

## EXTERNAL PARASITES OF THE LOWER SILESIAN BATS

## I. SIPHONAPTERA

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This paper is the first one of the cycle devoted to external parasites collected from the Lower Silesian bats. The need for such a research had arisen from an incomplete knowledge of the external parasites of home bats.

Perhaps the best knowledge has been gained of *Siphonaptera*, dealt with in this part. Actually, the fauna of home fleas of bats is composed of ten species coming from genera *Ischnopsyllus* and *Nycteridopsylla* (Skuratowicz, 1967). The list of subject literature is referred to by Skuratowicz (1964) in the catalogue of Polish fauna; information concerning fleas of the Lower Silesian bats have been given by Seidel (1937) and Skuratowicz (1964; 1966; 1967). So far seven species of *Siphonaptera* have been reported in this region.

This investigation has been carried out to supplement the information about the *Siphonaptera* of bats in faunistic-ecological aspect. It was made in the years 1971-1974 from October to April in lowland and mountaineous areas of the Lower Silesia, excluding the Karkonosze Mountains. As no individuals of spring and summer were at hand, the tabulated infestation indices are in some measure incomplete. However, this work does not pretend to exhaust the faunistic problems of *Siphonaptera* in the Lower Silesia. The method used, as well as the period of observation, rendered impossible the examination of fleas associated with bats genera *Pipistrellus* and *Nyctalus* which live in winter shelters of other type.

Several bats came from areas distant from the Lower Silesia, but the numerical data have been treated jointly, no matter where the host and its parasites came from.

The list of catch points (the dates of catch are given by Haitlinger, 1976):

### The Lower Silesia

Leśna n. Lubań; Płuczki Dolne n. Lwówek; Wojcieszów Górny; Jaskinia Północna (The North Cave), Jaskinia Nowa (The New Cave), rock tunnel (10 m deep); Chełmiec n. Jawor; Lipa Górna n. Jawor; Świny n. Bolków; Piotrowice n. Strzegom; Książ n. Świebodzice; Walim; Srebrna Góra (The Silver Mountain); Gniewoszów; Radochów; Złoty Stok (The Golden Slope); Kamieniec Ząbkowicki; Kłodzko; Ząbkowice; Stolec n. Ząbkowice; Koźmice n. Ząbkowice; Roztocznik n. Dzierżoniów; Karnków n. Strzelin; Wrocław; Żmigród; Szczepanów n. Środa Śląska; Kowale n. Trzebnica; Chojnów.

### The Opole Silesia

Wola Grodkowska n. Grodków; Ujeździec n. Nysa; Malina n. Opole; Kowalewice n. Namysłów.

### Other regions

Rzędowice n. Lubliniec (The Upper Silesia); Dębołęka n. Sieradz; Kania n. Grabów (the Kalisz province); Czarny Las (The Black Forest) n. Ostrów Wielkopolski; Niedźwiady n. Kalisz.

### Faunistic review

#### *Ischnopsyllus simplex simplex* Rothschild, 1906

Localities: Płuczki Dolne, Lipa Górna, Wojcieszów Górny, Chełmiec, Książ, Walim, Srebrna Góra, Kamieniec Ząbkowicki, Żmigród.

The extensiveness of invasion: 70.2% *Myotis nattereri* (Kuhl); 50% *M. dasycneme* (Boie); 30% *M. brandti* (Eversm.); 21.4% *M. mystacinus* (Kuhl); 6.3% *M. myotis* (Borkh.); 3.1% *M. daubentoni* (Kuhl); 3.7% *Barbastella barbastellus* (Schreb.).

The mean intensiveness of infestation, i.e. the average number of parasites on an individual in all the population under investigation (the intensiveness of invasion in brackets): 1.96 (2.79) *M. nattereri*; 2.67 (5.33) *M. dasycneme*; 0.50 *M. brandti*; 0.29 *M. mystacinus*; 0.09 *M. myotis*; 0.03 *M. daubentoni*; 0.04 *B. barbastellus*. Oscillation of the number: 1-22.

The distribution of this species in Poland has not yet been sufficiently known. Skuratowicz (1966) reports it from ten catch points, mainly in the western regions; other points in the Tatra Mountains are quoted by Bartkowska (1973). In summer period it is noted at the northern borders of the Lower Silesia, i.e. at Milicz and Potasznia n. Milicz (Skuratowicz, 1966).

