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## The Mites (*Acarina*) of Small Mammals of the Pieniny Mts., Poland

[With 1 text-fig.]

Roztocze (*Acarina*) drobnych ssaków Pienin

**Abstract.** A total of 61 species of mites occurring on rodents and insectivores in the Pieniny Mts. are discussed. *Neotrombicula earis* is new to the Polish fauna. The acarinium of small mammals of the Pieniny Mts. is characterized by its set of trombiculid species, the richest in this country, the presence of such rare species as *Neopodocimum mrciaki* and *Olopachys suecicus*, the small number of frigostable species (*Laelaps clethrionomydis* and *Neotrombicula zachvatkini*) and the particularly small number of *Ixodes ricinus*.

### I. INTRODUCTION

The distribution of the *Acarina* occurring on mammals or in their nests in Poland is poorly known. The mountainous areas of this country are specially neglected in this respect. There are hardly three items of literature dealing with the mites of the region of Śnieżnik Mt. and the Sowie Mts. (Sudetes — WILLMANN, 1944; HAITLINGER, 1976, 1977). There are besides studies on the *Acarina* which appear occasionally on mammals but generally live in litter or in burrows and nests of mammals. These mites include some species of the family *Parasitidae* investigated by WITALIŃSKI (1976) in the Pieniny Mts. In the Polish part of Carpathians the *Acarina* living on mammals were studied only in Tatra Mts. (HAITLINGER, 1980b). A broad study of mites living on rodents and insectivores in the whole chain of the Carpathians, first of all, in the Pieniny Rocky Belt has been taken up for this reason.

The study area stretches from the Rozdziele Pass in the east to the gorge of the River Białka in the west, but most attention has been given to the *Acarina* of the proper chain of the Pieniny Mts. and the Little Pieniny Mts., chiefly to those of the Jaworki region and Homole Gorge (Fig. 1). The material was gathered in the spring, summer and autumn in the years 1971—1972. A total of 7120 *Acarina*, belonging to 61 species and including 180 undetermined specimens (Tables I—IV), were obtained from 792 rodents and insectivores



Fig. 1

of 17 species (see Table I). There was also a small number of mites collected from small mammals captured in the Pieniny Mts. in 1970. A list of localities, the dates of catches and information about other ectoparasites obtained from the same group of hosts and about the hosts themselves are given in previous papers (HAITLINGER, 1974a, b; HAITLINGER and SZYSZKA, 1975).

## II. REVIEW OF FAUNA

### *Trombidiformes* REUTER, 1909

#### *Trombiculidae* EWING, 1929

#### *Neotrombicula autumnalis* (SHAW, 1790)

Localities: 1 — Białka Gorge, 5 — Zielone Skałki (Green Crags), 6 — Czorasztyń, 8 — Sromowce Wyżne, 11 — Podskalnia Mt., 16 — Sobczański Ravine, 17 — Trzy Korony (Three Crowns), 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 23 — Szlachtowa, 24 — Jaworki, 26 — Homole.

This species is common in Poland, known from the regions of Kartuzy (WEGNER, 1960), Kraków (MICHERDZIŃSKI, 1961), Augustów, Hrubieszów, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and the Sudetes (Sowie Mts. — HAITLINGER, 1977). *N. autumnalis* occurs in the whole area of the Rocky Range of the Pieniny Mts., particularly numerous in warm places



Trombidiformes collected on small mammals of Pieniny

Species	<i>Neotrombicula autumnalis</i>	<i>Neotrombicula zachvatkini</i>	<i>Neotrombicula inopinata</i>	<i>Neotrombicula taliniensis</i>	<i>Neotrombicula earis</i>	<i>Neotrombicula japonica</i>	<i>Neotrombicula</i> sp.	<i>Leptotrombidium europaeum</i>	<i>Cheladonta costulata</i>	<i>Pygmaephorus spinosus</i>	<i>Pygmaephorus</i> sp.	<i>Bakerdania</i> sp.	<i>Cheyletus eruditus</i>	<i>Radfordia lemnia</i>	<i>Amorphacarus elongatus</i>	Number of mammals	Number of mites
<i>Arrivola terrestris</i> (LINNAEUS, 1758)		1											1			1	2
<i>Microtus arvalis</i> (PALLAS, 1779)	19	2	107		19				11				1			104	159
<i>Microtus agrestis</i> (LINNAEUS, 1761)	7	9						2	1							35	19
<i>Clethrionomys glareolus</i> (SCHREBER, 1780)	343	415	259	36	1	3		57	1	1		1	1	1		134	1119
<i>Pitymys subterraneus</i> (DE SELYS LONGCHAMPS, 1835)	3	2															
<i>Apodemus tauricus</i> (PALLAS, 1811)	254	13					4	12	21							16	26
<i>Apodemus microps</i> KRATOCHVIL, ROSICKY, 1952	461	11				11		36	3				3			104	286
<i>Apodemus sylvaticus</i> (LINNAEUS, 1758)	12	6	2		1			3	1		1	1	3			46	30
<i>Apodemus agrarius</i> (PALLAS, 1771)		3		1									1			26	5
<i>Mus musculus</i> LINNAEUS, 1758	2	1											223			33	226
<i>Muscardinus avellanarius</i> (LINNAEUS, 1758)																	
<i>Sorex alpinus</i> SCHINZ, 1837																1	
<i>Sorex araneus</i> LINNAEUS, 1758	23	3		2				1						2		4	
<i>Sorex minutus</i> LINNAEUS, 1766	1	1														99	31
<i>Neomys fodiens</i> (PENNANT, 1771)	2	1			1											36	2
<i>Neomys anomalus</i> CABRERA, 1907	1	1														9	4
<i>Crocidura suaveolens</i> (PALLAS, 1811)																19	2
Total	1128	469	368	39	22	14	44	111	41	1	1	2	233	1	2	792	2436

on Podskalnia Mt., which have provided 76,2% of the total of specimens collected. It was gathered in May, June, August, October and November, 96.7% of the total in October. *N. autumnalis* has a wide range of hosts in Poland. In the Pieniny its specimens were taken from 12 mammalian species, in particularly large numbers from *Apodemus microps* (3.97) \*, *A. tauricus* (2.44) and *Clethrionomys glareolus* (2.56). In Poland this species had not been gathered from *A. microps*, *M. musculus* and *Neomys anomalus* before. The extensiveness of infestation was great in the species populating screes overgrown with bushes and their vicinity and also occurring along mid-field shrubs: *A. microps* — 33.6%, *A. tauricus* — 23.1% and *A. sylvaticus* — 21.7%. In *C. glareolus* living in the forest the extensiveness was low — 10.5%, and so was it in *Microtus arvalis*, a common inhabitant of the fields in the neighbourhood of Podskalnia Mt. (0.18 and 6.7%). The largest numbers of larvae were obtained from two *C. glareolus*: 105 and 173.

### *Neotrombicula zachvatkini* (SCHLUGER, 1948)

Localities: 5 — Zielone Skałki, 6 — Czorsztyn, 8 — Sromowce Wyżne, 11 — Podskalnia Mt., 12 — Obłążnia Mt., 14 — Grabczycha, 15 — Podłażce, 16 — Sobczański Ravine, 17 — Trzy Korony, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki, 26 — Homole.

In Poland known from Białowieża (KOZŁOWSKI, 1958), Siemianice near Kępno (KIELCZEWSKI et al., 1974), Braniewo, Giżycko, Suwałki, Augustów (HAITTLINGER, 1977), Hrubieszów, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975), and, as regards mountains, from the Middle Sudetes (Sowie Mts. — HAITTLINGER, 1977).

In the Pieniny *N. zachvatkini* occurs in fairly large forest complexes and rarely at their edges. 71.3% of the specimens were collected on the northern slopes of the Pieniny Proper, near Krościenko and in the ravine of the Pieniński Stream. This species was taken from May throughout November, most often in October. It was gathered from 14 host species but 88.3% of the larvae came from *C. glareolus*. This is the only host on which the intensity of infestation was found high (3.07, 36.6%). However, infestations affecting 57 and 75% of the population of that species are also known (ARZAMASOV and KRAEVSKAYA, 1972; KOLEBINOVA, 1974). Other mammals living in close forests, e. g. *A. tauricus*, or at their edges, e. g. *Microtus agrestis* showed a considerably lower intensity of infestation (0.12, 7.7% and 0.26, 8.6%, respectively). The largest number of larvae obtained from one host (*C. glareolus*) was 49. *N. zachvatkini* had already been collected from many mammalian species in Poland but never before from *A. microps*, *N. anomalus* and *Arvicola terrestris*.

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\* The figures given against the names of hosts represent the mean intensity of infestation and those accompanied with the symbol % the extensiveness of invasion.

***Neotrombicula inopinata* (OUDEMANS, 1909)**

Localities: 3 — Zielone Skalki, 6 — Czorsztyn, 12 — Obłężnia Mt., 16 — Sobczański Ravine, 17 — Trzy Korony, 19 — Pieniński Stream, 20 — Krościenko, 23 — Szlachtowa, 26 — Homole.

