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# MUD DAUBER WASPS (APOIDEA: CRABRONIDAE AND SPHECIDAE) OF THE NATURE RESERVE "RIVNENSKYI" AND THEIR BIOTOPES BELONGING

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The article presents a list of species of wasps of the Nature Reserve "Rivnenskyi", collected on the territory of all four massifs: "Biloozerskyi", "Somyne", "Syra Pogonya" and "Perebrody"; six departments: Biloozerske, Karasynske, Bilske, Hrabunske, Starosilske and Pivnichne. Wasps of the families Crabronidae and Sphecidae were caught in the growing seasons 2021–2024 with the help of an entomological net and Merike traps and trap-nests.

We analysed 486 specimens of wasps belonging to the families Crabronidae and Sphecidae. These were 81 species from 27 genera: *Bembecinus* (2), *Bembix* (1), *Cerceris* (7), *Crabro* (2), *Dryudella* (1), *Crossocerus* (3), *Diodontus* (2), *Ectemnius* (9), *Gorytes* (4), *Harpactus* (1), *Lestica* (2), *Lindenius* (1), *Mimumesa* (1), *Miscophus* (2), *Nysson* (6), *Oxybelus* (6), *Palarus* (1), *Passaloecus* (4), *Pemphredon* (4), *Philanthus* (1), *Psenulus* (2), *Tachysphex* (7), *Trypoxylon* (4), *Ammophila* (4), *Podalonia* (1), *Sceliphron* (2), *Sphex* (1 species). Of the 81 species which were caught, 78 were recorded for the first time in the reserve.

One of the identified species, *Sphex funerarius* Gussakovskij, 1934, is listed in the Red Data Book of Ukraine as "Not assessed".

Furthermore, *Dryudella lineata* Mocsáry, 1879 and *Passaloecus borealis* Dahlbom, 1844 were recorded for the first time in Ukraine.

Nests of the wasp *Sceliphron curvatum* (F.Smith, 1870), an invasive species in Ukraine, were also found. No adults were found.

35 species of wasps were caught directly on angiosperms from ten families: Apiaceae (6 species), Lamiaceae (1), Asteraceae (5), Brassicaceae (1), Rosaceae (2), Ericaceae (1), Campanulaceae (1), Rhamnaceae (1), Caprifoliaceae (1) and Hypericaceae (1). The largest number of wasp species, those were 13, were captured on *Thymus serpyllum* L., 1753.

All the collected material is stored in the Entomological Collection of the Zoological Museum of Ivan Franko National University of Lviv.

*Keywords:* Apoidea: Crabronidae and Sphecidae, biodiversity, checklist, pollination, biotope belonging

Wasps of the families Crabronidae and Sphecidae (Apoidea: Spheciformes) are some of the most numerous groups of insects (Crabronidae – 9180 species, Sphecidae – 808 species) [25].

Adult wasps feed on plant nectar and carry a small amount of pollen with them, making them potential pollinators of many angiosperms. Their larvae are parasitoids. In order to feed their offspring, females hunt other arthropods, thereby regulating their numbers [6–8, 17, 22]. Despite the great diversity of species and their biological characteristics, wasps remain a poorly studied group of insects.

The first researches on the territory of Western Ukraine were carried out about 150 years ago. In 1864, Maksymilian Nowicki published a list of insect species, including Hymenoptera,

collected on the territory of Galicia at that time [15]. In 1868 Antoni Wierzejski published his work – «Przyczynek do fauny owadow błonkoskrzydłych (Hymenoptera)», and also an appendix to it which was published in 1874 [28, 29]. An important contribution to the study of the entomofauna of Poland and Galicia was made by Jan Noskevich. In his works, he presented a detailed list of Hymenoptera insects on the territory of Galicia, especially in Ukrainian Roztochchia and around Lviv [13, 15].

Nowadays, researches on Crabronidae and Sphecidae wasps in Ukraine were fragmentary, in particular, in the regions of Volyn (Shatsk National Natural Park), Kyiv, Lviv, Mykolaiv, Odessa, Poltava, Kharkiv, Kherson, Khmelnytskyi, Cherkasy (Kaniv Nature Reserve) [5–8, 10, 12, 17, 18–22, 27] etc.

Also, in 1996, a detailed list of wasp species of the families Crabronidae and Sphecidae for the Male Polissia was presented, which included 192 species [27]. However, such studies have not yet been carried out in other regions, including the Nature Reserve "Rivnenskyi".

The Nature Reserve "Rivnenskyi" is located in the north of the Rivne region and consists of four remote massifs: "Biloozerskyi", "Somyne", "Syra Pohonya" and "Perebrody", covering an area of 42288.7 hectares. The massifs in turn consist of six departments: Biloozerske, Karasynske, Bilske, Hrabunske, Starosilske and Pivnichne. The territory of the reserve is represented by forests (21292.2 ha) and non-forest areas (20996.5 ha), which are mainly swamps (20287.8 ha) [2].

For the first time it is represented in this article the checklist of the mud dauber wasps Crabronidae and Sphecidae (Apoidea: Spheciformes) occurring within in the Nature Reserve "Rivnenskyi", based on our own collections as a result of the dissertation study.

## Materials and Methods

The collection of wasps of the families under study was carried out during the growing seasons of 2021–2024 on the territory of the Nature Reserve "Rivnenskyi", namely, in six departments: Biloozerske, Bilske, Hrabunske, Karasynske, Pivnichne and Starosilske (Fig. 1).

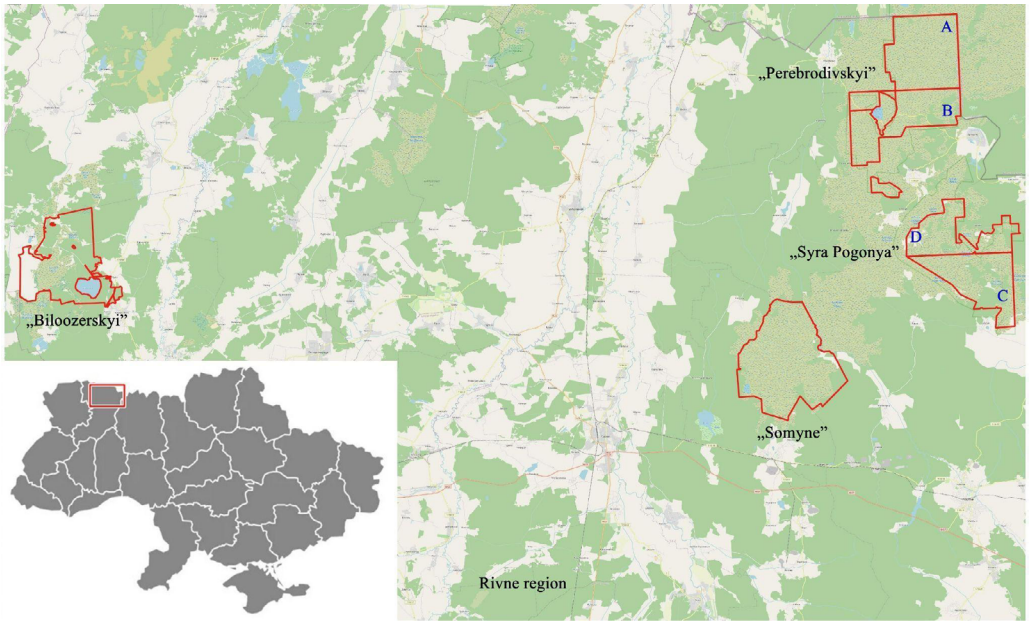


Fig. 1. Map Nature Reserve "Rivnenskyi": massif "Perebrodivskyi": A – Pivnichne; B – Starosilske; massif "Syra Pogonya": D – Hrabunske; C – Bilske departments; massif "Biloozerskyi": Biloozerske; massif "Somyne": Karasynske

The insects were caught with the help of an entomological net, Merike traps and traps-nests (Fig. 2A). The traps were yellow plastic plates, 210 mm diameter and 29 mm high. Traps were placed every 50 m in a certain biotope (Fig. 2B, C).

A B C

Fig. 2. Merike traps and trap-nests in different biotopes of the Nature Reserve "Rivnenskyi": A – Nests-trap; B – Д2.2.3 (Wet Scots pine forests); C – Д2.2.1 (Lichen Scots pine forests)

The transect consisted of 5 traps. Biotope types were identified with the help of the National catalogue of biotopes of Ukraine [11]. The traps were left in place for 24 hours. The caught insects were then transferred to 96 % ethanol.

The number of specimens taken on the territory of the reserve is in accordance with the limits laid down (№101/2021; №378/2023; №523/2024).

Also, after processing the collection of R. Zhuravchak, three representatives of the studied families caught in the territory of the reserve were found, but without species identification.

Wasps were identified with specialized keys and descriptions [1, 3, 4, 24] with the help of Konus Crystal 7x-45x binoculars (Konus, Italy). The nomenclature and taxonomy of the mud dauber wasps of the families Crabronidae and Sphecidae are based on the electronic catalogue of Sphecidae [25].

Since 2020, the number of expeditions was limited due to the quarantine of Covid-19 and since 2022, due to the state of martial law on the territory of Ukraine.

All collected wasps (Crabronidae and Sphecidae) are stored in the entomological collection of the Zoological Museum of Ivan Franko Lviv National University (ZMD). Much of the specimens are stored in ethanol.

