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Review of nycteribiid flies (Diptera: Nycteribiidae) of Russia

Обзор мух-никтерибиид (Diptera: Nycteribiidae) России

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КЛЮЧЕВЫЕ СЛОВА: Nycteribiidae, фауна, Россия, новые указания.

ABSTRACT. A checklist of Nycteribiidae flies from Russia including 18 species of 4 genera is provided. Three species, *Basilia nana* Theodor, 1954, *Nycteribia latreillii* Leach, 1817 and *N. pedicularia* Latreille, 1805 are found in Russia for the first time.

РЕЗЮМЕ. Представлен аннотированный список видов мух семейства Nycteribiidae включающий 18 видов из 4 родов. Три вида, *Basilia nana* Theodor, 1954, *Nycteribia latreillii* Leach, 1871 и *N. pedicularia* Latreille, 1805, впервые указаны в фауне России.

Introduction

The flies Nycteribiidae are known to be parasites of the bats (order Chiroptera) only. The Nycteribiidae includes 3 subfamilies, 12 genera, and about 300 species worldwide [Dick, Patterson, 2006]. Two subfamilies, Archinycteribiinae (1 genus, 3 species), and Cyclopodiinae (4 genera, 62 species) are exclusively Eastern Hemispheric in distribution, where they are primarily parasites of bats of the suborder Megachiroptera (mainly associated with the bat family Pteropodidae). The Nycteribiinae (7 genera, 210 species) are cosmopolitan in distribution and they are primarily parasites of bats of the suborder Microchiroptera (mainly associated with the bat families Vespertilionidae and Rhinolophidae). The majority of nycteribiid species are found in tropical and subtropical regions worldwide, however, they are richer in the Eastern Hemisphere (222 species versus 53 species in the Western) [Dick, Patterson, 2006].

Two subfamilies, 34 species and 5 genera are known in Palearctic [Theodor, 1954, 1967; Hůrka, Soós, 1986] and one subfamily, 15 species and 4 genera in Russia [Stackelberg, 1970; Farafonova, 1999].

All these flies are completely wingless. Apparently, the life cycle of nycteribiids is rather uniform. For example, the total life of *Basilia hispida* Theodor, 1967 is about 136 and 195 days for males and females, respectively, including 9 days in the larval stages, 25 days in puparium, and 97 days (males) or 156 days (females) in the adult stage [Marshall, 1970]. Flies reached sexual maturity 5–6 days after emergence from the puparium. The females deposited prepupae on roost substrate. Prepupal deposition occurred when the bats were in their roosts. From 25 to 46 days later, with host bats present or absent in the roost, wingless adults emerged and walked around searching for a host. The nycteribiids often have a high degree of host specificity and their species diversity depends on the diversity of fauna of the bats.

The fauna of Nycteribiidae of Old World is studied well enough and relatively full species checklists are provided in literature. However, a new checklist of nycteribiids of Russia is absent up to date. The present paper include various materials on the Nycteribiidae from different regions of Russia. All the materials studied are kept in the collection of Department of Entomology, Biological Faculty of Moscow State University.

Checklist of Nycteribiidae of Russia

Genus *Basilia* Miranda-Ribeiro, 1903

Basilia nana Theodor, 1954

MATERIAL. 1 ♂, 4 ♀♀, Russia, Krasnodar Terr., near Adler, caves, 1–31.08.1999, from *Myotis bechsteini*, leg. A. Borisenko; 1

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♀, Caucasus State Natur Reserve, Laura, 1–31.07.1999, from *M. mystacinus*, leg. A. Borisenko.

DISTRIBUTION. Russia (**new record**): North Caucasus. Europe, Caucasus, Israel [Hůrka, Soós, 1986].

HOSTS: *Myotis bechsteini* Kuhl, 1817, *M. dasycneme* (Boie, 1825), *M. mystacinus* Kuhl, 1819, *M. nattereri* (Kuhl, 1817).

