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Diptera Pupipara from bats of two large eastern Mediterranean islands, Crete and Cyprus

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Abstract: This paper presents a review of records of bat flies (families Nycteribiidae and Streblidae) from Crete and Cyprus, based on new findings and published data. Seven species representing 4 genera belonging to the family Nycteribiidae and 1 species from the family Streblidae from 5 bat species in Crete are reported, and 7 Nycteribiidae species (4 genera) and 1 Streblidae species from 9 bat species in Cyprus are reported. The bat flies *Nycteribia latreillii* (Leach, 1817), *Basilia mongolensis nudior* Hürka 1972, *Penicillidia conspicua* Speiser, 1900, *P. dufourii* Westwood, 1835, and *Brachytarsina flavipennis* Macquart, 1851 are reported from Crete for the first time, and *Phthiridium integrum* (Theodor and Moscona, 1954), *P. dufourii*, and *B. flavipennis* are reported from Cyprus for the first time.

Key words: Nycteribiidae, Streblidae, first records, distribution, hosts

1. Introduction

The family Nycteribiidae Samouelle, 1819 comprises the dipterans parasitising on bats of all zoogeographical regions. According to the checklist by Graciolli and Dick (2008), more than 270 species occur in the world. Seventeen species (5 genera) are known from the western Palaearctic (Theodor, 1967; Hürka and Soós, 1986a), and 14 species (5 genera) of them occur in the Mediterranean area (Hürka, 1964; Theodor, 1967).

No detailed information on Nycteribiidae has been available from Crete, except for several records of 3 species reported by Theodor (1967) and Kock (1974, 1989): *Nycteribia pedicularia* Latreille, 1805 (collected from *Myotis capaccinii* (Bonaparte, 1837)), *Nycteribia schmidlii* Schiner, 1853 (from *M. capaccinii* and *Miniopterus schreibersii* (Kuhl, 1817)), and *Phthiridium biarticulatum* Hermann, 1804 (from *Rhinolophus ferrumequinum* (Schreber, 1774)). A similar situation holds for the nycteribiid fauna of Cyprus: only scarce data have been available from this island, including records of 5 species, *Nycteribia pedicularia* (from *M. capaccinii*), *N. schmidlii* (from *Rhinolophus euryale* Blasius, 1853), *Phthiridium biarticulatum* (from *R. euryale*), *Basilia daganiae* Theodor and Moscona, 1954 (from *Pipistrellus kuhlii* (Kuhl, 1817)), and *Penicillidia conspicua* Speiser, 1900 (from *M. schreibersii*) (Bequaert, 1953; Theodor, 1956, 1967; Kock, 1974, 1984, 1989).

The family Streblidae Kolenati, 1863 is represented by 4 species of 3 genera in the Mediterranean (Jobling, 1939; Hürka and Soós, 1986b). Just one species, *Brachytarsina flavipennis* Macquart, 1851, occurs in Europe (Hürka, 1972). So far, no record of this species has been available either from Crete or from Cyprus.

2. Materials and methods

In October 2005, July and October 2006, and May and June 2008, bats were collected from Crete and Cyprus in the course of research trips (Benda et al., 2007, 2009). Mist nets were installed according to standard procedures (Kunz and Kurta, 1988) in front of water, and bats were also captured in their roosts (caves, mines). Each captured host was placed into a separate cloth bag and labelled. Hosts were inspected for bat flies, ectoparasites living in the fur of the body, which were collected with entomological tweezers and preserved in 75% ethanol. Samples for a species of host were stored in an Eppendorf tube. The age and sexual status (adult male (♂ ad), adult female (♀ ad), subadult female (♀ sad)) of the host is given for most samples, with the exception of the period of October 2010, when only the number and species of host were registered. All bat flies were observed freely under a magnifying glass, and keys were used for the determination and comparison of parasitic species: Theodor and Moscona (1954), Theodor (1967, 1975), and Hürka (1972). Voucher specimens of

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the parasites are deposited in the collection of the first author (cMŠ). The taxa are arranged alphabetically. The information for each species appears in the following format: synonyms available from the respective islands; published data; new material examined (number and developmental stage of specimens, locality, date, number of collection, age/number of host).

3. Results and discussion

In total, 6 species representing 4 genera belonging to the family Nycteribiidae and 1 species of the family Streblidae were collected from Crete, and 4 species of 2 genera of the family Nycteribiidae and 1 species of Streblidae were collected from Cyprus.