## Results and Discussion

During the research, 486 specimens of 81 species of wasps belonging to 27 genera of the Crabronidae and Sphecidae families were studied on the territory of the Nature Reserve "Rivnenskyi". Of all the species caught, 78 were recorded for the first time in the reserve. Below is a list of the species recorded in the reserve.

*kvartal – Kv., viddil – v.

### Family Crabronidae

Subfamily Astatinae

1. ***Dryudella lineata* Mocsáry, 1879**

**Material**: ♀, 17.07.2024 Hrabunske, kv. 25.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (Sand dune)) [11] – EUNIS: (G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Czech Republic, Hungary, Kazakhstan, Romania, russia, Serbia, Slovakia, Switzerland [25].

Subfamily Bembicinae: Bembicini

**2.** ***Bembecinus hungaricus*** (Frivaldszky, 1876)

**Material**: 2♀, ♂, 18.07.2023 Pivnichne; ♀, 16.07.2024 Starosilske, kv. 60, v. 7.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (Sand dune)) [11] – EUNIS: (G3.42112 Subcontinental lichen Scots pine forests [16]; C1.2.4 (Trampled habitats); Д2.2.2 (Acidopilous mesic and moist Scots pine forests).

**Global distribution**: Austria, belarus, Bulgaria, China, Croatia, Czech Republic, France, Germany, Greece, Hungary, Iran, Italy, Japan, Kazakhstan, Korea, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Turkey, Ukraine [25].

**3.** ***Bembecinus tridens*** Fabricius, 1781

**Material**: 5♀, 18.07.2023, 2♂, 18.07.2023 Pivnichne; ♀, 25.06.2024, 3 ♂, 25.06.2024 Biloozerske, kv. 18; 3♀, 17.07.2024 Hrabunske, kv. 25; ♀, 16.07.2024 Starosilske, kv. 60, v. 7; ♀, 16.07.2024 Starosilske, kv. 26, v. 22; ♂, 16.07.2024 Starosilske, kv. 26, v. 22; 2 ♂, 10.07.2024 Pivnichne, kv. 35, v. 13; ♂ Hrabunske, kv. 23, v. 16; 5 ♀, 4 ♂, 16.07.2024 Bilske, kv. 16, v. 3.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (Sand dune)) [11] – EUINIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests); C1.2.4 (Trampled habitats) [11].

**Global distribution**: Albania, Algeria, Austria, belarus, Croatia, Cyprus, Czech Republic, Djibouti, France, Georgia, Germany, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Libya, Morocco, Oman, Palestine, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Somalia, Spain, Sudan, Switzerland, Tajikistan, Turkey, Ukraine, Uzbekistan [25].

**4.** ***Bembix rostrata*** (Linnaeus, 1758)

**Material**: ♀, 17.07.2024 Hrabunske, kv. 25; ♂, 16.07.2024 Starosilske, kv. 33, v. 19.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (Sand dune)) [11] – EUINIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Albania, Austria, Belgium, belarus, Bulgaria, China, Czech Republic, Denmark, France, Germany, Gibraltar, Great Britain, Hungary, Italy, Latvia, Lithuania, Mongolia, Morocco, Netherlands, Poland, Portugal, russia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine [25].

**5.** ***Gorytes laticinctus*** (Lepeletier, 1832)

**Material**: ♀, 01.08.2022 Karasynske; ♀, 19.07.2023 Karasynske.

**Global distribution**: Austria, Belgium, belarus, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Georgia, Germany, Great Britain, Hungary, Italy, Latvia, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan [25].

**6.** ***Gorytes planifrons*** (Wesmael, 1852)

**Material**: ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 Species-rich helophyte beds [16];

**Global distribution**: Austria, Belgium, Bulgaria, Croatia, Czech Republic, France, Germany, Hungary, Italy, Poland, Romania, Slovakia, Slovenia, Spain, Switzerland, Ukraine [25].

**7.** ***Gorytes quinquecinctus*** (Fabricius, 1793)

**Material**: 2 ♂, 02.08.2022 Biloozerske; ♂, 24.06.2024 Biloozerske, kv. 18.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUINIS: G3.42112 Subcontinental lichen Scots pine forests [16]; B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 Species-rich helophyte beds [16].

**Global distribution**: Albania, Algeria, Austria, Azerbaijan, Belgium, belarus, Bulgaria, China, Croatia, Czech Republic, Finland, France, Germany, Greece, Hungary, Iran, Istria Peninsula, Italy, Kazakhstan, Latvia, Luxembourg, Netherlands, Poland, Portugal, Romania, russia, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, Uzbekistan [25].

**8.** ***Gorytes sulcifrons*** (A.Costa, 1867)

**Material**: ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUINIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Algeria, Austria, Azerbaijan, Belgium, Czech Republic, France, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Morocco, Portugal, Romania, russia, Slovakia, Spain, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**9.** ***Harpactes pulchellus*** A. Costa, 1859 (synonymy *Harpactus morawitzi* Radoszkowski, 1884);

**Material**: ♀, 17.07.2024 Hrabunske, kv. 16.

**Biotope**: Ч10.1 (Common heather heaths) [11] – EUINIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Austria, belarus, Bulgaria, Croatia, Czech Republic, France, Greece, Hungary, Iran, Italy, Kazakhstan, Poland, Portugal, russia, Slovakia, Spain, Switzerland, Turkey, Turkmenistan, Ukraine [25].

Subfamily Bembicinae: Nyssonini

**10.** ***Nysson dimidiatus*** Jurine, 1807

**Material**: ♂, 31.05.2024 Starosilske, kv. 31, v. 12.

**Biotope:** Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, Croatia, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Kazakhstan, Latvia, Luxembourg, Mongolia, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**11.** ***Nysson interruptus*** (Fabricius,1798)

**Material**: ♀, 19.07.2023 Karasynske.

**Biotope**: Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Albania, Austria, Azerbaijan, Belgium, belarus, Cyprus, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Latvia, Netherlands, Poland, Portugal, russia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**12.** ***Nysson maculosus*** (Fabricius, 1787)

**Material**: ♂, 23.06.2021 Biloozerske, kv. 53; ♀, 24.06.2024 Biloozerske; ♂, 19.07.2023 Karasynske.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Albania, Algeria, Austria, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Kazakhstan,

Korea, Latvia, Luxembourg, Netherlands, Poland, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan [25].

**13.** ***Nysson niger*** Chevrier, 1868

**Material**: 2 ♀, 13.07.2021 Karasynske; ♀, 18.07.2023 Pivnichne; ♀, Hrabunske, kv. 23, v. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUINIS: (G3.42112 Subcontinental lichen Scots pine forests) [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch); C1.2.4 (Trampled habitats) [11] – EUINIS: E1.E (Trampled xeric grasslands with annuals) [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Italy, Kazakhstan, Latvia, Lithuania, Netherlands, Poland, Poland, Romania, russia, Slovakia, Slovenia, Sweden, Switzerland, Ukraine [25].

**14.** ***Nysson spinosus*** (J.Forster, 1771)

**Material**: 6♀, 24.06.2021 Biloozerske; 2 ♂, 22.05.2024 Biloozerske; 4 ♀, 22.05.2024 Biloozerske, kv. 43, v. 27.

**Biotope**: Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, Croatia, Czech Republic, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Luxembourg, Netherlands, Norway, Poland, Romania, russia, Slovakia, Sweden, Switzerland, Turkey, Ukraine [25].

**15.** ***Nysson trimaculatus*** (Rossi,1790)

**Material**: 2 ♀, 19.07.2023 Karasynske; ♀, 05.08.2023 Karasynske.

**Biotope**: Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11]; Д2.2.3 (Wet Scots pine forests) [11] – EUNIS: G3.E (Nemoral bog conifer woodland) [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Czech Republic, Denmark, France, Georgia, Germany, Great Britain, Greece, Hungary, Italy, Japan, Kazakhstan, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

Subfamily Crabroninae: Crabronini

**16.** ***Crabro cribrarius*** (Linnaeus, 1758)

**Material**: ♂, 02.08.2022 Biloozerske;.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Iran, Italy, Kazakhstan, Korea, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, russia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**17.** ***Crabro scutellatus*** (von Scheven, 1781)

**Material**: ♂, 23.06.2022 Bilske, kv. 40; ♀, 24.06.2021 Biloozerske; 7 ♀, 18.07.2023 Pivnichne.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; C1.2.4 (Trampled habitats) [11] – EUNIS: E1.E (Trampled xeric grasslands with annuals) [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Hungary, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Mongolia, Netherlands, Norway, Poland, Romania, russia, Slovakia, Sweden,

Switzerland, Ukraine [25].

**18.** ***Crossocerus cetratus*** (Shuckard,1837)

**Material**: ♀, 05.08.2023 Karasynske, kv. 63.

**Biotope**: Д2.2.3 (Wet Scots pine forests) [11] – EUNIS: G3.E Nemoral bog conifer woodland [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Croatia, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Poland, russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**19.** ***Crossocerus exiguus*** (Vander Linden,1829)

**Material**: ♀, 31.05.2024 Starosilske, kv. 31, v. 12; ♀, 16.07.2024 Starosilske, kv. 14, v. 5; 4 ♀, 17.07.2024 Hrabun, kv. 25.

**Biotope:** Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д2.2.1 (Lichen Scots pine forests (Sandy dune) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, Belgium, belarus, Bulgaria, China, Czech Republic, Finland, France, Germany, Great Britain, Hungary, Iran, Ireland, Italy, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Mongolia, Netherlands, Poland, Romania, russia, Slovakia, Slovenia, Sweden, Switzerland, Turkey, Ukraine [25].

