

The barkfly (Insecta: Psocodea) fauna of the Republic of Belarus

К фауне сеноедов (Insecta: Psocodea) Беларуси

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КЛЮЧЕВЫЕ СЛОВА: Psocodea, сеноеды, фаунистика, Беларусь.

ABSTRACT. Results of a study of the species composition and distribution of barkflies (Psocodea) from the Republic of Belarus are presented. In total, 34 species from 21 genera and 11 families are present in the Belarusian fauna, of which 9 species are recorded for the first time. Data on the studied material and distribution for each species are given, and zoogeographical analysis of the known psocid fauna of the Republic of Belarus is presented.

РЕЗЮМЕ. В статье приведены результаты исследования видового состава и распространения сеноедов (Psocodea) Беларуси. Всего в фауне республики отмечены 34 вида сеноедов из 21 рода и 11 семейств, из них 9 видов указываются впервые для Беларуси. Для каждого вида приводятся изученный материал и общее распространение. Представлены результаты зоогеографического анализа известной фауны Psocodea Беларуси.

Introduction

The Psocodea are a taxonomic group of insects, traditionally considered within the cohort of Paraneoptera. Psocodea includes nonparasitic lice — former Order Psocoptera (booklice and barklice, or psocids), and parasitic lice — Phthiraptera. There are more than 5,730 species of psocids (barkflies) in the modern fauna, including 121 fossil species [Zhang, 2013]. The barkflies have a worldwide distribution [Lienhard, Smithers, 2002] and usually live on vegetation, especially on the bark and foliage of trees and shrubs, where they feed on epiphytic microflora (algae, fungi and lichen) or organic detritus and pollen; some species are regularly found in ground litter, under stones, in caves or in birds' nests, mammals' nests or human dwellings [Lienhard, forest and bog biocenoses, they are easily collected by simple standard methods. However, difficulties in species identification restrain of

use of barkflies for bioindication purposes [Ostrovsky, 2016].

The barkflies are very poorly known in Belarus. Till the author began working on barkflies, only 3 species had been registered in the country [Litvinava, 1985]. Subsequently, the list was extended to 25 known species [Ostrovsky, 2017, 2019]. A re-examination of the collection materials on which this checklist was based made it possible to correct the incorrect definition of some species, in particular by excluding *Liposcelis brunnea* Motschulsky, 1852 from it. In this article, I report 9 more species as new records to the Belarusian barkfly fauna.

Material and Methods

The study was carried out 2016–2023 in various biocenoses on the territory of the Gomel Region (South-Eastern Belarus). The barkflies were collected by beating the vegetation, using a sieve or by hand (more often with the use of a wet brush and exhauster). In the wild, the plant debris, the areas under the bark, and litter were inspected, as well as the anthills, bird, mammal and wasp nests have been sieved; in the anthropogenic environment, the areas under household and construction waste, bird droppings, in entomological collections, residential and non-residential premises were checked. The barkflies were fixed in 96% ethanol or glycerin (when prepared on microscope slides) and were determined was carried out according to keys [Vishnyakova, 1964; Martini, 1975; Lienhard, 1998]. As a supporting source, Saville [2008] was also used. Information on the GPS coordinates and altitude (in m a.s.l.) of the collecting sites are given for each species. After studying, part of the material was deposited at the University of Plovdiv (Bulgaria) and Natural History Museum of Geneva (Switzerland).

Results

The annotated species list includes all species of non-parasitic Psocodea, known to date from the Republic of Belarus. Types marked with an asterisk (*), are specified for this territory for the first time. The general distribution of the species in accordance with the catalog of Psocodea

(‘Psocoptera’) of the world fauna [Lienhard, Smithers, 2002] is given. Additionally, information is included on the location of the presented species in neighboring countries with Belarus: Lithuania, Latvia, Ukraine, Poland, European Russia. Notes according to Lienhard [1998] and Saville [2008] are given.

Annotated species list

Suborder Trogiomorpha Roesler, 1940
 Infraorder Atropetae Pearman, 1936
 Family Trogiidae Roesler, 1944
 Genus *Cerobasis* Kolbe, 1882
 **Cerobasis guesstfalica* (Kolbe, 1880)

MATERIAL EXAMINED. Khoyniki district, Oktyabr’ village, 51°54’54”N, 30°02’42”E, 126 m a.s.l., from an abandoned swallow’s nest inside an abandoned house, 29.07.2023, 1♀, 1 nymph, collected by sieving.

DISTRIBUTION. Almost cosmopolitan species. The nearest localities are in Poland [Martini, 1975].

NOTES. A small (c. 1.5–2 mm) apterous (wingless) barkfly, in central and northern territories almost exclusively found in association with human habitation whereas in the South it is associated with the bark of trees and leaf litter. This species is readily distinguished by the characteristic ‘anchor’ mark on the head.

Genus *Lepinotus* Heyden, 1850
Lepinotus inquilinus Heyden, 1850

Ostrovsky, Georgiev, 2020.

DISTRIBUTION. Almost cosmopolitan species. Known from Poland [Martini, 1975].

NOTES. A small (c. 1.2–1.7 mm) synanthropic species mainly associated with human dwellings, occasionally found also in leaf litter and bird nests.

Lepinotus reticulatus Enderlein, 1904

Ostrovsky, 2017, 2019; Ostrovsky, Georgiev, 2021.