3.1. Family Nycteribiidae (Samouelle 1819)

3.1.1. Subfamily Nycteribiinae Samouelle, 1819, sensu Maa 1965

3.1.1.1. *Nycteribia* (*Nycteribia*) *latreillii* (Leach, 1817)

Crete. New material examined: 1♂, 1♀, Lefkogeia, at Venetian bridge ca. 3 km E of Kato Preveli Monastery, 30 May 2008 (cMŠ 3962-3963, leg. P. Benda and V. Hanák) from 2♀♀ ad *Myotis blythii*.

Remarks: Until Theodor (1954a), the species was reported in Europe under various names, as the proper name was erroneously used for *N. kolenati* Theodor and Moscona, 1954. The distribution of *N. latreillii* corresponds to the ranges of its primary host species, *Myotis myotis* (Borkhausen, 1797), *M. blythii* (Tomes, 1857), and *M. punicus* Felten, 1977, i.e. almost all of continental Europe (northern limit of 51°N–52°N), the Maghreb, the Middle East, and Central Asia (Hürka, 1964; Theodor, 1967). In addition, it can also occur on other species of the genus *Myotis* Kaup, 1829, *Miniopterus* Bonaparte, 1837, and *Rhinolophus* Lacépède, 1799, as well as on other cave-dwelling bats (see Theodor, 1967). Our findings represent the first evidence of this species from Crete. Although we did not find this bat fly in Cyprus, its occurrence is to be expected due the presence of one of the principal host species, *M. blythii* (Benda et al., 2007).

3.1.1.2. *Nycteribia* (*Nycteribia*) *pedicularia* Latreille, 1805

Crete. Published records: Kock (1974): Piskokefalo at Sitia (host *Myotis capaccinii*).

Cyprus. Published records: Kock (1974): Kyrenia (host *Myotis capaccinii*).

Remarks: *Nycteribia pedicularia* has frequently been confused with *N. latreillii* and/or *N. kolenati* Theodor and Moscona, 1954. *N. pedicularia* is distributed in south-eastern Europe, and the northern limit of its range probably reaches the Alps and southern Carpathians (Hürka, 1962). In the broader scale of the western Palaearctic, its distribution range encompasses Turkey, Palestine, Iran, Tunisia, and Algeria (Theodor and

Moscona, 1954; Theodor, 1967). However, the record from Cyprus is doubtful, as the occurrence of the host species as well as the record itself is in doubt (see Benda et al., 2007). Host species of this bat fly are cave-dwelling bats of the genera *Myotis*, *Miniopterus*, and *Rhinolophus* (Theodor and Moscona, 1954).

3.1.1.3. *Nycteribia* (*Listropoda*) *s. schmidlii* Schiner, 1853
Crete. Published records: Theodor (1967): Limnea (host *Miniopterus schreibersii*). - Kock (1974): Canea = Chaniá (host *Miniopterus schreibersii*), Piskokefalo bei Sitia (host *Myotis capaccinii*).

New material examined: 2♂♂, 1♀, Dramia, Petres river bridge, 6 October 2006 (cMŠ 3400, leg. P. Benda and V. Hanák) from 1♀ ad *Myotis capaccinii*; 5♂♂, 9♀♀, Argypoli, Mouselas river, 3 June 2008 (cMŠ 3973-3974, leg. P. Benda and V. Hanák) from 2♀♀ ad *Myotis capaccinii*; 3♂♂, 3♀♀, Omalos Plateau, Tzani cave, 1 October 2006 (cMŠ 3360-3375, leg. P. Benda and V. Hanák) from collection 13♂♂ ad and 2♀♀ sad *Miniopterus schreibersii*.

Cyprus. Published records: Theodor (1967): site unspecified (host *Rhinolophus euryale*).

Remarks: The distribution of the western subspecies *N. s. schmidlii* corresponds to the distributional range of its principal host bat, *Miniopterus schreibersii*, viz. central and southern Europe, the Middle East, Afghanistan, and North Africa.

3.1.1.4. *Phthiridium biarticulatum* Hermann, 1804

Synonym: *Stylidia biarticulata* Hermann, 1804: Theodor (1967: 127).

Crete. Published records: Theodor (1967): Gonia = Mount Gonia (host *Rhinolophus ferrumequinum*). - Kock (1989): Rethimnon (host *Rhinolophus ferrumequinum*).