*I. simplex* is unusually common in Czechoslovakia, being the most numerous species in Hůrka's collection (1963 a). It appeared most numerous, too, in the Lower Silesian collection, since as many as 148

individuals (111 ♀♀ and 37 ♂♂) were caught. This number made 39.9% of all the fleas collected. Its main hosts are regarded *M. nattereri* and *M. mystacinus* (Hůrka, 1963 a; Skuratowicz, 1964, 1967). In the Lower Silesia it was collected from eight species of bats. 83.3% individuals were caught on *M. nattereri* and *M. dasycneme*, though it probably occurs also on *M. brandti* and *M. mystacinus*. In Poland it was collected from *M. dasycneme*, *M. brandti* and *E. nilssoni* for the first time. In literature *M. dasycneme* has not been noted as the main host of this flea. Hůrka (1963 a) regards the collection of 18 *I. simplex* individuals from 3 *M. dasycneme* as rather high. In the Lower Silesia the maximum collection of *I. simplex* from an *M. dasycneme* was 22 individuals (Wojcieszów, 21 March, 1971). This fact, as well as relatively high invasion extensiveness and intensiveness of this species on *M. dasycneme*, makes it to be considered — beside *M. nattereri* — the main host of *I. simplex*.

The extensiveness of invasion on *M. nattereri* (70.2%) and *M. dasycneme* (50%) is very high. The same pertains to the mean intensiveness of infestation, which, is particularly high on *M. dasycneme* (2.67), these values being characteristic of only the autumn-winter period (October-March). According to Hůrka (1963 a) higher invasions are noted in summer. In the material from the Lower Silesia there is a noticeable difference between the mean intensiveness of infestation of bats in autumn (October-November) or spring (March) and winter (December-February) months. In autumn and in March the infestation index (2.57 and 2.36, respectively) was evidently higher than in the winter months (0.93) (the data based on collections from *M. nattereri* and *M. dasycnema*). 60.1% of the collection came from Wojcieszów (Jaskinia Północna and Nowa), females having been in a clear preponderance (75%). Identical picture for the hibernation period of bats is given by Hůrka, Czechoslovakia (1963 a): 75% ♀♀ and 25% ♂♂. Mostly single fleas were found on the bats. With regard to infested bats, the percentage of catches with two fleas was 21.1%, with three fleas — 17.5%, with four fleas — 5.3%. With 5, 6, 7, 13 and 22 *I. simplex* the catches were only single. In 22.8% cases *I. simplex* was collected together with other species of fleas: eleven times with *I. hexactenus*, once with *I. variabilis*, twice with *I. octactenus* and four times with *I. intermedius*. As a rule, the fleas of both the species occurred singly, except for *I. simplex* whose four individuals occurred at the maximum. Infestations with three species were noted twice, in these 22 *I. simplex* with 2♀ *I. octactenus* and 1♂ and 1♀ *I. hexactenus* (from *M. dasycneme*). Hůrka (1963 a) also most often collected *I. simplex* with *I. hexactenus*.

*Ischnopsyllus simplex mysticus* Jordan, 1942**Locality: Wojcieszów Górny.**

The subspecies known in Poland from one catch point at Górecko-Kościelne on Roztocze (Skuratowicz, 1966). More catch points were found in Czechoslovakia, also in the regions bordering Poland (The Sudetes). At one catch point in the Lower Silesia *I. s. mysticus* (1 ♂) was collected from *M. brandti*.

*Ischnopsyllus intermedius* Rothschild, 1898

Localities: Płuczki Dolne, Wojcieszów Górny, Chełmiec, Książ, Walim, Kamieniec Ząbkowicki, Złoty Stok, Radochów.

The extensiveness of invasion: 15.9% *M. myotis*; 4.3% *M. nattereri*; 1.0% *M. daubentoni*; 16.7% *M. dasycneme*; 2.5% *B. barbastellus*.

The mean intensiveness of infestation: 0.33 (2.10) *M. myotis*; 0.33 *M. dasycneme*; 0.04 *M. nattereri*; 0.03 *B. barbastellus*; 0.02 *M. daubentoni*. Oscillation of the number: 1-8.

This species is known from few catch points in Poland (Skuratowicz, 1964), though it is quite common in Czechoslovakia (Hůrka, 1963 a). From the Lower Silesia it was reported by Seidel (1937); there *I. intermedius* belongs to more common species of fleas. In this research it was found at eight catch points in winter, i.e. in the period of less numerous appearance of this species. 34 individuals were collected (27 ♀♀ and 7 ♂♂).