MATERIAL EXAMINED. Loev district, Karpovka village, 52°01’09”N, 30°54’06”E, 116 m a.s.l., from an abandoned swallow’s nest inside an abandoned farm building, 11.06.2021, 1♀, collected by sieving; Gomel district, “Beryozki” gardens between Znamya Truda and Medvezhiy Log villages, 52°22’54”N, 31°09’00”E, 130 m a.s.l., from a beehive on a pine tree, 18.04.2021, 2♀, collected by hand with a wet brush; Loev district, NE of Abakumy village, 51°59’25”N, 30°51’55”E, 117 m a.s.l., lowland oak forest, from an abandoned bird’s nest in a hollow tree on the shore of a forest lake, 10.06.2021, 1♀, collected by sieving; Loev district, E of Pervomaisk village, 52°03’35”N, 30°46’25”E, 114 m a.s.l., from an abandoned wasp’s nest on the attic of an abandoned house, 27.08.2022, 4♀, collected by sieving; same locality, 52°03’34”N, 30°46’25”E, 114 m a.s.l., from a pile of dead bees on the floor of an abandoned house, 27.08.2022, 8♀, 2 nymphs, collected by sieving; Loev district, Koshevoe village, 52°03’07”N, 30°47’03”E, 114 m a.s.l., from the nest of *Formica rufa* L. inside an abandoned house, 27.08.2022, 2♀, 3 nymphs, collected by sieving; Gomel district, SW of Zadorovka village, 52°25’38”N, 30°38’18”E, 126 m a.s.l., field, from an abandoned swallow’s nest on a shepherd’s hut, 8.05.2023, 1♀, 4 nymphs, collected by sieving; Gomel city, Auerbakha str., 52°25’49”N, 30°59’12”E, 140 m a.s.l., in the pantry, 2.04.2023, 7♀, 3 nymphs, collected by hand with a wet

brush; Gomel district, Mirnyi village, 52°18’19”N, 30°47’52”E, 126 m a.s.l., from an abandoned bird’s nest inside an abandoned brick building, 1.07.2023, 2♀, 7 nymphs, collected by sieving; Khoyniki district, Oktyabr’ village, 51°54’54”N, 30°02’42”E, 126 m a.s.l., from an abandoned swallow’s nest inside an abandoned house, 29.07.2023, 3♀, collected by sieving; Bragin district, W of Velikiy Les village, 51°54’22”N, 30°09’40”E, 124 m a.s.l., mixed forest, from the nest of *Formica rufa* L., 30.07.2023, 4♀, 15 nymphs, collected by sieving; Khoyniki district, E of Krasnyi Pakhar’ village, 51°54’45”N, 30°06’08”E, 120 m a.s.l., from an abandoned bird’s nest under a reinforced concrete bridge over the Velikiy Canal in the field, 30.07.2023, 7♀, collected by sieving; same locality, from a swallow’s nest under a reinforced concrete bridge over the Velikiy Canal in the field, 31.07.2023, 1♀, collected by sieving; Khoyniki district, Korchevoe village, 51°55’26”N, 30°03’26”E, 126 m a.s.l., from an abandoned bird’s nest inside an abandoned house, 31.07.2023, 5♀, collected by sieving; Khoyniki district, E of Khoyniki city, 51°55’03”N, 30°01’17”E, 139 m a.s.l., mixed forest, from the nest of *Formica rufa* L., 01.08.2023, 15♀, 23 nymphs, collected by sieving; same locality, 51°55’01”N, 30°01’17”E, 140 m a.s.l., mixed forest, from the nest of *Formica polyctena* Förster, 1.08.2023, 2♀, 1 nymph, collected by sieving; Gomel district, N of Znamya Truda village, 52°22’46”N, 31°08’23”E, 130 m a.s.l., from the nest of *Formica rufa* L. inside a ruined gazebo near the woods, 15.08.2023, 1♀, collected by sieving; Gomel district, “Glushets” gardens, 52°15’28”N, 30°50’40”E, 121 m a.s.l., from an abandoned bird’s nest in a tangle of vines at the dacha, 23.08.2023, 45♀, 34 nymphs, collected by sieving; Gomel district, N of Borets village, 52°18’19”N, 30°57’20”E, 123 m a.s.l., pine forest, from an abandoned bird’s nest inside an abandoned brick building, 3.09.2023, 1♀, collected by sieving; same locality, from an abandoned bird’s nest in the recess of a column of a brick building, 3.09.2023, 62♀, 15 nymphs, collected by sieving.

DISTRIBUTION. Cosmopolitan species. Known from Poland [Martini, 1975].

NOTES. A small (c. 1.3 mm) parthenogenetic species with easily detaching wings, often found in human habitation and in warehouses where foodstuffs are stored, whereas in nature it is generally found in leaf litter and tufts of dry grass.

Genus *Trogium* Illiger, 1798
Trogium pulsatorium (Linnaeus, 1758)

Litvinava, 1985 (*Trogium pulsator*); Ostrovsky, 2019.

MATERIAL EXAMINED. Gomel district, “Glushets” gardens, 52°15’28”N, 30°50’40”E, 121 m a.s.l., in the kitchen of the dacha, 29.08.2023, 1♀, collected by hand with a wet brush.

DISTRIBUTION. Cosmopolitan species. Known from Poland and some localities European Russia [Danka, 1968; Martini, 1975; Golub, 2007].

NOTES. A small (c. 1.5–2 mm) micropterous (tiny winged) barkfly. This synanthropic species has a characteristic dark stripe running across the eyes and a reddish-brown stripe down the middle of the head. Widespread in domestic situations.

Infraorder Psyllipsocetae Smithers, 1972
 Family Psyllipsocidae Lienhard et Smithers, 2002
 Genus *Psyllipsocus* Selys-Longchamps, 1872
Psyllipsocus ramburii Selys-Longchamps, 1872

Ostrovsky, Georgiev, 2020.