**20.** ***Crossocerus subulatus*** Dahlbom, 1845

**Material**: ♀, 24.06.2021 Biloozerske.

**Global distribution**: belarus, Denmark, Estonia, Finland, France, Germany, Islands, Kazakhstan, Lithuania, North Zealand, Norway, Poland, Romania, russia, Sweden, Ukraine [25].

**21.** ***Ectemnius continuus*** (Fabricius, 1804)

**Material**: ♂, 12.08.2021 Karasynske; ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope:** B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution:** Algeria, Austria, Azerbaijan, Belgium, Canada, China, Croatia, Cuba, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Guatemala, Iran, Israel, Italy, Japan, Jordan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Luxembourg, Malta, Mongolia, Morocco, Netherlands, North Africa, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, USA, Ukraine, Uzbekistan [25].

**22.** ***Ectemnius cephalotes*** (Olivier,1792)

**Material**: ♀, 31.07.2023 Karasynske.

**Biotope**: Д2.2.3 (Wet Scots pine forests) [11] – EUNIS: G3.E Nemoral bog conifer woodland [16].

**Global distribution:** Andorra, Algeria, Austria, belarus, Belgium, Bulgaria, Canada, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Turkey, Ukraine, Wales [25].

**23.** ***Ectemnius guttatus*** (Vander Linden, 1829)

**Material**: ♀, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental

lichen Scots pine forests [16].

**Global distribution**: Algeria, Austria, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Italy, Kazakhstan, Latvia, Liechtenstein, Lithuania, Netherlands, Norway, Poland, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Ukraine [25].

**24.** ***Ectemnius fossorius*** (Linnaeus, 1758)

**Material**: ♀, ♂, 24.06.2021 Biloozerske; ♀, 29.08.2022 Karasynske; 3 ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope:** B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.3 (Wet Scots pine forests) [11] – EUNIS: G3.E Nemoral bog conifer woodland [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Hungary, India, Islands, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Mongolia, Netherlands, Norway, Poland, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan [25].

**25.** ***Ectemnius lapidarius*** (Panzer, 1803)

**Material**: 6 ♂, 23.06.2021 Biloozerske, kv. 53; ♀, 11.08.2021Hrabunske; 2 ♀, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azores, belarus, Belgium, Bulgaria, Canada, China, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Isle, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Mongolia, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, USA, Ukraine, Wales [25].

**26.** ***Ectemnius lituratus*** (Panzer,1805)

**Material**: 4 ♂, 23.06.2021 Biloozerske, kv. 53; ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, belarus, Belgium, Bulgaria, Bohemia, Croatia, Czech Republic, Denmark, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Italy, Kazakhstan, Lichtenstein, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine [25].

**27.** ***Ectemnius rubicola*** (Dufour & Perris, 1840)

**Material**: ♂, 23.06.2021 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, Azerbaijan, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Islands, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Poland, Romania, russia, Serbia, Slovakia, Slovenia, Sicily, Spain, Sweden, Switzerland, Turkey, Ukraine, Wales [25].

**28.** ***Ectemnius rugifer*** (Dahlbom, 1845)

**Material**: ♀, 12.08.2021 Karasynske.

**Global distribution**: Austria, Azerbaijan, belarus, Bulgaria, Czech Republic, France, Germany, Greece, Hungary, Iran, Islands, Italy, Latvia, Poland, Portugal, Rhodes, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Turkey, Ukraine [25].

**29.** ***Ectemnius spinipes*** (A.Morawitz, 1866)

**Material**: ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope:** B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16].

**Global distribution**: Austria, Azerbaijan, belarus, China, Czech Republic, Finland, France, Hungary, Italy, Japan, Kazakhstan, Korea, Lithuania, Poland, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Ukraine [25].

**30.** ***Lestica alata*** (Panzer, 1797)

**Material**: ♂, 25.06.2021 Biloozerske; 8 ♂, 25.06.2024 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Algeria, Austria, belarus, Belgium, Bulgaria, China, Czech Republic, Denmark, Finland, France, Germany, Hungary, Islands, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Lithuania, Manchuria, Mongolia, Netherlands, Norway, Poland, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan [25].

**31.** ***Lestica clypeata*** (Schreber, 1759)

**Material**: 2 ♂, 23.06.2021 Biloozerske, kv. 53; 6 ♀, 5 ♂, 02.08.2022 Biloozerske; 2 ♀, 2 ♂, 29.08.2022 Karasynske; ♂, 23.06.2022 Bilske, kv. 40; 2 ♀, ♂, 24.06.2024 Biloozerske, kv. 18; 5 ♀, 6 ♂, 25.06.2024 Biloozerske, kv. 53; 2 ♂, 16.07.2024 Starosilske, kv. 14, v. 5.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16]; Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Hvar, India, Iraq, Iran, Ireland, Israel, Islands, Italy, Kazakhstan, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Morocco, Netherlands, North Africa, Norway, Palestine, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**32.** ***Lindenius albilabris*** (Fabricius,1793)

**Material**: ♀, 25.06.2024 Biloozerske; 2 ♀, 17.07.2024 Hrabunske, kv. 25; ♂ Hrabunske, kv. 23, v. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Andorra, Albania, Austria, Azerbaijan,, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Islands, Italy, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Moldova, Mongolia, Netherlands, Norway, Palestine,

Poland, Portugal, Romania, russia, Serbia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan, Wales [25].

Subfamily Crabroninae: Oxybelini

**33.** ***Oxybelus argentatus*** Curtis, 1833

**Material**: ♀, 02.08.2022 Biloozerske, kv. 53.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUINIS: C3.1 (Species-rich helophyte beds) [16].

**Global distribution**: Austria, belarus, Belgium, Bulgaria, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Islands, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, russia, Slovakia, Spain, Sweden, Switzerland, Ukraine, Wales [25].

**34.** ***Oxybelus haemorrhoidalis*** Olivier, 1812

**Material**: ♂, 16.07.2024 Starosilske, kv. 26, v. 22.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Egypt, France, Germany, Great Britain, Greece, Hungary, Iran, Israel, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Libya, Lithuania, Moldova, Mongolia, Morocco, Netherlands, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Transcaucasia, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**35.** ***Oxybelus latro*** Olivier, 1812

**Material**: ♂, 16.07.2024 Starosilske, kv. 33, v. 19; 2 ♂, 16.07.2024 Starosilske, kv. 26; 2 ♂, 16.07.2024 Starosilske, kv. 26, v. 22; ♂, 16.07.2024 Starosilske, kv. 14, v. 5.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, France, Great Britain, Greece, Hungary, Iran, Islands, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Mongolia, Morocco, Poland, Portugal, Romania, russia, Slovakia, Spain, Switzerland, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**36.** ***Oxybelus mandibularis*** Dahlbom,1845

**Material**: ♂, ♀, 16.07.2024 Starosilske, kv. 26, v. 22; ♀, 16.07.2024 Bilske, kv. 16, v. 3.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, belarus, Belgium, Bulgaria, Bosnia and Herzegovina, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Hungary, Ireland, Islands, Isle, Italy, Kazakhstan, Latvia, Lithuania, Mongolia, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Spain, Sweden, Switzerland, Turkey, Turkmenistan, Ukraine, Uzbekistan, Wales [25].

**37.** ***Oxybelus mucronatus*** (Fabricius, 1793)

**Material**: ♂, 24.06.2021 Biloozerske; 2 ♂, 19.07.2023 Karasynske, kv. 62; ♂, 25.06.2024 Biloozerske, kv. 18; ♀, 16.07.2024 Starosilske, kv. 14, v. 5; 2 ♀, 16.07.2024 Starosilske.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Afghanistan, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Finland, France, Germany, Great Britain, Greece, Hungary, Iraq, Iran, Israel, Islands, Italy, Jordan, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Moldova, Morocco, Netherlands, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**38.** ***Oxybelus variegatus*** Wesmael, 1852

**Material**: ♂, 10.07.2024 Pivnichne, kv. 35, v. 13.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Austria, Azerbaijan, belarus, Bulgaria, Croatia, Czech Republic, France, Germany, Great Britain, Greece, Hungary, Iran, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Moldova, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

Subfamily Crabroninae: Larrini

**39.** ***Tachysphex fulvitarsis*** (A.Costa, 1867)

**Material**: ♂, 19.07.2023 Karasynske.

**Biotope**: Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, France, Germany, Greece, Hungary, Iran, Israel, Islands, Italy, Jordan, Kazakhstan, Luxembourg, Morocco, Netherlands, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**40.** ***Tachysphex helveticus*** Kohl, 1885

**Material**: ♂, 11.06.2024 Pivnichne, kv. 61, v. 24.1.

**Biotope**: Д3 (Areas with recently removed tree layer) [11] – EUNIS: G5.8 Recently felled areas [16].

**Global distribution**: Austria, Azerbaijan, belarus, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iran, Italy, Kazakhstan, Latvia, Lithuania, Netherlands, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan [25].

**41.** ***Tachysphex incertus*** (Radoszkowski, 1877)

**Material**:4 ♂, 15.06.2024 Starosilske, kv. 22, v. 26.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Algeria, Azerbaijan, Bulgaria, Bosnia and Herzegovina, China, Croatia, Cyprus, Egypt, France, Greece, Hungary, Iran, Israel, Italy, Jordan, Kazakhstan, Libya, Morocco, Oman, Palestine, Portugal, Romania, russia, Slovakia, Spain, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Yemen [25].