As the main hosts of *I. intermedius* are regarded *Eptesicus serotinus* (Schreb.), *E. nilssoni* (Keys. and Blaš.) and *M. myotis* (Hůrka, 1963 a). In Poland collected from *E. serotinus* and *M. myotis* (Skuratowicz, 1964).

In the Lower Silesia it was collected from six species (see Table). New chance hosts of *I. intermedius* in Poland are *M. daubentoni*, *M. nattereri*, *M. dasycneme* and *B. barbastellus*. The extensiveness of invasion is rather low, not exceeding 20% in any of the species. The highest extensiveness of invasion was noted on *E. serotinus* (40%) by Hůrka (1963 a). The mean intensiveness of infestation was low, with maximum on *M. myotis* and *M. dasycneme* (0.33). This species rarely occurs in a great number on one host; the maximum collection from one individual was eight *I. intermedius* (7 ♀♀ and 1 ♂ from *M. myotis*). The maximum number collected by Hůrka (1963 a) was nine individuals. *I. intermedius* were caught in October, December, January, February and March. Most individuals were collected at Wojcieszów (19), females preponderating (79.4%).

In 23.5% cases *I. intermedius* were collected together with other species of fleas, in these thrice with *I. simplex* and once with *I. hexacte-*

*nus* and *I. simplex*. Hürka (1963 a) most often observed its joint appearance with *I. hexactenus*.

*Ischnopsyllus hexactenus* Kolenati, 1856

Localities: Leśna, Chojnów, Płuczki Dolne, Wojcieszów Górny, Książ, Walim, Srebrna Góra, Ząbkowice, Gniewosów, Radochów, Złoty Stok, Kamieniec Ząbkowicki, Stolec, Roztocznik, Szczepanów, Żmigród.

Localities outside the Lower Silesia: Wola Grodkowska (the Opole Silesia), Rzędowice (the Upper Silesia), Dębołęka (the Sieradz province).

The extensiveness of invasion: 42.8% *Plecotus auritus* (L.) 25.9% *B. barbastellus*, 25.0% *M. dasycneme*, 23.4% *M. nattereri*, 19.9% *M. myotis*, 12.5% *P. austriacus* (Fischer), 10.0% *M. brandti*, 3.1% *M. daubentoni*.

The mean intensiveness of infestation: 1.02 (2.32) *P. auritus*, 0.50 *M. dasycneme*, 0.33 (1.29) *B. barbastellus*, 0.38 (1.64) *M. nattereri*, 0.22 (1.40) *M. myotis*, 0.17 *P. austriacus*, 0.10 *M. brandti*, 0.03 *M. daubentoni*.

Oscillation of the number: 1-7.

The species is widely spread in Poland, collected also in the Lower Silesia and in the Sudetes (Maschke, 1935; Pax, 1937; Seidel, 1937). In the autumn-winter period the most common species — beside *I. simplex* — in the Lower Silesia. It was collected at almost all the catch points. *I. hexactenus* is particularly common in habitations of *P. auritus*. Altogether 123 individuals (79♀♀ and 44♂♂) were collected from ten species of bats, females making up 64.2% of the collection. So far it has been collected in Poland on *P. auritus*, *B. barbastellus*, *M. myotis* and *M. nattereri* (Skuratowicz, 1957, 1964; Bartkowska, 1973). *M. dasycneme*, *M. daubentoni*, *P. austriacus*, *M. brandti*, *M. bechsteini* and *E. serotinus* are the new hosts to *I. hexactenus* in this country. As reported by Hürka (1963 a) its main hosts are: *P. auritus*, *B. barbastellus*, *M. nattereri*, *M. myotis* and *E. nilssoni*, but according to observations from the Lower Silesia *M. dasycneme* should also be reckoned among its regular hosts.