MATERIAL EXAMINED. Loev district, E of Pervomaisk village, 52°03’34”N, 30°46’25”E, 114 m a.s.l., from a pile of

dead bees on the floor of an abandoned house, 27.08.2022, 3♀, 1 nymph, collected by sieving; Gomel city, Auerbakha str., 52°25'49"N, 30°59'12"E, 140 m a.s.l., on the wallpaper in the room, 19.04.2021, 1♀, collected by hand with a wet brush; same locality, in the pantry, 12.06.2021, 1♀, collected by hand with a wet brush; same locality, in the closet, 1.07.2023, 1♀, collected by hand with a wet brush; same locality, on the table, 6.09.2023, 1♀, collected by hand with a wet brush; Khoyniki district, Korchevoe village, 51°55'26"N, 30°03'26"E, 126 m a.s.l., from an abandoned bird's nest inside an abandoned house, 31.07.2023, 1♀, 1 nymph, collected by sieving; Gomel district, N of Borets village, 52°18'15"N, 30°57'25"E, 125 m a.s.l., pine forest, from an abandoned mouse's nest inside an abandoned cellar, 3.09.2023, 1♀, 1 nymph, collected by sieving.

DISTRIBUTION. Cosmopolitan species. Known from Poland [Martini, 1975].

NOTES. A small (c. 2.3–2.5 mm) parthenogenetic species occurring mainly in houses and caves, tending to be troglomorphic. It is polymorphic and occurs in three forms: macropterous, brachypterous, and micropterous.

Suborder Psocomorpha Weber, 1936
 Infraorder Caeciliusetae Pearman, 1936
 Family Amphipsocidae Pearman, 1936
 Subfamily Amphipsocinae Pearman, 1936
 Tribe Kolbeini Mockford, 1978
 Genus *Kolbia* Bertkau, 1882
Kolbia quisquiliarum Bertkau, 1882

Ostrovsky, 2019.

DISTRIBUTION. Palaearctic species. Known from Latvia, Poland and Voronezh region of Russia [Vishnyakova, 1964; Danka, 1968; Martini, 1975; Golub, 2007, 2009].

NOTES. A moderately small (c. 3 mm) rare barkfly that is associated with low vegetation, has mainly been found in association with base-rich grassland. One of the few barkfly species that is not found with trees.

Family Caeciliusidae Mockford, 2000
 Subfamily Caeciliusinae Mockford, 2000
 Tribe Caeciliusini Mockford, 2000
 Genus *Caecilius* Curtis, 1837
Caecilius fuscopterus (Latreille, 1799)

Vishnyakova, 1964; Danka, 1968; Ostrovsky, 2019.

DISTRIBUTION. Trans-Palaearctic species. Known from Latvia, Lithuania, Poland, Ukraine and some regions of European Russia (incl. North Caucasus) [Danka, 1960, 1964, 1968; Vishnyakova, 1959, 1964; Martini, 1975; Golub, 1999, 2005, 2007, 2016; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023].

NOTES. A medium sized (c. 4 mm) barkfly that is most frequently associated with deciduous trees, but also occurs on coniferous trees. The species is readily distinguished by the distinctive wing markings.

Tribe Coryphacini Mockford, 2000
 Genus *Valenzuela* Navas, 1924
Valenzuela atricornis (McLachlan, 1869)

Vishnyakova, 1964 (*Caecilius atricornis* McLach.).

DISTRIBUTION. Palaearctic species. Known from Poland and central part of European Russia (Republic of Mordovia). [Martini, 1975; Georgiev *et al.*, 2023].

NOTES. A medium sized (c. 3–3.5 mm) barkfly. This species is unusual in being associated with low vegetation rather than trees, most frequently found in base-rich grasslands.

**Valenzuela corsicus* (Kolbe, 1882)

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from pine tree branches overgrown by lichens, 26.07.2020, 1♂, collected by beating the vegetation; Gomel district, E of Romanovichi village, 52°25'21"N, 31°08'33"E, 123 m a.s.l., sand dunes, from dry grass vegetation dominated by Poaceae near pine trees, 6.09.2020, 6♂, 2♀, collected by sweep netting.

DISTRIBUTION. West-Palaearctic species. Known from central part of European Russia (Republic of Mordovia) [Georgiev *et al.*, 2023].

NOTES. A moderately small (c. 3 mm) barkfly. This foliicole species lives on different kinds of trees and shrubs, occasionally also on herbaceous plants.

**Valenzuela despaxi* (Badonnel, 1936)

MATERIAL EXAMINED. Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from oak tree branches with dry leaves among the undergrowth, 9.10.2021, 1♀, collected by beating the vegetation.

DISTRIBUTION. Palaearctic species. Known from Poland and some localities of European Russia (incl. North Caucasus) [Martini, 1975; Golub, 2016; Ostrovsky *et al.*, 2023].

NOTES. A moderately small (c. 3 mm) yellow barkfly that is mainly associated with conifer (evergreen) branches but occasionally found on deciduous trees.

Valenzuela flavidus (Stephens, 1836)

Vishnyakova, 1964 (*Caecilius flavidus* Steph.); Danka, 1968; Ostrovsky, 2016, 2017, 2019.

MATERIAL EXAMINED. Buda-Koshelevo district, Uvarovich urban settlement, the place and date of collection are unknown, 1♀, collected by hand; Gomel district, W of "Romantika" gardens near Klenki village, 52°27'49"N, 31°05'25"E, 121 m a.s.l., flood meadow, in an abandoned bird's nest on the bushes, 3.10.2021, 1♀, collected by hand with exhauster; Gomel district, "Glushets" gardens, 52°15'28"N, 30°50'40"E, 121 m a.s.l., on light in the window of the dacha, 22.08.2023, 1♀, collected by hand with exhauster.