In Poland it is known from Silesia (WILLMANN, 1952) and Sowie Mts. (Middle Sudetes — HAITLINGER, 1977). It is numerous in the large complexes of forests of the main massif of the Pieniny Proper, 55% of the collection coming from the region of the Pieniński Stream. It was collected in August, September, October, November and, exceptionally, in June (2 larvae). In the Pieniny *N. inopinata* was obtained from 3 mammalian species: *C. glareolus*, *M. arvalis* and *A. sylvaticus*; in other regions it was recorded from larger numbers of hosts (cf. KOLEBINOVA, 1966, 1969; HAITLINGER, 1977). 70.3% of the specimens were obtained from *C. glareolus*, the intensity of infestation being high (1.93, 18.7%). The maximum number of larvae taken from one host (*M. arvalis*) was 107.

***Neotrombicula talmiensis* (SCHLUGER 1955)**

Localities: 6 — Czorsztyn, 11 — Podskalnia Mt., 17 — Trzy Korony, 20 — Krościenko.

It is known from the U.S.S.R. (Primorsk, Transcarpathia), Korea, Czechoslovakia, Hungary and Bulgaria. Rare in the Pieniny, it was gathered in fairly large wooded areas, chiefly on the northern slopes of the massif of the Pieniny Proper, near Krościenko. The greatest intensity of infestation was observed on *C. glareolus* (0.27, 11.2%), which provided 36 out of the 39 larvae collected. They were besides taken from *Apodemus agrarius* and *Sorex araneus*. The larvae usually occurred singly, their largest number found on one host (*C. glareolus*) was 8. Collected in June, September and October.

***Neotrombicula earis* KEPKA, 1964**

Localities: 5 — Zielone Skalki, 20 — Krościenko.

This is a rare species, known from England, Austria and Bulgaria; new to the fauna of Poland. In KEPKA's opinion (1964), the larvae described by MICHERDZIŃSKI (1961) from the region of Kraków belonged probably to *N. earis*. 22 larvae were taken from 4 host species in the unwooded areas of the Pieniny in August and October, 19 of them from *M. arvalis*, the intensity of infestation being low (0.02, 1.9%).

***Neotrombicula japonica* (TANAKA, KAIWA, TERAMURA et KAGAYA, 1930)**

Localities: 11 — Podskalnia Mt., 20 — Krościenko.

This species is rare and widely distributed, known from Japan, Korea, U.S.S.R. (Primorsk, European Republics), Czechoslovakia, Austria, Yugo-



slavia, Albania and Bulgaria. In Poland found on *Mustela nivalis* at Domasław near Wrocław (HAITLINGER, 1980a). In the Pieniny *N. japonica* was gathered in warm and dry places, chiefly on *A. microps* from Podskalnia Mt. (extensiveness of infestation — 6.0%, mean intensity of infestation — 0.30). It had never been taken from *A. microps* before.

***Leptotrombidium europaeum* (DANIEL et BRELIH, 1959)**

Localities: 6 — Czorsztyn, 11 — Podskalnia Mt., 12 — Obłąźnia Mt., 17 — Trzy Korony, 19 — Pieniński Stream, 21 — Hruszowa, 23 — Szlachtowa, 24 — Jaworki, 25 — Wysokie Skalki (High Crags).

It is known from the U.S.S.R. (Georgia, Krasnodar Kray), Czechoslovakia, Austria, Bulgaria, Yugoslavia and Albania. It occurs all over the Pieniny, more frequently in unwooded dry places. 53% of the larvae collected were found on screes and in the vicinity of Podskalnia Mt., 34% at dry forest edges (eastern slopes) near Krościenko. In the Pieniny the main hosts of *L. europaeum* are *C. glareolus* (0.40, 14.9), *A. microps* (0.31, 8.6%) and *A. tauricus* (0.11, 10.6%). It was also collected from four other hosts. *L. europaeum* had never been caught on *A. microps* before. The largest number of larvae found on one host (*C. glareolus* and *A. microps*) was 14.

***Cheladonta constulata* (WILLMANN, 1952)**

Localities: 6 — Czorsztyn, 11 — Podskalnia Mt., 20 — Krościenko, 21 — Hruszowa, 22 — Szczawnica, 24 — Jaworki.

In Poland this species was noted in the regions of Śnieżnik and the Sowie Mts. (WILLMANN, 1952; HAITLINGER, 1977). It is rare in the Pieniny, most frequently found in unwooded and dry places. 78.9% of the larvae collected were taken from the mammals captured on the grassy slopes near Jaworki. A total of 38 larvae were obtained from 6 rodential species, 55.3% of them from *P. subterraneus*. Never before had *Ch. costulata* been taken from *A. microps*, *M. agrestis* and *M. arvalis* in Poland. The greatest infestation intensity was found in *P. subterraneus* (1.31, 18.7%), the highest number of larvae collected from one host was 14 (*P. subterraneus*).

***Myobiidae* MEGNIN, 1877**

***Amorphacarus elongatus* (POPPE, 1896)**

Localities: 2 — Krempachy, 21 — Hruszowa.

In Poland this species is known from Silesia (WILLMANN, 1952), Giżycko, Suwałki and Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and the Sowie Mts. (HAITLINGER, 1977). Two specimens (♀, ♂) were taken from *S. araneus* in June and October.

*Radfordia lemnina* (KOCH, 1841)

Locality: 19 — Pieniński Stream.

In Poland known from Siemianice (KIELCZEWSKI et al., 1974), Braniewo, Hrubieszów, Radzyń Podlaski (HAITLINGER, 1977). It occurs on the *Microtidae*. Very rare in the Pieniny. One ♀ taken from *C. glareolus* in June.

*Cheyletidae* LEACH, 1914*Cheyletus eruditus* SCHRANK, 1781

Localities: 10 Goła Mt., 20 — Krościenko, 22 — Szczawnica, 24 — Jaworki.

This is a cosmopolitan species, frequently present in rooms, food storerooms and in nests and burrows of mammals. In Poland found on *Rattus norvegicus* and *M. musculus* at Gdynia and Bielów near Kartuzy (WEGNER, 1960). In the Pieniny it was collected in large numbers from mammals in houses and their vicinity. Out of the 233 *Ch. eruditus* found, 224 were taken amongst the houses of Szczawnica. Only single specimens were gathered from mammals which occurred far from the houses. In Poland it had hitherto been collected on *R. norvegicus* and *M. musculus*, now taken for the first time in this country from *A. microps*, *A. sylvaticus*, *A. agrarius*, *M. arvalis*, *C. glareolus* and *A. terrestris*.

The greatest intensity of infestation was noted in *M. musculus* — 6.76, its extensiveness being however very low — 6.1%. A maximum of 200 *Ch. eruditus* were gathered on one house mouse, this being an exceptionally high intensity of infestation of one specimen.

*Pygmephoridae* CROSS, 1965*Pygmephorus spinosus* KRAMER, 1877

Locality: 19 — Pieniński Stream.

In Poland known from the region of Śnieżnik and the Sowie Mts. (WILLMANN, 1952; HAITLINGER, 1977). One ♀ was taken from *C. glareolus* in the Pieniny.

*Sarcoptiformes* REUTER, 1909*Myocoptidae* GUNTHER, 1942*Myocoptes japonensis japonensis* RADFORD, 1955

Localities: 11 — Podskalnia Mt., 20 — Krościenko.

This is a holarctic species associated with the *Microtidae*. It occurs from Japan to Canada (FAIN et al., 1970). In Poland it was known from the Sowie

Mts. (HAITLINGER, 1977). In the Pieniny rare; two specimens were obtained from *A. microps* and *C. glareolus* in June and October, from *A. microps* for the first time in this country. It had been gathered on *C. glareolus*, *M. agrestis*, *P. subterraneus* and *A. tauricus* in Poland.

### *Myocoptes musculus* (KOCH, 1844)

Localities: 20 — Krościenko; 22 — Szczawnica.

In Poland known from Siemianice (KIELCZEWSKI et al., 1974), Hrubieszów, Radzyń Podlaski (BITKOWSKA, ŻUKOWSKI, 1975) Sowie Mts. (HAITLINGER, 1977), Gdynia (WEGNER, KRUMINIS-ŁOZOWSKA, 1977); Wrocław (KLAUSA, ZŁOTORZYCKA, 1979). It is rare in the Pieniny, hardly 2 tritonymphs and 1 protonymph were obtained in October. *A. sylvaticus* is a new host for *M. musculus* in Poland.

### *Glycyphagidae* BERLESE, 1887

#### *Orycteroxenus soricis* (OUDEMANS, 1915)

Localities: 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica.

In Poland known from Hrubieszów, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and Sowie Mts. (HAITLINGER, 1977). In the Pieniny collected from many mammalian species. The highest mean intensity of infestation was found on *N. fodiens* (6.22) and *N. anomalus* (3.11) and the highest extensiveness on *N. anomalus* (26.3%). The *Soricidae* are usually infested most heavily, including *S. araneus* (BITKOWSKA and ŻUKOWSKI, 1975; HAITLINGER, 1977), but in the Pieniny the indices of infestation of *S. araneus* were found exceptionally low (0.09, 3.0%). *O. soricis* had been collected from many mammalian species in Poland (BITKOWSKA and ŻUKOWSKI, 1975; HAITLINGER, 1977), but never before taken from *C. suaveolens*, *N. anomalus*, *M. agrestis* and *M. musculus*. The maximum number of specimens collected from one host (*N. fodiens*) was 50 deutonymphs.