New material examined: 1♂, Kolyvari, mine above village, 9 October 2006 (cMŠ 3426, leg. P. Benda and V. Hanák) from 1♂ ad *Rhinolophus ferrumequinum*; 2♀♀, Omalos Plateau, Tzani cave, 1 October 2006 (cMŠ 3377-3378, leg. P. Benda and V. Hanák) from 2♂♂ ad *Rhinolophus ferrumequinum*.

Cyprus. Published records: Theodor (1967): site undefined (host *Rhinolophus euryale*).

New material examined: 1♀, Kakopetria, Troodos Forest, abandoned mine 5 km to SW, upper gallery, 13 October 2005 (cMŠ c07, leg. R.K. Lučan) from *Rhinolophus ferrumequinum* individual of unknown sex and age; 1♂, Afendrika, ruins of Panagia Chrysotissa church and Asomatos church, 17 October 2005 (cMŠ c02, leg. R.K. Lučan) from 1♂ ad *Rhinolophus ferrumequinum* (Schreber, 1774); 3♂♂, 6♀♀, Kakopetria, Troodos Forest, abandoned mine 5 km to SW, upper gallery, 27 July 2006 (cMŠ 3335, 3336, leg. P. Benda) from 1♀ ad and 1♀ sad *Rhinolophus blasii* (Peters, 1866).

Remarks: This cave-dwelling bat fly lives on representatives of the genus *Rhinolophus*. Its distribution

range is circum-Mediterranean and reaches Tajikistan and Kyrgyzstan (Hürka, 1964). While *Rhinolophus ferrumequinum* is the most frequent host of this bat fly (Hürka, 1964), other (mostly cave-dwelling) bats, e.g., *Miniopterus schreibersii*, *Myotis myotis* and *M. blythii*, are less-parasitised hosts (Hürka, 1964).

3.1.1.5. *Phthiridium integrum* (Theodor and Moscona, 1954)

Cyprus. New material examined: 3♀♀, Kantara, Kantara castle ruins 3 km to NE, 25 July 2006 (cMŠ 3328, leg. P. Benda) from 1♂ ad *Eptesicus anatolicus*.

Remarks: This species was described by Speiser (1901) and redescribed by Karaman (1939) based on a record from Egypt. Findings are known from host species of the genera *Taphozous* Geoffroy, 1818, *Rhinolophus* and *Hipposideros* Gray, 1831 from the Middle East: Egypt, Palestine, Jordan, Saudi Arabia, and Yemen (Sanborn and Hoogstraal, 1953; Theodor and Moscona, 1954; Theodor, 1976; Kock and Nader, 1979; Amr and Qumsiyeh, 1993). This species is reported here for the first time from Cyprus and from a new host, *Eptesicus anatolicus* Felten, 1971.

3.1.1.6. *Basilina (Basilina) daganiae* Theodor and Moscona, 1954

Cyprus. Published records: Bequaert (1953): Limassol (host *Pipistrellus kuhlii*). - Theodor (1956): Limassol, (host *Pipistrellus kuhlii*), site undefined, leg. Lilford (without host). - Theodor (1967): site undefined, leg. Lilford (host *Pipistrellus kuhlii*). - Kock (1974): Larnaka (host *Pipistrellus kuhlii*).

Remarks: The distribution range of this species from the “*bathybothyra* group” covers the whole eastern Mediterranean: Cyprus, Turkey, Syria, Jordan, Egypt, Lebanon, and Palestine (Theodor and Moscona, 1954; Lewis and Harrison, 1962; Hürka and Soós, 1986a; Benda et al., 2010). Its occurrence outside the eastern Mediterranean region is not excluded, considering the much broader distribution of its main host *Pipistrellus kuhlii*. *B. daganiae* has also been recorded from other species of the genus *Pipistrellus*: *P. pipistrellus* (Schreber, 1774) from Jordan (Benda et al., 2010).

3.1.1.7. *Basilina (Basilina) mongolensis nudior* Hürka, 1972

Crete. New material examined: 2♀♀, Meskla, above creek, 5 October 2006 (cMŠ 3393, leg. P. Benda and V. Hanák) from 1♂ ad *Myotis aurascens*; 1♂, 1♀, Katholiko monastery, Agiou Ioanni cave, 27 May 2008 (cMŠ 3958, leg. P. Benda) from 1♀ ad *Myotis aurascens*.