DISTRIBUTION. Holarctic species. Known from Latvia, Lithuania, Ukraine, Poland and all over European Russia (incl. North Caucasus) [Jacobson, Bianki, 1905; Zavarzin, 1906; Danka, 1960, 1964, 1968; Vishnyakova, 1959, 1964; Martini, 1975; Savel'ev, 1997; Golub, 2005, 2007, 2016; Szawaryn *et al.*, 2020; Ostrovsky, Aleksandrowicz, 2022; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. A medium sized (c. 4 mm) parthenogenetic barkfly that is mainly found on branches of deciduous trees and bushes though occasionally on conifers (evergreen) branches. Frequently, but not always, has a striking yellow colour.

Valenzuela gynapterus (Tetens, 1891)

Vishnyakova, 1964 (*Caecilius gynapterus* Tet.); Ostrovsky, 2017, 2019.

DISTRIBUTION. Palaearctic species. Known from Latvia, Poland and some localities European Russia

[Vishnyakova, 1959, 1964; Martini, 1975; Golub, 1994, 2005, 2007].

NOTES. A moderately small (c. 3.2 mm) barkfly. Males have long wings (macropterous) while females have not winged (apterous). This species lives on the one hand on shrubs, bushes, hedges and herbs close to the ground, on the other hand in the leaf litter.

Family Paracaeciliidae Mockford, 1989
Genus *Enderleinella* Badonnel, 1932
Enderleinella obsoleta (Stephens, 1836)

Vishnyakova, 1964.

DISTRIBUTION. European species. Known from Latvia, Ukraine, Poland and some localities European Russia [Vishnyakova, 1964; Martini, 1975].

NOTES. A moderately small (c. 3 mm) barkfly that is strongly associated with conifers (evergreens); very rare found on deciduous trees.

Family Stenopsocidae Pearman, 1936
Genus *Graphopsocus* Kolbe, 1880
Graphopsocus cruciatus (Linnaeus, 1768)

Vishnyakova, 1964; Danka, 1968; Ostrovsky, 2017, 2019.

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 a.s.l., pine forest, from dry oak tree branches among the undergrowth, 26.07.2020, 2♀, collected by beating the vegetation; Buda-Koshelevo district, SW of Rudnya-Ol'khovka village, 52°31'23"N, 30°22'00"E, 128 m a.s.l., mixed forest, from oak tree branches with dry leaves, 23.10.2021, 2♂, 5♀, collected by beating the vegetation; Gomel district, N of "Motor" gardens between Chenki and Borets villages, Chenki forestry, 52°19'46"N, 30°57'45"E, 130 m a.s.l., broad leaf forest, from oak tree branches among the undergrowth on the outskirts of a forest swamp, 20.10.2019, 1♀, collected by beating the vegetation; Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from oak tree branches with dry leaves among the undergrowth, 9.10.2021, 2♂, 4♀, collected by beating the vegetation; Buda-Koshelevo district, S of Rudnya-Ol'khovka village, 52°32'50"N, 30°23'21"E, 133 m a.s.l., mixed forest, from oak tree branches with dry leaves, 8.11.2020, 1♀, collected by beating the vegetation; Gomel district, N of Nagornoe village, Dolgolesye forestry, 52°13'37"N, 30°37'30"E, 133 m a.s.l., cutting area, from oak tree branches with leaves, 16.07.2023, 1♂, 1♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Latvia, Lithuania, Ukraine, Poland and all over European Russia (incl. North Caucasus) [Ul'yanin, 1869; Vishnyakova, 1959, 1964; Danka, 1960, 1968; Martini, 1975; Golub, 1999, 2005, 2007, 2016; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. A moderate sized (4–5 mm), 'picture-winged' barkfly. This foliage species lives on very wide range of trees, shrubs and other microhabitats.

Genus *Stenopsocus* Hagen, 1866
Stenopsocus immaculatus (Stephens, 1836)

Vishnyakova, 1964; Danka, 1968; Ostrovsky, 2016, 2017, 2019.

MATERIAL EXAMINED. Gomel district, N of "Motor" gardens between Chenki and Borets villages, Chenki forestry, 52°19'46"N, 30°57'45"E, 130 m a.s.l., broad leaf forest, from oak tree branches among the undergrowth on the outskirts

of a forest swamp, 20.10.2019, 1♀, collected by beating the vegetation.

DISTRIBUTION. Palaearctic species. Known from Poland and some regions of European Russia [Martini, 1975; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023].

NOTES. A moderately large (5–6 mm) barkfly often with green abdomen. This species found on a wide range of deciduous and coniferous (evergreen) tree and bush branches.

Stenopsocus stigmaticus (Imhoff, Labram, 1842)

Vishnyakova, 1964.

MATERIAL EXAMINED. Gomel district, N of "Motor" gardens between Chenki and Borets villages, Chenki forestry, 52°19'46"N, 30°57'45"E, 130 m a.s.l., broad leaf forest, from oak tree branches among the undergrowth on the outskirts of a forest swamp, 20.10.2019, 1♀, collected by beating the vegetation.

DISTRIBUTION. Palaearctic species. Known from Latvia, Poland and some regions of European Russia [Vishnyakova, 1959, 1964; Martini, 1975; Savel'ev, 1997; Golub, 2005, 2007; Georgiev, Ruchin, 2023].

NOTES. A moderately large (5–6 mm) barkfly that often has a green abdomen. This species found mainly on deciduous tree and bush branches.