#### *Glycyphagus hypuadei* (KOCH, 1841)

Localities: 5 — Zielone Skałki, 6 — Czorsztyn, 11 — Podskálnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki, 25 — Wysokie Skałki, 26 — Homole, 27 — Zaskalskie.

In Poland recorded from the Kartuszy region (WEGNER, 1960), Siemianice (KIELCZEWSKI et al., 1974), Braniewo, Giżycko, Suwałki, Hrubieszów, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and Sowie Mts. (HAITLINGER, 1977). In the Pieniny common but not very numerous; collected from 12 mammalian species. Its largest numbers were gathered in the Krościenko



Table II  
Sarcoptiformes and Ixodides collected on small mammals of Pieniny

Species	<i>Glycyphagus hyppuadei</i>	<i>Xenoryctes krameri</i>	<i>Orycteromys sorvici</i>	<i>Glycyphagidae</i> sp.	<i>Istrophorus brevipres</i>	<i>Istrophorus leuckarti</i>	<i>Istrophorus</i> sp.	<i>Aearus farris</i>	<i>Aearus nidicolous</i>	<i>Acotyledon pedispinifer</i>	<i>Orbaidae</i> sp.	<i>Myocoptes japonensis</i>	<i>Myocoptes musculinus</i>	<i>Ixodes trianguliceps</i>	<i>Ixodes ricinus</i>	Number of mammals	Number of mites
<i>Arvicola terrestris</i>	6		2	2		11		1			2			22	1	1	17
<i>Microtus arvalis</i>	9		17	2	189						1			7	1	104	39
<i>Microtus agrestis</i>	3		1	1	6		2		2		6	1		28	8	35	219
<i>Clethrionomys glareolus</i>	133	1			1									5		134	189
<i>Pitymys subterraneus</i>			3	3							4			16	1	16	5
<i>Apodemus tauricus</i>	12								3	1	2	1		5	1	104	40
<i>Apodemus microps</i>	46			3							1			6	1	116	62
<i>Apodemus sylvaticus</i>	29		36	1							1		1			46	75
<i>Apodemus agrarius</i>				1							1					26	2
<i>Mus musculus</i>	2		30	2	1								2			33	37
<i>Muscardinus avellanarius</i>																1	
<i>Sorex alpinus</i>																4	2
<i>Sorex araneus</i>	3	2	9		6						4			2		99	33
<i>Sorex minutus</i>	1		1		1						1			8	1	36	46
<i>Neomys fodiens</i>	2		56											42		9	65
<i>Neomys anomalus</i>	1		59		11									7		19	76
<i>Crocidura suaveolens</i>	1		7											5		9	8
Total	248	3	221	15	215	11	2	1	5	3	22	2	3	153	13	792	915

region and on Podskalnia Mt. The highest intensity of infestation was found in *C. glareolus* (0.97, 16.4%), *A. sylvaticus* (0.63, 15.2%) and *A. microps* (0.39, 9.5%). The largest number of specimens taken from one mammal (*C. glareolus*) was 35 deutonymphs. *G. hypuadei* was collected in May, June, August, October and November. In Poland it is known from many hosts; from *A. microps*, *A. terrestris*, *M. musculus* and *C. suaveolens* recorded for the first time in this country.

***Xenoryctes krameri* (MICHAEL, 1886)**

Localities: 2 — Krempachy, 20 — Krościenko, 21 — Hałuszowa.

In Poland known from Siemianice near Kępno (KIELCZEWSKI et al., 1974) and Sowie Mts. (HAITLINGER, 1977). It is rare in the Pieniny, hardly 3 deutonymphs were obtained in June and October.

***Listrophoridae* MEGNIN et TROUESSART, 1884**

***Listrophorus brevipes* DUBININA, 1968**

Localities: 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 26 — Homole, 27 — Zaskalskie.

In Poland known from the Sowie Mts. (HAITLINGER, 1977). The main hosts of *L. brevipes* are species of the genus *Microtus*, especially *M. agrestis*, but occasionally it occurs on other rodentia and insectivorous species. In the Pieniny it is numerous on *M. agrestis* (5.17, 25.0%). The relatively high intensity of infestation of an occasional host, *N. anomalus* (0.58, 10.5%), is noteworthy. In Poland hitherto collected from *M. agrestis*, *C. glareolus*, *P. subterraneus*, *A. agrarius* and *S. araneus*, it was for the first time obtained from *N. anomalus*. *L. brevipes* was collected in the Pieniny in May, June and October.

***Listrophorus leuckarti* PAGENSTECHER, 1862**

Locality: 20 — Krościenko.

In Poland known from the Kartuzy region (WEGNER, 1960). WEGNER collected it from *A. tauricus* and *Microtus* sp., which are hosts to *L. brevipes* Dub. and *Afrolistrophorus apodemi* FAIN, at that time still unknown and described as *L. leuckarti*, specific to *A. terrestris*. Her information is therefore questionable. Eleven specimens were obtained from *A. terrestris* in a small swamp near Krościenko in June.

*Acaridae* MURRAY, 1877*Acotyledon pedispinifer* (NESBITT, 1944)

Localities: 6 — Czorsztyn, 20 — Krościenko, 11 — Podskalnia Mt.

In Poland known from the regions of Sieniawka (KIELCZEWSKI et al., 1970), Siemianice (KIELCZEWSKI et al., 1974) and the Sowie Mts. (HAITLINGER, 1977). On the small mammals of the Pieniny it appears rarely; 3 deutonymphs were taken in October; they were the first specimens ever taken from *A. microps*.

*Acarus nidicolous* GRIFFITHS, 1970

Locality: 11 — Podskalnia Mt.

In Poland known from Białowieża (FAIN and BEAUCOURNU, 1972), Zagórz Śląski (Sowie Mts.), Koszarki (Nowy Sącz Basin), Muszyna and Milik (Sądecki Beskids) (HAITLINGER, 1978a). In the Pieniny 3 deutonymphs were collected from *A. microps*. Deutonymphs of *A. nidicolous* occur on flees and never before had been found on the bodies of mammals. In all probability, these deutonymphs, originally occurring on flees, fell off them into the pelt of the mouse, while this last was being treated with chloroform or combed, but it may well be that they got on to the body of the mouse on their own.

*Ixodidae* MURRAY, 1877*Ixodes ricinus* (LINNAEUS, 1758)

Localities: 8 — Sromowce Wyżnie, 19 — Pieniński Stream, 20 — Krościenko.

In Poland extremely common but, except for the Middle Sudetes (Sowie Mts. — HAITLINGER, 1977), there is no information about this species from the mountainous regions. In the Pieniny Mts. it belongs to rather rare species. 61.6% of the specimens collected came from *C. glareolus*. Single specimens were besides collected from 5 other mammalian species. In Poland *I. ricinus* has a very wide range of hosts, but hitherto it had not been taken from *A. microps*.

69.2% of the total of specimens were gathered in the region of the Pieniński Stream. This locality points to the fact that in the Pieniny *I. ricinus* chooses relatively warm and wooded places for its refuges. Twelve larvae and a nymph were caught in June, August and October, 61.6% of them in June.

*Ixodes trianguliceps* BIRULA, 1895

Localities: 5 — Zielone Skałki, 8 — Sromowce Wyżnie, 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki, 26 — Homole, 28 — Biała Woda.



Known from many localities in this country. In the highlands it has been recorded from the Sudetes (Sowie Mts. — HAITLINGER, 1977). In the Pieniny it is one of the most abundant mites living on mammals. It occurs in various habitats, in the forest and in unwooded areas. It readily infests the mammals associated with a damp environment. *I. trianguliceps* was collected from 12 mammalian species. The highest intensity of infestation was found in *S. minutus* (1.17, 25.0%), *N. fodiens* (0.77, 33.3%) and *P. subterraneus* (0.31, 25.0%). Fairly large numbers of ticks were collected from only one specimen of *S. minutus*, at most 13 and 15 specimens.

*I. trianguliceps* was gathered in May, June, August, October and November. 53.6% of the total of specimens were obtained in October. Larvae (123), taken from May to November, prevailed in the collection, there were 26 nymphs (May, June and August), 2 ♂ (June) and 1 ♀ (June). *I. trianguliceps* has many hosts in Poland, but hitherto had not been collected from *A. microps* and *N. anomalus*.

### *Dermanyssidae* KOLENATI, 1859

#### *Laelaps agilis* KOCH, 1836

Localities: 5 — Zielone Skałki, 6 — Czorsztyn, 8 — Sromowce Wyżnie 1 — Podskalnica Mt., 19 — Pieniński Stream, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki, 25 — Wysokie Skałki, 28 — Biała Woda.

In Poland this species is known from the Dreuzdenko region (WYRWICKA, 1947), Szczecin Province (KOZŁOWSKI, 1955), Piasków near Ostrów Wlkp. and Braniewo (KIELCZEWSKI, 1958), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a), Kartuzy region (WEGNER, 1960), Poznań, Będziewo, Jezior near Poznań, Kórnik, Żabno near Śrem, Złotopole near Lipno and Bełchatów (BŁASZAK, 1970), Suwałki, Hrubieszów and Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975), and as regards the highlands from the Sudetes (WILLMANN, 1944; HAITLINGER, 1976).

