. agilis</i> .....	1.8	2.6	2.6	69.7	47.8
<i>H. arvalis</i> .....	0.6	0.3	55.0	0.6	0.3
<i>M. rossicus</i> .....	—	0.7	—	8.7	1.7
<i>H. nidi</i> .....	2.8	15.8	18.5	18.7	8.0

Tab. 5. The frequency (%) of well-represented mite species on common host animals.  
\* = less than 1 %. (100 % = all mites on one host species.)

	<i>S. araneus</i>	<i>C. glareolus</i>	<i>M. agrestis</i>	<i>A. flavicollis</i>	<i>A. sylvaticus</i>
<i>E. stabularis</i> .....	6.6	8.7	1.2	1.8	9.6
<i>L. hilaris</i> .....	17.5	2.4	60.5	*	*
<i>L. agilis</i> .....	5.8	5.7	*	85.4	82.1
<i>H. arvalis</i> .....	3.6	*	31.9	1.1	*
<i>M. rossicus</i> .....	—	*	—	3.3	1.3
<i>H. nidi</i> .....	7.3	69.7	4.0	5.8	5.5