Infraorder Homilopsocidea Pearman, 1936
Family Elipsocidae Pearman, 1936
Genus *Elipsocus* Hagen, 1866
**Elipsocus abdominalis* Reuter, 1904

MATERIAL EXAMINED. Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from oak tree branches with dry leaves among the undergrowth, 9.10.2021, 2♀, collected by beating the vegetation; Buda-Koshelevo district, SW of Rudnya-Ol'khovka village, 52°32'41"N, 30°22'42"E, 130 m a.s.l., pine forest, from pine tree branches overgrown by lichens, 23.10.2021, 10♂, 19♀, collected by beating the vegetation; Gomel district, W of "Glushets" gardens between Mikhal'ki and Starye Dyatlovichi villages, 52°15'18"N, 30°50'05"E, 122 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 22.07.2023, 2♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some localities European Russia [Vishnyakova, 1964; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. A moderately small (c. 2.5–3.5 mm) barkfly. Generally, it is associated with the dead branches of conifers, but is occasionally found also on other trees and shrubs.

Family Ectopsocidae Roesler, 1944
Genus *Ectopsocus* McLachlan, 1899
Ectopsocus briggsi McLachlan, 1899

Ostrovsky, 2017, 2019.

DISTRIBUTION. Cosmopolitan species. Known from Poland, Ukraine and some localities European Russia [Vishnyakova, 1964; Martini, 1975].

NOTES. Small (1.5–2 mm) barkfly with dark spots on forewings present but not prominent. Always have wings longer than abdomen (macropterous). This species associated with numerous trees and shrubs, especially on dead leaves still attached to the living plant. It is sometimes also found in human habitation or on cultivated plants.

**Ectopsocus petersi* Smithers, 1978

MATERIAL EXAMINED. Buda-Koshelevo district, between Uza and Rudenets villages, 52°35'30"N, 30°49'01"E, 138 m a.s.l., spontaneous landfill of household waste, among the reeds, 25.10.2020, 2♀, collected by hand with exhaustor.

DISTRIBUTION. Almost cosmopolitan species, but there is no information about its findings in neighboring countries with Belarus in the available literature.

NOTES. Small (1.5–2 mm) barkfly with conspicuous dark spots on forewings. Males always have wings longer than abdomen (macropterous) but females occur in both long and short-winged (brachypterous) forms. This species found on very wide range of trees, shrubs and other microhabitats.

Infraorder Homilopsocidea Pearman, 1936

Family Peripsocidae Roesler, 1944

Genus *Peripsocus* Hagen, 1866**Peripsocus albo guttatus* (Dalman, 1823)

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from dry oak and pine tree branches overgrown by lichens, 26.07.2020, 3♂, 7♀, collected by beating the vegetation; Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from oak tree branches with dry leaves among the undergrowth, 9.10.2021, 1♀, collected by beating the vegetation; Buda-Koshelevo district, SW of Rudnya-Ol'khovka village, 52°32'41"N, 30°22'42"E, 130 m a.s.l., pine forest, from pine tree branches overgrown by lichens, 23.10.2021, 1♂, 2♀, collected by beating the vegetation; Gomel district, W of Mirnyi village, Dolgolesye forestry, 52°18'15"N, 30°47'31"E, 129 m a.s.l., cutting area, from dry birch tree branches, 1.07.2023, 1♂, 2♀, collected by beating the vegetation; Gomel district, W of "Glushets" gardens between Mikhail'ki and Starye Dyatlovichi villages, 52°15'11"N, 30°49'40"E, 119 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 9.07.2023, 1♂, 1♀, collected by beating the vegetation; Gomel district, N of Znanya Truda village, 52°22'48"N, 31°08'41"E, 130 m a.s.l., from dry pine tree branches near the woods, 15.08.2023, 1♂, collected by beating the vegetation;

DISTRIBUTION. Holarctic species. Known from Poland and some regions of European Russia (incl. North Caucasus) [Vishnyakova, 1959; Danka, 1964, 1968; Martini, 1975; Savel'ev, 1997; Golub, 1994, 2005, 2007, 2016; Ostrovsky, Aleksandrowicz, 2022; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023].

NOTES. Moderately small (c. 2.5–3 mm) 'picture-winged' barkfly, appears to be most frequently associated with low trees and bushes.

Peripsocus parvulus Kolbe, 1880

Vishnyakova, 1964.

DISTRIBUTION. Palaearctic species. Known from Poland and some localities European Russia (incl. North Caucasus) [Vishnyakova, 1964; Martini, 1975; Golub, 1999, 2016].

NOTES. Small (c. 2–3 mm) brown barkfly. Males have long wings (macropterous) while females are frequently short-winged (brachypterous). This species found on the bark of trunks and branches of old and shrinking trees.

Peripsocus phaeopterus (Stephens, 1836)

Ostrovsky, 2019.

MATERIAL EXAMINED. Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from oak tree branches with dry leaves among the undergrowth, 9.10.2021, 1♀, collected by beating the vegetation; Gomel district, W of Mirnyi village, Dolgolesye forestry, 52°18'15"N, 30°47'31"E, 129 m a.s.l., cutting area, from dry birch tree branches, 1.07.2023, 4♂, 4♀, collected by beating the vegetation; Gomel district, W of "Glushets" gardens between Mikhail'ki and Starye Dyatlovichi villages, 52°15'11"N, 30°49'40"E, 119 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 9.07.2023, 3♀, collected by beating the vegetation; same locality, 52°15'18"N, 30°50'05"E, 122 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 22.07.2023, 1♂, collected by beating the vegetation; Bragin district, NW of Velikiy Les village, 51°54'38"N, 30°09'07"E, 123 m a.s.l., pine forest, from dry oak and pine trees branches overgrown by lichens, 30.07.2023, 1♀, collected by beating the vegetation; Khoyniki district, SE of Oktyabr' village, 51°54'43"N, 30°03'35"E, 122 m a.s.l., from oak tree branches with leaves near the woods, 31.07.2023, 1♀, collected by beating the vegetation; Gomel district, N of Znanya Truda village, 52°22'48"N, 31°08'41"E, 130 m a.s.l., from dry pine tree branches near the woods, 15.08.2023, 1♀, collected by beating the vegetation; Gomel district, NE of "Beryozki" gardens between Znanya Truda and Medvezhiy Log villages, 52°23'10"N, 31°09'43"E, 130 m a.s.l., tree and shrub thickets in the field, 15.08.2023, 1♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some localities European Russia (incl. North Caucasus) [Zavarzin, 1906; Vishnyakova, 1959; Danka, 1964, 1968; Martini, 1975; Savel'ev, 1997; Golub, 1994, 2005, 2007, 2016; Szawaryn *et al.*, 2020; Georgiev *et al.*, 2023].