Remarks: This subspecies from the “*bathybothyra* group” was described by Hürka (1972) from the host *Plecotus austriacus* Fischer, 1829. The full expansion of this subspecies is unknown, and we expect it to be in the same area distribution as the host *Myotis nattereri* (Kuhl, 1817). Its occurrence on other arboreal host species is

not excluded, but it occurs mostly in the “*mystacinus* group”, viz. *M. alcathoe* von Helvesen and Heller, 2001 (Heddergott, 2009), and in our records from *M. aurascens* Kusjakin, 1935. Previous records are from Croatia, Greece (Hürka, 1972), Bulgaria (Hürka, 1984), Austria (Kock, 1984), Turkey (Aktaş and Hasbenli, 1994; Hasbenli, 1997), and Germany (Heddergott, 2009).

3.1.1.8. *Penicillidia (Neopenicillidia) conspicua* Speiser, 1901

Crete. New material examined: 3♂♂, 3♀♀, Omalos Plateau, Tzani cave, 1 October 2006 (cMŠ 3360-3375, leg. P. Benda and V. Hanák) from collection 13♂♂ ad and 2♀♀ sad *Miniopterus schreibersii*; 2♀♀, Milatos, Milatou cave, 7 October 2006 (cMŠ 3422-3425, leg. P. Benda and V. Hanák) from collection 1♀ ad and 3♀♀ sad *Miniopterus schreibersii*.

Cyprus. Published records: Kock (1989): Emba, Paphos Distr. (host *Miniopterus schreibersii*).

New material examined: 1♂, 1♀, Neo Horio, Smigies Trail, ca. 3 km to NW, abandoned chromite mine system ‘Magnesia Mine’, 12 October 2005 (cMŠ c03, c04, leg. R.K. Lučan) from 2 *Miniopterus schreibersii* individuals of unknown sex and age.

Remarks: *Penicillidia conspicua* is a species bound to its principal host, *Miniopterus schreibersii*, and its distribution range corresponds to the occurrence of this bat (Hürka, 1964). Within this range, it has frequently been found also on *Myotis myotis* and other cave-dwelling bat species (Hürka, 1964). This parasite species is reported from Crete for the first time here.

3.1.1.9. *Penicillidia (Penicillidia) dufourii* Westwood, 1835

Crete. New material examined: 2♂♂, 3♀♀, Lefkogeia, at Venetian bridge ca. 3 km E of Kato Preveli Monastery, 30 May 2008 (cMŠ 3962-3963, leg. P. Benda and V. Hanák) from 2♀♀ ad *Myotis blythii*; 1♂, 1♀, Dramia, Petres river bridge, 6 October 2006 (cMŠ 3400, leg. P. Benda and V. Hanák) from 1♀ ad *Myotis capaccinii*; 2♂♂, 2♀♀, Argyroupoli, Mouselas river, 3 June 2008 (cMŠ 3973-3974, leg. P. Benda and V. Hanák) from 2♀♀ ad *Myotis capaccinii*.

Cyprus. New material examined: 2♀♀, Kakopetria, Troodos Forest, abandoned mine 4 km to SW, lower gallery, 15 October 2005 (cMŠ c05, leg. R.K. Lučan) from 1♂ ad *Myotis blythii*; 1♂, Kakopetria, Troodos Forest, abandoned mine 5 km to SW, upper gallery, 13 October 2005 (cMŠ c06, leg. R.K. Lučan) from *Myotis nattereri* individual of unknown sex and age.

Remarks: The subspecies *P. d. dufourii* is distributed over continental Europe, North Africa, and south-western Asia to the western Himalayas and eastern Kazakhstan. *Myotis myotis* and *M. blythii* are the main hosts of this species, but it can also be found on *Miniopterus schreibersii*, though much more rarely. This parasite species is recorded here for the first time from Crete and Cyprus.

3.2. Family Streblidae Kolenati, 1863

3.2.1. Subfamily Brachytarsininae (Speiser, 1900)

3.2.1.1. *Brachytarsina* (*Brachytarsina*) *flavipennis* Macquart, 1851

Crete. New material examined: 1♂, Patsos, Agiou Antoniou cave, 3 October 2006 (cMŠ 3388, leg. P. Benda and V. Hanák) from 1♀ sad *Rhinolophus ferrumequinum*; 2♀♀, Katholiko monastery, Agiou Ioanni cave, 27 May 2008 (cMŠ 3958, leg. P. Benda) from 1♀ ad *Myotis aurascens*.