Basilia rybini Hůrka, 1969

MATERIAL. 6 ♂♂, 7 ♀♀, Russia, Novosibirsk Prov., Maslyaninsk Distr., caves, 2.05.1981, from *M.daubentoni*, leg. P. Morozov; 2 ♂♂, 2 ♀, Far East, Primorsky Terr., cave Seraphimovskaya, 4.02.1983, from *M. nattereri*, leg. M.P. Tiunov; 1 ♂, Far East, Primorsky Terr., cave Makrushinskaya, 6.02.1983, from *M. nattereri*, leg. M.P. Tiunov; 1 ♂, Far East, Primorsky Terr., cave Velican, 11.03.1983, from *M. frater*, leg. M.P. Tiunov; 1 ♂, 1 ♀, Primorsky Terr., cave Priiskovaya, 13.02.1983. leg. M.P. Tiunov; 1 ♂, Primorsky Terr., Khasan, 1–31.03.1983, from *M. daubentoni*, leg. M.P. Tiunov; 1 ♀, Khabarovsk Terr., 18.08.1983, from *M. daubentoni*, leg. M. P. Tiunov; 1 ♀, Khabarovsk Terr., 27.08.1983, from *M. frater*, leg. M.P. Tiunov; 1 ♂, 4 ♀♀, Khabarovsk Terr., cave Stary Medved, from *M. nattereri*; 5 ♂♂, 4 ♀♀, Altai, caves, 25.01–5.02.1989, from *M. daubentoni*, leg. A. Polkanov.

DISTRIBUTION. Russia: Siberia, Far East [Medvedev *et al*., 1991; Farafonova, 1999]. Kazakhstan, Turkmenia.

HOSTS: *Myotis daubentoni* Kuhl, 1819, *M. nattereri*, *M. mystacinus*, *M. frater* G. Allen, 1923.

Basilia truncata Theodor, 1966

MATERIAL. 1 ♂, 2 ♀♀, Far East, Khasan, Zaozernaya, 1–31.08.1981, from *Miniopterus schreibersi*, leg. P. Morozov; 1 ♂, Far East, cave Priiskovaya, 17.12.1983, from *Murina leucogaster*, leg. M.P. Tiunov; 1 ♀, Far East, Kiparisovo, 25.07.1985, from *M.daubentoni*, leg. M.P. Tiunov; 2 ♂♂, Khabarovsk Terr., cave Steregushee Kop'e, 24.10.1983, from *M. brandti*, leg. M.P. Tiunov; 2 ♂♂, 2 ♀♀, Khabarovsk Terr., cave, Proshania, 30.10.1983, from *M. brandti*, leg. M.P. Tiunov; 2 ♂♂, 7 ♀♀, Khabarovsk Terr., cave Stary Medved', 30.10. 1983, from *M. brandti*, leg. M.P. Tiunov; 1 ♂, Altay, cave, 5.02.1983, from *Murina leucogaster*, leg. M.P. Tiunov; 2 ♂♂, 4 ♀♀, Khakasia, caves, 1986, from *M.brandti*, leg. A. Hritankov; 1 ♂, 1 ♀, Krasnoyarsk Terr., cave Ledopadnaya, 22.03.1987, from *M. brandti*, leg. A. Hritankov; 2 ♂♂, 2 ♀♀, from *M. daubentoni*, Krasnoyarsk Terr., cave Tergalinskaya, 21.12.1989, leg. Kotepov; 1 ♂, from *M. brandti*, Krasnoyarsk Terr., cave Podnebesnaya,1–28.02.1984, leg. A. Hritankov.

DISTRIBUTION. Russia: Siberia, Far East [Medvedev *et al*., 1991; Farafonova, 1999]. Mongolia.

HOSTS: *Miniopterus schreibersi* Kuhl, 1819, *Murina leucogaster* Milne-Edwards, 1872, *Myotis brandti* Eversmann, 1845, *M. daubentoni*, *M. mystacinus*.