NOTES. Medium sized (c. 3–4 mm) brown barkfly that is found mainly on branches of deciduous and coniferous (evergreen) trees and bushes.

Peripsocus subfasciatus (Rambur, 1842)

Ostrovsky, 2019.

MATERIAL EXAMINED. Gomel district, W of "Glushets" gardens between Mikhail'ki and Starye Dyatlovichi villages, 52°15'18"N, 30°50'05"E, 122 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 22.07.2023, 7♀, collected by beating the vegetation; Bragin district, NW of Velikiy Les village, 51°54'38"N, 30°09'07"E, 123 m a.s.l., pine forest, from dry oak and pine trees branches overgrown by lichens, 30.07.2023, 1♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some regions of European Russia (incl. North Caucasus) [Vishnyakova, 1959; Danka, 1964, 1968; Martini, 1975; Golub, 1994, 1999, 2005, 2007, 2016; Ostrovsky, Aleksandrowicz, 2022; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. Medium sized (c. 3–4 mm) 'picture-winged' brown parthenogenetic barkfly that is found on a wide range of deciduous trees and bushes (branches and trunks), conifer (evergreen) branches and heather.

Family Lachesillidae Pearman, 1936
 Subfamily Lachesillinae Pearman, 1936
 Genus *Lachesilla* Westwood, 1840
Lachesilla pedicularia (Linnaeus, 1758)

Ostrovsky, 2017, 2019.

MATERIAL EXAMINED. Buda-Koshelevo district, between Uza and Rudenets villages, 52°35'30"N, 30°49'01"E, 138 m a.s.l., spontaneous landfill of household waste, among the garbage, 25.10.2020, 13♂, 33♀, 3 nymphs, collected by hand with exhaustor; Gomel city, Kosmonavtov av., 52°26'57"N, 30°58'00"E, 140 m a.s.l., arrival at the light of the apartment windows of a high-rise building, 7.07.2021, 1♂, collected by hand.

DISTRIBUTION. Almost cosmopolitan species. Known from Poland and many localities all over European Russia [Ul'yanin, 1869; Jacobson, Bianki, 1905; Vishnyakova, 1959; Svadjan et al., 1963; Danka, 1964; Martini, 1975; Golub, 1999, 2005; Georgiev, Ruchin, 2023; Georgiev et al., 2023].

NOTES. A small (c. 1.5–2 mm) barkfly. Males and females often have long wings (macropterous) while short winged (brachypterous) specimens are occasionally found. This species mainly associated with dried twigs and branches of different shrubs and herbaceous plants, occasionally found also in leaf litter, in birds' nests or in human dwellings.

Lachesilla quercus (Kolbe, 1880)

Ostrovsky, 2017, 2019.

DISTRIBUTION. Almost cosmopolitan species. Known from Poland and some localities European Russia (incl. North Caucasus) [Vishnyakova, 1959; Danka, 1960, 1964, 1968; Martini, 1975; Golub, 2005, 2007, 2016; Georgiev et al., 2023].

NOTES. A small (c. 1.5–2.5 mm) barkfly that is most frequently associated with deciduous trees. This species mainly associated with dried branches with dry leaves of different shrubs and trees. This species mainly found on branches with dry leaves.

**Lachesilla tanaidana* Roesler, 1953

MATERIAL EXAMINED. Loev district, Rudnya Kameneva village, 52°05'48"N, 30°44'54"E, 119 m a.s.l., sand dunes, from grass vegetation dominated by Poaceae and Canada fleabane near pine trees, 8.08.2021, 2♂, 4♀, collected by sweep netting.

DISTRIBUTION. Palaearctic species. Known from some localities European Russia [Roesler, 1953; Golub, Golub, 2013; Georgiev et al., 2023].

NOTES. A small (c. 1.5–2 mm) barkfly. Xerophilous species that lives on low vegetation, especially on the dead parts of herbs close to the ground, as well as in the leaf litter.

Infraorder Psocetae Pearman, 1936
 Family Psocidae Hagen, 1865
 Subfamily Amphigerontiinae Kolbe, 1880
 Tribe Amphigerontiini Kolbe, 1880
 Genus *Amphigerontia* Kolbe, 1880
Amphigerontia bifasciata (Latreille, 1799)

Litvinava, 1985.

MATERIAL EXAMINED. Gomel district, W of Mirnyi village, Dolgolesye forestry, 52°18'15"N, 30°47'31"E, 129 m a.s.l., cutting area, from dry birch tree branches, 1.07.2023, 3♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some regions of European Russia (incl. North Caucasus) [Reuter,

1893; Jacobson, Bianki, 1905; Zavarzin, 1906; Vishnyakova, 1959; Martini, 1975; Golub, 1999, 2005, 2016; Georgiev et al., 2023].