The maximum extensiveness of invasion (42.8%) and the mean intensiveness of infestation (1.02) were noted on *P. auritus*. Approximate values are quoted by Hürka (1963 a) from Czechoslovakia (39.4% and 0.84, respectively). Characteristic is a considerable difference in the infestation of two similar species: *P. auritus* and *P. austriacus*. The maximum number of parasites collected from one bat was: 7 *I. hexactenus* from *M. nattereri* and 6 ones from *P. auritus*. It is rare that a great number of these parasites be found on a host. Hürka (1963 b) found as many as 11 *I. hexactenus* individuals only on *P. auritus*; on other species there were no more of them than 4. In 21.6% cases *I. hexactenus* was collected together with other species of fleas, most often with *I. simplex* (11 cases),

then with *N. pentactena* (5 cases), *I. intermedius* (2 cases) and *I. octactenus* (1 case). In two cases *I. hexactenus* appeared with two other species: *I. simplex* and *I. intermedius* or *I. simplex* and *I. octactenus*. Hürka (1963 b) most often noted its joint occurrence with *N. pentactena*, *I. intermedius* and *I. simplex*.

*I. hexactenus* was caught from October to the beginning of April inclusive.

#### *Ischnopsyllus variabilis* Wagner, 1898

Locality: Wojcieszów Górny.

The extensiveness of invasion: 16.6% *M. dasycneme*.

The mean intensiveness of infestation: 0.16.

One of the rarest species in Poland, known from the Nizina Wielkopolsko-Kujawska (Skuratowicz, 1964). In the Lower Silesia hardly two females were caught on *M. dasycneme*. Their main hosts are species of the genus *Pipistrellus*. So far it was recorded in Poland on *P. pipistrellus* and *P. auritus*. From *M. dasycneme* it was collected for the first time, though it had been found on that host in Czechoslovakia (Hürka, 1963 a). Only once was *I. variabilis* caught together with *I. simplex*.

#### *Ischnopsyllus octactenus* Kolenati, 1856

Localities: Płuczki, Dolne, Wojcieszów Górny, Książ.

The extensiveness of invasion: 8.3% *M. dasycneme*, 6.4% *M. nattereri*.

The mean intensiveness of infestation: 0.17 *M. dasycneme*, 6.4% *M. nattereri*.

In Poland *I. octactenus* is known from few catch points in different regions of the country (Skuratowicz, 1964). From the Lower Silesia it was reported by Seidel (1937). This species is associated with bats genus *Pipistrellus*, though in Poland it was collected also from bats genera *Myotis* and *Barbastella*. In the Lower Silesia it is one of rarer species; so far it was collected only from *M. dasycneme* and *M. nattereri*, the former being its new host in this country. The extensiveness of invasion and the mean intensiveness of infestation are very low — hardly seven females were collected, all of them only in March. *I. octactenus* was twice caught with *I. simplex* (in these once with *I. hexactenus*).

#### *Nycteridopsylla pentactena* Kolenati, 1856

Localities: Walim, Kamieniec Ząbkowicki, Złoty Stok, Stolec, Roztocznik, Karnków, Wrocław, Kowale, Szczepanów, Żmigród.

Catch points outside the Lower Silesia: Kowalowice n. Namysłów, Malina n. Opole.

The extensiveness of invasion: 20.0% *P. austriacus*, 11.1% *B. barbastellus*, 9.5% *P. auritus*, 1.0% *M. daubentoni*.

The mean intensiveness of infestation: 0.70 (3.50) *P. austriacus*, 0.40 *P. auritus*, 0.11 *B. barbastellus*, 0.01 *M. daubentoni*.

Oscillation of the number: 1-13.

This species is not very numerous in Poland; it is more frequently met in the western part of the country (Skuratowicz, 1967), known from the Lower Silesia and the Western Sudetes (Seidel, 1937). As shown in this investigation, in the Lower Silesia *N. pentactena* is a common species though localized mainly in the plains. Although quite a number of bats were caught in the Sudetes, *N. pentactena* was noted only in Góry Sowie, at Walim and at Złoty Stok at the edge of the mountains. Its main hosts pointed to by Hürka (1963 b) are *P. auritus* and *B. barbastellus*, but this author does not mention *P. austriacus* having then been joined with *P. auritus*. It appears that in the Lower Silesia *N. pentactena* most often occurs on *P. austriacus* (20%), while from *P. auritus* and *B. barbastellus* it was collected — besides the two cases mentioned above — only in lowland areas, though most bats of these two species had been caught in the Kaczawskie, Złote and Wałbrzyskie Mountains. In this country *P. austriacus* is a new host to *N. pentactena*. The extensiveness of invasion and the mean intensiveness of infestation are very low, although on several bats *N. pentactena* occur in a greater number, e.g. as many as 13 individuals collected from *P. austriacus* or *P. auritus*; from *B. barbastellus* 2 individuals of *N. pentactena* were collected at the most. The greatest number of *N. pentactena* collected from a *B. barbastellus* by Hürka (1963 b) was 18.