Basilia truncatiformis Farafonova, 1998

MATERIAL. 2 ♂♂, 3 ♀♀, Russia, Krasnoyarsk Terr., Shirinsk Distr., vill. Malaya Siya, cave Archeologicheskaya, 5.10.1989, from *M. brandti*, leg. A. Hritankov, Denisova; 2 ♂♂, 1 ♀, Krasnoyarsk Terr., river Biryusa, caves, 19.09.1989, from *M. brandti*, leg. A. Hritankov.

DISTRIBUTION. Russia: Siberia [Farafonova, 1998].

HOST: *Myotis brandti*.

Genus *Nycteribia* Latreille, 1797

Nycteribia allotopa Speiser, 1901

MATERIAL. 1 ♂, 1 ♀, Russia, from *Miniopterus schreibersi*, Far East, Primorsky Terr., Khasan, Zaozernaya, 2.08.1988, leg. P. Morozov.

DISTRIBUTION. Russia: Far East [Medvedev *et al*., 1991; Farafonova, 1999]. Japan, China, Sri Lanka, India.

HOST: *Miniopterus schreibersi*.

Nycteribia formosana (Karaman, 1939)

MATERIAL. 4 ♂♂, 2 ♀♀, Russia, no host, Far East, Khasan, 6.07.1966, leg. V.G. Belyaev; 2 ♂♂, 2 ♀♀ from *Miniopterus schreibersi*, Far East, Khasan, Zaozernaya, 2.08.1981, leg. P. Morozov; 3 ♂♂, 3 ♀♀ from *Myotis capaccini*, Far East, cave Seraphimovskaya, 5.06.1983, leg. M.P. Tiunov; 1 ♂, 1 ♀ from *M. daubentoni*, Far East, cave Velican, 11.03.1983, leg. M. Tiunov; 2 ♀♀ from *Plecotus auritus*, Far East, cave Bogataya Fanza, 7.03.1983, leg. M. P. Tiunov; 1 ♀, from *M. capaccini*, Far East, cave Velican, 11.03.1983, leg. M.P. Tiunov; 2 ♀♀, from *M. daubentoni*, Far East, cave Letuchaya mish, 14.06.1985, leg. M.P. Tiunov; 5 ♂♂, 4 ♀♀, from *M. capaccini*, Far East, Khasan, Zaozernaya, 18.07.1985, leg. M.P. Tiunov; 1 ♂, from *M. cappacini*, Sachalinskaya ar., Kunashir, 2.08.1985, leg. M.P. Tiunov.

DISTRIBUTION. Russia: Far East [Medvedev *et al*., 1991; Farafonova, 1999]. China, Taiwan (Formosa).

HOSTS: *Miniopterus schreibersi*, *Myotis capaccini* Bonaparte, 1837, *M. daubentoni*, *M. ricketti* Thomas, 1894, *Plecotus auritus* (Linnaeus, 1758), *Rhinolophus ferrumequinum* Schreber, 1775.

Nycteribia kolenati Theodor et Moscona, 1954

MATERIAL. 16 ♂♂, 20 ♀♀, Russia, from *Vespertilio* sp., Simbirsk Prov. 07.1896, leg. Pleske, det. Stackelberg; 9 ♂♂, 14 ♀♀, from *Myotis daubentoni*, Penza Prov., Novo-Lomovsky rest., vill.Virta, 1–30.09.1983, leg.V.Yu. Il'in; 1 ♂, from *M. brandti*, 13.12.1977, leg. V.Yu. Il'in; 5 ♀♀, from *M. daubentoni*, Penza, Norovschatsk Distr., vill. Skan, 1–31.08.1983, leg. V.Yu. Il'in; 6 ♂♂, 6 ♀♀, from *M.daubentoni*, Krasnodar Ter., Adler Distr., 1–31.08.1999, leg. A. Borisenko; Pskov Prov., 2 ♂♂, 3 ♀♀, from *Myotis dasycneme*, 1–30.04.1984, leg. Masing.