**42.** ***Tachysphex obscuripennis*** (Schenck, 1857)

**Material**: ♀, 11.08.2021 Hrabunske; ♂, 01.08.2022 Karasynske; 2 ♂, 19.07.2023 Karasynske; ♀, 18.07.2023 Pivnichne; 3 ♀, 9 ♂, 25.06.2024 Biloozerske, kv. 18; 2 ♂, 15.06.2024 Starosilske, kv. 22, v. 16; 4 ♂, 10.07.2024 Biloozerske, kv. 34, v. 16; 2 ♀, ♂, 16.07.2024 Bilske, kv. 16, v. 3; ♀, 16.07.2024 Starosilske, kv. 14, v. 5; ♂, 26.07.2024 Pivnichne, kv. 46, v. 5; 2 ♀, 17.07.2024 Hrabunske, kv. 25; ♀, ♂, 17.07.2024 Hrabunske kv. 16; 2 ♂, Hrabunske, kv. 23, v. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Д2.2.2 (Acidopilous mesic and moist Scots pine

forests) [11]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11]; С1.2.4 (Trampled habitats) [11] – EUNIS: E1.E Trampled xeric grasslands with annuals [16].

**Global distribution**: Andorra, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**43.** ***Tachysphex nitidior*** de Beaumont, 1940

**Material**: ♂, 10.07.2024 Biloozerske, kv. 34, v. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Azerbaijan, Bulgaria, Croatia, Egypt, France, Germany, Greece, Iran, Israel, Islands, Italy, Kazakhstan, Libya, Mongolia, Morocco, Portugal, russia, Saudi Arabia, Spain, Switzerland, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan [25].

**44.** ***Tachysphex panzeri*** (Vander Linden, 1829)

**Material**: ♂, 17.07.2024 Hrabunske, kv. 25.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Botswana, Canary Islands, China, Croatia, Cyprus, Czech Republic, Djibouti, Ethiopia, Egypt, Eritrea, France, Germany, Greece, Hungary, India, Iran,, Israel, Italy, Jordan, Kazakhstan, Latvia, Libya, Lithuania, Malta, Mongolia, Morocco, Netherlands, Oman, Poland, Portugal, Romania, russia, Saudi Arabia, Slovakia, Spain, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, United Arab Emirates, Uzbekistan, Yemen [25].

**45.** ***Tachysphex pompiliformis*** (Panzer,1805)

**Material**: ♀, 19.07.2023 Karasynske.

**Biotope**: С1.2.4 (Trampled habitats) [11] – EUNIS: E1.E Trampled xeric grasslands with annuals [16].

**Global distribution**: Andorra, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Cape Verde Islands, Canada, China, Croatia, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, India, Iran, Ireland, Isle, Italy, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Mongolia, Morocco, Netherlands, North America, North Korea, Norway, Pakistan, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Turkmenistan, USA, Ukraine, Uzbekistan, Wales [25].

Subfamily Crabroninae: Miscophini

**46.** ***Miscophus ater*** Lepeletier de Saint Fargeau, 1845

**Material**: ♀, 16.07.2024 Starosilske, kv. 26, v. 22; ♀, 16.07.2024 Bilske, kv. 16, v. 3; 3 ♀, 3 ♂, 17.07.2024 Hrabunske, kv. 16; ♀, Hrabunske, kv. 23, v. 16; ♀, 17.08.2024 Biloozerske, kv. 27, v. 2.14.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Algeria, Austria, belarus, Belgium, Bulgaria, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland,

Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Netherlands, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Ukraine [25].

**47.** ***Miscophus bicolor*** Jurine, 1807

**Material**: ♂, 25.06.2024 Biloozerske, kv. 18.

**Global distribution**: Andorra, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Croatia, Corsica, Cyprus, Czech Republic, Egypt, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Kazakhstan, Korea, Latvia, Lithuania, Luxembourg, Malta, Mongolia, Netherlands, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Turkey, Ukraine [25].

Subfamily Crabroninae: Palarini

**48.** ***Palarus variegatus*** (Fabricius, 1781)

**Material**: ♂, 10.07.2024 Pivnichne, kv. 35, v. 13.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Algeria, Austria, Azerbaijan, Bulgaria, China, Czech Republic, France, Germany, Greece, Hungary, India, Iran, Italy, Kazakhstan, Macedonia, Mongolia, Pakistan, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

Subfamily Crabroninae: Trypoxylini

**49.** ***Trypoxylon attenuatum*** Smith,1851

**Material:** ♂, 22.05.2024 Pivnichne, kv. 25, v. 2.2.

**Biotope**: Д3 (Areas with recently removed tree layer) [11] – EUNIS: G5.8 Recently felled areas [16].

**Global distribution**: Afghanistan, Andorra, Albania, Algeria, Austria, Azores, belarus, Belgium, Bulgaria, Canada, Canary Islands, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, India, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Morocco, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Slovakia, Spain, Sweden, Switzerland, Tunisia, Turkey, Ukraine, Ukraine, Uzbekistan [25].

**50.** ***Trypoxylon clavicerum*** Lepeletier & Serville,1828

**Material**: ♀, 2024 Hrabunske, kv. 33, v. 16.

**Biotope**: Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azerbaijan, Azores, belarus, Belgium, Bulgaria, Canada, Canary Islands, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

**51.** ***Trypoxylon figulus*** (Linnaeus, 1758)

**Material**: ♂, 31.07.2023 Karasynske; ♂, Starosilske, kv. 33, v. 9; ♀, 22.05.2024 Biloozerske, kv. 43, v. 27; ♂, 17.07.2024 Bilske, kv. 16, v. 3; ♀, 20.08.2024 Bilske, kv. 34, v. 29; ♀, Biloozerske.

**Biotope**: Д 2.2.3 (Wet Scots pine forests) [11] – EUINIS: G3.E Nemoral bog conifer woodland [16]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista*

[16].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mongolia, Morocco, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Ukraine, Uzbekistan [25].

**52.** ***Trypoxylon fronticorne*** Gussakowskij, 1936

**Material**: ♀, ♂, 19.07.2023 Karasynske; 2 ♂, 31.07.2023 Karasynske; ♀, 2 ♂, Starosilske, kv. 33, v. 9; 3 ♀, 21-22.05.2024 Bilske, kv. 43, v. 47; 4 ♂, 21-22.05.2024 Bilske, kv. 43, v. 47; ♂, 16-17.05.2024 Bilske, kv. 45, v. 2; ♂, Starosilske, kv. 7, v. 3; 5 ♂, 13.05.2024 Karasynske, kv. 63, v. 23; ♀, 22.05.2024 Biloozerske, kv. 43, v. 27; ♀, ♂, 11.06.2024 Pivnichne, kv. 61, v. 24.1; ♀, 16.07.2024, Bilske, kv. 16, v. 3; ♀, 17.07.2024 Hrabunske, kv. 25; 2 ♀, 4 ♂, Pivnichne, kv. 61, v. 23; 2 ♀, Hrabunske, kv. 33, v. 16; ♀, 21.07.2024 Bilske, kv. 28, v. 6; 2 ♀, 20.08.2024 Bilske, kv. 34, v. 29.

**Biotope**: Д 2.2.3 (Wet Scots pine forests) [11] – EUINIS: G3.E Nemoral bog conifer woodland [16]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д2.5.2 (Bogs witha layer of pine) [11]; Д1.7.2 (Bogs with layer of birch) [11]; Д3 (Areas with recently removed tree layer) [11] – EUINIS: G5.8 Recently felled areas [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Б2.1.1 (Sedge calcareous fens without sphagnum mosses) [11] – EUNIS: D4.1 Rich fens, including eutrophic tall-herb fens and calcareous flushes and soaks [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Austria, belarus, Bulgaria, Bohemia, China, Czech Republic, France, Georgia, Germany, Hungary, India, Italy, Japan, Kazakhstan, Lithuania, Poland, russia, Slovakia, Switzerland, Turkey, Ukraine [25].

Subfamily Pemphredoninae: Pemphredonini

**53.** ***Diodontus insidiosus*** Spooner,1938

**Material**: 2 ♂, 16.07.2024 Starosilske, kv. 26, v. 22; ♂, 17.07.2024 Hrabunske, kv. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Austria, Belgium, Bulgaria, Bohemia, China, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Kazakhstan, Luxembourg, Netherlands, Poland, Portugal, russia, Slovakia, Spain, Switzerland, Tunisia, Turkey, Ukraine, Uzbekistan [25].

**54.** ***Diodontus minutus*** (Fabricius, 1793)

**Material**: 2 ♀, 16.07.2024 Starosilske, kv. 14, v. 5; ♀, 16.07.2024 Starosilske, kv. 26, v. 22; 3 ♀, 16.07.2024 Bilske, kv. 16, v. 3; ♀, 17.07.2024 Hrabunske, kv. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Afghanistan, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iraq, Iran, Ireland, Israel, Isle, Italy, Kazakhstan, Korea, Kyrgyzstan, Kuwait, Latvia, Liechtenstein, Malta, Moldova, Mongolia, Netherlands,

North America, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sudan, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Wales [25].

**55.** ***Passaloecus borealis*** Dahlbom, 1844

**Material**: 2 ♂, 22.05.2024 Biloozerske, kv. 43, v. 27; 4 ♂, 16.07.2024 Bilske, kv. 16, v. 3.

**Biotope**: Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, belarus, Belgium, Bulgaria, Bohemia, Canada, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Italy, Kazakhstan, Liechtenstein, Luxembourg, Netherlands, North America, Norway, Poland, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey [25].