*N. pentactena* is an autumn-winter species; it was caught from November to February inclusive. Exceptionally two individuals were collected from *P. austriacus* on the 10th April, 1971, at Malina n. Opole. The earliest catches reported by Hürka (1963 b) were of 8th October, and the latest ones of 17th April, with an exceptional catch of May.

A greater number of *N. pentactena* males (54.4%) than females are found on a host, which is a rather rare case. The same is also reported by Hürka (1963 b).

In 27.3% cases *N. pentactena* appeared together with *I. hexactenus*. Hürka (1963 b) also observed frequent cases of joint appearance of both these species. With other species it appears only sporadically.

#### General remarks

The infestation degree of several species of bats in the Lower Silesia is highly differentiated, though generally low. With regard to the mean intensiveness of infestation, 4 groups can be distinguished among the

TABLE 1  
Fleas collected on bats of Lower Silesia  
TABELA 1  
Pchły zebrane z nietoperzy Dolnego Śląska

Species Gatunek	<i>Ischnopsyllus hexactenus</i>		<i>Ischnopsyllus simplex simplex</i>		<i>Ischnopsyllus simplex mysticus</i>		<i>Ischnopsyllus intermedius</i>		<i>Ischnopsyllus variabilis</i>		<i>Ischnopsyllus octactenus</i>		<i>Nycteridopsylla pentactena</i>		Number of fleas Liczba pcheł	Mean intensity of infection Srednia intensywność za- razenia	Intensity of invasion Intensywność inwazji	Extensywność inwazji Extensywność inwazji	Number of bats Liczba nietoperzy
	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂	♀	♂					
<i>Myotis daubentoni</i>	1	2	2	1			1						1	9	0.09	1.13	7.8	103	
<i>Myotis myotis</i>	9	5	5	1			4							41	0.65	1.95	33.3	63	
<i>Myotis nattereri</i>	11	7	67	25			1							117	2.47	2.97	83.0	47	
<i>Myotis dasycneme</i>	3	3	25	7			4		2					46	3.83	5.11	75.0	12	
<i>Myotis mystacinus</i>			4											4	0.29	1.33	21.4	14	
<i>Myotis brandti</i>	2		3	2										8	0.80	1.60	50.0	10	
<i>Myotis bechsteini</i>	2													2				5	
<i>Barbastella barbastellus</i>	18	9	3				2							43	0.52	1.49	35.8	81	
<i>Plecotus austriacus</i>	5	2												15	0.87	3.18	27.5	40	
<i>Plecotus auritus</i>	27	16												60	1.43	2.73	52.4	42	
<i>Eptesicus serotinus</i>	1		2	1			2							4				5	
<i>Eptesicus nilssonii</i>														3				2	
total	79	44	111	37		1	27	7					26	372				424	
razem	123		148		1	34	2	2	7	7	57								



12 species examined (Table 1): high infestation — *M. dasycneme* and *M. nattereri*, mean infestation — *P. auritus*, low infestation — *P. austriacus*, *M. brandti*, *M. myotis* and *B. barbastellus*, and very low infestation — *M. mystacinus* and *M. daubentoni*, *E. serotinus*, *E. nilssoni* and *M. bechsteini* have been out of consideration because of too small number of individuals caught. The highest extensiveness of invasion was observed on *M. nattereri* (83%) and *M. dasycneme* (75%), the lowest on *M. mystacinus* (21.4%) and *M. daubentoni* (8.3%) (Table 1).

TABLE 2

Extensivity of invasion and mean intensity of infection in both sexes of some bats

TABELA 2

Ekstensywność inwazji i średnia intensywność zarażenia samców i samic niektórych nietoperzy

Species Gatunek	Extensivity of invasion Ekstensywność inwazji	Mean intensity of infection Średnia intensy- wność zarażenia
<i>Myotis daubentoni</i>	♀	5.3
	♂	12.9
<i>Myotis myotis</i>	♀	27.3
	♂	39.0
<i>Myotis nattereri</i>	♀	85.0
	♂	81.5
<i>Barbastella barbastellus</i>	♀	28.5
	♂	41.7
<i>Plecotus auritus</i>	♀	68.4
	♂	34.7
<i>Plecotus austriacus</i>	♀	34.8
	♂	23.5