Being the most numerous in the collection from the Pieniny, *L. agilis* occurs in accordance with the distribution of its main hosts, *A. tauricus* and *A. sylvaticus*. The intensity of infestation was the highest in *A. tauricus* (12.26, 75.0%), distinctly lower in *A. sylvaticus* (5.83, 50.0%) and very low in *A. microps* (0.31, 17.2%). It was taken from May to November.

In the Pieniny *L. agilis* was collected from 6 occasional host species, in other parts of Poland a higher number of hosts were noted, but it had never been collected from *A. microps*, *M. musculus* and *S. alpinus* in Poland before. The largest number taken from one host (*A. tauricus*) was 112 specimens. Females (82.9%) prevailed over males (8.2%) and deutonymphs (8.9%) in the collection.

*Laelaps hilaris* KOCH, 1836

Localities: 5 — Zielone Skałki, 6 — Czorsztyn, 7 — Falszyn, 8 — Sromowce Wyżnie, 11 — Podskalnia Mt., 12 — Obłąźnia Mt., 14 — Grabczycha, 15 — Podlaźce, 16 — Sobczański Ravine, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 23 — Szlachtowa, 24 — Jaworki, 25 — Wysokie Skałki, 27 — Zaskalskie.

In Poland known from the Poznań region (WYRWICKA, 1947), Szczecin Province (KOZŁOWSKI, 1953), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958), Bielów near Kartuzy and Kartuzy (WEGNER, 1960), Poznań (BŁASZAK, 1970), Żmigród region (KIEŁCZEWSKI and WIŚNIEWSKI, 1974), Radzyń Podlaski, Hrubieszów, Suwałki (BITKOWSKA and ŻUKOWSKI, 1975), Kamieniec Zabkowiecki (HAITLINGER, 1978b), Domasław near Wrocław and Strachów near Niemcza (HAITLINGER, 1980a) and, as far as the mountains are concerned, from the Kłodzko Basin and Sowie Mts. (WILLMANN, 1944; HAITLINGER, 1976).

One of the commonest species in the Pieniny, *L. hilaris* occurs everywhere in places haunted by large numbers of its main hosts, *M. arvalis* and *M. agrestis*. The intensity of infestation of these species was high, 4.64 and 60.6% for *M. arvalis* and 4.23 and 45.7% for *M. agrestis*. Particularly many specimens of *L. hilaris* were obtained at Krościenko and Jaworki. In addition to the main hosts, it was noted from 11 other species of small mammals in the Pieniny. In Poland it had not been collected from *A. tauricus*, *A. sylvaticus*, *A. microps*, *N. fodiens* and *N. anomalus* before.

The wide circle of hosts in the Pieniny seems to have been connected with the abundant occurrence of *M. arvalis* in the years of study and the increased contacts of these voles with other mammals.

While females prevailed in the collection (94%), the males and deutonymphs formed 3% each. The largest number of specimens collected from one *M. agrestis* was 30.

*Laelaps clethrionomydis* LANGE, 1955

Localities: 5 — Zielone Skałki, 9 — Macelowa Mt., 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki, 26 — Hcmole.

In Poland known from Braniewo (BITKOWSKA and ŻUKOWSKI, 1975) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny rare; the extensiveness of infestation was 24.6% for *C. glareolus* (main host), the mean intensity of infestation being hardly 0.55. *L. clethrionomydis* occurs in rather cool biotopes, in the Pieniny it was gathered chiefly in the regions of the Pieniński Stream and Krościenko in May, June, August (1 specimen) and October. It was taken from 6 mammalian species, among which from *A. microps*, *M. musculus* and *P. subterraneus* for the first time in Poland. There were hardly 2 males and 4 deutonymphs among the 84 specimens of *L. clethrionomydis* collected.

Mesostigmata (only Dermanyssidae)

Species	<i>Laelaps agilis</i>	<i>Laelaps hilaris</i>	<i>Laelaps pavlovskyi</i>	<i>Laelaps clethrionomydis</i>	<i>Laelaps muris</i>	<i>Hyperlaelaps microti</i>	<i>Androlaelaps fahrenheitzi</i>	<i>Hypoaspis sardoa</i>	<i>Hypoaspis heselhausi</i>	<i>Hypoaspis</i> sp.	<i>Eulaelaps stabularis</i>
<i>Arvicola terrestris</i>					16		2				
<i>Microtus arvalis</i>	3	483		2		131	114	1	1		8
<i>Microtus agrestis</i>	4	148				90	6			1	4
<i>Clethrionomys glareolus</i>	17	8	1	74		1	5	1			27
<i>Pitymys subterraneus</i>		3		1		1	3				3
<i>Apodemus tauricus</i>	127	3		5			3	2		1	17
<i>Apodemus microps</i>	36	1		1		2	13				17
<i>Apodemus sylvaticus</i>	283	3				2	3				35
<i>Apodemus agrarius</i>		1	62				1				
<i>Mus musculus</i>	2	2		1		1	1			2	1
<i>Muscardinus avellanarius</i>											
<i>Sorex alpinus</i>	1										
<i>Sorex araneus</i>	5	6				2	1			1	1
<i>Sorex minutus</i>		2				1					
<i>Neomys fodiens</i>		1				1					2
<i>Neomys anomalus</i>		1				1					1
<i>Crocidura suaveolens</i>											
Total	1607	622	63	84	16	233	152	4	1	5	116

*Laelaps pavlovskyi* ZACHVATKIN, 1948

Localities: 6 — Czorsztyn, 19 — Pieniński Stream, 22 — Szczawnica, 24 — Jaworki.

In Poland known from Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and the Sowie Mts. (HATTLINGER, 1976, sub. *L. jettmari* VITZH.). In the Pieniny it is not rare and appears wherever its main host, *A. agrarius*, occurs (2.38, 42.3%). It was also collected from *C. glareolus*. Fifty-five females, 3 males and 4 deutonymphs were obtained in June, October and November, the largest number on one host being 9 specimens.

*Laelaps muris* LJUNGH, 1799

Locality: 20 — Krościenko.

In Poland known from Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958) and Bielów near Kartuzy (WEGNER, 1960). It had never been recorded from the



Table III

collected on small mammals of Pieniny

<i>Haemogamasus nidi</i>	<i>Haemogamasus hirsutus</i>	<i>Haemogamasus horridus</i>	<i>Haemogamasus hirsutosi-milis</i>	<i>Haemogamasus</i> sp.	<i>Hirtionyssus isabellinus</i>	<i>Hirtionyssus sunci</i>	<i>Hirtionyssus soricis</i>	<i>Hirtionyssus musculi</i>	<i>Ornithonyssus bacoti</i>	<i>Myonyssus rossicus</i>	<i>Myonyssus ingricus</i>	Number of mammals	Number of mites
49	10		1		4	1						1	18
31	4	4		3	50							104	808
56	19	12		4	10	7				1		35	345
31	3		8			1						134	243
36	7	2	7			8			1	1		16	54
21	13				2	20						104	1364
14	1		1			28						116	126
	1				2							46	355
								1	38			26	105
									2			33	13
	3											1	
4	4	6		2			3		1			4	4
3											1	99	37
4	2											36	6
1		3					1				1	9	11
				1							3	19	11
												9	1
250	67	27	17	10	68	65	4	1	42	2	5	792	3501

Polish mountains before. In the Pieniny 11 females, 3 males and 2 deutonymphs were obtained from one juvenile of *A. terrestris*.

*Hyperlaelaps microti* (EWING, 1933)

Localities: 6 — Czorsztyn, 7 — Falsztyn, 8 — Sromowce Wyżnie, 14 — Grabczycha, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki, 25 — Wysokie Skalki, 26 — Homole, 27 — Zaskalskie.

In Poland known from Jezowo and Nowy Dwór — Orłowo (Gdańsk Province) (KIELCZEWSKI, 1958), from the region of Żmigród (KIELCZEWSKI and WIŚNIEWSKI, 1974), Siemianice near Kępno (KIELCZEWSKI et al., 1974), Gdynia (WEGNER and PRZYBOROWSKI, 1962), Hrubieszów, Radzyń Podlaski, Augustów and Suwałki (BITKOWSKA and ŻUKOWSKI, 1973) and Wojcieszków Górny (HAITLINGER, 1978b); in the highlands only from the Middle Sudetes (HAITLINGER, 1976). In the Pieniny it is a common species, living in the places of

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occurrence of its main hosts, *M. arvalis* and *M. agrestis*. *M. agrestis* was more heavily infested (2.40, 48.6%) than was *M. arvalis* (1.26, 37.4%). It was besides collected from 9 other species of mammals, the circle of its occasional hosts being broad, but hitherto it had not been taken from *N. anomalus*, *N. fodiens*, *A. sylvaticus*, *A. microps* and *M. musculus* in Poland. The highest number of *H. microti* obtained from one host (*M. agrestis*) was 15. The collection consisted of 75.5% of females, 18.9% of males and 5.6% of deutonymphs.

### *Androlaelaps fahrenheiti* (BERLESE, 1911)

Localities: 2 — Krempachy, 3 — Zielone Skalki, 8 — Sromowce Wyżnie, 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hahuszowa, 22 — Szczawnica, 24 — Jaworki.