**56.** ***Passaloecus gracilis*** (Curtis,1834)

**Material**: 4 ♂, 13.05.2024 Karasynske, kv. 63, v. 23; ♀, 22.05.2024 Biloozerske, kv. 43, v. 27.

**Biotope**: Д1.7.2 (Bogs with layer of birch) [11]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11].

**Global distribution**: Andorra, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Canada, Canary Islands, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Isle, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Morocco, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Slovakia, Spain, Switzerland, Tunisia, Turkey, Ukraine, Uzbekistan [25].

**57.** ***Passaloecus corniger*** Shuckard, 1837

**Material**: ♂, 10.07.2024 Biloozerske, kv. 34, v. 16.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Andorra, Algeria, Austria, belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Wales [25].

**58.** ***Passaloecus singularis*** Dahlbom, 1844

**Material**: ♂, 22.05.2024 Biloozerske, kv. 43, v. 27; 2 ♀, 11.06.2024 Pivnichne, kv. 61, v. 24,1; ♀, 20.08.2024 Bilske, kv. 34, v .29.

**Biotope**: Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д3 (Areas with recently removed tree layer) [11] – EUINIS: G5.8 Recently felled areas [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Andorra, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Wales [25].

**59.** ***Pemphredon inornata*** Say,1824

**Material**: 3 ♀, ♂, 19.07.2023 Karasynske; 5 ♀, 13.05.2024 Karasynske, kv. 63, v. 23; ♀, 16.07.2024 Starosilske, kv. 26, v. 22; ♀, 11.06.2024 Pivnichne, kv. 61, v. 24.1.

**Biotope**: Д1.7.2 (Bogs with layer of birch) [11]; Д2.2.1 (Lichen Scots pine forests)

[11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Д3 (Areas with recently removed tree layer) [11] – EUINIS: G5.8 Recently felled areas [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Austria, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Islands, Italy, Japan, Kazakhstan, Korea, Liechtenstein, Lithuania, Luxembourg, Netherlands, North America, Norway, Poland, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, USA, Ukraine, Uzbekistan, Wales [25].

**60.** ***Pemphredon lethifer*** (Shuckard, 1837)

**Material**: 4 ♂, 01.08.2022 Karasynske, kv. 62; 2 ♂, 19.07.2023 Karasynske; 4 ♂, Starosilske, kv. 33, v. 9; 3 ♂, ♀, 24.05.2024 Bilske, kv. 27, v. 3; 39 ♂, 3 ♀13.05.2024 Karasynske, kv. 63, v. 23; 2 ♂, 22.05.2024 Biloozerske, kv. 43, v. 27; ♂, 23.05.2024 Pivnichne, kv. 61, v. 23.

**Biotope**: Д2.2.3 (Wet Scots pine forests) [11] – EUNIS: G3.E Nemoral bog conifer woodland [16]; Д2.5.2 (Bogs witha layer of pine) [11]; Д1.7.2 (Bogs with layer of birch) [11]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Б2.1.1 (Sedge calcareous fens without sphagnum mosses) [11] – EUNIS: D4.1 Rich fens, including eutrophic tall-herb fens and calcareous flushes and soaks [16]; Д1.7.1 (Eutrophic swamps with layer of black alder or birch) [11].

**Global distribution**: Afghanistan, Andorra, Algeria, Austria, Azerbaijan, Azores, belarus, Belgium, Bulgaria, Canada, China, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iraq, Iran, Ireland, Israel, Isle, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Mongolia, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, USA, Ukraine, Uzbekistan, Wales [25].

**61.** ***Pemphredon lugubris*** (Fabricius,1793)

**Material**: ♀, 25.06.2024 Biloozerske.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, Ireland, Isle, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Lithuania, Luxembourg, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine, Uzbekistan, Wales [25].

**62.** ***Pemphredon rugifer*** (Dahlbom, 1844)

**Material**: 2 ♀, 13.05.2024 Karasynske, kv. 63, v. 23.

**Biotope**: Д1.7.2 (Bogs with layer of birch) [11].

**Global distribution**: Andorra, Algeria, Austria, Azerbaijan, Azores, belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Moldova, Morocco, Netherlands, Korea, Norway, Poland, Portugal, Romania, russia, Scotland, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, USA, Ukraine, Uzbekistan [25].

Subfamily Pemphredoninae: Psenini

**63.** ***Mimumesa unicolor*** (Vander Linden,1829)

**Material**: ♀, 01.08.2022 Karasynske; 2 ♂, Starosilske, kv. 33, v. 9.

**Biotope**: Д 2.2.3 (Wet Scots pine forests) [11] – EUINIS: G3.E Nemoral bog conifer woodland [16].

**Global distribution**: Afghanistan, Austria, belarus, Belgium, Bulgaria, China, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iraq, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Moldova, Netherlands, Pakistan, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**64.** ***Psenulus concolor*** (Dahlbom, 1843)

**Material**: 3 ♂, Biloozerske.

**Global distribution**: Andorra, Albania, Algeria, Austria, belarus, Belgium, Bulgaria, Czech Republic, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Ireland, Italy, Japan, Kazakhstan, Korea, Latvia, Liechtenstein, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Wales [25].

**65.** ***Psenulus fuscipennis*** (Dahlbom, 1843)

**Material**: ♀, 30.04.2024, ♂, 20.01.2024, Biloozerske.

**Global distribution**: Andorra, Algeria, Austria, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, India, Italy, Japan, Kazakhstan, Latvia, Liechtenstein, Lithuania, Netherlands, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, Ukraine [25].

Subfamily Philanthinae: Philanthini

**66.** ***Philanthus triangulum*** (Fabricius,1775)

**Material**: ♀, ♂, 18.07.2023 Pivnichne; ♀, 16.07.2024 Starosilske, kv. 60, v. 7.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; C1.2.4 (Trampled habitats) [11] – EUNIS: E1.E Trampled xeric grasslands with annuals [16].

**Global distribution**: Afghanistan, Albania, Algeria, Arabian Peninsula, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Benin, Cameroon, Canary Islands, Central African Republic, China, Croatia, Congo, Cyprus, Czech Republic, Denmark, Ethiopia, Egypt, Finland, France, Germany, Great Britain, Greece, Guinea, Holland, Hungary, India, Iraq, Iran, Ireland, Israel, Island, Isle, Italy, Jordan, Kazakhstan, Kenya, Kyrgyzstan, Kuwait, Latvia, Libya, Liechtenstein, Lithuania, Luxembourg, Madagascar, Malagasy, Malawi, Mali, Malta, Montenegro, Morocco, Mozambique, Namibia, Netherlands, Norway, Oman, Pakistan, Poland, Portugal, Romania, russia, Saudi Arabia, Senegal, South Africa, South Korea, Slovakia, Slovenia, Spain, Somalia, Sudan, Sweden, Switzerland, Syria, Tanzania, Tajikistan, Tunisia, Turkey, Turkmenistan, United Arab Emirates, Ukraine, Uzbekistan, Zambia, Zaire, Zimbabwe, Yemen, Wales [25].

Subfamily Philanthinae: Cercerini

**67.** ***Cerceris albofasciata*** (Thunberg, 1815)

**Material**: 6 ♂, 25.06.2024 Biloozerske; 5 ♂, 25.06.2024 Biloozerske, kv. 18.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUNIS: C3.1 Species-rich helophyte beds [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, belarus, China, Croatia, Czech Republic, France, Germany, Great Britain, Hungary, Iran, Italy, Japan, Kazakhstan, Korea, Mongolia, Poland, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Taiwan, Turkey, Ukraine, Uzbekistan [25].

**68.** ***Cerceris arenaria*** (Linnaeus,1758)

**Material**: ♀, 14.07.2021 Pivnichne; ♂, 25.06.2021 Biloozerske; ♂, 11.08.2021 Hrabunske; ♂, 23.06.2022 Bilske, kv. 24; 3 ♂, 23.06.2022 Bilske, kv. 34; ♂, 23.06.2022 Bilske, kv. 33; ♂, 23.06.2022 Bilske, kv. 40; ♀, ♂, 02.08.2022 Biloozerske; ♂, 19.07.2023 Karasynske; ♂, 26.06.2024 Biloozerske, kv. 18; 2 ♀, 25.06.2024 Biloozerske; ♂, 17.07.2024 Hrabunske, kv. 25.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUNIS:C3.1 Species-rich helophyte beds [16]; Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Andorra, Albania, Algeria, Armenia, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Bosnia, China, Croatia, Cyprus, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Israel, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Malta, Mongolia, Montenegro, Netherlands, North America, Norway, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Tajikistan, Transcaucasia, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan, Wales [25].

**69.** ***Cerceris flavilabris*** (Fabricius, 1793)

**Material**: ♂, 25.06.2024 Biloozerske, kv. 18.

**Biotope**: Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Algeria, Armenia, Austria, Bulgaria, China, Croatia, Cyprus, Czech Republic, France, Germany, Greece, Hungary, Iran, Israel, Island, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Malta, Morocco, North Africa, Poland, Portugal, Rhodes, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Syria, Tajikistan, Transcaucasia, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**70.** ***Cerceris interrupta*** (Panzer, 1799)

**Material**: ♀, ♂, 17.07.2024 Hrabunske, kv. 25.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, France, Germany, Great Britain, Greece, Hungary, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Netherlands, North Africa, Poland, Romania, russia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey, Ukraine, Uzbekistan [25].