The faunistic composition of fleas on the Lower Silesian bats is very poor. Most species (5) were found on *M. dasycneme*, 4 species on *M. daubentoni*, *M. nattereri* and *B. barbastellus*, 3 species on *M. myotis*, 2 species on *M. brandti*, *P. auritus* and *P. austriacus*, and 1 species on *M. mystacinus*, *M. bechsteini* and *E. nilssoni*. These low numbers point to little exchange of fleas among different species of bats. The exchange is easier among the species forming mixed associations in faults, cracks and clefts; in the Lower Silesia it was observed with *M. daubentoni*, *M. nattereri*, *M. dasycneme* and sometimes *B. barbastellus*. Now, *P. austriacus*, *P. au-*

*ritus* and *M. mystacinus* almost always kept alone, not associating with other species of bats (Haitlinger, 1976). Hůrka (1963 b) noted the greatest number of species (including the fleas of rodents) on bats most numerous in the collection: *M. myotis* (6) and *B. barbastellus* (5).

Low infestation indices of *M. daubentoni* in the material coming from the Lower Silesia are probably closely related with the high degree of this bat infestation with other external parasites, first of all *Nycteriidae*.

In the hibernation period in some species there are observed significant differences in the extensiveness of invasion and the mean intensiveness of infestation between individuals of opposite sex. This phenomenon was watched on six most numerous species. The indices in question appeared to be similar in males and females of *M. nattereri* only (Table 2). Higher extensiveness of invasion was noted in females of *P. auritus* and *P. austriacus* as well as in males of *M. daubentoni*, *M. myotis* and *B. barbastellus*. Particularly high extensiveness of invasion was recorded in females of *P. auritus* — it was by 33.7% higher than in males. In this species the extensiveness is clearly evident, also with mean intensiveness of infestation. Then, in the hibernation period, females of the species genus *Plecotus* show much higher intensiveness of infestation than males, contrary to some species genera *Myotis* and *Barbastella*. Similar correlations were observed by Hůrka (1963 b) in Czechoslovak material; he relates them to the differences in the biology of bat males and females in the active period of life, when the animals get intensively infested with some species of fleas (e.g. *I. hexactenus* on *P. auritus*) and when the differences in the infestation with this flea species are tangible in both the sexes. Now, no such differences are observed concerning the winter species *N. pentactena*.

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## PASOŻYTY ZEWNĘTRZNE NIETOPERZY DOLNEGO ŚLĄSKA

### I. SIPHONAPTERA

R. HAITLINGER

Z 414 nietoperzy należących do 12 gatunków, złowionych na Dolnym Śląsku, zebrano 371 pcheł należących do 6 gatunków: *Ischnopsyllus hexactenus* (Kolen.), *I. simplex* (Rothsch.), *I. intermedius* (Rothsch.), *I. variabilis* (Wagn.), *I. octactenus* (Kolen.), *Nycteridopsylla pentactena* (Kolen.).

Nowymi żywicielami na terenie kraju są: dla *I. simplex simplex* — *Myotis dasycneme*, *M. brandti* i *Eptesicus nilssoni*; dla *I. s. mysticus* — *M. brandti*; dla *I. intermedius* — *M. dasycneme*, *M. daubentoni*, *M. nattereri*, *Barbastella barbastellus*; dla *I. hexactenus* — *M. dasycneme*, *M. brandti*, *M. daubentoni*, *Plecotus austriacus*, *M. bechsteini*, *E. serotinus*; dla *I. variabilis* — *M. dasycneme*; dla *I. octactenus* — *M. dasycneme* i dla *N. pentactena* — *P. austriacus*.

Najliczniejsze w okresie hibernacji nietoperzy są *I. simplex* i *I. hexactenus*. Najwyższą ekstensywność inwazji i średnią intensywność zarażenia notowano na *M. nattereri* (83%; 2,47) i *M. dasycneme* (75%; 3,83); najmniejszą na *M. daubentoni* (7,8%; 0,09) oraz *M. mystacinus* (21,4%; 0,29). Najwięcej gatunków (5) pcheł stwierdzono na *M. dasycneme*.

Zanotowano różnice w ekstensywności inwazji i średniej intensywności zarażenia u obu płci niektórych gatunków nietoperzy. Wskaźniki te są większe u samic *P. auritus* i *P. austriacus* oraz u samców *M. daubentoni*, *M. myotis* i *B. barbastellus*.