In Poland known from Lower Silesia (WILLMANN, 1952), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a, b), Gdynia (WEGNER and PRZYBORSKI, 1958, 1962), Kartuzy and Bielów near Kartuzy (WEGNER, 1960), the region of Miastko, Poznań Będlewo and Jezior near Poznań, Żabno near Śrem, Kórnik, Złotopole near Lipno, Bełchatów, Łask, Rawka near Skierniewice, Płońsk region, Nasielsk near Pułtusk, Ciechanów (BŁASZAK, 1970), Siemianice near Kępno (KIEŁCZEWSKI et al., 1974), Białowieża and Hrubieszów (BITKOWSKA and ŻUKOWSKI, 1975); in the highlands from the Middle Sudetes (HAITLINGER, 1976). In the Pieniny it is common in unwooded areas. Seventy-five specimens were gathered from *M. arvalis* (1.10, 24.0%). Moreover, it was taken from 10 other mammalian species. Its circle of hosts is very large in Poland, but hitherto had not been collected from *A. terrestris*, *A. microps* and *A. sylvaticus*.

A total of 118 females, 2 males and 32 deutonymphs were gathered, the largest number of specimens obtained from one host (*M. arvalis*) being 23.

### *Hypoaspis sardoa* (BERLESE, 1911)

Localities: 8 — Sromowce Wyżnie, 19 — Pieniński Stream, 20 — Krościenko.

In Poland known from Lower Silesia (WILLMANN, 1952), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a, b), Zielonka near Poznań (WIŚNIEWSKI, 1965), Będlewo and Jezior near Poznań, Kórnik, Ciechanów nad Płońsk (BŁASZAK, 1970); in the highlands from the Kłodzko Basin and Sowie Mts. (WILLMANN, 1944; HAITLINGER, 1976). In the Pieniny rare, 4 females were taken from 3 mammalian species in June and August.

### *Hypoaspis heselhausi* OUDEMANS, 1912

Locality: 8 — Sromowce Wyżnie.

In Poland known from Dąbrowa in the Kartuzy region (WEGNER, 1960), Puszczykowo, Ujście near Chodzież (PATAN, 1969) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny rare, 1 female was obtained from *M. arvalis* in August, never before taken from this species in Poland.

*Eulaelaps stabularis* (KOCH, 1836)

Localities: 1 — Nowa Biała, 5 — Zielone Skałki, 6 — Czorsztyn, 7 — Falsztyn, 8 — Sromowce Wyżnie, 9 — Macelowa Mt., 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki, 25 — Wysokie Skałki.

In Poland known from Poznań and Kórnik (WYRWICKA, 1947), Lower Silesia (WILLMANN, 1952), Szczecin Province (KOZŁOWSKI, 1955), Urząd near Słubice, Elbląg, Jezewo and Nowy Dwór (Gdańsk Province) (KIELCZEWSKI, 1958), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a, b), Kraków region (MICHERDZIŃSKI, 1959), Kartuzy and Kielpin near Kartuzy (WEGNER, 1960), Będlewo and Jezior near Poznań, Miastko region, Żabno near Śrem, Bełchatów, Łasko, Złotopole near Lipno, Środa region, Płońsk, Nasielsk, Ciechanów (BŁASZAK, 1970), Siemianice near Kępno (KIELCZEWSKI et al., 1974), Ujście near Chodzież (PATAN, 1969), Augustów, Suwałki, Braniewo, Giżycko, Radzyń Podlaski, Hrubieszów (BITKOWSKA and ŻUKOWSKI, 1975); Gdynia (WEGNER, KRUMINIS-ŁOZOWSKA, 1977); in the highlands only from the Middle Sudetes (HAITLINGER, 1976). In the Pieniny it is one of the commonest mites and was collected from 11 mammalian species. The highest intensity of infestation was found in *A. sylvaticus* (0.76, 13.0%) and *C. glareolus* (0.20, 17.9%). *E. stabularis* exceptionally occurred on hosts in large numbers (26 females on *A. sylvaticus* in October). The collection consisted of 113 females and 3 males. In Poland it had never been gathered from *A. microps*, *N. anomalus* and *N. fodiens* before.

*Haemogamsus nidi* MICHAEL, 1892

Localities: 1 — Nowa Biała, 3 — Dursztyn, 5 — Zielone Skałki, 7 — Falsztyn, 8 — Sromowce Wyżnie, 9 — Macelowa Mt., 10 — Gola Mt., 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki, 25 — Wysokie Skałki, 26 — Homole.

In Poland known from the Szczecin Province (KOZŁOWSKI, 1955), Urząd near Słubice and Nowy Dwór near Gdańsk (KIELCZEWSKI, 1958), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a, b), Kraków region (MICHERDZIŃSKI, 1959), Kielpin, Smętowo and Bielowo near Kartuzy (WEGNER, 1960), Gdynia (WEGNER and PRZYBOROWSKI, 1962), Ujście near Chodzież (PATAN, 1969), Będlewo and Jezior near Poznań, Poznań, Środa region, Kórnik, Żabno near Śrem, Miastko region, Bełchatów, Łask, Płońsk, Nasielsk, Złotopole near Lipno (BŁASZAK, 1970), Siemianice near Kępno (KIELCZEWSKI et al., 1974), Braniewo, Giżycko, Suwałki, Augustów, Białowieża, Radzyń Podlaski, Hrubieszów (BITKOWSKA and ŻUKOWSKI, 1975), Szczepanów near Środa (HAITLINGER, 1978b); in the highlands from the region of Śnieżnik and Sowie Mts. (WILLMANN, 1944; HAITLINGER, 1976). In the Pieniny *H. nidi* is one of the commonest mites, taken from 11 mammalian species. The highest intensity of infestation



was found on *P. subterraneus* (1.94, 25%), *M. agrestis* (0.89, 28.6%), *C. glareolus* (0.42, 25.4%), *M. arvalis* (0.47, 23.1%) and *A. tauricus* (0.34, 21.1%).

*H. nidi* has a very broad circle of hosts, but hitherto had not been collected from *A. microps* and *N. anomalus* in Poland. The collection consists of 206 females, 14 males and 30 deutonymphs.

### *Haemogamasus hirstutus* BERLESE, 1889

Localities: 1 — Nowa Biała, 2 — Krempachy, 3 — Dursztyn, 5 — Zielone Skalki, 8 — Sromowce Wyżnie, 9 — Macelowa Mt., 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki.

In Poland known from the Wrocław region (WILLMANN, 1952), Szczecin Province (KOZŁOWSKI, 1955), Urząd near Słubice and Poznań (KIELCZEWSKI, 1958), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a), Kraków region (MICHERDZIŃSKI, 1959), Kartuzy, Bielowo and Dąbrowa near Kartuzy (WEGNER, 1960), Będlewo, Jezior near Poznań, Poznań, Środa region, Bełchatów, Nasielsk (BŁASZAK, 1970), Siemianice near Kępno (KIELCZEWSKI et al., 1974), Braniewo and Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and in the highlands from the Sudetes (Sowie Mts.) (HAITLINGER, 1976). In the Pieniny this species is common but not very numerous; collected from 11 mammalian species. It had been taken from many hosts in Poland but never before from *A. microps* and *S. alpinus*. The intensity of infestation was found in *C. glareolus* (0.14, 9.7%). The collection was made up of 73.1% of deutonymphs, 16.4% of females and 10.5% of males. The highest number of specimens taken from one host (*C. glareolus*) was 6.

### *Haemogamasus hirsutosimilis* WILLMANN, 1952

Localities: 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko.

In Poland known from the Wrocław region (WILLMANN, 1952), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a), Kartuzy (WEGNER, 1960) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny this species is rare, collected from 4 rodent species, chiefly from *A. tauricus* (0.07, 5.8%) in June and October. In Poland it had not hitherto been taken from *P. subterraneus*, *M. arvalis* and *A. sylvaticus*. The highest number of specimens obtained from one host (*P. subterraneus*) was 8.

### *Haemogamasus horridus* MICHAEL, 1892

Localities: 5 — Zielone Skalki, 15 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa.

In Poland known from Białowieża (KOZŁOWSKI, 1958; KOZŁOWSKI and

ŻUKOWSKI, 1958a, b), the Kartuzy region (WEGNER, 1960), Miastko near Koszalin, Poznań (BŁASZAK, 1970), Braniewo, Hrubieszów and Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975); in the highlands from the Sudetes (Śnieżnik region, Sowie Mts.) (WILLMANN, 1944, HAITLINGER, 1976). In the Pieniny it is rare, collected from 5 mammalian species. Never before had it been taken from *N. anomalus* in Poland. Seven females, 11 males and 9 deutonymphs were gathered in June, August and October. The highest intensity of infestation was found in *M. agrestis* (0.11, 11.4%) and *N. anomalus* (0.16, 10.5%).

### *Hirstionyssus isabellinus* (OUDEMANS, 1913)

Localities: 1 — Nowa Biała, 6 — Czorsztyn, 7 — Falsztyn, 14 — Grabczycha, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki, 25 — Wysokie Skalki, 26 — Homole.