**71.** ***Cerceris media*** Klug, 1835

**Material**: ♂, 23.06.2022 Bilske, kv. 34.

**Global distribution**: Albania, Algeria, Azerbaijan, Bulgaria, France, Greece, Hungary, Iran, Israel, Italy, Kazakhstan, Kyrgyzstan, Macedonia, Malta, Portugal, Romania, russia, Serbia, Spain, Syria, Tajikistan, Transcaucasia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**72.** ***Cerceris rybyensis*** (Linnaeus, 1771)

**Material**: ♂, 25.06.2021 Biloozerske; ♂, 11.08.2021 Hrabunske; ♀, 2 ♂, 25.06.2024 Biloozerske; 2 ♀, 16.07.2024 Starosilske, kv. 60, v. 7; 2 ♂, 16.07.2024 Starosilske.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUNIS: C3.1 Species-rich helophyte beds [16]; Д2.2.1 (Lichen Scots pine forests) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Croatia, Czech Republic, Denmark, Egypt, Finland, France, Germany, Great Britain, Greece, Hungary, India, Iran, Ireland, Island, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Mongolia, Montenegro, Morocco, Netherlands, North Africa, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sudan, Sweden, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**73.** ***Cerceris ruficornis*** (Fabricius, 1793)

**Material**: ♀, 11.08.2021 Hrabunske.

**Biotope**: Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16].

**Global distribution**: Albania, Algeria, Austria, belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Italy, Kazakhstan, Korea, Kyrgyzstan, Latvia, Lithuania, Mongolia, Montenegro, Netherlands, North Africa, Norway, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Sicily, Spain, Sweden, Switzerland, Tajikistan, Turkey, Ukraine, Uzbekistan [25].

**Family Sphecidae**

Subfamily Ammophilinae

**74.** ***Ammophila campestris*** Latreille, 1809

**Material**: ♀, 02.08.2022 Biloozerske; ♂, 17.07.2024 Hrabunske, kv. 16; ♀, 17.07.2024 Hrabunske, kv. 25.

**Biotope**: Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16]; Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Algeria, Austria, belarus, Belgium, Bulgaria, China, Croatia, Czech Republic, Denmark, Finland, France, Georgia, Germany, Great Britain, Greece, Hungary, India, Italy, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Mongolia, Morocco, Netherlands, Norway, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Sicily, Spain, Sweden, Switzerland, Tajikistan, Transcaucasia, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**75.** ***Ammophila hungarica*** Mocsáry, 1883

**Material**: ♀, 02.08.2022 Biloozerske; ♀, 23.06.2022 Bilske, kv. 40.

**Global distribution**: Afghanistan, Algeria, Armenia, Austria, Azerbaijan, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, France, Greece, Hungary, Iraq, Iran, Italy, Jordan, Kazakhstan, Kyrgyzstan, Morocco, Portugal, Romania, russia, Slovenia, Spain, Switzerland, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**76.** ***Ammophila pubescens*** Curtis, 1836

**Material**: ♀, ♂, 01.08.2022 Karasynske, kv. 63; ♀, 19.07.2023 Karasynske; ♀, 25.06.2024 Biloozerske; ♂, 16.07.2024 Starosilske, kv. 33, v. 19; ♂, 16.07.2024 Starosilske, kv. 26.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Austria, belarus, Belgium, Bulgaria, Canada, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, India, Iran, Ireland, Island, Italy, Kazakhstan, Latvia, Lithuania, Luxembourg, Mongolia, Netherlands, North America, Norway, Poland, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Turkey, USA, Ukraine, Wales [25].

**77.** ***Ammophila sabulosa*** (Linnaeus, 1758)

**Material**: ♂, 24.06.2021 Biloozerske; ♂, 12.08.2021 Karasynske; ♀, ♂, 01.08.2022 Karasynske; ♂, 29.08.2022 Karasynske; ♂, 23.06.2022 Bilske, kv. 34; 2 ♀, 7 ♂, 18.07.2023 Pivnichne; 2 ♀, ♂, 19.07.2023 Karasynske; 2 ♀, 25.06.2024 Biloozerske; 2 ♀, 31.05.2024 Starosilske, kv. 31, v. 12; 3 ♀, 2 ♂, 17.07.2024 Hrabunske kv. 25; 4 ♀, 2 ♂, 16.07.2024 Starosilske, kv. 26, v. 22; 2 ♀, 16.07.2024 Starosilske, kv. 33, v. 19; ♂, 16.07.2024 Bilske, kv. 16, v. 3; ♀, 21.07.2024 Bilske, kv. 28, v. 6; ♀, 27.08.2024 Starosilske, kv. 33, v. 15.

**Biotope**: B4.1.2 (Riverine grass-forb thickets along watercourses) [11] – EUNIS: C3.1 Species-rich helophyte beds [16]; Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16]; Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11]; Д3 (Areas with recently removed tree layer) [11] – EUNIS: G5.8 Recently felled areas [16]; Ч10.1 (Common heather heaths) [11] – EUNIS: F4.262 Dry sandy heaths with *Calluna* and *Genista* [16]; C1.2.4 (Trampled habitats) [11] – EUNIS: E1.E Trampled xeric grasslands with annuals [16].

**Global distribution**: Andorra, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, Canary Islands, China, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, India, Iran, Ireland, Island, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Latvia, Liechtenstein, Lithuania, Luxembourg, Macedonia, Moldova, Mongolia, Montenegro, Netherlands, Nepal, North Africa, North America, Norway, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Tajikistan, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**78.** ***Podalonia affinis*** (W.Kirby, 1798)

**Material**: ♀, Hrabunske, kv. 23, v. 1.

**Biotope**: Д2.2.2 (Acidopilous mesic and moist Scots pine forests) [11].

**Global distribution**: Algeria, Arabian Peninsula, Austria, belarus, Belgium, Bulgaria, Czech Republic, Denmark, Egypt, Estonia, Finland, France, Germany, Great Britain, Greece, Hungary, Iran, Ireland, Israel, Isle, Italy, Japan, Jordan, Kashmir, Kazakhstan, Korea, Kyrghyzstan, Latvia, Libya, Lithuania, Luxembourg, Macedonia, Mongolia, Morocco, Netherlands, North Africa, Poland, Portugal, Romania, russia, Saudi Arabia, Slovakia, Spain, Sweden, Switzerland, Tajikistan, Turkey, Ukraine, Uzbekistan, Yemen, Wales [25].

Subfamily Sceliphrinae

**79.** ***Sceliphron destillatorium*** (Illiger, 1807)

**Material**: ♀, 01.08.2022 Karasynske, kv. 75.

**Global distribution**: Afghanistan, Albania, Algeria, Austria, Azerbaijan, belarus, Bulgaria, China, Croatia, Czech Republic, France, Georgia, Germany, Great Britain, Greece, Hungary, India, Iran, Israel, Istria Peninsula, Italy, Jordan, Kazakhstan, Kyrgyzstan, Lithuania, Macedonia, Malta, Montenegro, Morocco, Poland, Portugal, Romania, russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Syria, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

**80.** ***Sceliphron curvatum*** (F.Smith, 1870) – invasive species [26].

**Material**: nests -10-20.05.2021 Hrabunske.

**Global distribution**: Afghanistan, Argentina, Austria, belarus, Belgium, Bulgaria, Bohemia, Chile, Croatia, Czech Republic, France, Georgia, Germany, Greece, Hungary, India, Iraq, Italy, Kazakhstan, Kyrgyzstan, Lithuania, Luxembourg, Montenegro, Netherlands, Nepal, Pakistan, Poland, Portugal, russia, Serbia, Slovakia, Slovenia, Spain, Switzerland, Tajikistan, Turkey, Ukraine, Uzbekistan [25].

Subfamily Sphecinae

**81.** ***Sphex funerarius*** Gussakovskij, 1934

The species is listed in the Red Book of Ukraine. Conservation status: "Unassessed" [30].

**Material**: ♀, 16.07.2024 Starosilske, kv. 33, v. 19; ♂, 16.07.2024 Starosilske, kv. 26.

**Biotope**: Д2.2.1 (Lichen Scots pine forests (sandy dune)) [11] – EUNIS: G3.42112 Subcontinental lichen Scots pine forests [16].

**Global distribution**: Afghanistan, Albania, Algeria, Austria, Azerbaijan, belarus, Belgium, Bulgaria, China, Croatia, Cyprus, Czech Republic, Denmark, Egypt, France, Germany, Greece, Hungary, Iraq, Iran, Israel, Istria Peninsula, Italy, Japan, Kazakhstan, Korea, Kyrgyzstan, Libya, Lithuania, Luxembourg, Macedonia, Malta, Mongolia, Morocco, Netherlands, North Africa, Palestine, Poland, Portugal, Romania, russia, Slovakia, Slovenia, Spain, Sweden, Switzerland, Syria, Taiwan, Tajikistan, Tunisia, Turkey, Turkmenistan, Ukraine, Uzbekistan [25].

*Sceliphron curvatum* (F. Smith, 1870) is the only species of wasp for which only its nests have been recorded on the territory of the department of Hrabun. No adult individuals were found [22].

The Margalef indices were calculated in order to assess the species diversity in the territory of each biotope. The index Margalef represents the species diversity in a given area. The more diverse the area, the higher the index value.