DISTRIBUTION. European part of Russia and Ural [Markova, 1938; Orlova, 2011]. Caucasus, Kazakhstan.

HOSTS: *Myotis daubentoni*, *M. nattereri*, *M. brandti*, *M. dasycneme*, *Vespertilio murinus* Linnaeus, 1758, *Eptesicus serotinus* (Schreber, 1774).

Nycteribia latreillii (Leach, 1817)

MATERIAL. 1 ♂, Russia, North Osetiya, Alagir, 13.06.1982, from *M. blythi*, leg. S. Alekseev; 6 ♂♂, 6 ♀♀, from *M. daubentoni*, Krasnodar Terr., Adler Distr., caves, 1–31.08.1999, leg. A. Borisenko.

DISTRIBUTION. Russia (**new record**): North Caucasus. Europe, North Africa, West Asia.

HOSTS: *Myotis daubentoni*, *M. blythi* Tomes, 1857, *M. myotis* Borkhausen, 1797, *Rhinolophus ferrumequinum*.

Nycteribia pedicularia Latreille, 1805

Material. 1 ♂, 2 ♀♀, Russia, Altai, cave, 1–31.08.1989, from *M. daubentoni*, leg. A. Polkanov; 1 ♂, 4 ♀♀, Adygeya, 1–31.07.1985, from *Miniopterus schreibersi*, leg. S. Alekseev.

DISTRIBUTION. Russia (**new record**): North Caucasus, Altai. Europe, North Africa, West Asia.

HOSTS: *Miniopterus schreibersi*, *Myotis daubentoni*, *M. myotis*, *M. capaccini*, *Rhinolophus ferrumequinum*.

Nycteribia pygmaea (Kishida, 1932)

MATERIAL. 5 ♂♂, 4 ♀♀, Russia, Magadan Prov., Ol'sk Distr., riv. Shelomdga, 1–31.08.1981, from *M. daubentoni*, leg. M.E. Dokushaev; 2 ♂♂, 1 ♀, 14.08.1982, from *M. daubentoni,* leg. M. Dokushaev; 75 ♂♂, 108 ♀♀, no host, Far East, Khasan, 1–31.07.1966, leg. Belyaev; 1 ♂, Far East, Khasan, Zaozernaya, 2.08.1981, from *Miniopterus schreibersi*, leg. P. Morozov.

DISTRIBUTION. Russia: Far East [Medvedev *et al*., 1991; Farafonova, 1999]. Japan, Korea.

HOSTS: *Miniopterus schreibersi*, *Myotis daubentoni*, *Rhinolophus ferrumequinum*, *Pipistrellus savii* (Bonaparte, 1837).

Nycteribia quasiocellata Theodor, 1966

MATERIAL. 15 ♂♂, 18 ♀♀, Russia, Novosibirsk Prov., Maslyaninsky Distr., caves, 2.05.1981, from *M. daubentoni* and *M. mystacinus*, leg. P. Morozov; 1 ♂, 3 ♀♀, from *M. daubentoni*, Altai, cave, 1–31.03.1986, leg. A. Polkanov; 1 ♀, Chita Prov., cave Kira, 1–31.07.1988, from *Eptesicus nilssoni*, leg. A. Hritankov; 1 ♂, 5 ♀♀, Krasnoyarsk Terr., Schugur, 1988, from *M. mystacinus*, leg. A. Hritankov; 2 ♂♂, 2 ♀♀, Krasnoyarsk Terr., cave Ledopadnaya, 1–31.03.1987, from *M. daubentoni*, leg. A. Hritankov; 2 ♂♂, 2 ♀♀, Krasnoyarsk Terr., Malaya Siya, cave Archeologycheskaya, 5.10. 1989, from *M. daubentoni*, leg. A. Hritankov; 2 ♂♂, Krasnoyarsk Terr., cave Torgalinskaya, 21.12.1989, from *M. daubentoni*, leg. Kotepov; 2 ♂♂, 3 ♀♀, Khabarovsk Terr., Blagoveschensk, mansarda of house, 12.06.1984, from *M. daubentoni*, leg. M.P. Tiunov; 9 ♂♂, 7 ♀♀, Ayano-Maysky Distr., caves, 1–31.08.1984, from *M.daubentoni*, leg. M. Tiunov.