NOTES. A moderately large (c. 4.5 mm) barkfly that is usually found on branches of deciduous and coniferous (evergreen) trees and bushes.

**Amphigerontia contaminata* (Stephens, 1836)

MATERIAL EXAMINED. Gomel district, W of Mirnyi village, Dolgolesye forestry, 52°18'15"N, 30°47'31"E, 129 m a.s.l., cutting area, from dry birch tree branches, 1.07.2023, 3♂, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some localities European Russia [Vishnyakova, 1964; Danka, 1964; Martini, 1975; Golub, 2005; Ostrovsky, Aleksandrowicz, 2022; Georgiev et al., 2023; Ostrovsky et al., 2023].

NOTES. A moderately large (c. 4.5 mm) barkfly that is found on deciduous trees (branches and trunks), conifers (branches) and acid grassland, as well as moorland.

Genus *Neopsocopsis* Badonnel, 1936
Neopsocopsis hirticornis (Reuter, 1893)

Ostrovsky, 2019.

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from dry oak and pine trees branches overgrown by lichens, 26.07.2020, 1♀, collected by beating the vegetation; Loev district, E of Pervomaisk village, 52°03'35"N, 30°46'25"E, 114 m a.s.l., abandoned garden, 27.08.2022, 1♂, collected by hand.

DISTRIBUTION. Palaearctic species. Known from some regions of European Russia [Vishnyakova, 1964; Georgiev, Ruchin, 2023; Georgiev et al., 2023].

NOTES. A moderately small (c. 2.5–3.5 mm) barkfly. This species found on a wide range of deciduous and coniferous (evergreen) tree and bush branches.

Genus *Blaste* Kolbe, 1883
Blaste conspurcata (Rambur, 1842)

Vishnyakova, 1964 (*Euclismia conspurcata* Ramb.); Danka, 1968; Ostrovsky, 2019.

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from dry oak and pine trees branches overgrown by lichens, 26.07.2020, 1♀, 1 nymph, collected by beating the vegetation; Khoyniki district, Khoyniki city, Kalinina str., 51°53'20"N, 29°57'37"E, 128 m a.s.l., in the crown of a deciduous tree, 12.09.2021, 1♀, collected by hand.

DISTRIBUTION. Palaearctic species. Known from Latvia, Lithuania, Poland, Ukraine and all over European Russia (incl. North Caucasus) [Vishnyakova, 1959, 1964; Martini, 1975; Golub, 2005, 2016].

NOTES. A medium sized (c. 3.5–4 mm) barkfly that is found on the bark of various coniferous and deciduous trees.

Subfamily Psocinae Hagen, 1865
 Tribe Metylophorini Roesler, 1943
 Genus *Metylophorus* Pearman, 1932
Metylophorus nebulosus (Stephens, 1836)

Ostrovsky, 2019.

MATERIAL EXAMINED. Bragin district, N of Verkhnie Zhary village, 51°21'58"N, 30°34'16"E, 110 m a.s.l., pine forest,

from dry pine tree branches among the undergrowth, 18.07.2020, 1♀, 1 nymph, collected by beating the vegetation; Bragin district, N of Nizhnie Zhary village, 51°18'47"N, 30°33'17"E, 104 m a.s.l., pine forest, among the undergrowth, 22.07.2020, 1♀, collected by hand; Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from dry oak and pine trees brunches overgrown by lichens, 26.07.2020, 3♂, 10♀, 2 nymphs, collected by beating the vegetation; Gomel district, S of Gomel city, Novobelitsa forestry, 52°20'43"N, 31°02'21"E, 135 m a.s.l., mixed forest, from dry oak and pine trees brunches among the undergrowth, 9.10.2021, 2♀, collected by beating the vegetation; Gomel district, W of Gomel city, Makeevka forestry, 52°23'38"N, 30°54'18"E, 130 m a.s.l., pine forest, among the undergrowth, 20.08.2021, 1♂, collected by hand; Gomel district, W of Mirnyi village, Dolgolesye forestry, 52°18'15"N, 30°47'31"E, 129 m a.s.l., cutting area, from dry birch tree branches, 1.07.2023, 2♂, 2♀, 1 nymph, collected by beating the vegetation; Gomel district, W of "Glushets" gardens between Mikhal'ki and Starye Dyatlovichi villages, 52°15'11"N, 30°49'40"E, 119 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 9.07.2023, 1♂, 2♀, 7 nymphs, collected by beating the vegetation; same locality, 52°15'18"N, 30°50'05"E, 122 m a.s.l., pine forest, from dry pine tree branches among the undergrowth, 22.07.2023, 1♀, collected by beating the vegetation; Bragin district, NW of Velikiy Les village, 51°54'38"N, 30°09'07"E, 123 m a.s.l., pine forest, from dry oak and pine trees brunches overgrown by lichens, 30.07.2023, 1♂, 6♀, 2 nymphs, collected by beating the vegetation; Khoyniki district, SE of Oktyabr' village, 51°54'43"N, 30°03'35"E, 122 m a.s.l., from oak tree branches with leaves near the woods, 31.07.2023, 3♂, 6♀, collected by beating the vegetation; Gomel district, N of Znamya Truda village, 52°22'48"N, 31°08'41"E, 130 m a.s.l., from dry pine tree brunches near the woods, 15.08.2023, 1 nymph, collected by beating the vegetation; Gomel district, NE of "Beryozki" gardens between Znamya Truda and Medvezhiy Log villages, 52°23'10"N, 31°09'43"E, 130 m a.s.l., tree and shrub thickets in the field, 15.08.2023, 2♀, collected by beating the vegetation; Gomel district, "Glushets" gardens, 52°15'29"N, 30°50'40"E, 121 m a.s.l., infield, on light, 28.08.2023, 1♂, collected by hand with exhauster.