Cyprus. New material examined: 1♀, Kakopetria, Troodos Forest, abandoned mine 5 km to SW, upper gallery, 13 October 2005 (cMŠ 08, leg. R.K. Lučan) from *Rhinolophus ferrumequinum* individual of unknown sex and age; 1♂, 2♀♀, Kakopetria, Troodos Forest, abandoned mine 5 km to SW, upper gallery, 27 July 2006 (cMŠ 3336, leg. P. Benda) from 1♀ sad *Rhinolophus blasii*.

Remarks: *B. flavipennis* is the only streblid species occurring in the Mediterranean portion of the Palaearctic. This species has a circum-Mediterranean distribution range, and in Europe it reaches the latitude of 40°N–43° N, roughly corresponding to the areas of mean January temperatures of 8 to 10 °C (Jobling, 1951; Hürka, 1972).

Jobling (1934, 1939) indicated the occurrence of this species in Cyprus and Theodor's record (1954b) is uncertain, since a direct finding has not been reported. This bat fly is recorded here from both large islands for the first time.

In conclusion, the combination of our new data with previously published information has resulted in an increase in the total number of species of the Nycteribiidae family on Crete from 3 to 7 species, and from 5 to 7 species

on Cyprus. In addition to the above discussion, we may expect other species from this family (genera *Nycteribia* Latreille, 1796, *Basilisa* Miranda-Ribeiro, 1903, and *Eucampsipoda* Kolenati, 1857) on the individual islands. *Nycteribia* (*Acrocholidia*) *vexata* Westwood, 1835 is a species with a relation to the extension of the principal hosts *Myotis myotis* and *M. blythii* (as *N. latreilii*), whereas the second host was confirmed on the island of Crete (Benda et al., 2008). The principal host of *Basilisa nana* Theodor, 1954, in Middle Eastern countries is *M. nattereri* (Turkey - Aktaş and Hasbenli, 1994; Hasbenli, 1997; Jordan - Amr and Qumsiyeh, 1993; Benda et al., 2010), and on this basis we can expect this parasitic species to confirm this host from Cyprus (Benda et al., 2007). In addition, on the same island there probably occurs the parasitic species of the host *Rousettus aegyptiacus* (Geoffroy, 1810), viz. *Eucampsipoda aegyptia* (Macquart, 1851). The occurrence of this species on island has already been considered by Theodor (1952, 1954a, 1955; see also Kock and Nader, 1979). This host species has been confirmed on Cyprus by several authors (summary in Benda et al., 2011).

The fauna of Streblidae is represented by a single species, which was confirmed for the first time on both islands.

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Appendix

Appendix I. Gazetteer.

Only the originally recorded sites are mentioned.

Crete. Prefecture of Chania: Argyroupoli [Αργυρούπολη], Mouselas river, old building, 35°19'N, 24°20'E, 105 m a. s. l.; - Katholiko Monastery [Μονή Καθολικού], Agiou Ioanni cave, 35°35'N, 24°09'E, 80 m a. s. l.; - Kolympvari [Κολυμβάρι], mine, 35°33'N, 23°46'E, 44 m a. s. l.; - Meskla [Μεσκλά], creek, 35°24'N, 23°57'E, 206 m a. s. l.; - Omalos Plateau [Οροπέδιο Ομαλού], Tzani cave, 35°21'N, 23°54'E, 1025 m a. s. l.; Prefecture of Rethymno: Dramia [Δράμια], Petre river bridge, 35°21'N, 24°21'E, 2 m a. s. l. - Lefkogeia [Λευκόγεια], Venetian bridge ca. 3 km E of Kato Preveli Monastery, 35°10'N, 24°28'E, 45 m a. s. l.; - Patsos [Πατσός], Agiou Antoniou cave, 35°15'N, 24°34'E, 200 m a. s. l.; Prefecture of Lasithi: Milatos [Μίλατος], Milatou cave, 35°18'N, 25°35'E, 129 m a. s. l.