DISTRIBUTION. Russia: Siberia, Far East [Medvedev *et al*., 1991; Farafonova, 1999; Orlova *et al*., 2014]. Mongolia, Kazakhstan, China.

HOSTS: *Myotis daubentoni*, *M. mystacinus*, *Eptesicus nilssoni* Keyserling et Blasius, 1839.

Nycteribia schmidlii Schiner, 1853

MATERIAL. 1 ♂, 2 ♀♀, Russia, Krasnodar Terr., near Sochi, 1–31.07.1978, from *Miniopterus scheibersi*, leg. P. Sagdieva; 1 ♂, 3 ♀♀, Simbirsk Prov., 1–31.08.1896, no host, det. A.A. Stackelberg, leg. Pleske; 1 ♂, 4 ♀♀, Krasnodar Terr., near Adler, cave, 19.08.1979, from *Pipistrellus* sp., leg. M. Perov.

DISTRIBUTION. Russia: North Caucasus, Central Volga, Crimea [Stackelberg, 1970]. Caucasus. Austria, Turkey, Lebanon, Israel, Iran, Afghanistan, Algeria.

HOSTS: *Miniopterus schreibersi*, *Rhinolophus ferruequinum*, *Rh. euryale* Blasius, 1853, *Plecotus auritus, Pipistrellus* sp.

Nycteribia vexata Westwood, 1835

MATERIAL. 2 ♂♂, 3 ♀♀, Russia, Krasnodar Terr., near Adler, cave, 19.08.1979, from *Myotis* sp., leg. M. Perov.

DISTRIBUTION. Russia: North Caucasus, Crimea [Volkova, 1957]. Caucasus, West Europe, North Africa, West Asia.

HOSTS: *Myotis blythi. Rhinolophus* spp., *Plecotus auritus*.

Genus *Penicillidia* Kolenati, 1863

Penicillidia conspicua Speiser, 1901

MATERIAL. 1 ♂, Russia, from *Vesperugo* sp., Simbirskaya Prov., 12.08.1896, leg. Pleske, det. A. Stackelberg.

DISTRIBUTION. Russia: Central Volga, Tatarstan, Zabaikal'e [Volkova, 1957; Jovty *et al*., 1962; Stackelberg, 1970]. Europe, North Africa.

HOSTS: *Miniopterus schreibersi*, *Myotis* spp., *Rhinolophus* sp., *Vesperugo* sp.

Penicillidia dufouri Westwood, 1835

MATERIAL. 1 ♀, Russia, Simbirskaya Prov.,12.08.1896, no host, leg. Pleske, det. Stackelberg; 1 ♂, Novosibirsk Prov., caves, 2.05.1981, from *M. daubentoni*, leg. P. Morozov; 1 ♂, Penza Prov., Novo-Lomovsky Distr., vill. Virga, 11.07.1983, from *M. daubentoni*, leg. V.Yu. Il'in; 1 ♂, 1 ♀, Tver' Prov., cave, 1985, from *M. daubentoni*, leg. K.K. Panyutin; 1 ♂, 1 ♀, Altai, 1–28.02.1989, from *M. dasycneme*, leg. A. Polkanov.

DISTRIBUTION. Russia: European part, West Siberia, Far East [Stackelberg, 1970; Medvedev *et al*., 1991; Farafonova, 1999]. Europe, Japan, China, Middle Asia.

HOSTS: *Myotis daubentoni*, *M. dasycneme*, *Rhinolophus* spp., *Miniopterus schreibersi*.