DISTRIBUTION. Palaearctic species. Known from Poland and some regions of European Russia (incl. North Caucasus) [Ul'yanin, 1869; Vishnyakova, 1959; Danka, 1960, 1964, 1968; Martini, 1975; Savel'ev, 1997; Golub, 1994, 2005, 2007, 2016; Szawaryn *et al.*, 2020; Ostrovsky, Aleksandrowicz, 2022; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. A large (6–7 mm), dark barkfly that is found on branches of deciduous and coniferous (evergreen) trees and bushes. The forewings of males and females are different: the female forewing has an overall medium brown colour with colourless patches and darker brown areas, the male forewing is almost uniformly medium brown.

Tribe Psocini Hagen, 1865

Genus *Hyalopsocus* Roesler, 1954

Hyalopsocus contrarius (Reuter, 1893)

Vishnyakova, 1964 (*Copostigma contrarium* Reut.); Danka, 1968.

MATERIAL EXAMINED. Bragin district, E of Gden' village, 51°20'08"N, 30°28'37"E, 115 m a.s.l., pine forest, from dry oak and pine trees brunches overgrown by lichens, 26.07.2020, 1♀, collected by beating the vegetation.

DISTRIBUTION. Palaearctic species. Known from Ukraine, Poland and some localities European Russia (incl. North

Caucasus) [Vishnyakova, 1959, 1964; Martini, 1975; Golub, 2016; Ostrovsky *et al.*, 2023].

NOTES. Medium sized (c. 3–4 mm) barkfly that is found on trunks of deciduous and evergreen trees and bushes.

Tribe Ptyctini Mockford, 1993

Genus *Trichadenotecnum* Enderlein, 1909

**Trichadenotecnum majus* (Kolbe, 1880)

MATERIAL EXAMINED. Gomel district, N of "Motor" gardens between Chenki and Borets villages, Chenki forestry, 52°19'46"N, 30°57'45"E, 130 m a.s.l., broad leaf forest, from oak tree branches among the undergrowth on the outskirts of a forest swamp, 20.10.2019, 1♀, collected by beating the vegetation.

DISTRIBUTION. Holarctic species. Known from Poland and some regions of European Russia (incl. North Caucasus) [Jacobson, Bianki, 1905; Vishnyakova, 1959; Danka, 1960, 1964, 1968; Martini, 1975; Golub, 1994, 2005, 2007, 2016; Georgiev, Ruchin, 2023; Georgiev *et al.*, 2023; Ostrovsky *et al.*, 2023].

NOTES. A moderately large (4.5–5.5 mm) 'picture-winged' barkfly that is found on various deciduous and coniferous (evergreen) trees and bushes. This species prefers humid conditions (such as riverine woodlands) and the environment may be more important than the specific tree species.

Tribe Thyrsophorini Kolbe 1882

Genus *Psococerastis* Pearman, 1932

Psococerastis gibbosa (Sulzer, 1776)

Vishnyakova, 1964 (*Psococerastis gibbosus* Sulz.); Danka, 1968; Ostrovsky, 2016, 2017, 2019.

DISTRIBUTION. Palaearctic species. Known from Latvia, Lithuania, Ukraine, Poland and some regions of European Russia (incl. North Caucasus) [Ul'yanin, 1869; Vishnyakova, 1959, 1964; Danka, 1960, 1964; Martini, 1975; Savel'ev, 1997; Golub, 2005, 2016; Szawaryn *et al.*, 2020; Ostrovsky *et al.*, 2023].

NOTES. A large (c. 6.5–8 mm) barkfly; the largest species found in Belarus. In the field the combination of large size and mainly colourless wings makes the species easily recognisable. Found mainly on branches of deciduous and coniferous (evergreen) trees and bushes.

Conclusion

As the result of this study, 34 species of barkflies are recorded from the South-Eastern Belarus. Nine species, *Cerobasis guestfalica*, *Valenzuela corsicus*, *V. despaxi*, *Elipsocus abdominalis*, *Ectopsocus petersi*, *Peripsocus alboguttatus*, *Lachesilla tanaidana*, *Amphigerontia contaminata* and *Trichadenotecnum majus*, are new for the Belarusian fauna.

The barkfly fauna of Belarus is composed of 9 Cosmopolitan and Almost cosmopolitan species, 9 Holarctic species, 1 Trans-Palaearctic, 13 Palaearctic, 1 West-Palaearctic and 1 European species.

Most of the discovered barkflies are typical inhabitants of forest ecosystems, where they inhabit almost all tiers — from the crown of trees to the surface layer of the soil inclusive. In particular, many of them are confined to deciduous trees and shrubs. The predominance among species living on hardwoods of taxa with wide ranges can

be explained by the nature and genesis of vegetation in the surveyed area. Five species from suborder Trogiomorpha are common in anthropogenic habitats.

Four psocid species were dominant during the collections period: *Lepinotus reticulatus*, *Metylophorus nebulosus*, *Lachesilla pedicularia*, as well as *Elipsocus abdominalis*, which was not noted in the Belarusian barkfly fauna before. The number of *Graphopsocus cruciatus* and barkflies of the genus *Peripsocus* is quite large, which in the conditions of the South-Eastern Belarus mainly inhabit well-insulated areas of light forests with sparse undergrowth.

It should be noted that Lienhard & Smithers [2002] list up to 75 species of barkflies for the neighboring countries. Thus, additional species are expected to be found in the forthcoming studies of barkflies of Belarus.

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