Cyprus. Northern Cyprus: Afendrika (= Panagia Afentrika [Παναγία Αφεντρικά]), ruins, İskele District, 35°39'N, 34°26'E, ca. 25 m a. s. l.; - Kantara (= Kantara [Κανταρά]), Kantara castle ruins 3 km to NE, İskele District, 35°24'N, 33°55'E, ca. 625 m a. s. l.; - Southern Cyprus: Kakopetria [Κακοπετρία], Troodos Forest, mine 5 km to SW (upper gallery), Lefkosia District, 34°57'N, 32°52'E, ca. 1665 m a. s. l.; - Kakopetria [Κακοπετρία], Troodos Forest, mine 4 km to SW (lower gallery), Lefkosia District, 34°58'N, 32°52'E, ca. 1305 m a. s. l.; - Neo Horio [Νεο Χωριο], Smigies Trail ca. 3 km to NW, abandoned chromite mine system 'Magnesia Mine', Akamas Peninsula, Pafos District, 35°03'N, 32°20'E, ca. 305 m a. s. l.

Appendix II. Checklist of Nycteribiidae and Streblidae with their hosts from the islands of Crete and Cyprus.
 Checklist of 7 species, with 4 genera of bat flies Nycteribiidae and 1 species of Streblidae known from Crete and the same number of species and genera from

both parasitic families documented from Cyprus, based on both literature data and new records obtained during recent field studies. The first record of the parasite (*) and the first record from the host (**) of the respective island are indicated.

Country / Family / Subfamily / Genus / Species

Species of host

Country: CRETE

Family: NYCTERIBIIDAE Samouelle, 1819

Subfamily: Nycteribiinae Samouelle, 1819

Genus: Nycteribia Latreille, 1796

Nycteribia latreilii (Leach, 1817)*

Nycteribia pedicularia Latreille, 1805

Nycteribia schmidlii schmidlii Schiner, 1853

Myotis blythii (Tomes, 1857)**

Myotis capaccinii (Bonaparte, 1837)

Myotis capaccinii (Bonaparte, 1837)

Miniopterus schreibersii (Kuhl, 1817)

Genus: Phthiridium Hermann, 1804

Phthiridium biarticulatum Hermann, 1804

Genus: Basilia Miranda-Ribeiro, 1903

Basilia mongolensis nudior Hürka, 1972*

Genus: Penicillidia Kolenati, 1863

Penicillidia conspiciua Speiser, 1901*

Penicillidia dufourii Westwood, 1835*

Rhinolophus ferrumequinum (Schreber, 1774)

Myotis aurascens Kujakin, 1935**

Miniopterus schreibersii (Kuhl, 1817)**

Myotis blythii (Tomes, 1857)**

Myotis capaccinii (Bonaparte, 1837)**

Family: STREBLIDAE Kolenati, 1683

Subfamily: Brachytarsinae (Speiser, 1900)

Genus: Brachytarsina Macquart, 1851

Brachytarsina flavipennis Macquart, 1851*

Rhinolophus ferrumequinum (Schreber, 1774)**

Myotis aurascens Kujakin, 1935**

Country: CYPRUS

Family: NYCTERIBIIDAE Samouelle, 1819

Subfamily: Nycteribiinae Samouelle, 1819

Genus: Nycteribia Latreille, 1796

Nycteribia pedicularia Latreille, 1805

Nycteribia schmidlii schmidlii Schiner, 1853

Genus: Phthiridium Hermann, 1804

Phthiridium biarticulatum Hermann, 1804

Myotis capaccinii (Bonaparte, 1837)

Rhinolophus euryale Blasius, 1853

Rhinolophus blasii Peters, 1867**

Rhinolophus euryale Blasius, 1853

Rhinolophus ferrumequinum (Schreber, 1774)**

Eptesicus anatolicus Felten, 1971**

Phthiridium integrum (Theodor and Moscona, 1954)*

Genus: Basilia Miranda-Ribeiro, 1903

Basilia daganiae Theodor and Moscona, 1954

Genus: Penicillidia Kolenati, 1863

Penicillidia conspiciua Speiser, 1901

Penicillidia dufourii Westwood, 1835*

Pipistrellus kuhlii (Kuhl, 1817)

Miniopterus schreibersii (Kuhl, 1817)

Myotis blythii (Tomes, 1857)**

Myotis nattereri (Kuhl, 1817)**

Family: STREBLIDAE Kolenati, 1683

Subfamily: Brachytarsinae (Speiser, 1900)

Genus: Brachytarsina Macquart, 1851

Brachytarsina flavipennis Macquart, 1851*

Rhinolophus blasii Peters, 1867**

Rhinolophus ferrumequinum (Schreber, 1774)**

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