In Poland known from Gdynia (WEGNER and PRZYBOROWSKI, 1958, 1962), Kartuzy (WEGNER, 1960), Poznań (BŁASZAK, 1970), Żmigród region (KIELCZEWSKI and WIŚNIEWSKI, 1974), Braniewo, Giżycko, Augustów, Białowieża, Hrubieszów, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975), Pieski near Międzyrzecz and Namysłów region (HAITLINGER, 1980a) and in the highlands from the Sudetes (Sowie Mts.) (HAITLINGER, 1976). Common in the Pieniny, chiefly on *M. agrestis* (1.43, 17.1%), more rarely on other members of the *Microtidae*. Hitherto it had not been collected from *A. microps* in Poland. Sixty-seven females and one male were taken in May, June, October and November, the largest number from one host (*M. agrestis*) being 32 specimens.

### *Hirstionyssus sunci* WANG, 1962

Localities: 5 — Zielone Skalki, 7 — Falsztyn, 9 — Macelowa Mt., 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica.

It probably occurs throughout this country in accordance with the distribution of mice of the genus *Apodemus*. Often confused with *H. musculi*, hence it is not known to which species the localities given so far refer. Known from the Sudetes (Sowie Mts. — HAITLINGER, 1976). In the Pieniny common, it occurs on mice of the genus *Apodemus*. The highest intensity of infestation was found on *A. sylvaticus* (0.61, 13.0%) and *A. microps* (0.18, 8.6%). *H. sunci* was collected from 6 mammalian species, from *A. microps* for the first time in Poland. It most often occurs on its hosts singly, the highest number from one host (*A. sylvaticus*) being 13 specimens. Sixty-four females and one male were gathered.

*Hirstionyssus musculi* (JOHNSTON, 1848)

Locality: 2 — Krempachy.

Not infrequently confused with *H. sunci*. Hence the localities given earlier are not reliable. The species is associated with *Mus musculus*. In the Pieniny one female was obtained in June.

*Hirstionyssus soricis* TURK, 1945

Localities: 2 — Krempachy, 20 — Krościenko.

In Poland known from the Warsaw region (KOZŁOWSKI et al., 1964), Ujście near Chodzież (PATAN, 1969), Będlewo near Poznań, Poznań, Kórnik, Bełchatów, Złotopole near Lipno, Łask, Płońsk, Nasielsk, Ciechanów (BŁASZAK, 1970), Braniewo and Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975), Siemianice near Kępno (KIELCZEWSKI et al., 1974) and in the highlands only from the Sudetes (Sowie Mts.) (HAITLINGER, 1976). In the Pieniny rare. Hardly 4 females were obtained in June. They occur on the members of the *Soricidae*, but in had not hitherto been collected from *N. anomalus*.

*Ornithonyssus bacoti* (HIRST, 1913)

Localities: 20 — Krościenko, 22 — Szczawnica.

In Poland known from Wrocław (GRZYWIŃSKI, 1956) and Gdynia (WEGNER and PRZYBOROWSKI, 1958, 1962). This species of warmer climatic zones occurs also in other countries of Europe, chiefly on rats *Rattus rattus* and *R. norvegicus*, more frequently in port towns (EVANS and TILL, 1966). In this situation the presence of *O. bacoti* in the south of Poland is interesting. In the Pieniny it was collected at two localities, in a hamlet and its vicinity, from 4 mammalian species. *A. agrarius* was particularly heavily infested (1.46, 7.7%), in one case there were 34 *O. bacoti* on one specimen. The occurrence of *O. bacoti* on *M. musculus*, *A. tauricus* and *S. araneus* indicates that in favourable conditions it can infest various mammalian species. Thirty-six females, 5 males and 1 deutonymph were taken in June, October and November.

*Myonyssus rossicus* BREGETOVA, 1956

Localities: 19 — Pieniński Stream, 20 — Krościenko.

In Poland rare, it is known from Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a), Poznań and the Środa region (BŁASZAK, 1970) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny it is one of the rarest species. Two females were caught on *C. glareolus* and *A. tauricus* in June. He had not hitherto been taken from *C. glareolus* in Poland.



*Myonyssus ingricus* BREGETOVA, 1956

Localities: 20 — Krościenko, 21 — Hałuszowa.

This is a rare species, known in Poland from Białowieża and the Sowie Mts. (KOZŁOWSKI and ŻUKOWSKI, 1958a; HAITLINGER, 1976). In the Pieniny it belongs to the rarest forms: 5 females were collected from *S. araneus*, *N. anomalus* and *N. fodiens* in June and October, from *N. anomalus* and *N. fodiens* for the first time in Poland.

*Rhodacaridae* OUDEMANS, 1902

*Cyrtolaelaps mucronatus* (G. et R. CANESTRINI, 1881)

Localities: 8 — Sromowce Wyżnie, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 22 — Szczawnica, 24 — Jaworki.

In Poland known from Kartuzy (WEGNER, 1960), Ujście near Chodzież (PATAN, 1969), Poznań, Kórnik, Jezior near Poznań, Bełchatów (BŁASZAK, 1970), Braniewo, Suwałki, Białowieża, Radzyń Podlaski, Hrubieszów (BITKOWSKA and ŻUKOWSKI, 1975) and in the highlands from the Śnieżnik region (WILLMANN, 1944) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny *C. mucronatus* is rare, found on 8 mammalian species, of which on *M. arvalis*, *M. agrestis* and *M. musculus* for the first time in Poland. The greatest intensity of infestation occurred in *S. araneus* (0.05, 4.0%). Only its deutonymphs were taken in June, August, October and November.

*Cyrtolaelaps minor* WILLMANN, 1952

Localities: 8 — Sromowce Wyżnie, 19 — Pieniński Stream, 20 — Krościenko.

In Poland known from Lower Silesia (WILLMANN, 1952), Kielpin near Kartuzy (WEGNER, 1960), Poznań, Jezior near Poznań, Kórnik, Bełchatów (BŁASZAK, 1970) and the Sowie Mts. (HAITLINGER, 1976).

In the Pieniny it is very rare, 4 deutonymphs were collected from 4 mammalian species in June, August and October. It had not hitherto been taken from *A. terrestris*, *M. agrestis* and *M. arvalis* in Poland.

*Euparasitus emarginatus* (KOCH, 1839)

Localities: 1 — Nowa Biała, 5 — Zielone Skalki, 6 — Czorsztyn, 8 — Sromowce Wyżnie, 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki, 25 — Wysokie Skalki, 26 — Hcmole.

In Poland known from Lower Silesia (WILLMANN, 1952), Urząd near Słubice (KIELCZEWSKI, 1958), Białowieża (KOZŁOWSKI and ŻUKOWSKI, 1958a, b), Kcniezynka near Toruń (DZIUBA, 1959), Kraków region (MICHERDZIŃSKI, 1959), Kielpin near Kartuzy and Kartuzy (WEGNER, 1960), Ujście near Chodzież (PATAN, 1969), Jezior near Poznań and Poznań (BŁASZAK, 1970), Suwałki, Giżycko, Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and the

Sowie Mts. (HAITLINGER, 1976). This species is common in the Pieniny, where it was gathered from 8 mammalian species. The greatest intensity of infestation was found in *C. glareolus* (0.09, 6.0%) and *A. tauricus* (0.07, 6.7%). It had not been taken from *A. microps* and *M. agrestis* in Poland before. The largest number of specimens found on one mammal (*C. glareolus*) was 6 deutonymphs.

***Eviphididae* BERLESE, 1913**

***Eviphis ostrinus* (KOCH, 1836)**

Locality: 19 — Pieniński Stream.

This species occurs on mammals occasionally. In Poland known from Zielonka near Poznań (WIŚNIEWSKI, 1965), Ciechocinek (DZIUBA, 1968), Radzyń Podlaski (BITKOWSKA and ŻUKOWSKI, 1975) and the Sowie Mts. (HAITLINGER, 1976). In the Pieniny rare, 2 females were taken from *C. glareolus* in June.

***Veigaiidae* OUDEMANS, 1939**

***Veigaia kochi* TRÄGÅRDH, 1901**

Locality: 19 — Pieniński Stream.

This species appears occasionally on small mammals. In Poland found in litter at Ciechocinek and Janików (DZIUBA, 1968) and on mammals in the Śnieżnik region and Sowie Mts. (WILLMANN, 1939; HAITLINGER, 1976). In the Pieniny 1 female was collected from *C. glareolus* in October. It had not been taken from this species in Poland before.

***Pachylaelapidae* VITZTHUM, 1931**

***Pachylaelaps furcifer* OUDEMANS, 1903**

Localities: 5 — Zielone Skałki, 19 — Pieniński Stream, 20 — Krościenko.

It occurs occasionally on mammals. In Poland collected from *A. tauricus* in the Sowie Mts. (HAITLINGER, 1976) and, in addition, from litter at Ciechocinek, Janików and Mątwy near Inowrocław, Kołobrzeg and Owczary near Busko (DZIUBA, 1970). In the Pieniny 2 females and 1 male were collected from *C. glareolus* in May and June.

***Olopachys suecicus* SELLNICK, 1950**

Locality: 5 — Zielone Skałki.

It appears exceptionally on mammals. Only once had it been collected from *A. sylvaticus* in Hungary (HAITLINGER, 1979a). In the Pieniny 1 female was obtained from *C. glareolus* in May.