Penicillidia jenynsii (Westwood, 1835)

MATERIAL. 2 ♂♂, Russia, Far East, Khasan, 7.07.1966, from *Miniopterus schreibersi*, leg. V.G. Belyaev, 2 ♂♂, 4 ♀♀, Far East, Khasan, Zaozernaya, 26.07.1981, from *M. schreibersi*, leg. P, Morozov; 1 ♂, 1 ♀, 2.08. 1981, from *M. schreibersi*, leg. P. Morozov.

DISTRIBUTION. Russia: Far East [Medvedev *et al*., 1991; Farafonova, 1999]. Japan, China, Taiwan.

HOST: *Miniopterus schreibersi*.

Penicillidia monoceros Speiser, 1900

MATERIAL. 2 ♂♂, 1 ♀, Russia, Novosibirsk Prov., cave, 2.05.1981, from *M. daubentoni*, leg. P. Morozov; 4 ♀♀, Altai, 25.01–5.02.1989, from *M. daubentoni*, leg. A. Polkanov; 2 ♂♂, 1 ♀, Far East, Primorsky Terr., cave Sinegorskaya, 6.11.1983, from *M. nattereri*, leg. M. Tiunov; 1 ♂, 1 ♀, Far East, Primorsky Terr., cave Seraphimovskaya, 4.02.1983, from *M. nattereri*, leg. M.P. Tiunov; 1 ♀, Khabarovsk Terr., Ayano-Maisky Distr., Abogy-Dyus, 13.08.1984, from *M. daubentoni*, leg. M.P. Tiunov; 2 ♂♂, 4 ♀♀, Tver' Prov., quarry, 28.03.1985, from *M. dasycneme*, leg. P. Morozov.

DISTRIBUTION. Russia: European part, Siberia, Far East [Markova, 1938; Stackelberg, 1970; Medvedev *et al*., 1991; Farafonova, 1999]. Mongolia.

HOSTS: *Myotis daubentoni*, *M. nattereri*, *M. dasycneme*, *Plecotus auritus*, *Eptesicus nilssoni*.

Genus *Phthiridium* Hermann, 1804

Phthiridium biarticulatum (Hermann, 1804)

MATERIAL. 1 ♂, Russia, Krasnodar Terr., caves, 1–31.08. 1976, from *Rhinolophus* sp., leg. M. Perov.

DISTRIBUTION. Russia: North Caucasus [Stackelberg, 1970]. Europe, North Africa, West Asia.

HOSTS: *Rhinolophus ferrumequinum*, *Miniopterus schreibersi*, *Pipistrellus pipistrellus* (Schreber, 1774).

Discussion

Thus, a total of 18 species (genera *Basilia*, *Nycteribia*, *Penicillidia* and *Phthiridium*) of subfamily Nycteribiinae are found in Russia, it is more than half of 34 species of this subfamily known from Palearctic. Three species, *Basilia nana*, *Nycteribia latreillii* and *Nycteribia pedicularia*, are found in Russia for the first time. Thus, 9 nycteribiid species recorded in the Far East (*Basilia rybini*, *B.truncata*, *Nycteribia allotopa*, *N. formosana*, *N. pygmaea*, *N. quasiocellata*, *Penicillidia dufouri*, *P. jenynsii*, *P.monoceros*), 8 species in Siberia (*Basilia rybini*, *B. truncata*, *B.truncatiformis, Nycteribia quasiocellata*, *N. pedicularia*, *Penicillidia conspicua*, *P. dufouri*, *P. monoceros*), 7 species in the North Caucasus (*Basilia nana*, *Nycteribia kolenati*, *N. latreillii*, *N. pedicularia*, *N. schmidlii*, *N. vexata*, *Phthiridium biarticulatum*) and 5 species in the center of European Russia (*Nycteribia kolenati*, *N. schmidlii*, *Penicillidia conspicua*, *P. dufouri*, *P. monoceros*).

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