Table 1

Margalef index value for all biotopes

| Biotope | Species | Number specimens | Index Margalefa |
|---|---|---|---|
| С1.2.4 | 8 | 23 | 2.23 |
| Д1.7.1 | 11 | 20 | 3.34 |
| Б2.1.1 | 2 | 7 | 0.51 |
| Д3 | 6 | 9 | 2.27 |
| Ч10.1 | 14 | 22 | 4.2 |
| Д2.2.1 | 44 | 175 | 8.32 |
| В4.1.2 | 18 | 59 | 4.17 |
| Д1.7.2 | 5 | 58 | 0.98 |
| Д2.2.2 | 15 | 33 | 4 |
| Д2.5.2 | 2 | 5 | 0.62 |
| Д2.2.3 | 8 | 19 | 2.37 |

The highest index value is observed for biotope Д2.2.1 (Lichen Scots pine forests) – 8.32. This biotope is characterised by a pine forest with sandy soil. On the other hand, the lowest indicator for Б2.1.1 (Sedge calcareous fens without sphagnum mosses) is 0.51, which is represented by bogs formed both in river floodplains and in watersheds [11].

In order to determine the similarity of species diversity in the biotopes of the Nature Reserve "Rivnensky", the Czekanowski-Sorensen similarity coefficient was calculated.

The highest commonality is observed between biotopes Д1.7.2 (Bogs with layer of birch) and Б2.1.1 (Sedge calcareous fens without sphagnum mosses) (the coefficient is 0.57) and between Д2.5.2 (Bogs witha layer of pine) and Д1.7.2 (Bogs with layer of birch) (the coefficient is 0.57). It should be noted that these biotopes are characterised by low species diversity (Table 1), but most of the species caught are similar for these biotopes. In general, the values of the coefficients are low due to the small number of similar species for the biotopes.

A total of 35 species of wasps were caught directly on angiosperms from 10 families, namely: Apiaceae, Lamiaceae, Asteraceae, Brassicaceae, Rosaceae, Ericaceae, Campanulaceae, Rhamnaceae, Caprifoliaceae та Hypericaceae (Table 3).

Table 2

Similarity of species diversity of the study biotopes
(value of the Czekanowski-Sorensen coefficient)

| Biotope | С1.2.4 | Д1.7.1 | Б2.1.1 | Д3 | Ч10.1 | Д2.2.1 | В4.1.2 | Д1.7.2 | Д2.2.2 | Д2.5.2 | Д2.2.3 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| С1.2.4 | | 0.21 | *0* | 0.14 | 0.18 | 0.19 | 0.15 | *0* | 0.35 | *0* | *0* |
| Д1.7.1 | 0.21 | | 0.31 | 0.24 | 0.16 | 0.15 | 0.07 | 0.38 | 0.23 | 0.31 | 0.42 |
| Б2.1.1 | 0 | 0.31 | | 0.25 | 0.13 | 0.04 | 0 | **0.57** | 0.24 | 1 | 0.4 |
| Д3 | 0.14 | 0.24 | 0.25 | | 0.3 | 0.12 | 0.08 | 0.36 | 0.29 | 0.25 | 0.14 |
| Ч10.1 | 0.18 | 0.16 | 0.13 | 0.3 | | 0.38 | 0.25 | 0.11 | 0.34 | 0.13 | 0.18 |
| Д2.2.1 | 0.19 | 0.15 | 0.04 | 0.12 | 0.38 | | 0.23 | 0.08 | 0.27 | 0.04 | 0.08 |
| В4.1.2 | 0.15 | 0.07 | 0 | 0.08 | 0.25 | 0.23 | | 0 | 0.06 | 0 | 0.08 |
| Д1.7.2 | 0 | 0.38 | 0.57 | 0.36 | 0.11 | 0.08 | 0 | | 0.3 | **0.57** | 0.31 |
| Д2.2.2 | 0.35 | 0.23 | 0.24 | 0.29 | 0.34 | 0.27 | 0.06 | 0.3 | | 0.24 | 0.35 |
| Д2.5.2 | 0 | 0.31 | 1 | 0.25 | 0.13 | 0.04 | 0 | 0.57 | 0.24 | | 0.4 |
| Д2.2.3 | 0 | 0.42 | 0.4 | 0.14 | 0.18 | 0.08 | 0.08 | 0.31 | 0.35 | 0.4 | |

Table 3

Wasps (Crabronidae and Sphecidae) of the Nature Reserve “Rivnenskyi”
and some of their ethological peculiarities

| Family | Genus | Species | Num. speci-mens. | Family plants | | | | | | | | | | Nests | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | I | II | III | IV | V | VI | VII | VIII | IX | X | un. | ab. |
| Crabronidae | Bembecinus | *Bembecinus hungaricus* (Frivaldszky, 1876) | 4 | | | | | | | | | | | * | |
| | | *Bembecinus tridens* Fabricius, 1781 | 29 | | * | | | | | | | | | * | |
| | Bembix | *Bembix rostrata* (Linnaeus, 1758) | 4 | | * | | | | | | | | | * | |
| | Cerceris | *Cerceris albofasciata* (Thunberg, 1815) | 11 | * | | * | | | | | | * | | * | |
| | | *Cerceris arenaria* (Linnaeus,1758) | 18 | * | * | | | * | * | | | | | * | |
| | | *Cerceris flavilabris* (Fabricius, 1793) | 1 | | | | | | | | | * | | * | |
| | | *Cerceris interrupta* (Panzer, 1799) | 3 | | * | | | | | | | | | * | |
| | | *Cerceris media* Klug, 1835 | 1 | | | | | | | | | | * | * | |
| | | *Cerceris rybyensis* (Linnaeus, 1771) | 9 | * | | * | | | * | * | | | | * | |
| | | *Cerceris ruficornis* (Fabricius, 1793) | 1 | | | | | | * | | | | | * | |
| | Crabro | *Crabro cribrarius* (Linnaeus, 1758) | 1 | * | | | | | | | | | | * | |
| | | *Crabro scutellatus* (von Scheven, 1781) | 9 | * | * | | | * | | * | | | | * | |
| | Dryudella | *Dryudella lineata* Mocsáry, 1879 | 1 | | | | | | | | | | | N | |
| | Crossocerus | *Crossocerus exiguus* (Vander Linden,1829) | 6 | | | | | | | | | | | * | |
| | | *Crossocerus cetratus* (Shuckard,1837) | 1 | | | | | | | | | | | | * |
| | | *Crossocerus subulatus* Dahlbom, 1845 | 1 | | | | | | | | | | | | * |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crabronidae | Diodontus | *Diodontus insidiosus* Spooner,1938 | 3 | | | | | | | | | | * | |
| | | *Diodontus minutus* (Fabricius, 1793) | 7 | | | | | | | | | | * | |
| | Ectemnius | *Ectemnius continuus* (Fabricius, 1804) | 3 | * | | * | | | | | | | | * |
| | | *Ectemnius cephalotes* (Olivier,1792) | 1 | | | | | | | | | | | * |
| | | *Ectemnius fossorius* (Linnaeus, 1758) | 9 | * | | | | | | | | | | * |
| | | *Ectemnius guttatus* (Vander Linden, 1829) | 1 | * | | | | | | | | | | * |
| | | *Ectemnius lapidarius* (Panzer, 1803) | 9 | * | | | | | | | | | | * |
| | | *Ectemnius lituratus* (Panzer,1805) | 5 | * | | | | * | | | | | | * |
| | | *Ectemnius rubicola* (Dufour & Perris, 1840) | 1 | | | | | | | | | | | * |
| | | *Ectemnius rugifer* (Dahlbom, 1845) | 1 | | | | | | | | | | N | |
| | | *Ectemnius spinipes* (A.Morawitz, 1866) | 1 | * | | | | | | | | | N | |
| | Gorytes | *Gorytes laticinctus* (Lepeletier,1832) | 2 | | | * | | | | | | | * | |
| | | *Gorytes planifrons* (Wesmael, 1852) | 1 | * | | | | | | | | | N | |
| | | *Gorytes quinquecinctus* (Fabricius, 1793) | 3 | * | | | | | | | | | * | |
| | | *Gorytes sulcifrons* (A.Costa, 1867) | 1 | | | | | | | | | | N | |
| | | *Harpactus morawitzi* Radoszkowski, 1884 | 1 | | | | | | | | | | N | |
| | Lestica | *Lestica alata* (Panzer, 1797) | 9 | * | | | | * | | * | | * | * | |
| | | *Lestica clypeata* (Schreber, 1759) | 35 | * | | * | | | | | * | | | * |
| | Lindenius | *Lindenius albilabris* (Fabricius,1793) | 4 | | * | | | | | | | | * | |
| | *Mimumesa* | *Mimumesa unicolor* (Vander Linden,1829) | 3 | | | | | | | | | | | * |
| | *Miscophus* | *Miscophus ater* Lepeletier,1845 | 10 | | | | | | | | | | * | |
| | | *Miscophus bicolor* Jurine, 1807 | 1 | * | | | | | | | | | * | |
| | Nysson | *Nysson dimidiatus* Jurine, 1807 | 1 | | | | | | | | | | Clep | |
| | | *Nysson interruptus* (Fabricius,1798) | 1 | | | | | | | | | | Clep | |
| | | *Nysson maculatus* (Fabricius, 1787) | 3 | * | | | | * | | | | | Clep | |
| | | *Nysson niger* Chevrier, 1868 | 5 | | | | | | | | | | Clep | |
| | | *Nysson spinosus* (J.Forster, 1771) | 12 | | | | | * | | | | | Clep | |
| | | *Nysson trimaculatus* (Rossi,1790) | 3 | | | | | | | | | | Clep | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crabronidae | Oxybelus | *Oxybelus argentatus* Curtis, 1833 | 1 | * | | | | | | | | | | * | |
| | | *Oxybelus haemorrhoidalis* Olivier, 1812 | 1 | | | | | | | | | | | * | |
| | | *Oxybelus latro* Olivier, 1812 | 6 | | * | | | | | | | | | N | |
| | | *Oxybelus mandibularis* Dahlbom,1845 | 2 | | * | | | | | | | | | N | |
| | | *Oxybelus mucronatus* (Fabricius, 1793) | 7 | | | | | | | | | | | N | |
| | | *Oxybelus variegatus* Wesmael, 1852 | 1 | | | | | | | | | | | * | |
| | Palarus | *Palarus variegatus* (Fabricius, 1781) | 1 | | | | | | | | | | | * | |
| | Passaloecus | *Passaloecus borealis* Dahlbom, 1844 | 6 | | | | | | | | | | | N | |
| | | *Passaloecus gracilis* (Curtis,1834) | 5 | | | | | | | | | | | | * |
| | | *Passaloecus corniger* Shuckard, 1837 | 1 | | | | | | | | | | | | * |
| | | *Passaloecus singularis* Dahlbom, 1844 | 4 | | | | | | | | | | | | * |
| | Pemphredon | *Pemphredon inornata* Say,1824 | 11 | | | | | | | | | | | | * |
| | | *Pemphredon lethifer* (Shuckard, 1837) | 59 | | | | | | | | | | | | * |
| | | *Pemphredon lugubris* (Fabricius,1793) | 1 | | | | | | | | | | | | * |
| | Pemphredon | *Pemphredon rugifer* (Dahlbom, 1844) | 2 | | | | | | | | | | | N | |
| | Philanthus | *Philanthus triangulum* (Fabricius,1775) | 3 | | | | | | | | | | | * | |
| | Psenulus | *Psenulus concolor* (Dahlbom, 1843) | 3 | | | | | | | | | | | | * |
| | | *Psenulus fuscipennis* (Dahlbom, 1843) | 2 | | | | | | | | | | | | * |
| | Tachysphex | *Tachysphex fulvitarsis* (A.Costa, 1867) | 1 | | | | | | | | | | | * | |
| | | *Tachysphex helveticus* Kohl, 1885 | 1 | | | | | | | | | | | * | |
| | | *Tachysphex incertus* (Radoszkowski, 1877) | 4 | | | | | | | | | | | N | |
| | | *Tachysphex obscuripennis* (Schenck, 1857) | 34 | | | | | | | | | | | * | |
| | | *Tachysphex nitidior* de Beaumont, 1940 | 1 | | | | | | | | | | | N | |
| | | *Tachysphex panzeri* (Vander Linden, 1829) | 1 | | * | | | | | | | | | * | |
| | | *Tachysphex pompiliformis* (Panzer,1805) | 1 | | | | | | | | | | | * | |

| | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Crabronidae | Trypoxylon | *Trypoxylon attenuatum* Smith,1851 | 1 | | | | | | | | | | | | * |
| | | *Trypoxylon clavicerum* Lepeletier & Serville,1828 | 1 | | | | | | | | | | | | * |
| | | *Trypoxylon figulus* (Linnaeus, 1758) | 6 | | | | | | | | | | | | * |
| | | *Trypoxylon fronticorne*, Gussakowskij, 1936 | 38 | | | | | | | | | | | | * |
| Sphecidae | Ammophila | *Ammophila campestris* Latreille, 1809 | 3 | | * | * | | | | | | | | * | |
| | | *Ammophila hungarica* Mocsáry, 1883 | 2 | | | | | * | | * | | | | * | |
| | | *Ammophila pubescens* Curtis, 1836 | 6 | | * | | | | | | | | | * | |
| | | *Ammophila sabulosa* (Linnaeus, 1758) | 37 | * | * | | * | | * | | | | | * | |
| | *Podalonia* | *Podalonia affinis* (W.Kirby, 1798) | 1 | | | | | | | | | | | * | |
| | Sceliphron | *Sceliphron destillatorium* (Illiger, 1807) | 1 | | | | | | | | | | | | * |
| | | *Sceliphron curvatum* (F.Smith, 1870) | nests | | | | | | | | | | | | * |
| | Sphex | *Sphex funerarius* Gussakovskij, 1934 | 3 | | * | | | | | | | | | * | |

**Notes:** I – Apiaceae; II – Lamiaceae; III – Asteraceae; IV – Brassicaceae; V – Rosaceae; VI – Ericaceae; VII –Campanulaceae; VIII – Rhamnaceae; IX – Caprifoliaceae; X – Hypericaceae; un. – nests underground; ab. – nests above ground

The largest number of wasp species, namely 19, were caught on a planti of the family Apiaceae. A significant part of wasp species, namely 13, fed on plants of the family Lamiaceae.

Of all the species recorded, 35 form burrows, mainly in loose, sandy soils. The rest of the species nest by creating tunnels in dead wood or in hollow plant stalks, or by building jugs out of soil [23, 24]. Six species, in particular members of the genus *Nysson*, are kleptoparasites. On the other hand, there are no data on the nesting site for 13 species of wasp.

## Conclusions

The modern species list of wasps of the Crabronidae and Sphecidae families in the territory of the Rivne Nature Reserve includes 81 species of 27 genera. 78 species of wasps were recorded for the first time on the territory of the reserve and two species of wasps, namely *D. lineata* and *P. borealis* – were recorded for the first time on the territory of Ukraine.

The highest Margalef index (species diversity) value is observed for biotope Д2.2.1 (Lichen Scots pine forests) – 8.32.

As a result of the comparison of the species diversity of different biotopes (Chekanovsky-Sorensen coefficient), the greatest similarity was found between biotopes Д1.7.2 (Bogs with layer of birch) and Б2.1.1 (Sedge calcareous fens without sphagnum mosses) (the coefficient is 0.57) and between Д2.5.2 (Bogs witha layer of pine) and Д1.7.2 (Bogs with layer of birch) (the coefficient is 0.57).

Of all the species caught, 35 were caught directly on angiosperms belonging to 10 families: Apiaceae, Lamiaceae, Asteraceae, Brassicaceae, Rosaceae, Ericaceae, Campanulaceae, Rhamnaceae, Caprifoliaceae та Hypericaceae. The largest number of wasp species (19 species) were caught on plants of the family Apiaceae.

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## РИЙНІ ОСИ (APOIDEA: CRABRONIDAE ТА SPHECIDAE) РІВНЕНСЬКОГО ПРИРОДНОГО ЗАПОВІДНИКА ТА ЇХНІЙ БІОТОПНИЙ РОЗПОДІЛ

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Представлено перелік рийних ос Рівненського природного заповідника, зібраних на території усіх чотирьох масивів: “Білоозерський”, “Сомине”, “Сира Погоня” та “Переброди”; шести природоохоронних науково-дослідних відділень (ПНДВ): Білоозерське, Карасинське, Більське, Грабунське, Старосільське та Північне. Ос родин Crabronidae та Sphecidae ловили упродовж вегетаційних періодів 2021–2024 рр. за допомогою ентомологічного сачка, пасток Меріке та гнізд-пасток з очерету. Проаналізовано 486 екземплярів ос родин Crabronidae та Sphecidae з 81 виду, що належать до 27 родів: *Bembecinus* (2), *Bembix* (1), *Cerceris* (7), *Crabro* (2), *Dryudella* (1), *Crossocerus* (3), *Diodontus* (2), *Ectemnius* (9), *Gorytes* (4), *Harpactus* (1), *Lestica* (2), *Lindenius* (1), *Mimumesa* (1), *Miscophus* (2), *Nysson* (6), *Oxybelus* (6), *Palarus* (1), *Passaloecus* (4), *Pemphredon* (4), *Philanthus* (1), *Psenulus* (2), *Tachysphex* (7), *Trypoxylon* (4), *Ammophila* (4), *Podalonia* (1), *Sceliphron* (2), *Sphex* (1 вид). Із 81 зловлених видів 78 уперше зареєстрували для території заповідника.

Серед виявлених видів один – сфекс рудуватий (*Sphex funerarius* Gussakovskij, 1934) – занесено до Червоної книги України під статусом “Неоцінений”. Види *Dryudella lineata* Mocsáry, 1879 та *Passaloecus borealis* Dahlbom, 1844 вперше зареєстровано на території України. Також знайдено гнізда інвазивного виду ос для

України – пелопея вигнутого (*Sceliphron curvatum* (F.Smith, 1870)). Імаго виявлено не було. 35 видів ос зловили безпосередньо на покритонасінних рослинах із десяти родин: Apiaceae (6 видів), Lamiaceae (1), Asteraceae (5), Brassicaceae (1), Rosaceae (2), Ericaceae (1), Campanulaceae (1), Rhamnaceae (1), Caprifoliaceae (1) та Hypericaceae (1). Найбільше видів ос, а саме 13, зловили на чебреці повзучому (*Thymus serpyllum* L., 1753).

Увесь зібраний матеріал зберігається в ентомологічній колекції Зоологічного музею Львівського національного університету імені Івана Франка (ZMD).

*Ключові слова:* Apoidea: Crabronidae та Sphecidae, біорізноманіття, перелік видів, запилення, біотопний розподіл