*Ascidae* OUDEMANS, 1905*Proctolaelaps pygmaeus* (J. MÜLLER, 1859)

Localities: 1 — Podskalnia Mt., 20 — Krościenko.

In Poland known from anthills at Zielonka near Poznań (WIŚNIEWSKI, 1966) and from mammals in the Sowie Mts. (HAITLINGER, 1976). In the Pieniny rare. Three females were taken from *A. tauricus* and *S. araneus* in October.

*Macrochelidae* VITZTHUM, 1930*Macrocheles montanus* (WILLMANN, 1951)

Localities: 6 — Czorsztyn, 11 — Podskalnia Mt., 19 — Pieniński Stream, 20 — Krościenko, 22 — Szczawnica, 24 — Jaworki.

It occurs occasionally on mammals; in Poland found on *C. glareolus* in the Sowie Mts. (HAITLINGER, 1976). Common in the Pieniny, it was collected from 9 mammalian species, from all of them except *C. glareolus* for the first time in Poland. The specimens, exclusively females, were taken in October and November.

*Neopodocinum mrciaki* SELLNICK, 1968

Localities: 19 — Pieniński Stream, 20 — Krościenko.

In Poland known only from the Pieniny Mts. (HAITLINGER, 1979b). A total of 9 specimens (5 females and 4 deutonymphs) were collected from *C. glareolus*, *P. subterraneus* and *A. tauricus*, only in June.

*Parasitidae* OUDEMANS, 1902*Parasitus kraepelini* (BERLESE, 1903)

Localities: 5 — Zielone Skalki, 8 — Sromowce Wyżnie, 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki.

This is a free-living species, which also occurs on mammals. In Poland collected from litter on Śnieżnik Kłodzki (WILLMANN, 1956) and caves in the Sudetes (PAX and MASCHKE, 1935), from Kalwaria near Wadowice, Rytko near Stary Sącz, the Bieszczady Mts., Tomaszowice near Kraków, Ojców, the Kampinos Forest, a nest of *Talpa europaea* in Kraków (MICHERDZIŃSKI, 1969) and the Pieniny Mts. (WITALIŃSKI, 1976). In the Sowie Mts. collected, in addition, from the following rodents and insectivores: *C. glareolus*, *M. agrestis*, *P. subterraneus*, *A. tauricus*, *A. sylvaticus*, *A. agrarius*, *S. araneus*, *S. minutus* and *S. alpinus* (HAITLINGER, 1976).



Table IV

Mesostigmata (free living) collected on small mammals of Pieniny

Species	<i>Euryparastus emarginatus</i>	<i>Cyrtolaelaps mucronatus</i>	<i>Cyrtolaelaps minor</i>	<i>Eviptis ostrinus</i>	<i>Veigalia kochi</i>	<i>Veigalia sp.</i>	<i>Pachylaelaps fureifer</i>	<i>Olopachys suecicus</i>	<i>Proctolaelaps pygmaeus</i>	<i>Uropodidae sp.</i>	<i>Macrocheles montanus</i>	<i>Macrocheles sp.</i>	<i>Neopodoecium mrciaki</i>	<i>Parasitus kraepelini</i>	<i>Parasitus lunulatus</i>	<i>Parasitidae sp.</i>	<i>Holoparastus pseudoperforatus</i>	<i>Holoparastus sp.</i>	<i>Pergamasus brevicornis</i>	<i>Pergamasus crassipes</i>	<i>Pergamasus septentrionalis</i>	<i>Poecilochirus neorophori</i>	Number of mammals	Number of mites
<i>Arvicola terrestris</i>	3	2	1								3			2	1	2							1	3
<i>Microtus arvalis</i>	2	1	1								1			3	1	11							104	23
<i>Microtus agrestis</i>	13	5	1	2	1	1	3	1			2	1	6	9	2	5			3		1		35	17
<i>Clethrionomys glareolus</i>																37			4				134	88
<i>Pitymys subterraneus</i>	7	4							2	1	3		1	5		2	1		1				16	4
<i>Apodemus tauricus</i>	6										3		2	2		24			2	2			104	51
<i>Apodemus microps</i>	1										3			2		6		1					116	19
<i>Apodemus sylvaticus</i>	1	1								2	3			3		3							46	13
<i>Apodemus agrarius</i>	1	1			1						2					2							26	7
<i>Mus musculus</i>		2									1					2				1			33	6
<i>Muscardinus avellanarius</i>																								
<i>Sorex alpinus</i>		1																				1	1	
<i>Sorex araneus</i>	6	5							1		1			2		12			1		1		99	29
<i>Sorex minutus</i>															1								36	1
<i>Neomys fodiens</i>														1									9	1
<i>Neomys anomalus</i>																3							19	5
<i>Crocidura suaveolens</i>														2									9	
Total	39	21	4	2	2	1	3	1	3	3	19	1	9	29	4	109	1	1	11	3	1	1	792	268

In the Pieniny *P. kraepelini*, 17 females, 4 males and 8 deutonymphs, were obtained from 9 mammalian species in May, June, August, October and November (Table IV). Hitherto, it had not been taken from *A. microps*, *N. fodiens* and *N. anomalus* in Poland.

***Parasitus lunulatus* (J. MÜLLER, 1859)**

Localities: 19 — Pieniński Stream, 20 — Krościenko, 24 — Jaworki.

This free-living species occurs occasionally on mammals. In Poland collected from litter in the Mazury area (SCHWEIZER, 1925), Konieczynka near Toruń, Ciechocinek, Mątwy near Inowrocław, Owczary near Busko (DZIUBA, 1959, 1968, 1972), Jordanów near Sucha, Œwiliń near Limanowa, Tomaszowice near Kraków (MICHERDZIŃSKI, 1969) and in the Pieniny (WITALIŃSKI, 1976), and from the following mammals: *C. glareolus*, *M. agrestis*, *M. arvalis*, *P. subterraneus*, *A. tauricus*, *A. sylvaticus*, *S. araneus* and *S. minutus* in the Wrocław Province (WILLMANN, 1952), Giżycko and Suwałki (BITKOWSKA and ŻUKOWSKI, 1975) and Sowie Mts. (HAITLINGER, 1976).

Hardly 2 females and 2 males were collected in the Pieniny in June, October and November. It is here much rarer than *P. kraepelini* (WITALIŃSKI, 1976).

***Holoparasitus pseudoperforatus* (BERLESE, 1905)**

Locality: 20 — Krościenko.

It appears very rarely on mammals. In Poland taken from litter at Tomaszowice and Myślenice near Kraków, the Kampinos Forest, Grabowiec near Busko (MICHERDZIŃSKI, 1969; WITALIŃSKI, 1972), in the valley of the Czarna Woda in the Pieniny (WITALIŃSKI, 1976), at Siemianice near Kępno (KIELCZEWSKI et al., 1974) and in the Sowie Mts. (HAITLINGER, 1976) from *C. glareolus*.

In the Pieniny 1 female was obtained from *A. tauricus* in June.

***Pergamasus crassipes* (LINNAEUS, 1758)**

Localities: 2 — Krempachy, 10 — Goła Mt., 26 — Homole.

This species occurs occasionally on small mammals. In Poland collected from litter on Śnieżnik Kłodzki (MASCHKE, 1936), in Lower Silesia (WILLMANN, 1956), Ciechocinek, Mątwy and Janików near Inowrocław, Owczary near Busko, the Toruń region (DZIUBA, 1959, 1968, 1972), Łuczyce near Miechów, Tomaszowice near Kraków, the Kampinos Forest (MICHERDZIŃSKI, 1969), Pieniny (WITALIŃSKI, 1976) and on *C. glareolus* and *A. tauricus* in the Sowie Mts. (HAITLINGER, 1976).

In the Pieniny 3 females of *P. crassipes* were obtained from *M. musculus* and *A. microps* in May and June. It had not hitherto been taken from these species in Poland.

***Pergamasus septentrionalis* (OUDEMANS, 1902)**

Locality: 20 — Krościenko.

It occurs occasionally on mammals; hitherto not collected from them in Poland. Known from Zielonka near Poznań (WIŚNIEWSKI, 1966), the Kołobrzeg region, Wolin (DZIUBA, 1972), the Poznań region and Pieniny (Czorstyn area — Carpathin alder forest) (WITALIŃSKI, 1976).

A female was taken from *C. glareolus* in June.

***Pergamasus brevicornis* BERLESE, 1903**

Localities: 19 — Pieniński Stream, 20 — Krościenko, 21 — Hałuszowa, 24 — Jaworki.

It occurs occasionally on mammals. In Poland collected from litter on Śnieżnik Kłodzki, at Ciechocinek (WILLMANN, 1939), Warcin near Szczecin (KIELCZEWSKI, 1957), Zielonka near Poznań (WIŚNIEWSKI, 1965), in the Tatra Mts., Œwilin near Limanowa, Rytro near Stary Sącz, Smerek and Wetlina (Bieszczady Mts.), Ojców, Grabowiec near Busko and in the Pieniny (WITALIŃSKI, 1976).

In the Pieniny 4 females and 7 males of *P. brevicornis* were caught on 5 mammalian species in June, October and November. It had not hitherto been collected from mammals in Poland.

***Poecilochirus necrophori* VITZTHUM, 1930**

Locality: 20 — Krościenko.

It occurs occasionally on mammals. In Poland collected chiefly from litter, from the *Coleoptera*, on Śnieżnik Kłodzki (WILLMANN, 1939), at Tuszyn near Mielec, Krościenko (Pieniny), Rytro near Stary Sącz, Mikołajki and the Kampinos Forest (MICHERDZIŃSKI, 1969); besides, taken from mammals at Radzyń Podlaski (*S. araneus*, *C. glareolus*) (BITKOWSKA and ŻUKOWSKI, 1975) and in the Sowie Mts. (*C. glareolus*, *A. sylvaticus*, *A. agrarius*, *S. araneus* and *S. alpinus*) (HAITLINGER, 1976).

In the Pieniny one deutonymph was obtained from *S. araneus* in June.

### III. RESULTS

The review presented above is not exhaustive. The *Acarina* have not been studied on *Talpa europaea*, *Rattus norvegicus*, *Sciurus vulgaris* and glirids, living in the Pieniny and infested by specific species of mites.



This notwithstanding, a relatively rich acarine fauna has been collected from small mammals in the Pieniny Mts. Out of the 62 species taken, the particularly interesting ones are *O. suecicus*, *N. talmiensis*, *N. earis* and *L. europaeum*, which are new to the fauna of Poland, and *N. japonica* and *N. mrciaki*, which are rare. The haematophages of the subfamily *Laelapinae* and the family *Trombiculidae*, permanently or temporarily associated with their hosts, prevail in this assemblage of mites (37.3 and 30.8%, respectively). The nest-and-host-infesting *Acarina* are represented by a large number of species but a small number of specimens, e. g. the species of the family *Parasitidae*, living in nests and occasionally occurring on mammals, form hardly 2.2% of the assemblage.

The prevalent species of the assemblage are *L. agilis*, occurring almost exclusively on *A. tauricus* and *A. sylvaticus*, *L. hilaris*, chiefly on *M. arvalis* and *M. agrestis*, and *N. autumnalis*, *N. zachvatkini* and *N. inopinata*, associated with a wide circle of hosts. The small number of *I. ricinus*, a tick abundant in the lowlands and piedmont, is noteworthy. In the Sowie Mts. it is as numerous as *I. trianguliceps* (HAILLINGER, 1977) and in the Ojców National Park more than four times as abundant as this last species (PAWLIK et al., 1973).

The hosts show great differences in the intensity of infestation. Rodents are more heavily infested than are insectivores. A particularly great intensity of infestation has been found in *M. agrestis* (17.14) and *A. tauricus* (16.72). *C. glareolus*, *M. arvalis*, *A. sylvaticus* and *M. musculus* must be counted among the heavily infested species, *A. microps*, *A. agrarius*, *P. subterraneus* and *N. anomalus* among the moderately infested ones and *S. minutus*, *S. araneus* and *C. suaveolens* were very weakly infested.

In the Pieniny *C. glareolus*, which occurred everywhere in wooded areas, was the main host of mites characterized by a wide circle of hosts. It provided the most species of mites — 45. Much fewer species were found on *A. tauricus* — 30, *M. arvalis* — 30 and *S. araneus* — 29, and particularly few on *P. subterraneus* — 15, *A. agrarius* — 13, *N. anomalus* — 14 and *S. minutus* — 10, which were not rare in the Pieniny.

The number of acarine species occurring on particular mammalian species depended on the abundance of these last species and the differentiation of environments inhabited by them. These were mostly occasional infestations. In mammals devoid of specific mites, or if these are not numerous, there may be no dominant species or it is one of the species with a wide circle of hosts. For example, in *S. araneus* one non-specific species (*N. autumnalis*) forms more than 10% of the assemblage, similarly *I. trianguliceps* in *S. minutus* and *O. soricis* in *N. anomalus*. There are more such species appearing in large numbers in rodents (up to 9 in *A. microps* and *A. sylvaticus* of the *Muridae* and up to 14 in *M. agrestis* of the *Microtidae*). In all the *Muridae*, however, one species is responsible for the intensity of infestation, *L. agilis* in *A. tauricus* and *A. sylvaticus*, *L. pavlovskyi* in *A. agrarius*, *N. autumnalis* in *A. microps* and *Ch. eruditus* in *M. musculus*. In the *Microtidae* the intensity of infestation is dependent on a larger number of acarine species. It is worth while to give

attention to the mice of the genus *Apodemus*. *A. tauricus* and *A. sylvaticus* show very similar qualitative and quantitative relations in their acarinium. *A. microps* deviates distinctly in this respect and *A. agrarius* differs particularly much. The differentiation of environments inhabited by these mammalian species is of no major importance here. It may exert a certain influence on the intensity of infestation of some *Trombiculidae*.

In Poland the acarofauna of small mammals of the Pieniny can be compared only with that of the Sowie Mts. (Middle Sudetes); other mountainous regions have not, as yet, been explored in this regard. The latter fauna differs from the former, above all, in its being richer. They have 47 species in common, which form 60.3% of the acarofauna of small mammals of the Sowie Mts.

The *Acarina* which live permanently on small mammals and haematophages infesting both nests and animals in these two mountainous regions may be regarded as identical. The data obtained indicate that they form only 87.9% of the acarofauna of the Pieniny, which is due to the fact that in the assemblage from the Sowie Mts. there were no species found on *A. terrestris* in the Pieniny but living also in the Sowie Mts. Thermophilous *Ornithonyssus bacoti* absent from the Sowie Mts. forms an exception. Instead, the mammals of the Sowie Mts. are besides infested by *Afrolistophorus apodemi*, which are common on *A. tauricus*, *Xenoryctes punctatus* and perhaps *Protomyobia onci* and *P. claparadei*, but these last three species are rare and therefore it may well be that they occur also in the Pieniny.

Greater differences take place in the group of free-living mites, which are more often than not predators living in nests and burrows. They occasionally stay on mammals for a short time. This group of the acarinium of small mammals in the Sowie Mts. is distinctly richer. The species it has in common with the acarinium of small mammals of the Pieniny Mts. constitute hardly 37.8%. There are great differences in the genus *Pygmephorus* (7 species in the Sowie Mts. and 1 species in the Pieniny), the lack of *P. microti*, *P. soricis* and *P. stammeri*, constant inhabitants of mammalian nests, being particularly conspicuous; similar differences are also visible in the family *Macrochelidae* (5 species in the Sowie Mts. and 3 in the Pieniny). The lack of some free-living species on the mammals of the Pieniny Mts. does not prove their absence from this area, but indicates their rareness, for this concerns the species occurring in the nests of mammals and getting on to the mammals themselves, and such acarine species are not very many. According to WITALIŃSKI (1976), 21 species of the family *Parasitidae* (including *P. necrophori*, not mentioned by the author) live in the Pieniny. Seven of them have been collected from mammals. The most common and numerous species, *Leptagamasus anoxygenellus*, has never been taken from mammals. This is also true of other fairly abundant *Parasitidae*. This fact is worth emphasis, for it is thought that various mites that happen to be in the proximity invade mammals after their death. They may be members of the species which often infest the nests of mammals but also get on to living animals.

The *Trombiculidae* show great differences. Four species were found in the Sowie Mts. and 8 in the Pieniny, 3 of them new to the fauna of Poland. They are species abounding in the south and south-east of Europe.

To sum up, it should be stated that the acarinium of small mammals of the Pieniny Mts. is poorer than that of the Sowie Mts. The cold-resistant species, *L. clethrionomydis* and *N. zachvatkini*, are less abundant here than they are in the Sowie Mts. Only the *Trombiculidae* are the richest and varied family in Poland.

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## STRESZCZENIE

Z 792 ssaków złowionych w Pieninach zebrano 7120 roztoczy należących do 61 gatunków, w tym 1 nowy dla fauny Polski: *Neotrombicula earis* KEPKA; oraz 2 rzadkie: *Neotrombicula japonica* (TAN. et al.) i *Neopodocinum mrciaki* SELL.

W zbiorze dominowały hematofagi z podrodziny *Laelapinae* (37,3%) i rodziny *Trombiculidae* (30,8%), trwale lub okresowo występujące na żywicielach. *Acarina* gniazdowo-żywicielskie i gniazdowe były reprezentowane przez dużą liczbę gatunków, lecz małą osobników. Najliczniejsze były: *Laelaps agilis* (KOCH), *L. hilaris* (KOCH) oraz *Neotrombicula autumnalis* (SHAW).

W Pieninach głównym żywicielem dla roztoczy o szerokim kręgu żywicieli jest *Clethrionomys glareolus* (SCHREB.); uzyskano z niego 45 gatunków. Najwyższe nasilenie inwazji stwierdzono u *Microtus agrestis* (L.) i *Apodemus tauricus* (Pall.).

Acarinium drobnych ssaków Pienin charakteryzuje urozmaicony zestaw gatunków *Trombiculidae*, najbogatszy w Polsce; obecność *N. mrciaki* i *O. suecicus*, oraz niska liczebność *Laelaps clethrionomydis* LANGE, *Neotrombicula zachvatkini* (SCHLUNG.) i szczególnie niska *Ixodes ricinus* (L.).

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